

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

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TestAmerica Job ID: 580-79389-2

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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Authorized for release by:  
8/31/2018 12:38:23 PM

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

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

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# Case Narrative

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

TestAmerica Job ID: 580-79389-2

**Job ID: 580-79389-2**

**Laboratory: TestAmerica Seattle**

## Narrative

### CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-79389-2

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**

Twenty-four samples were received on 8/6/2018 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 2.4° C, 3.0° C and 4.3° C.

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-SC-S203-0to2 (580-79389-1), PDI-SC-S203-4to6 (580-79389-2), PDI-SC-S203-12to13.8 (580-79389-3), PDI-SC-S203-2to4 (580-79389-4), PDI-SC-S203-8to10 (580-79389-5), PDI-SC-S203-10to12 (580-79389-6), PDI-SC-S257-0to2 (580-79389-7), PDI-SC-S257-2to4 (580-79389-8), PDI-SC-S257-4to6 (580-79389-9), PDI-SC-S257-6to8 (580-79389-10), PDI-SC-S257-6to8D (580-79389-11), PDI-SC-S257-8to10 (580-79389-12), PDI-SC-S257-10to12 (580-79389-13), PDI-SC-S257-12to14.2 (580-79389-14), PDI-SC-S203-6to8 (580-79389-15), PDI-SC-S254-10to12 (580-79389-16), PDI-SC-S254-0.3to2 (580-79389-17), PDI-SC-S254-14to15.4 (580-79389-18), PDI-SC-S254-2to4 (580-79389-19), PDI-SC-S254-8to10 (580-79389-20), PDI-SC-S254-4to6 (580-79389-21), PDI-SC-S254-6to8 (580-79389-22) and PDI-SC-S254-12to14 (580-79389-23) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 08/17/2018 and analyzed on 08/22/2018, 08/23/2018, 08/24/2018 and 08/25/2018.**

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD and OCDD were detected in method blank MB 320-240515/1-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.

Several analytes were detected in method blank MB 320-240531/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SC-S203-0to2 (580-79389-1), (CCV 320-241645/14), (LCS 320-240515/2-A), (LCSD

# Case Narrative

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### Laboratory: TestAmerica Seattle (Continued)

320-240515/3-A), (MB 320-240515/1-A), PDI-SC-S203-4to6 (580-79389-2), PDI-SC-S203-12to13.8 (580-79389-3), PDI-SC-S203-2to4 (580-79389-4), PDI-SC-S203-8to10 (580-79389-5), PDI-SC-S203-10to12 (580-79389-6), PDI-SC-S257-0to2 (580-79389-7), (CCV 320-241791/43), PDI-SC-S257-2to4 (580-79389-8), PDI-SC-S257-6to8 (580-79389-10), PDI-SC-S257-6to8D (580-79389-11), PDI-SC-S257-8to10 (580-79389-12), PDI-SC-S254-2to4 (580-79389-19), PDI-SC-S254-8to10 (580-79389-20), (CCV 320-241944/2), PDI-SC-S254-4to6 (580-79389-21), PDI-SC-S254-6to8 (580-79389-22), PDI-SC-S254-12to14 (580-79389-23), (CCV 320-241214/46), (LCS 320-240531/2-A), (LCSD 320-240531/3-A), (MB 320-240531/1-A), (CCV 320-239903/2), (LCS 320-238927/2-A), (LCSD 320-238927/3-A) and (MB 320-238927/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: PDI-SC-S203-0to2 (580-79389-1), PDI-SC-S203-2to4 (580-79389-4), PDI-SC-S257-2to4 (580-79389-8), PDI-SC-S257-4to6 (580-79389-9), PDI-SC-S257-6to8 (580-79389-10), PDI-SC-S257-6to8D (580-79389-11), PDI-SC-S257-8to10 (580-79389-12), PDI-SC-S257-10to12 (580-79389-13), PDI-SC-S257-12to14.2 (580-79389-14), PDI-SC-S254-10to12 (580-79389-16), PDI-SC-S254-0.3to2 (580-79389-17), PDI-SC-S254-14to15.4 (580-79389-18), PDI-SC-S254-2to4 (580-79389-19), PDI-SC-S254-8to10 (580-79389-20), PDI-SC-S254-4to6 (580-79389-21), PDI-SC-S254-6to8 (580-79389-22) and PDI-SC-S254-12to14 (580-79389-23). These analytes have been qualified; however, the peaks 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.

The following samples exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): PDI-SC-S203-2to4 (580-79389-4), PDI-SC-S257-4to6 (580-79389-9), PDI-SC-S257-6to8D (580-79389-11), PDI-SC-S257-10to12 (580-79389-13), PDI-SC-S257-12to14.2 (580-79389-14), PDI-SC-S254-10to12 (580-79389-16), PDI-SC-S254-0.3to2 (580-79389-17), PDI-SC-S254-14to15.4 (580-79389-18), PDI-SC-S254-2to4 (580-79389-19), PDI-SC-S254-8to10 (580-79389-20), and PDI-SC-S254-6to8 (580-79389-22). 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 sample is below the method recommended limit: PDI-SC-S203-8to10 (580-79389-5), PDI-SC-S203-10to12 (580-79389-6), PDI-SC-S257-4to6 (580-79389-9), PDI-SC-S257-6to8 (580-79389-10), PDI-SC-S257-8to10 (580-79389-12), PDI-SC-S257-10to12 (580-79389-13) and PDI-SC-S254-10to12 (580-79389-16). 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. All detection limits are below the lower calibration.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SC-S203-0to2 (580-79389-1), PDI-SC-S203-4to6 (580-79389-2), PDI-SC-S203-12to13.8 (580-79389-3), PDI-SC-S203-2to4 (580-79389-4), PDI-SC-S203-8to10 (580-79389-5), PDI-SC-S203-10to12 (580-79389-6), PDI-SC-S257-0to2 (580-79389-7), PDI-SC-S257-2to4 (580-79389-8), PDI-SC-S257-4to6 (580-79389-9), PDI-SC-S257-6to8 (580-79389-10), PDI-SC-S257-6to8D (580-79389-11), PDI-SC-S257-8to10 (580-79389-12), PDI-SC-S257-10to12 (580-79389-13), PDI-SC-S257-12to14.2 (580-79389-14), PDI-SC-S203-6to8 (580-79389-15), PDI-SC-S254-10to12 (580-79389-16), PDI-SC-S254-0.3to2 (580-79389-17), PDI-SC-S254-14to15.4 (580-79389-18), PDI-SC-S254-2to4 (580-79389-19), PDI-SC-S254-8to10 (580-79389-20), PDI-SC-S254-4to6 (580-79389-21), PDI-SC-S254-6to8 (580-79389-22) and PDI-SC-S254-12to14 (580-79389-23). The reporting limits (RLs) have been adjusted proportionately.

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

### **DIOXIN/ FURAN - RINSE BLANK**

**Sample PDI-RB-SS-180806-1100 (580-79389-24) was analyzed for Dioxin/ Furan in accordance with 1613B.** The sample was prepared on 08/09/2018 and analyzed on 08/15/2018.

Several analytes were detected in method blank MB 320-238927/1-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 associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-RB-SS-180806-1100 (580-79389-24) and (CCV 320-239905/16). 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

# Case Narrative

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

TestAmerica Job ID: 580-79389-2

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## Job ID: 580-79389-2 (Continued)

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### Laboratory: TestAmerica Seattle (Continued)

analytes. System retention times have been updated for proper analyte identification.

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

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# Definitions/Glossary

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

TestAmerica Job ID: 580-79389-2

## 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.
E	Result exceeded calibration range.
*	Isotope Dilution analyte is outside acceptance limits.
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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 Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-0to2**

**Lab Sample ID: 580-79389-1**

Date Collected: 08/03/18 14:05

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 43.1

## 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	1.0	B	0.0057	0.0036	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,4,6,7,8-HpCDF	0.45	B	0.0057	0.0036	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,4,7,8,9-HpCDF	0.025	B	0.0057	0.0051	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,4,7,8-HxCDD	0.0046	J B	0.0057	0.00092	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,4,7,8-HxCDF	0.048		0.0057	0.0040	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,6,7,8-HxCDD	0.037		0.0057	0.00086	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,6,7,8-HxCDF	0.011		0.0057	0.0040	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,7,8,9-HxCDD	0.0085		0.0057	0.00082	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,7,8,9-HxCDF	ND		0.0057	0.0021	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,7,8-PeCDD	0.0021	J	0.0057	0.00048	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
1,2,3,7,8-PeCDF	0.0034	J	0.0057	0.00061	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
2,3,4,6,7,8-HxCDF	0.0055	J	0.0057	0.0030	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
2,3,4,7,8-PeCDF	0.0057		0.0057	0.00070	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
2,3,7,8-TCDD	0.0013		0.0011	0.000072	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
OCDD	10	E B	0.011	0.0029	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1
OCDF	2.1		0.011	0.00045	ug/Kg	☼	08/17/18 11:36	08/23/18 16:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	43		23 - 140	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,4,6,7,8-HpCDF	40		28 - 143	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,4,7,8,9-HpCDF	32		26 - 138	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,4,7,8-HxCDD	49		32 - 141	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,4,7,8-HxCDF	50		26 - 152	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,6,7,8-HxCDD	50		28 - 130	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,6,7,8-HxCDF	52		26 - 123	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,7,8,9-HxCDF	50		29 - 147	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,7,8-PeCDD	53		25 - 181	08/17/18 11:36	08/23/18 16:21	1
13C-1,2,3,7,8-PeCDF	49		24 - 185	08/17/18 11:36	08/23/18 16:21	1
13C-2,3,4,6,7,8-HxCDF	52		28 - 136	08/17/18 11:36	08/23/18 16:21	1
13C-2,3,4,7,8-PeCDF	49		21 - 178	08/17/18 11:36	08/23/18 16:21	1
13C-2,3,7,8-TCDD	53		25 - 164	08/17/18 11:36	08/23/18 16:21	1
13C-OCDD	32		17 - 157	08/17/18 11:36	08/23/18 16:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	122		35 - 197	08/17/18 11:36	08/23/18 16:21	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	0.0066		0.0011	0.00077	ug/Kg	☼	08/17/18 11:36	08/24/18 17:23	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	52		24 - 169	08/17/18 11:36	08/24/18 17:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	115		35 - 197	08/17/18 11:36	08/24/18 17:23	1

TestAmerica Seattle



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-4to6**

**Lab Sample ID: 580-79389-2**

Date Collected: 08/03/18 14:15

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 69.2

**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	0.057	B	0.0035	0.00047	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,4,6,7,8-HpCDF	0.029	B	0.0035	0.00050	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,4,7,8,9-HpCDF	0.0020	J B	0.0035	0.00046	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,4,7,8-HxCDD	0.00054	J B	0.0035	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,4,7,8-HxCDF	0.0029	J	0.0035	0.00042	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,6,7,8-HxCDD	0.0020	J	0.0035	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,6,7,8-HxCDF	0.0012	J	0.0035	0.00044	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,7,8,9-HxCDD	0.0011	J	0.0035	0.00012	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,7,8,9-HxCDF	ND		0.0035	0.00021	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,7,8-PeCDD	ND		0.0035	0.00011	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
1,2,3,7,8-PeCDF	0.00032	J	0.0035	0.00015	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
2,3,4,6,7,8-HxCDF	ND		0.0035	0.00032	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
2,3,4,7,8-PeCDF	0.00037	J	0.0035	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
2,3,7,8-TCDD	ND		0.00070	0.000022	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
2,3,7,8-TCDF	0.00049	J	0.00070	0.000071	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
OCDD	0.63	B	0.0070	0.00029	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1
OCDF	0.12		0.0070	0.000086	ug/Kg	☼	08/17/18 11:36	08/24/18 03:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	34		23 - 140	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,4,6,7,8-HpCDF	28		28 - 143	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,4,7,8,9-HpCDF	34		26 - 138	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,4,7,8-HxCDD	36		32 - 141	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,4,7,8-HxCDF	37		26 - 152	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,6,7,8-HxCDD	38		28 - 130	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,6,7,8-HxCDF	37		26 - 123	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,7,8,9-HxCDF	42		29 - 147	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,7,8-PeCDD	39		25 - 181	08/17/18 11:36	08/24/18 03:59	1
13C-1,2,3,7,8-PeCDF	39		24 - 185	08/17/18 11:36	08/24/18 03:59	1
13C-2,3,4,6,7,8-HxCDF	39		28 - 136	08/17/18 11:36	08/24/18 03:59	1
13C-2,3,4,7,8-PeCDF	42		21 - 178	08/17/18 11:36	08/24/18 03:59	1
13C-2,3,7,8-TCDD	52		25 - 164	08/17/18 11:36	08/24/18 03:59	1
13C-2,3,7,8-TCDF	52		24 - 169	08/17/18 11:36	08/24/18 03:59	1
13C-OCDD	22		17 - 157	08/17/18 11:36	08/24/18 03:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	123		35 - 197	08/17/18 11:36	08/24/18 03:59	1



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-12to13.8**

**Lab Sample ID: 580-79389-3**

**Date Collected: 08/03/18 14:35**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 70.2**

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>0.0011</b>	<b>J B</b>	0.0035	0.00011	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.00025</b>	<b>J B q</b>	0.0035	0.000082	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,4,7,8,9-HpCDF	ND		0.0035	0.000073	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
<b>1,2,3,4,7,8-HxCDD</b>	<b>0.000092</b>	<b>J B q</b>	0.0035	0.000066	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,4,7,8-HxCDF	ND		0.0035	0.000057	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,6,7,8-HxCDD	ND		0.0035	0.000063	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,6,7,8-HxCDF	ND		0.0035	0.000061	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,7,8,9-HxCDD	ND		0.0035	0.000059	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.000079</b>	<b>J</b>	0.0035	0.000030	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,7,8-PeCDD	ND		0.0035	0.000031	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
1,2,3,7,8-PeCDF	ND		0.0035	0.000024	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
2,3,4,6,7,8-HxCDF	ND		0.0035	0.000045	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
2,3,4,7,8-PeCDF	ND		0.0035	0.000024	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
2,3,7,8-TCDD	ND		0.00070	0.000013	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
2,3,7,8-TCDF	ND		0.00070	0.000010	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
<b>OCDD</b>	<b>0.017</b>	<b>B</b>	0.0070	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1
<b>OCDF</b>	<b>0.0013</b>	<b>J</b>	0.0070	0.000045	ug/Kg	☼	08/17/18 11:36	08/24/18 04:45	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	35		23 - 140	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,4,6,7,8-HpCDF	28		28 - 143	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,4,7,8,9-HpCDF	37		26 - 138	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,4,7,8-HxCDD	37		32 - 141	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,4,7,8-HxCDF	38		26 - 152	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,6,7,8-HxCDD	40		28 - 130	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,6,7,8-HxCDF	38		26 - 123	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,7,8,9-HxCDF	43		29 - 147	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,7,8-PeCDD	42		25 - 181	08/17/18 11:36	08/24/18 04:45	1
13C-1,2,3,7,8-PeCDF	41		24 - 185	08/17/18 11:36	08/24/18 04:45	1
13C-2,3,4,6,7,8-HxCDF	40		28 - 136	08/17/18 11:36	08/24/18 04:45	1
13C-2,3,4,7,8-PeCDF	44		21 - 178	08/17/18 11:36	08/24/18 04:45	1
13C-2,3,7,8-TCDD	57		25 - 164	08/17/18 11:36	08/24/18 04:45	1
13C-2,3,7,8-TCDF	55		24 - 169	08/17/18 11:36	08/24/18 04:45	1
13C-OCDD	22		17 - 157	08/17/18 11:36	08/24/18 04:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	125		35 - 197	08/17/18 11:36	08/24/18 04:45	1

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-2to4**

**Lab Sample ID: 580-79389-4**

Date Collected: 08/03/18 14:10

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 51.9

**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	1.3	B	0.0047	0.0038	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,6,7,8-HpCDF	0.58	G B	0.0057	0.0057	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8,9-HpCDF	0.043	G B	0.013	0.013	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8-HxCDD	0.0070	B	0.0047	0.00093	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8-HxCDF	0.055	G	0.0050	0.0050	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,6,7,8-HxCDD	0.044		0.0047	0.00091	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,6,7,8-HxCDF	0.014	G	0.0052	0.0052	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8,9-HxCDD	0.010		0.0047	0.00084	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8,9-HxCDF	ND		0.0047	0.0025	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8-PeCDD	ND		0.0047	0.0011	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8-PeCDF	0.0034	J	0.0047	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,4,6,7,8-HxCDF	0.0044	J q	0.0047	0.0033	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,4,7,8-PeCDF	0.0057		0.0047	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,7,8-TCDD	0.0025		0.00094	0.000095	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
OCDD	13	E B	0.0094	0.0031	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
OCDF	3.0		0.0094	0.00059	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	31		23 - 140	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,6,7,8-HpCDF	27	*	28 - 143	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8,9-HpCDF	19	*	26 - 138	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8-HxCDD	46		32 - 141	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8-HxCDF	47		26 - 152	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,6,7,8-HxCDD	44		28 - 130	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,6,7,8-HxCDF	45		26 - 123	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8,9-HxCDF	47		29 - 147	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8-PeCDD	51		25 - 181	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8-PeCDF	46		24 - 185	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,4,6,7,8-HxCDF	47		28 - 136	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,4,7,8-PeCDF	49		21 - 178	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,7,8-TCDD	49		25 - 164	08/17/18 11:36	08/24/18 05:31	1
13C-OCDD	20		17 - 157	08/17/18 11:36	08/24/18 05:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	107		35 - 197	08/17/18 11:36	08/24/18 05:31	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	0.0045		0.00094	0.00039	ug/Kg	☼	08/17/18 11:36	08/24/18 18:01	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	61		24 - 169	08/17/18 11:36	08/24/18 18:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	134		35 - 197	08/17/18 11:36	08/24/18 18:01	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-8to10**

**Lab Sample ID: 580-79389-5**

Date Collected: 08/03/18 14:25

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 67.8

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>0.0016</b>	<b>J B</b>	0.0037	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.00024</b>	<b>J B q</b>	0.0037	0.000098	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.000089	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,4,7,8-HxCDD	ND		0.0037	0.000071	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.000074	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,6,7,8-HxCDD	ND		0.0037	0.000071	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.000076	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,7,8,9-HxCDD	ND		0.0037	0.000065	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.00012</b>	<b>J</b>	0.0037	0.000036	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,7,8-PeCDD	ND		0.0037	0.000037	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
1,2,3,7,8-PeCDF	ND		0.0037	0.000019	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.000055	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000019	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
2,3,7,8-TCDD	ND		0.00073	0.000033	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
2,3,7,8-TCDF	ND		0.00073	0.000011	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
<b>OCDD</b>	<b>0.021</b>	<b>B</b>	0.0073	0.00020	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1
<b>OCDF</b>	<b>0.0018</b>	<b>J</b>	0.0073	0.000079	ug/Kg	☼	08/17/18 11:36	08/24/18 06:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	31		23 - 140	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,4,6,7,8-HpCDF	25 *		28 - 143	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,4,7,8,9-HpCDF	33		26 - 138	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,4,7,8-HxCDD	37		32 - 141	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,4,7,8-HxCDF	37		26 - 152	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,6,7,8-HxCDD	37		28 - 130	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,6,7,8-HxCDF	37		26 - 123	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,7,8,9-HxCDF	44		29 - 147	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,7,8-PeCDD	43		25 - 181	08/17/18 11:36	08/24/18 06:17	1
13C-1,2,3,7,8-PeCDF	42		24 - 185	08/17/18 11:36	08/24/18 06:17	1
13C-2,3,4,6,7,8-HxCDF	40		28 - 136	08/17/18 11:36	08/24/18 06:17	1
13C-2,3,4,7,8-PeCDF	46		21 - 178	08/17/18 11:36	08/24/18 06:17	1
13C-2,3,7,8-TCDD	58		25 - 164	08/17/18 11:36	08/24/18 06:17	1
13C-2,3,7,8-TCDF	56		24 - 169	08/17/18 11:36	08/24/18 06:17	1
13C-OCDD	18		17 - 157	08/17/18 11:36	08/24/18 06:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	121		35 - 197	08/17/18 11:36	08/24/18 06:17	1

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-10to12**

**Lab Sample ID: 580-79389-6**

**Date Collected: 08/03/18 14:30**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 68.1**

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>0.0015</b>	<b>J B</b>	0.0037	0.00014	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.00027</b>	<b>J B q</b>	0.0037	0.00015	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.00014	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
<b>1,2,3,4,7,8-HxCDD</b>	<b>0.00011</b>	<b>J B q</b>	0.0037	0.000074	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.000060	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,6,7,8-HxCDD	ND		0.0037	0.000075	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.000063	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,7,8,9-HxCDD	ND		0.0037	0.000068	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
<b>1,2,3,7,8,9-HxCDF</b>	<b>0.000083</b>	<b>J</b>	0.0037	0.000029	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,7,8-PeCDD	ND		0.0037	0.000038	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
1,2,3,7,8-PeCDF	ND		0.0037	0.000020	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.000047	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000020	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
2,3,7,8-TCDD	ND		0.00073	0.000020	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
2,3,7,8-TCDF	ND		0.00073	0.0000095	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
<b>OCDD</b>	<b>0.021</b>	<b>B</b>	0.0073	0.00017	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1
<b>OCDF</b>	<b>0.0012</b>	<b>J</b>	0.0073	0.000060	ug/Kg	☼	08/17/18 11:36	08/24/18 07:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	29		23 - 140	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,4,6,7,8-HpCDF	23 *		28 - 143	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,4,7,8,9-HpCDF	31		26 - 138	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,4,7,8-HxCDD	33		32 - 141	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,4,7,8-HxCDF	32		26 - 152	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,6,7,8-HxCDD	33		28 - 130	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,6,7,8-HxCDF	33		26 - 123	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,7,8,9-HxCDF	41		29 - 147	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,7,8-PeCDD	40		25 - 181	08/17/18 11:36	08/24/18 07:03	1
13C-1,2,3,7,8-PeCDF	40		24 - 185	08/17/18 11:36	08/24/18 07:03	1
13C-2,3,4,6,7,8-HxCDF	36		28 - 136	08/17/18 11:36	08/24/18 07:03	1
13C-2,3,4,7,8-PeCDF	44		21 - 178	08/17/18 11:36	08/24/18 07:03	1
13C-2,3,7,8-TCDD	57		25 - 164	08/17/18 11:36	08/24/18 07:03	1
13C-2,3,7,8-TCDF	57		24 - 169	08/17/18 11:36	08/24/18 07:03	1
13C-OCDD	17		17 - 157	08/17/18 11:36	08/24/18 07:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	126		35 - 197	08/17/18 11:36	08/24/18 07:03	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-0to2**

**Lab Sample ID: 580-79389-7**

Date Collected: 08/06/18 09:40

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 54.7

**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	0.082	B	0.0046	0.00079	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,4,6,7,8-HpCDF	0.015	B	0.0046	0.00069	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,4,7,8,9-HpCDF	ND		0.0046	0.00068	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,4,7,8-HxCDD	0.00059	J B	0.0046	0.00017	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,4,7,8-HxCDF	0.0015	J	0.0046	0.00020	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,6,7,8-HxCDD	0.0031	J q	0.0046	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,6,7,8-HxCDF	0.00088	J	0.0046	0.00022	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,7,8,9-HxCDD	0.0024	J	0.0046	0.00015	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,7,8,9-HxCDF	ND		0.0046	0.00011	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,7,8-PeCDD	0.00050	J	0.0046	0.000084	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
1,2,3,7,8-PeCDF	0.00039	J	0.0046	0.000097	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
2,3,4,6,7,8-HxCDF	0.00031	J q	0.0046	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
2,3,4,7,8-PeCDF	0.00043	J	0.0046	0.00010	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
2,3,7,8-TCDD	0.00022	J q	0.00092	0.000031	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
2,3,7,8-TCDF	0.00088	J	0.00092	0.000042	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
OCDD	0.86	B	0.0092	0.00031	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1
OCDF	0.060		0.0092	0.000063	ug/Kg	☼	08/17/18 11:36	08/24/18 09:48	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	44		23 - 140	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,4,6,7,8-HpCDF	38		28 - 143	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,4,7,8,9-HpCDF	44		26 - 138	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,4,7,8-HxCDD	43		32 - 141	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,4,7,8-HxCDF	45		26 - 152	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,6,7,8-HxCDD	47		28 - 130	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,6,7,8-HxCDF	46		26 - 123	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,7,8,9-HxCDF	50		29 - 147	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,7,8-PeCDD	46		25 - 181	08/17/18 11:36	08/24/18 09:48	1
13C-1,2,3,7,8-PeCDF	45		24 - 185	08/17/18 11:36	08/24/18 09:48	1
13C-2,3,4,6,7,8-HxCDF	48		28 - 136	08/17/18 11:36	08/24/18 09:48	1
13C-2,3,4,7,8-PeCDF	49		21 - 178	08/17/18 11:36	08/24/18 09:48	1
13C-2,3,7,8-TCDD	61		25 - 164	08/17/18 11:36	08/24/18 09:48	1
13C-2,3,7,8-TCDF	60		24 - 169	08/17/18 11:36	08/24/18 09:48	1
13C-OCDD	32		17 - 157	08/17/18 11:36	08/24/18 09:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	122		35 - 197	08/17/18 11:36	08/24/18 09:48	1

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-2to4**

**Lab Sample ID: 580-79389-8**

Date Collected: 08/06/18 09:45

Matrix: Solid

Date Received: 08/06/18 15:00

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	0.62	B	0.0044	0.0042	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,4,6,7,8-HpCDF	0.077	B	0.0044	0.00098	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,4,7,8,9-HpCDF	0.0060	B	0.0044	0.0011	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,4,7,8-HxCDD	0.0034	J q B	0.0044	0.00095	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,4,7,8-HxCDF	0.0065		0.0044	0.00098	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,6,7,8-HxCDD	0.018		0.0044	0.00093	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,6,7,8-HxCDF	0.0059		0.0044	0.00099	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,7,8,9-HxCDD	0.013		0.0044	0.00086	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,7,8,9-HxCDF	ND		0.0044	0.00054	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,7,8-PeCDD	0.0028	J	0.0044	0.00022	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
1,2,3,7,8-PeCDF	0.0011	J	0.0044	0.00051	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
2,3,4,6,7,8-HxCDF	0.0017	J q	0.0044	0.00080	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
2,3,4,7,8-PeCDF	0.0011	J	0.0044	0.00055	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
2,3,7,8-TCDD	0.0012		0.00087	0.000047	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
OCDD	7.9	E B	0.0087	0.0024	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1
OCDF	0.33		0.0087	0.00014	ug/Kg	☼	08/17/18 11:36	08/24/18 14:15	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	38		23 - 140	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,4,6,7,8-HpCDF	37		28 - 143	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,4,7,8,9-HpCDF	38		26 - 138	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,4,7,8-HxCDD	46		32 - 141	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,4,7,8-HxCDF	48		26 - 152	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,6,7,8-HxCDD	49		28 - 130	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,6,7,8-HxCDF	50		26 - 123	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,7,8,9-HxCDF	51		29 - 147	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,7,8-PeCDD	49		25 - 181	08/17/18 11:36	08/24/18 14:15	1
13C-1,2,3,7,8-PeCDF	50		24 - 185	08/17/18 11:36	08/24/18 14:15	1
13C-2,3,4,6,7,8-HxCDF	50		28 - 136	08/17/18 11:36	08/24/18 14:15	1
13C-2,3,4,7,8-PeCDF	52		21 - 178	08/17/18 11:36	08/24/18 14:15	1
13C-2,3,7,8-TCDD	58		25 - 164	08/17/18 11:36	08/24/18 14:15	1
13C-OCDD	26		17 - 157	08/17/18 11:36	08/24/18 14:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	125		35 - 197	08/17/18 11:36	08/24/18 14:15	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	0.00087		0.00087	0.00012	ug/Kg	☼	08/17/18 11:36	08/24/18 22:00	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	55		24 - 169	08/17/18 11:36	08/24/18 22:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	117		35 - 197	08/17/18 11:36	08/24/18 22:00	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-4to6**

**Lab Sample ID: 580-79389-9**

Date Collected: 08/06/18 09:50

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.3	G B	0.0059	0.0059	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,4,6,7,8-HpCDF	0.17	B	0.0043	0.0019	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,4,7,8,9-HpCDF	0.013	B	0.0043	0.0039	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,4,7,8-HxCDD	0.010	B	0.0043	0.0026	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,4,7,8-HxCDF	0.0067		0.0043	0.0042	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,6,7,8-HxCDD	0.048		0.0043	0.0026	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,6,7,8-HxCDF	0.011	q	0.0043	0.0039	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,7,8,9-HxCDD	0.041		0.0043	0.0024	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,7,8,9-HxCDF	ND		0.0043	0.0019	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,7,8-PeCDD	0.011		0.0043	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
1,2,3,7,8-PeCDF	0.0015	J	0.0043	0.00078	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
2,3,4,6,7,8-HxCDF	0.0029	J	0.0043	0.0027	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
2,3,4,7,8-PeCDF	ND		0.0043	0.00097	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
2,3,7,8-TCDD	0.0053		0.00087	0.000095	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
OCDD	17	G E B	0.025	0.025	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1
OCDF	0.83	B	0.0087	0.00032	ug/Kg	☼	08/17/18 13:00	08/22/18 03:24	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	30		23 - 140	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,4,6,7,8-HpCDF	28		28 - 143	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,4,7,8,9-HpCDF	25 *		26 - 138	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,4,7,8-HxCDD	40		32 - 141	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,4,7,8-HxCDF	41		26 - 152	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,6,7,8-HxCDD	42		28 - 130	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,6,7,8-HxCDF	43		26 - 123	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,7,8,9-HxCDF	46		29 - 147	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,7,8-PeCDD	47		25 - 181	08/17/18 13:00	08/22/18 03:24	1
13C-1,2,3,7,8-PeCDF	49		24 - 185	08/17/18 13:00	08/22/18 03:24	1
13C-2,3,4,6,7,8-HxCDF	45		28 - 136	08/17/18 13:00	08/22/18 03:24	1
13C-2,3,4,7,8-PeCDF	51		21 - 178	08/17/18 13:00	08/22/18 03:24	1
13C-2,3,7,8-TCDD	55		25 - 164	08/17/18 13:00	08/22/18 03:24	1
13C-OCDD	21		17 - 157	08/17/18 13:00	08/22/18 03:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	94		35 - 197	08/17/18 13:00	08/22/18 03:24	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	0.0016		0.00087	0.00034	ug/Kg	☼	08/17/18 13:00	08/23/18 14:18	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	56		24 - 169	08/17/18 13:00	08/23/18 14:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	91		35 - 197	08/17/18 13:00	08/23/18 14:18	1

TestAmerica Seattle



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-6to8**

**Lab Sample ID: 580-79389-10**

Date Collected: 08/06/18 09:55

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 58.1

**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	0.43	B	0.0042	0.0034	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,4,6,7,8-HpCDF	0.11	B	0.0042	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,4,7,8,9-HpCDF	0.0074	B	0.0042	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,4,7,8-HxCDD	0.0034	J B	0.0042	0.00044	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,4,7,8-HxCDF	0.0049		0.0042	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,6,7,8-HxCDD	0.015		0.0042	0.00040	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,6,7,8-HxCDF	0.0058		0.0042	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,7,8,9-HxCDD	0.0055		0.0042	0.00039	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,7,8,9-HxCDF	ND		0.0042	0.00060	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,7,8-PeCDD	0.0014	J	0.0042	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
1,2,3,7,8-PeCDF	0.00079	J	0.0042	0.00033	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
2,3,4,6,7,8-HxCDF	ND		0.0042	0.00094	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
2,3,4,7,8-PeCDF	0.0010	J	0.0042	0.00037	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
2,3,7,8-TCDD	0.00067	J	0.00085	0.000073	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
OCDD	8.6	E B	0.0085	0.0037	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1
OCDF	0.61		0.0085	0.00021	ug/Kg	☼	08/17/18 11:36	08/24/18 15:01	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	29		23 - 140	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,4,6,7,8-HpCDF	27	*	28 - 143	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,4,7,8,9-HpCDF	30		26 - 138	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,4,7,8-HxCDD	36		32 - 141	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,4,7,8-HxCDF	39		26 - 152	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,6,7,8-HxCDD	36		28 - 130	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,6,7,8-HxCDF	39		26 - 123	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,7,8,9-HxCDF	44		29 - 147	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,7,8-PeCDD	42		25 - 181	08/17/18 11:36	08/24/18 15:01	1
13C-1,2,3,7,8-PeCDF	44		24 - 185	08/17/18 11:36	08/24/18 15:01	1
13C-2,3,4,6,7,8-HxCDF	40		28 - 136	08/17/18 11:36	08/24/18 15:01	1
13C-2,3,4,7,8-PeCDF	46		21 - 178	08/17/18 11:36	08/24/18 15:01	1
13C-2,3,7,8-TCDD	52		25 - 164	08/17/18 11:36	08/24/18 15:01	1
13C-OCDD	18		17 - 157	08/17/18 11:36	08/24/18 15:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	126		35 - 197	08/17/18 11:36	08/24/18 15:01	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	0.00062	J	0.00085	0.00014	ug/Kg	☼	08/17/18 11:36	08/24/18 22:38	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	52		24 - 169	08/17/18 11:36	08/24/18 22:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	121		35 - 197	08/17/18 11:36	08/24/18 22:38	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-6to8D**

**Lab Sample ID: 580-79389-11**

Date Collected: 08/06/18 09:55

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.1

**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	0.56	B G	0.0055	0.0055	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,4,6,7,8-HpCDF	0.13	B	0.0043	0.0020	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,4,7,8,9-HpCDF	0.0091	B	0.0043	0.0022	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,4,7,8-HxCDD	0.0041	J B	0.0043	0.00055	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,4,7,8-HxCDF	0.0059		0.0043	0.0017	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,6,7,8-HxCDD	0.018		0.0043	0.00052	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,6,7,8-HxCDF	0.0064		0.0043	0.0016	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,7,8,9-HxCDD	0.0067		0.0043	0.00049	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,7,8,9-HxCDF	ND		0.0043	0.00093	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,7,8-PeCDD	0.0016	J	0.0043	0.00019	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
1,2,3,7,8-PeCDF	0.00093	J	0.0043	0.00042	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
2,3,4,6,7,8-HxCDF	0.0022	J	0.0043	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
2,3,4,7,8-PeCDF	0.0011	J	0.0043	0.00048	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
2,3,7,8-TCDD	0.00058	J q	0.00087	0.000055	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
OCDD	11	E B	0.0087	0.0042	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1
OCDF	0.75		0.0087	0.00022	ug/Kg	☼	08/17/18 11:36	08/24/18 15:47	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	36		23 - 140	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,4,6,7,8-HpCDF	34		28 - 143	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,4,7,8,9-HpCDF	35		26 - 138	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,4,7,8-HxCDD	40		32 - 141	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,4,7,8-HxCDF	41		26 - 152	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,6,7,8-HxCDD	42		28 - 130	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,6,7,8-HxCDF	44		26 - 123	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,7,8,9-HxCDF	43		29 - 147	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,7,8-PeCDD	40		25 - 181	08/17/18 11:36	08/24/18 15:47	1
13C-1,2,3,7,8-PeCDF	41		24 - 185	08/17/18 11:36	08/24/18 15:47	1
13C-2,3,4,6,7,8-HxCDF	43		28 - 136	08/17/18 11:36	08/24/18 15:47	1
13C-2,3,4,7,8-PeCDF	41		21 - 178	08/17/18 11:36	08/24/18 15:47	1
13C-2,3,7,8-TCDD	49		25 - 164	08/17/18 11:36	08/24/18 15:47	1
13C-OCDD	25		17 - 157	08/17/18 11:36	08/24/18 15:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	125		35 - 197	08/17/18 11:36	08/24/18 15:47	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	0.00066	J	0.00087	0.00014	ug/Kg	☼	08/17/18 11:36	08/24/18 23:16	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	46		24 - 169	08/17/18 11:36	08/24/18 23:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	127		35 - 197	08/17/18 11:36	08/24/18 23:16	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-8to10**

**Lab Sample ID: 580-79389-12**

Date Collected: 08/06/18 10:00

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 61.0

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.39	B	0.0041	0.0018	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,4,6,7,8-HpCDF	0.18	B	0.0041	0.0011	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,4,7,8,9-HpCDF	0.0058	B	0.0041	0.0016	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,4,7,8-HxCDD	0.0029	J B	0.0041	0.00038	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,4,7,8-HxCDF	0.0052		0.0041	0.0019	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,6,7,8-HxCDD	0.018		0.0041	0.00036	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,6,7,8-HxCDF	0.013		0.0041	0.0019	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,7,8,9-HxCDD	0.0063		0.0041	0.00034	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,7,8,9-HxCDF	ND		0.0041	0.00099	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,7,8-PeCDD	0.0016	J	0.0041	0.00017	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
1,2,3,7,8-PeCDF	0.0011	J	0.0041	0.00076	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
2,3,4,6,7,8-HxCDF	0.0026	J	0.0041	0.0015	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
2,3,4,7,8-PeCDF	0.0018	J	0.0041	0.00082	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
2,3,7,8-TCDD	0.00079	J	0.00082	0.000042	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
OCDD	5.8	E B	0.0082	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1
OCDF	0.47		0.0082	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 16:33	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	33		23 - 140	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,4,6,7,8-HpCDF	31		28 - 143	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,4,7,8,9-HpCDF	24 *		26 - 138	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,4,7,8-HxCDD	51		32 - 141	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,4,7,8-HxCDF	50		26 - 152	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,6,7,8-HxCDD	50		28 - 130	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,6,7,8-HxCDF	52		26 - 123	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,7,8,9-HxCDF	54		29 - 147	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,7,8-PeCDD	57		25 - 181	08/17/18 11:36	08/24/18 16:33	1
13C-1,2,3,7,8-PeCDF	56		24 - 185	08/17/18 11:36	08/24/18 16:33	1
13C-2,3,4,6,7,8-HxCDF	54		28 - 136	08/17/18 11:36	08/24/18 16:33	1
13C-2,3,4,7,8-PeCDF	57		21 - 178	08/17/18 11:36	08/24/18 16:33	1
13C-2,3,7,8-TCDD	64		25 - 164	08/17/18 11:36	08/24/18 16:33	1
13C-OCDD	21		17 - 157	08/17/18 11:36	08/24/18 16:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	127		35 - 197	08/17/18 11:36	08/24/18 16:33	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	0.00079	J	0.00082	0.00023	ug/Kg	☼	08/17/18 11:36	08/24/18 23:54	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	63		24 - 169	08/17/18 11:36	08/24/18 23:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	128		35 - 197	08/17/18 11:36	08/24/18 23:54	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-10to12**

**Lab Sample ID: 580-79389-13**

Date Collected: 08/06/18 10:05

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 63.5

**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	0.19	B G	0.0055	0.0055	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,4,6,7,8-HpCDF	0.088	B	0.0039	0.0029	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,4,7,8,9-HpCDF	0.0052	B	0.0039	0.0030	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,4,7,8-HxCDD	0.0014	J B	0.0039	0.00052	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,4,7,8-HxCDF	0.0035	J	0.0039	0.0015	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,6,7,8-HxCDD	0.0064		0.0039	0.00051	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,6,7,8-HxCDF	0.011		0.0039	0.0015	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,7,8,9-HxCDD	0.0035	J	0.0039	0.00048	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,7,8,9-HxCDF	ND		0.0039	0.00070	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,7,8-PeCDD	ND		0.0039	0.00030	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
1,2,3,7,8-PeCDF	0.0010	J	0.0039	0.00033	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
2,3,4,6,7,8-HxCDF	ND		0.0039	0.00080	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
2,3,4,7,8-PeCDF	0.00079	J q	0.0039	0.00033	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
2,3,7,8-TCDD	0.00085		0.00079	0.00026	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
OCDD	4.5	E B	0.0079	0.0047	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1
OCDF	0.29		0.0079	0.00073	ug/Kg	☼	08/17/18 11:36	08/24/18 01:29	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	26		23 - 140	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,4,6,7,8-HpCDF	20	*	28 - 143	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,4,7,8,9-HpCDF	29		26 - 138	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,4,7,8-HxCDD	29	*	32 - 141	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,4,7,8-HxCDF	25	*	26 - 152	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,6,7,8-HxCDD	29		28 - 130	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,6,7,8-HxCDF	24	*	26 - 123	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,7,8,9-HxCDF	33		29 - 147	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,7,8-PeCDD	39		25 - 181	08/17/18 11:36	08/24/18 01:29	1
13C-1,2,3,7,8-PeCDF	41		24 - 185	08/17/18 11:36	08/24/18 01:29	1
13C-2,3,4,6,7,8-HxCDF	29		28 - 136	08/17/18 11:36	08/24/18 01:29	1
13C-2,3,4,7,8-PeCDF	48		21 - 178	08/17/18 11:36	08/24/18 01:29	1
13C-2,3,7,8-TCDD	47		25 - 164	08/17/18 11:36	08/24/18 01:29	1
13C-OCDD	20		17 - 157	08/17/18 11:36	08/24/18 01:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	139		35 - 197	08/17/18 11:36	08/24/18 01:29	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	0.00047	J	0.00079	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 18:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	52		24 - 169	08/17/18 11:36	08/24/18 18:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	118		35 - 197	08/17/18 11:36	08/24/18 18:39	1

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-12to14.2**

**Lab Sample ID: 580-79389-14**

Date Collected: 08/06/18 10:10

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 60.7

## 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	0.27	B G	0.0053	0.0053	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,4,6,7,8-HpCDF	0.12	B	0.0042	0.0028	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,4,7,8,9-HpCDF	0.0064	B	0.0042	0.0039	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,4,7,8-HxCDD	0.0018	J B	0.0042	0.00039	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,4,7,8-HxCDF	0.0061		0.0042	0.0018	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,6,7,8-HxCDD	0.011		0.0042	0.00038	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,6,7,8-HxCDF	0.0083		0.0042	0.0016	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,7,8,9-HxCDD	0.0041	J	0.0042	0.00036	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,7,8,9-HxCDF	ND		0.0042	0.00090	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,7,8-PeCDD	0.0014	J	0.0042	0.00029	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
1,2,3,7,8-PeCDF	0.0010	J	0.0042	0.00043	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
2,3,4,6,7,8-HxCDF	0.0021	J	0.0042	0.00099	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
2,3,4,7,8-PeCDF	0.0014	J	0.0042	0.00043	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
2,3,7,8-TCDD	0.0028		0.00083	0.00018	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
OCDD	4.6	E B	0.0083	0.0031	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1
OCDF	0.45		0.0083	0.00067	ug/Kg	☼	08/17/18 11:36	08/24/18 02:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	45		23 - 140	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,4,6,7,8-HpCDF	38		28 - 143	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,4,7,8,9-HpCDF	45		26 - 138	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,4,7,8-HxCDD	47		32 - 141	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,4,7,8-HxCDF	41		26 - 152	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,6,7,8-HxCDD	46		28 - 130	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,6,7,8-HxCDF	39		26 - 123	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,7,8,9-HxCDF	50		29 - 147	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,7,8-PeCDD	55		25 - 181	08/17/18 11:36	08/24/18 02:17	1
13C-1,2,3,7,8-PeCDF	56		24 - 185	08/17/18 11:36	08/24/18 02:17	1
13C-2,3,4,6,7,8-HxCDF	45		28 - 136	08/17/18 11:36	08/24/18 02:17	1
13C-2,3,4,7,8-PeCDF	59		21 - 178	08/17/18 11:36	08/24/18 02:17	1
13C-2,3,7,8-TCDD	55		25 - 164	08/17/18 11:36	08/24/18 02:17	1
13C-OCDD	39		17 - 157	08/17/18 11:36	08/24/18 02:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	134		35 - 197	08/17/18 11:36	08/24/18 02:17	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	0.00064	J q	0.00083	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 19:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	58		24 - 169	08/17/18 11:36	08/24/18 19:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	117		35 - 197	08/17/18 11:36	08/24/18 19:17	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-6to8**

**Lab Sample ID: 580-79389-15**

Date Collected: 08/03/18 14:20

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 67.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>0.0017</b>	<b>J B</b>	0.0037	0.00018	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.00053</b>	<b>J B q</b>	0.0037	0.00013	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.00012	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,4,7,8-HxCDD	ND		0.0037	0.000098	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.00020	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,6,7,8-HxCDD	ND		0.0037	0.000096	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.00017	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,7,8,9-HxCDD	ND		0.0037	0.000090	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,7,8,9-HxCDF	ND		0.0037	0.000088	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,7,8-PeCDD	ND		0.0037	0.00011	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
1,2,3,7,8-PeCDF	ND		0.0037	0.000074	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.00011	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000070	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
2,3,7,8-TCDD	ND		0.00073	0.00010	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
2,3,7,8-TCDF	ND		0.00073	0.000055	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
<b>OCDD</b>	<b>0.022</b>	<b>B</b>	0.0073	0.00027	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1
<b>OCDF</b>	<b>0.0023</b>	<b>J</b>	0.0073	0.00035	ug/Kg	☼	08/17/18 11:36	08/24/18 03:06	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	36		23 - 140	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,4,6,7,8-HpCDF	30		28 - 143	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,4,7,8,9-HpCDF	42		26 - 138	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,4,7,8-HxCDD	39		32 - 141	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,4,7,8-HxCDF	32		26 - 152	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,6,7,8-HxCDD	36		28 - 130	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,6,7,8-HxCDF	31		26 - 123	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,7,8,9-HxCDF	41		29 - 147	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,7,8-PeCDD	45		25 - 181	08/17/18 11:36	08/24/18 03:06	1
13C-1,2,3,7,8-PeCDF	45		24 - 185	08/17/18 11:36	08/24/18 03:06	1
13C-2,3,4,6,7,8-HxCDF	34		28 - 136	08/17/18 11:36	08/24/18 03:06	1
13C-2,3,4,7,8-PeCDF	50		21 - 178	08/17/18 11:36	08/24/18 03:06	1
13C-2,3,7,8-TCDD	52		25 - 164	08/17/18 11:36	08/24/18 03:06	1
13C-2,3,7,8-TCDF	57		24 - 169	08/17/18 11:36	08/24/18 03:06	1
13C-OCDD	27		17 - 157	08/17/18 11:36	08/24/18 03:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	132		35 - 197	08/17/18 11:36	08/24/18 03:06	1

TestAmerica Seattle



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-10to12**

**Lab Sample ID: 580-79389-16**

Date Collected: 08/06/18 12:15

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.9

**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	0.73	G B	0.013	0.013	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,4,6,7,8-HpCDF	0.15	G B	0.0048	0.0048	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,4,7,8,9-HpCDF	0.0092	G B	0.0049	0.0049	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,4,7,8-HxCDD	0.0051	B	0.0043	0.0010	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,4,7,8-HxCDF	0.0034	J	0.0043	0.0023	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,6,7,8-HxCDD	0.022		0.0043	0.00095	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,6,7,8-HxCDF	0.0090		0.0043	0.0021	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,7,8,9-HxCDD	0.0067		0.0043	0.00091	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,7,8,9-HxCDF	ND		0.0043	0.0010	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,7,8-PeCDD	0.0032	J	0.0043	0.00053	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
1,2,3,7,8-PeCDF	0.0012	J q	0.0043	0.00042	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
2,3,4,6,7,8-HxCDF	0.0028	J	0.0043	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
2,3,4,7,8-PeCDF	0.0014	J	0.0043	0.00041	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
2,3,7,8-TCDD	0.0015		0.00086	0.00024	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
OCDD	14	G E B	0.011	0.011	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1
OCDF	0.74		0.0086	0.00097	ug/Kg	☼	08/17/18 11:36	08/24/18 03:54	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	29		23 - 140	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,4,6,7,8-HpCDF	22	*	28 - 143	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,4,7,8,9-HpCDF	33		26 - 138	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,4,7,8-HxCDD	31	*	32 - 141	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,4,7,8-HxCDF	27		26 - 152	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,6,7,8-HxCDD	31		28 - 130	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,6,7,8-HxCDF	26		26 - 123	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,7,8,9-HxCDF	35		29 - 147	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,7,8-PeCDD	39		25 - 181	08/17/18 11:36	08/24/18 03:54	1
13C-1,2,3,7,8-PeCDF	41		24 - 185	08/17/18 11:36	08/24/18 03:54	1
13C-2,3,4,6,7,8-HxCDF	31		28 - 136	08/17/18 11:36	08/24/18 03:54	1
13C-2,3,4,7,8-PeCDF	46		21 - 178	08/17/18 11:36	08/24/18 03:54	1
13C-2,3,7,8-TCDD	45		25 - 164	08/17/18 11:36	08/24/18 03:54	1
13C-OCDD	25		17 - 157	08/17/18 11:36	08/24/18 03:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	135		35 - 197	08/17/18 11:36	08/24/18 03:54	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	0.00088		0.00086	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 19:55	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	50		24 - 169	08/17/18 11:36	08/24/18 19:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	124		35 - 197	08/17/18 11:36	08/24/18 19:55	1

TestAmerica Seattle



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-0.3to2**

**Lab Sample ID: 580-79389-17**

Date Collected: 08/06/18 11:50

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 53.1

**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	0.91	G B	0.014	0.014	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,4,6,7,8-HpCDF	0.13	B	0.0047	0.0032	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,4,7,8,9-HpCDF	0.0097	B	0.0047	0.0041	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,4,7,8-HxCDD	0.0066	B	0.0047	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,4,7,8-HxCDF	0.0090		0.0047	0.0021	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,6,7,8-HxCDD	0.030		0.0047	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,6,7,8-HxCDF	0.012		0.0047	0.0018	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,7,8,9-HxCDD	0.019		0.0047	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,7,8,9-HxCDF	ND		0.0047	0.0011	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,7,8-PeCDD	0.0042	J	0.0047	0.00050	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
1,2,3,7,8-PeCDF	0.0025	J	0.0047	0.00058	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
2,3,4,6,7,8-HxCDF	0.0033	J	0.0047	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
2,3,4,7,8-PeCDF	0.0025	J	0.0047	0.00064	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
2,3,7,8-TCDD	0.0026		0.00095	0.00018	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
OCDD	14	E B	0.0095	0.0080	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1
OCDF	0.49		0.0095	0.00041	ug/Kg	☼	08/17/18 11:36	08/24/18 04:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	71		23 - 140	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,4,6,7,8-HpCDF	61		28 - 143	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,4,7,8,9-HpCDF	70		26 - 138	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,4,7,8-HxCDD	57		32 - 141	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,4,7,8-HxCDF	49		26 - 152	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,6,7,8-HxCDD	58		28 - 130	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,6,7,8-HxCDF	50		26 - 123	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,7,8,9-HxCDF	58		29 - 147	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,7,8-PeCDD	61		25 - 181	08/17/18 11:36	08/24/18 04:43	1
13C-1,2,3,7,8-PeCDF	60		24 - 185	08/17/18 11:36	08/24/18 04:43	1
13C-2,3,4,6,7,8-HxCDF	54		28 - 136	08/17/18 11:36	08/24/18 04:43	1
13C-2,3,4,7,8-PeCDF	60		21 - 178	08/17/18 11:36	08/24/18 04:43	1
13C-2,3,7,8-TCDD	57		25 - 164	08/17/18 11:36	08/24/18 04:43	1
13C-OCDD	76		17 - 157	08/17/18 11:36	08/24/18 04:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	134		35 - 197	08/17/18 11:36	08/24/18 04:43	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	0.0011		0.00095	0.00015	ug/Kg	☼	08/17/18 11:36	08/24/18 20:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	55		24 - 169	08/17/18 11:36	08/24/18 20:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	122		35 - 197	08/17/18 11:36	08/24/18 20:32	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-14to15.4**

**Lab Sample ID: 580-79389-18**

Date Collected: 08/06/18 12:25

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 60.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.41	G B	0.0063	0.0063	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,6,7,8-HpCDF	0.097	B	0.0041	0.0023	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8,9-HpCDF	0.0070	B	0.0041	0.0032	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8-HxCDD	0.0026	J q B	0.0041	0.00045	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,4,7,8-HxCDF	0.0042		0.0041	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,6,7,8-HxCDD	0.013		0.0041	0.00042	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,6,7,8-HxCDF	0.0071		0.0041	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8,9-HxCDD	0.0054		0.0041	0.00040	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8,9-HxCDF	ND		0.0041	0.00072	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8-PeCDD	0.0015	J	0.0041	0.00024	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
1,2,3,7,8-PeCDF	0.0014	J	0.0041	0.00033	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,4,6,7,8-HxCDF	0.0021	J	0.0041	0.00081	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,4,7,8-PeCDF	0.0012	J	0.0041	0.00035	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
2,3,7,8-TCDD	0.00085	q	0.00082	0.00017	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
OCDD	8.6	E B	0.0082	0.0053	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1
OCDF	0.47		0.0082	0.00041	ug/Kg	☼	08/17/18 11:36	08/24/18 05:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	58		23 - 140	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,6,7,8-HpCDF	52		28 - 143	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8,9-HpCDF	60		26 - 138	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,4,7,8-HxCDF	46		26 - 152	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,6,7,8-HxCDD	53		28 - 130	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,6,7,8-HxCDF	46		26 - 123	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8,9-HxCDF	56		29 - 147	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8-PeCDD	60		25 - 181	08/17/18 11:36	08/24/18 05:31	1
13C-1,2,3,7,8-PeCDF	59		24 - 185	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,4,6,7,8-HxCDF	49		28 - 136	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,4,7,8-PeCDF	60		21 - 178	08/17/18 11:36	08/24/18 05:31	1
13C-2,3,7,8-TCDD	56		25 - 164	08/17/18 11:36	08/24/18 05:31	1
13C-OCDD	62		17 - 157	08/17/18 11:36	08/24/18 05:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	136		35 - 197	08/17/18 11:36	08/24/18 05:31	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	0.00067	J	0.00082	0.00016	ug/Kg	☼	08/17/18 11:36	08/24/18 21:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	57		24 - 169	08/17/18 11:36	08/24/18 21:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	125		35 - 197	08/17/18 11:36	08/24/18 21:10	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-2to4**

**Lab Sample ID: 580-79389-19**

Date Collected: 08/06/18 11:55

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 52.4

**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	1.1	B G	0.0059	0.0059	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,4,6,7,8-HpCDF	0.18	B	0.0048	0.0016	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,4,7,8,9-HpCDF	0.012	B	0.0048	0.0022	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,4,7,8-HxCDD	0.0085	B	0.0048	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,4,7,8-HxCDF	0.015		0.0048	0.0015	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,6,7,8-HxCDD	0.043		0.0048	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,6,7,8-HxCDF	0.012		0.0048	0.0015	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,7,8,9-HxCDD	0.022		0.0048	0.0012	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,7,8,9-HxCDF	ND		0.0048	0.00088	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,7,8-PeCDD	0.0054		0.0048	0.00038	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
1,2,3,7,8-PeCDF	0.0028	J	0.0048	0.00054	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
2,3,4,6,7,8-HxCDF	0.0034	J	0.0048	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
2,3,4,7,8-PeCDF	0.0027	J	0.0048	0.00060	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
2,3,7,8-TCDD	0.0027		0.00096	0.000053	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
OCDD	15	E B	0.0096	0.0045	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1
OCDF	0.70		0.0096	0.00020	ug/Kg	☼	08/17/18 11:36	08/24/18 17:19	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	46		23 - 140	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,4,6,7,8-HpCDF	46		28 - 143	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,4,7,8,9-HpCDF	39		26 - 138	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,4,7,8-HxCDD	53		32 - 141	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,4,7,8-HxCDF	55		26 - 152	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,6,7,8-HxCDD	55		28 - 130	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,6,7,8-HxCDF	57		26 - 123	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,7,8,9-HxCDF	56		29 - 147	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,7,8-PeCDD	51		25 - 181	08/17/18 11:36	08/24/18 17:19	1
13C-1,2,3,7,8-PeCDF	50		24 - 185	08/17/18 11:36	08/24/18 17:19	1
13C-2,3,4,6,7,8-HxCDF	55		28 - 136	08/17/18 11:36	08/24/18 17:19	1
13C-2,3,4,7,8-PeCDF	50		21 - 178	08/17/18 11:36	08/24/18 17:19	1
13C-2,3,7,8-TCDD	55		25 - 164	08/17/18 11:36	08/24/18 17:19	1
13C-OCDD	34		17 - 157	08/17/18 11:36	08/24/18 17:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	124		35 - 197	08/17/18 11:36	08/24/18 17:19	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	0.0012		0.00096	0.00019	ug/Kg	☼	08/17/18 11:36	08/25/18 00:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	51		24 - 169	08/17/18 11:36	08/25/18 00:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	127		35 - 197	08/17/18 11:36	08/25/18 00:32	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-8to10**

**Lab Sample ID: 580-79389-20**

Date Collected: 08/06/18 12:10

Matrix: Solid

Date Received: 08/06/18 15:00

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	1.5	B G	0.0075	0.0075	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,4,6,7,8-HpCDF	0.19	B	0.0044	0.0018	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,4,7,8,9-HpCDF	0.012	B	0.0044	0.0021	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,4,7,8-HxCDD	0.0095	B	0.0044	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,4,7,8-HxCDF	0.011		0.0044	0.0020	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,6,7,8-HxCDD	0.047		0.0044	0.0014	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,6,7,8-HxCDF	0.0083		0.0044	0.0020	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,7,8,9-HxCDD	0.032		0.0044	0.0013	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,7,8,9-HxCDF	ND		0.0044	0.0010	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,7,8-PeCDD	0.0082		0.0044	0.00035	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
1,2,3,7,8-PeCDF	0.0015	J	0.0044	0.00039	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
2,3,4,6,7,8-HxCDF	0.0029	J	0.0044	0.0016	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
2,3,4,7,8-PeCDF	0.0016	J	0.0044	0.00041	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
2,3,7,8-TCDD	0.0032		0.00088	0.000049	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
OCDD	18	E B	0.0088	0.0046	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1
OCDF	0.78		0.0088	0.00023	ug/Kg	☼	08/17/18 11:36	08/24/18 18:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	30		23 - 140	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,4,6,7,8-HpCDF	30		28 - 143	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,4,7,8,9-HpCDF	29		26 - 138	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,4,7,8-HxCDD	44		32 - 141	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,4,7,8-HxCDF	45		26 - 152	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,6,7,8-HxCDD	44		28 - 130	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,6,7,8-HxCDF	45		26 - 123	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,7,8,9-HxCDF	49		29 - 147	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,7,8-PeCDD	48		25 - 181	08/17/18 11:36	08/24/18 18:08	1
13C-1,2,3,7,8-PeCDF	50		24 - 185	08/17/18 11:36	08/24/18 18:08	1
13C-2,3,4,6,7,8-HxCDF	47		28 - 136	08/17/18 11:36	08/24/18 18:08	1
13C-2,3,4,7,8-PeCDF	53		21 - 178	08/17/18 11:36	08/24/18 18:08	1
13C-2,3,7,8-TCDD	57		25 - 164	08/17/18 11:36	08/24/18 18:08	1
13C-OCDD	19		17 - 157	08/17/18 11:36	08/24/18 18:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	126		35 - 197	08/17/18 11:36	08/24/18 18:08	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	0.00077	J	0.00088	0.00012	ug/Kg	☼	08/17/18 11:36	08/25/18 01:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	60		24 - 169	08/17/18 11:36	08/25/18 01:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	135		35 - 197	08/17/18 11:36	08/25/18 01:10	1

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-4to6**

**Lab Sample ID: 580-79389-21**

Date Collected: 08/06/18 12:00

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.1

**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	0.51	B	0.0043	0.0038	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,4,6,7,8-HpCDF	0.089	B	0.0043	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,4,7,8,9-HpCDF	0.0063	B	0.0043	0.0014	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,4,7,8-HxCDD	0.0038	J B	0.0043	0.00084	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,4,7,8-HxCDF	0.0060		0.0043	0.0012	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,6,7,8-HxCDD	0.019		0.0043	0.00083	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,6,7,8-HxCDF	0.0066		0.0043	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,7,8,9-HxCDD	0.010		0.0043	0.00077	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,7,8,9-HxCDF	ND		0.0043	0.00066	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,7,8-PeCDD	0.0027	J	0.0043	0.00025	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
1,2,3,7,8-PeCDF	0.0017	J	0.0043	0.00039	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
2,3,4,6,7,8-HxCDF	0.0021	J	0.0043	0.00096	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
2,3,4,7,8-PeCDF	0.0015	J	0.0043	0.00043	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
2,3,7,8-TCDD	0.0017		0.00086	0.000073	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
OCDD	7.8	E B	0.0086	0.0026	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1
OCDF	0.50	B	0.0086	0.00025	ug/Kg	☼	08/17/18 13:00	08/22/18 04:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	37		23 - 140	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,4,6,7,8-HpCDF	36		28 - 143	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,4,7,8,9-HpCDF	38		26 - 138	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,4,7,8-HxCDD	45		32 - 141	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,4,7,8-HxCDF	49		26 - 152	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,6,7,8-HxCDD	46		28 - 130	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,6,7,8-HxCDF	51		26 - 123	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,7,8,9-HxCDF	53		29 - 147	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,7,8-PeCDD	49		25 - 181	08/17/18 13:00	08/22/18 04:10	1
13C-1,2,3,7,8-PeCDF	52		24 - 185	08/17/18 13:00	08/22/18 04:10	1
13C-2,3,4,6,7,8-HxCDF	50		28 - 136	08/17/18 13:00	08/22/18 04:10	1
13C-2,3,4,7,8-PeCDF	53		21 - 178	08/17/18 13:00	08/22/18 04:10	1
13C-2,3,7,8-TCDD	58		25 - 164	08/17/18 13:00	08/22/18 04:10	1
13C-OCDD	26		17 - 157	08/17/18 13:00	08/22/18 04:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	100		35 - 197	08/17/18 13:00	08/22/18 04:10	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	0.0012		0.00086	0.00034	ug/Kg	☼	08/17/18 13:00	08/23/18 14:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	53		24 - 169	08/17/18 13:00	08/23/18 14:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	81		35 - 197	08/17/18 13:00	08/23/18 14:56	1

TestAmerica Seattle

# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-6to8**

**Lab Sample ID: 580-79389-22**

Date Collected: 08/06/18 12:05

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 56.5

## 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	0.46	B G	0.0053	0.0053	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,4,6,7,8-HpCDF	0.12	B	0.0044	0.0030	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,4,7,8,9-HpCDF	0.0094	B	0.0044	0.0034	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,4,7,8-HxCDD	0.0052	B	0.0044	0.00033	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,4,7,8-HxCDF	0.0066		0.0044	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,6,7,8-HxCDD	0.021		0.0044	0.00030	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,6,7,8-HxCDF	0.0090		0.0044	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,7,8,9-HxCDD	0.0099		0.0044	0.00029	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,7,8,9-HxCDF	ND		0.0044	0.00064	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,7,8-PeCDD	0.0036	J	0.0044	0.00024	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
1,2,3,7,8-PeCDF	0.0020	J	0.0044	0.00035	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
2,3,4,6,7,8-HxCDF	0.0020	J	0.0044	0.00097	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
2,3,4,7,8-PeCDF	0.0017	J	0.0044	0.00039	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
2,3,7,8-TCDD	0.0017		0.00089	0.000081	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
OCDD	8.0	E B	0.0089	0.0081	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1
OCDF	0.42	B	0.0089	0.00018	ug/Kg	☼	08/17/18 13:00	08/22/18 04:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	78		23 - 140	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,4,6,7,8-HpCDF	73		28 - 143	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,4,7,8,9-HpCDF	77		26 - 138	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,4,7,8-HxCDD	72		32 - 141	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,4,7,8-HxCDF	73		26 - 152	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,6,7,8-HxCDD	71		28 - 130	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,6,7,8-HxCDF	73		26 - 123	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,7,8,9-HxCDF	77		29 - 147	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,7,8-PeCDD	71		25 - 181	08/17/18 13:00	08/22/18 04:56	1
13C-1,2,3,7,8-PeCDF	69		24 - 185	08/17/18 13:00	08/22/18 04:56	1
13C-2,3,4,6,7,8-HxCDF	73		28 - 136	08/17/18 13:00	08/22/18 04:56	1
13C-2,3,4,7,8-PeCDF	69		21 - 178	08/17/18 13:00	08/22/18 04:56	1
13C-2,3,7,8-TCDD	74		25 - 164	08/17/18 13:00	08/22/18 04:56	1
13C-OCDD	67		17 - 157	08/17/18 13:00	08/22/18 04:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	99		35 - 197	08/17/18 13:00	08/22/18 04:56	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	0.00097	q	0.00089	0.00022	ug/Kg	☼	08/17/18 13:00	08/23/18 15:33	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	67		24 - 169	08/17/18 13:00	08/23/18 15:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	94		35 - 197	08/17/18 13:00	08/23/18 15:33	1

TestAmerica Seattle



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-12to14**

**Lab Sample ID: 580-79389-23**

Date Collected: 08/06/18 12:20

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 59.3

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.41	B	0.0042	0.0027	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,4,6,7,8-HpCDF	0.12	B	0.0042	0.0013	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,4,7,8,9-HpCDF	0.0098	B	0.0042	0.0016	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,4,7,8-HxCDD	0.0033	J B	0.0042	0.00050	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,4,7,8-HxCDF	0.0053		0.0042	0.0019	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,6,7,8-HxCDD	0.015		0.0042	0.00047	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,6,7,8-HxCDF	0.0092		0.0042	0.0019	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,7,8,9-HxCDD	0.0059		0.0042	0.00044	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,7,8,9-HxCDF	ND		0.0042	0.0010	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,7,8-PeCDD	0.0015	J	0.0042	0.00020	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
1,2,3,7,8-PeCDF	0.0011	J	0.0042	0.00044	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
2,3,4,6,7,8-HxCDF	0.0016	J	0.0042	0.0015	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
2,3,4,7,8-PeCDF	0.0014	J	0.0042	0.00051	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
2,3,7,8-TCDD	0.00091		0.00083	0.000063	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
OCDD	8.7	E B	0.0083	0.0023	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1
OCDF	0.60	B	0.0083	0.00018	ug/Kg	☼	08/17/18 13:00	08/22/18 05:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	48		23 - 140	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,4,6,7,8-HpCDF	44		28 - 143	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,4,7,8,9-HpCDF	42		26 - 138	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,4,7,8-HxCDF	55		26 - 152	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,6,7,8-HxCDD	55		28 - 130	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,6,7,8-HxCDF	58		26 - 123	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,7,8,9-HxCDF	58		29 - 147	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,7,8-PeCDD	57		25 - 181	08/17/18 13:00	08/22/18 05:42	1
13C-1,2,3,7,8-PeCDF	57		24 - 185	08/17/18 13:00	08/22/18 05:42	1
13C-2,3,4,6,7,8-HxCDF	57		28 - 136	08/17/18 13:00	08/22/18 05:42	1
13C-2,3,4,7,8-PeCDF	58		21 - 178	08/17/18 13:00	08/22/18 05:42	1
13C-2,3,7,8-TCDD	63		25 - 164	08/17/18 13:00	08/22/18 05:42	1
13C-OCDD	34		17 - 157	08/17/18 13:00	08/22/18 05:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	95		35 - 197	08/17/18 13:00	08/22/18 05:42	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	0.00070	J	0.00083	0.00025	ug/Kg	☼	08/17/18 13:00	08/23/18 16:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	60		24 - 169	08/17/18 13:00	08/23/18 16:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	81		35 - 197	08/17/18 13:00	08/23/18 16:11	1



# Client Sample Results

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-RB-SS-180806-1100**

**Lab Sample ID: 580-79389-24**

**Date Collected: 08/06/18 11:00**

**Matrix: Water**

**Date Received: 08/06/18 15:00**

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,2,3,4,6,7,8-HpCDD</b>	<b>3.4</b>	<b>J B</b>	51	0.31	pg/L		08/09/18 08:30	08/15/18 03:22	1
<b>1,2,3,4,6,7,8-HpCDF</b>	<b>0.71</b>	<b>J B q</b>	51	0.20	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,4,7,8,9-HpCDF	ND		51	0.24	pg/L		08/09/18 08:30	08/15/18 03:22	1
<b>1,2,3,4,7,8-HxCDD</b>	<b>1.7</b>	<b>J B</b>	51	0.37	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,4,7,8-HxCDF	ND		51	0.48	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,6,7,8-HxCDD	ND		51	0.35	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,6,7,8-HxCDF	ND		51	0.50	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,7,8,9-HxCDD	ND		51	0.33	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,7,8,9-HxCDF	ND		51	0.26	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,7,8-PeCDD	ND		51	0.53	pg/L		08/09/18 08:30	08/15/18 03:22	1
1,2,3,7,8-PeCDF	ND		51	0.28	pg/L		08/09/18 08:30	08/15/18 03:22	1
2,3,4,6,7,8-HxCDF	ND		51	0.33	pg/L		08/09/18 08:30	08/15/18 03:22	1
2,3,4,7,8-PeCDF	ND		51	0.30	pg/L		08/09/18 08:30	08/15/18 03:22	1
2,3,7,8-TCDD	ND		10	0.36	pg/L		08/09/18 08:30	08/15/18 03:22	1
2,3,7,8-TCDF	ND		10	0.29	pg/L		08/09/18 08:30	08/15/18 03:22	1
<b>OCDD</b>	<b>55</b>	<b>J B</b>	100	0.35	pg/L		08/09/18 08:30	08/15/18 03:22	1
<b>OCDF</b>	<b>5.6</b>	<b>J B q</b>	100	0.48	pg/L		08/09/18 08:30	08/15/18 03:22	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	71		23 - 140	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,4,6,7,8-HpCDF	68		28 - 143	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,4,7,8,9-HpCDF	70		26 - 138	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,4,7,8-HxCDD	66		32 - 141	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,4,7,8-HxCDF	66		26 - 152	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,6,7,8-HxCDD	68		28 - 130	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,6,7,8-HxCDF	68		26 - 123	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,7,8,9-HxCDF	66		29 - 147	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,7,8-PeCDD	64		25 - 181	08/09/18 08:30	08/15/18 03:22	1
13C-1,2,3,7,8-PeCDF	63		24 - 185	08/09/18 08:30	08/15/18 03:22	1
13C-2,3,4,6,7,8-HxCDF	67		28 - 136	08/09/18 08:30	08/15/18 03:22	1
13C-2,3,4,7,8-PeCDF	64		21 - 178	08/09/18 08:30	08/15/18 03:22	1
13C-2,3,7,8-TCDD	69		25 - 164	08/09/18 08:30	08/15/18 03:22	1
13C-2,3,7,8-TCDF	66		24 - 169	08/09/18 08:30	08/15/18 03:22	1
13C-OCDD	69		17 - 157	08/09/18 08:30	08/15/18 03:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	96		35 - 197	08/09/18 08:30	08/15/18 03:22	1

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: MB 320-238927/1-A**  
**Matrix: Water**  
**Analysis Batch: 239903**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 238927**

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.15	J q	50	0.20	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,4,6,7,8-HpCDF	0.766	J q	50	0.16	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,4,7,8,9-HpCDF	0.552	J	50	0.20	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,4,7,8-HxCDD	1.70	J	50	0.31	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,4,7,8-HxCDF	ND		50	0.37	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,6,7,8-HxCDD	ND		50	0.29	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,6,7,8-HxCDF	ND		50	0.38	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,7,8,9-HxCDD	ND		50	0.27	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,7,8,9-HxCDF	ND		50	0.21	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,7,8-PeCDD	ND		50	0.41	pg/L		08/09/18 08:30	08/14/18 13:45	1
1,2,3,7,8-PeCDF	ND		50	0.24	pg/L		08/09/18 08:30	08/14/18 13:45	1
2,3,4,6,7,8-HxCDF	ND		50	0.25	pg/L		08/09/18 08:30	08/14/18 13:45	1
2,3,4,7,8-PeCDF	ND		50	0.26	pg/L		08/09/18 08:30	08/14/18 13:45	1
2,3,7,8-TCDD	ND		10	0.27	pg/L		08/09/18 08:30	08/14/18 13:45	1
2,3,7,8-TCDF	ND		10	0.23	pg/L		08/09/18 08:30	08/14/18 13:45	1
OCDD	4.69	J	100	0.22	pg/L		08/09/18 08:30	08/14/18 13:45	1
OCDF	2.31	J	100	0.37	pg/L		08/09/18 08:30	08/14/18 13:45	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	88		23 - 140	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,4,6,7,8-HpCDF	86		28 - 143	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,4,7,8,9-HpCDF	86		26 - 138	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,4,7,8-HxCDD	83		32 - 141	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,4,7,8-HxCDF	84		26 - 152	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,6,7,8-HxCDD	88		28 - 130	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,6,7,8-HxCDF	87		26 - 123	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,7,8,9-HxCDF	83		29 - 147	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,7,8-PeCDD	78		25 - 181	08/09/18 08:30	08/14/18 13:45	1
13C-1,2,3,7,8-PeCDF	76		24 - 185	08/09/18 08:30	08/14/18 13:45	1
13C-2,3,4,6,7,8-HxCDF	86		28 - 136	08/09/18 08:30	08/14/18 13:45	1
13C-2,3,4,7,8-PeCDF	79		21 - 178	08/09/18 08:30	08/14/18 13:45	1
13C-2,3,7,8-TCDD	83		25 - 164	08/09/18 08:30	08/14/18 13:45	1
13C-2,3,7,8-TCDF	81		24 - 169	08/09/18 08:30	08/14/18 13:45	1
13C-OCDD	84		17 - 157	08/09/18 08:30	08/14/18 13:45	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	112		35 - 197	08/09/18 08:30	08/14/18 13:45	1

**Lab Sample ID: LCS 320-238927/2-A**  
**Matrix: Water**  
**Analysis Batch: 239903**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 238927**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	1000	943		pg/L		94	70 - 140
1,2,3,4,6,7,8-HpCDF	1000	970		pg/L		97	82 - 122
1,2,3,4,7,8,9-HpCDF	1000	994		pg/L		99	78 - 138
1,2,3,4,7,8-HxCDD	1000	995		pg/L		99	70 - 164
1,2,3,4,7,8-HxCDF	1000	1000		pg/L		100	72 - 134

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: LCS 320-238927/2-A**  
**Matrix: Water**  
**Analysis Batch: 239903**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 238927**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,6,7,8-HxCDD	1000	954		pg/L		95	76 - 134
1,2,3,6,7,8-HxCDF	1000	980		pg/L		98	84 - 130
1,2,3,7,8,9-HxCDD	1000	983		pg/L		98	64 - 162
1,2,3,7,8,9-HxCDF	1000	994		pg/L		99	78 - 130
1,2,3,7,8-PeCDD	1000	991		pg/L		99	70 - 142
1,2,3,7,8-PeCDF	1000	1000		pg/L		100	80 - 134
2,3,4,6,7,8-HxCDF	1000	1010		pg/L		101	70 - 156
2,3,4,7,8-PeCDF	1000	1020		pg/L		102	68 - 160
2,3,7,8-TCDD	200	192		pg/L		96	67 - 158
2,3,7,8-TCDF	200	198		pg/L		99	75 - 158
OCDD	2000	1870		pg/L		93	78 - 144
OCDF	2000	1980		pg/L		99	63 - 170

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	78		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	75		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	77		20 - 186
13C-1,2,3,4,7,8-HxCDD	71		21 - 193
13C-1,2,3,4,7,8-HxCDF	74		19 - 202
13C-1,2,3,6,7,8-HxCDD	76		25 - 163
13C-1,2,3,6,7,8-HxCDF	76		21 - 159
13C-1,2,3,7,8,9-HxCDF	75		17 - 205
13C-1,2,3,7,8-PeCDD	73		21 - 227
13C-1,2,3,7,8-PeCDF	71		21 - 192
13C-2,3,4,6,7,8-HxCDF	75		22 - 176
13C-2,3,4,7,8-PeCDF	73		13 - 328
13C-2,3,7,8-TCDD	75		20 - 175
13C-2,3,7,8-TCDF	74		22 - 152
13C-OCDD	75		13 - 199

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	107		31 - 191

**Lab Sample ID: LCSD 320-238927/3-A**  
**Matrix: Water**  
**Analysis Batch: 239903**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 238927**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	
								RPD	Limit
1,2,3,4,6,7,8-HpCDD	1000	1040		pg/L		104	70 - 140	10	50
1,2,3,4,6,7,8-HpCDF	1000	1050		pg/L		105	82 - 122	8	50
1,2,3,4,7,8,9-HpCDF	1000	1060		pg/L		106	78 - 138	6	50
1,2,3,4,7,8-HxCDD	1000	1020		pg/L		102	70 - 164	2	50
1,2,3,4,7,8-HxCDF	1000	1050		pg/L		105	72 - 134	5	50
1,2,3,6,7,8-HxCDD	1000	1050		pg/L		105	76 - 134	10	50
1,2,3,6,7,8-HxCDF	1000	1040		pg/L		104	84 - 130	6	50
1,2,3,7,8,9-HxCDD	1000	1040		pg/L		104	64 - 162	5	50
1,2,3,7,8,9-HxCDF	1000	1050		pg/L		105	78 - 130	5	50
1,2,3,7,8-PeCDD	1000	1030		pg/L		103	70 - 142	3	50

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: LCSD 320-238927/3-A**

**Matrix: Water**

**Analysis Batch: 239903**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

**Prep Batch: 238927**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	1000	1050		pg/L		105	80 - 134	5	50
2,3,4,6,7,8-HxCDF	1000	1050		pg/L		105	70 - 156	4	50
2,3,4,7,8-PeCDF	1000	1060		pg/L		106	68 - 160	4	50
2,3,7,8-TCDD	200	199		pg/L		100	67 - 158	3	50
2,3,7,8-TCDF	200	210		pg/L		105	75 - 158	6	50
OCDD	2000	2080		pg/L		104	78 - 144	11	50
OCDF	2000	2220		pg/L		111	63 - 170	11	50

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	78		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	79		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	80		20 - 186
13C-1,2,3,4,7,8-HxCDD	77		21 - 193
13C-1,2,3,4,7,8-HxCDF	79		19 - 202
13C-1,2,3,6,7,8-HxCDD	80		25 - 163
13C-1,2,3,6,7,8-HxCDF	81		21 - 159
13C-1,2,3,7,8,9-HxCDF	79		17 - 205
13C-1,2,3,7,8-PeCDD	77		21 - 227
13C-1,2,3,7,8-PeCDF	73		21 - 192
13C-2,3,4,6,7,8-HxCDF	82		22 - 176
13C-2,3,4,7,8-PeCDF	77		13 - 328
13C-2,3,7,8-TCDD	78		20 - 175
13C-2,3,7,8-TCDF	78		22 - 152
13C-OCDD	73		13 - 199

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	113		31 - 191

**Lab Sample ID: MB 320-240515/1-A**

**Matrix: Solid**

**Analysis Batch: 241645**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 240515**

Analyte	MB		RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,2,3,4,6,7,8-HpCDD	0.0000759	J q	0.0050	0.000016	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,4,6,7,8-HpCDF	0.0000580	J q	0.0050	0.000024	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,4,7,8,9-HpCDF	0.0000835	J	0.0050	0.000030	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,4,7,8-HxCDD	0.000123	J q	0.0050	0.000036	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000041	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000033	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000041	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000031	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,7,8,9-HxCDF	ND		0.0050	0.000025	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000039	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000025	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000034	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000027	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
2,3,7,8-TCDD	ND		0.0010	0.000028	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
2,3,7,8-TCDF	ND		0.0010	0.000023	ug/Kg		08/17/18 11:36	08/23/18 13:17	1

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: MB 320-240515/1-A**  
**Matrix: Solid**  
**Analysis Batch: 241645**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 240515**

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	0.000444	J	0.010	0.000025	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
OCDF	ND		0.010	0.000040	ug/Kg		08/17/18 11:36	08/23/18 13:17	1
Isotope Dilution	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	68		23 - 140				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,4,7,8,9-HpCDF	60		26 - 138				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,4,7,8-HxCDD	61		32 - 141				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,4,7,8-HxCDF	63		26 - 152				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,6,7,8-HxCDD	69		28 - 130				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,6,7,8-HxCDF	67		26 - 123				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,7,8,9-HxCDF	63		29 - 147				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,7,8-PeCDD	61		25 - 181				08/17/18 11:36	08/23/18 13:17	1
13C-1,2,3,7,8-PeCDF	56		24 - 185				08/17/18 11:36	08/23/18 13:17	1
13C-2,3,4,6,7,8-HxCDF	65		28 - 136				08/17/18 11:36	08/23/18 13:17	1
13C-2,3,4,7,8-PeCDF	55		21 - 178				08/17/18 11:36	08/23/18 13:17	1
13C-2,3,7,8-TCDD	65		25 - 164				08/17/18 11:36	08/23/18 13:17	1
13C-2,3,7,8-TCDF	58		24 - 169				08/17/18 11:36	08/23/18 13:17	1
13C-OCDD	53		17 - 157				08/17/18 11:36	08/23/18 13:17	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	118		35 - 197				08/17/18 11:36	08/23/18 13:17	1

**Lab Sample ID: LCS 320-240515/2-A**  
**Matrix: Solid**  
**Analysis Batch: 241645**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 240515**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.0970		ug/Kg		97	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.104		ug/Kg		104	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.107		ug/Kg		107	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.105		ug/Kg		105	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.106		ug/Kg		106	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.106		ug/Kg		106	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.106		ug/Kg		106	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.104		ug/Kg		104	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.107		ug/Kg		107	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0988		ug/Kg		99	70 - 142
1,2,3,7,8-PeCDF	0.100	0.105		ug/Kg		105	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	70 - 156
2,3,4,7,8-PeCDF	0.100	0.105		ug/Kg		105	68 - 160
2,3,7,8-TCDD	0.0200	0.0179		ug/Kg		90	67 - 158
2,3,7,8-TCDF	0.0200	0.0202		ug/Kg		101	75 - 158
OCDD	0.200	0.197		ug/Kg		99	78 - 144
OCDF	0.200	0.215		ug/Kg		108	63 - 170
Isotope Dilution	%Recovery	LCS Qualifier	Limits				
13C-1,2,3,4,6,7,8-HpCDD	63		26 - 166				

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: LCS 320-240515/2-A**  
**Matrix: Solid**  
**Analysis Batch: 241645**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 240515**

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,6,7,8-HpCDF	59		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	57		20 - 186
13C-1,2,3,4,7,8-HxCDD	57		21 - 193
13C-1,2,3,4,7,8-HxCDF	59		19 - 202
13C-1,2,3,6,7,8-HxCDD	62		25 - 163
13C-1,2,3,6,7,8-HxCDF	63		21 - 159
13C-1,2,3,7,8,9-HxCDF	58		17 - 205
13C-1,2,3,7,8-PeCDD	56		21 - 227
13C-1,2,3,7,8-PeCDF	52		21 - 192
13C-2,3,4,6,7,8-HxCDF	59		22 - 176
13C-2,3,4,7,8-PeCDF	52		13 - 328
13C-2,3,7,8-TCDD	61		20 - 175
13C-2,3,7,8-TCDF	54		22 - 152
13C-OCDD	50		13 - 199

<i>Surrogate</i>	<i>%Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	123		31 - 191

**Lab Sample ID: LCSD 320-240515/3-A**  
**Matrix: Solid**  
**Analysis Batch: 241645**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 240515**

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
1,2,3,4,6,7,8-HpCDD	0.100	0.0960		ug/Kg		96	70 - 140	1	50
1,2,3,4,6,7,8-HpCDF	0.100	0.103		ug/Kg		103	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF	0.100	0.107		ug/Kg		107	78 - 138	0	50
1,2,3,4,7,8-HxCDD	0.100	0.103		ug/Kg		103	70 - 164	2	50
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134	1	50
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134	1	50
1,2,3,6,7,8-HxCDF	0.100	0.106		ug/Kg		106	84 - 130	0	50
1,2,3,7,8,9-HxCDD	0.100	0.109		ug/Kg		109	64 - 162	4	50
1,2,3,7,8,9-HxCDF	0.100	0.105		ug/Kg		105	78 - 130	2	50
1,2,3,7,8-PeCDD	0.100	0.0988		ug/Kg		99	70 - 142	0	50
1,2,3,7,8-PeCDF	0.100	0.105		ug/Kg		105	80 - 134	0	50
2,3,4,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	70 - 156	0	50
2,3,4,7,8-PeCDF	0.100	0.104		ug/Kg		104	68 - 160	0	50
2,3,7,8-TCDD	0.0200	0.0177		ug/Kg		89	67 - 158	1	50
2,3,7,8-TCDF	0.0200	0.0206		ug/Kg		103	75 - 158	2	50
OCDD	0.200	0.199		ug/Kg		99	78 - 144	1	50
OCDF	0.200	0.216		ug/Kg		108	63 - 170	0	50

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>LCSD Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,6,7,8-HpCDD	61		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	56		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	54		20 - 186
13C-1,2,3,4,7,8-HxCDD	52		21 - 193
13C-1,2,3,4,7,8-HxCDF	53		19 - 202
13C-1,2,3,6,7,8-HxCDD	57		25 - 163

TestAmerica Seattle



# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: LCSD 320-240515/3-A**  
**Matrix: Solid**  
**Analysis Batch: 241645**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 240515**

<i>Isotope Dilution</i>	<i>LCSD LCSD</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C-1,2,3,6,7,8-HxCDF	58		21 - 159
13C-1,2,3,7,8,9-HxCDF	57		17 - 205
13C-1,2,3,7,8-PeCDD	54		21 - 227
13C-1,2,3,7,8-PeCDF	51		21 - 192
13C-2,3,4,6,7,8-HxCDF	57		22 - 176
13C-2,3,4,7,8-PeCDF	48		13 - 328
13C-2,3,7,8-TCDD	59		20 - 175
13C-2,3,7,8-TCDF	53		22 - 152
13C-OCDD	48		13 - 199
<i>Surrogate</i>	<i>LCSD LCSD</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
37Cl4-2,3,7,8-TCDD	128		31 - 191

**Lab Sample ID: MB 320-240531/1-A**  
**Matrix: Solid**  
**Analysis Batch: 241214**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 240531**

<i>Analyte</i>	<i>MB MB</i>		<i>RL</i>	<i>EDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
	<i>Result</i>	<i>Qualifier</i>							
1,2,3,4,6,7,8-HpCDD	0.000219	J q	0.0050	0.000028	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,4,6,7,8-HpCDF	0.000256	J	0.0050	0.000037	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,4,7,8,9-HpCDF	0.000135	J q	0.0050	0.000044	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,4,7,8-HxCDD	0.000164	J	0.0050	0.000060	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.00011	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000054	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.00011	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000052	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,7,8,9-HxCDF	ND		0.0050	0.000062	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000061	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000034	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000090	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000039	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
2,3,7,8-TCDD	ND		0.0010	0.000043	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
2,3,7,8-TCDF	ND		0.0010	0.000030	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
OCDD	0.00177	J	0.010	0.000033	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
OCDF	0.000792	J	0.010	0.000056	ug/Kg		08/17/18 13:00	08/22/18 01:06	1
<i>Isotope Dilution</i>	<i>MB MB</i>		<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>			
	<i>%Recovery</i>	<i>Qualifier</i>							
13C-1,2,3,4,6,7,8-HpCDD	84		23 - 140	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,4,6,7,8-HpCDF	80		28 - 143	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,4,7,8,9-HpCDF	79		26 - 138	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,4,7,8-HxCDD	71		32 - 141	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,4,7,8-HxCDF	77		26 - 152	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,6,7,8-HxCDD	78		28 - 130	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,6,7,8-HxCDF	81		26 - 123	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,7,8,9-HxCDF	78		29 - 147	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,7,8-PeCDD	69		25 - 181	08/17/18 13:00	08/22/18 01:06	1			
13C-1,2,3,7,8-PeCDF	69		24 - 185	08/17/18 13:00	08/22/18 01:06	1			
13C-2,3,4,6,7,8-HxCDF	76		28 - 136	08/17/18 13:00	08/22/18 01:06	1			

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: MB 320-240531/1-A**  
**Matrix: Solid**  
**Analysis Batch: 241214**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 240531**

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C-2,3,4,7,8-PeCDF	67		21 - 178	08/17/18 13:00	08/22/18 01:06	1
13C-2,3,7,8-TCDD	76		25 - 164	08/17/18 13:00	08/22/18 01:06	1
13C-2,3,7,8-TCDF	72		24 - 169	08/17/18 13:00	08/22/18 01:06	1
13C-OCDD	68		17 - 157	08/17/18 13:00	08/22/18 01:06	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
37Cl4-2,3,7,8-TCDD	100		35 - 197	08/17/18 13:00	08/22/18 01:06	1

**Lab Sample ID: LCS 320-240531/2-A**  
**Matrix: Solid**  
**Analysis Batch: 241214**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 240531**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDF	0.100	0.104		ug/Kg		104	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.107		ug/Kg		107	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.106		ug/Kg		106	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.105		ug/Kg		105	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.107		ug/Kg		107	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0996		ug/Kg		100	70 - 142
1,2,3,7,8-PeCDF	0.100	0.107		ug/Kg		107	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.106		ug/Kg		106	70 - 156
2,3,4,7,8-PeCDF	0.100	0.106		ug/Kg		106	68 - 160
2,3,7,8-TCDD	0.0200	0.0182		ug/Kg		91	67 - 158
2,3,7,8-TCDF	0.0200	0.0210		ug/Kg		105	75 - 158
OCDD	0.200	0.200		ug/Kg		100	78 - 144
OCDF	0.200	0.224		ug/Kg		112	63 - 170

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	82		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	78		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	79		20 - 186
13C-1,2,3,4,7,8-HxCDD	70		21 - 193
13C-1,2,3,4,7,8-HxCDF	74		19 - 202
13C-1,2,3,6,7,8-HxCDD	76		25 - 163
13C-1,2,3,6,7,8-HxCDF	78		21 - 159
13C-1,2,3,7,8,9-HxCDF	75		17 - 205
13C-1,2,3,7,8-PeCDD	68		21 - 227
13C-1,2,3,7,8-PeCDF	67		21 - 192
13C-2,3,4,6,7,8-HxCDF	75		22 - 176
13C-2,3,4,7,8-PeCDF	65		13 - 328
13C-2,3,7,8-TCDD	75		20 - 175
13C-2,3,7,8-TCDF	71		22 - 152
13C-OCDD	69		13 - 199

TestAmerica Seattle

# QC Sample Results

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

TestAmerica Job ID: 580-79389-2

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

**Lab Sample ID: LCS 320-240531/2-A**  
**Matrix: Solid**  
**Analysis Batch: 241214**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 240531**

Surrogate	LCS %Recovery	LCS Qualifier	Limits
37Cl4-2,3,7,8-TCDD	98		31 - 191

**Lab Sample ID: LCSD 320-240531/3-A**  
**Matrix: Solid**  
**Analysis Batch: 241214**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 240531**

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	0.0990		ug/Kg		99	70 - 140	2	50
1,2,3,4,6,7,8-HpCDF	0.100	0.102		ug/Kg		102	82 - 122	2	50
1,2,3,4,7,8,9-HpCDF	0.100	0.103		ug/Kg		103	78 - 138	3	50
1,2,3,4,7,8-HxCDD	0.100	0.104		ug/Kg		104	70 - 164	1	50
1,2,3,4,7,8-HxCDF	0.100	0.104		ug/Kg		104	72 - 134	1	50
1,2,3,6,7,8-HxCDD	0.100	0.102		ug/Kg		102	76 - 134	2	50
1,2,3,6,7,8-HxCDF	0.100	0.104		ug/Kg		104	84 - 130	3	50
1,2,3,7,8,9-HxCDD	0.100	0.103		ug/Kg		103	64 - 162	2	50
1,2,3,7,8,9-HxCDF	0.100	0.105		ug/Kg		105	78 - 130	2	50
1,2,3,7,8-PeCDD	0.100	0.0988		ug/Kg		99	70 - 142	1	50
1,2,3,7,8-PeCDF	0.100	0.105		ug/Kg		105	80 - 134	2	50
2,3,4,6,7,8-HxCDF	0.100	0.103		ug/Kg		103	70 - 156	3	50
2,3,4,7,8-PeCDF	0.100	0.104		ug/Kg		104	68 - 160	2	50
2,3,7,8-TCDD	0.0200	0.0182		ug/Kg		91	67 - 158	0	50
2,3,7,8-TCDF	0.0200	0.0209		ug/Kg		104	75 - 158	1	50
OCDD	0.200	0.273		ug/Kg		137	78 - 144	31	50
OCDF	0.200	0.220		ug/Kg		110	63 - 170	2	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	85		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	79		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	80		20 - 186
13C-1,2,3,4,7,8-HxCDD	72		21 - 193
13C-1,2,3,4,7,8-HxCDF	77		19 - 202
13C-1,2,3,6,7,8-HxCDD	78		25 - 163
13C-1,2,3,6,7,8-HxCDF	80		21 - 159
13C-1,2,3,7,8,9-HxCDF	76		17 - 205
13C-1,2,3,7,8-PeCDD	69		21 - 227
13C-1,2,3,7,8-PeCDF	68		21 - 192
13C-2,3,4,6,7,8-HxCDF	77		22 - 176
13C-2,3,4,7,8-PeCDF	67		13 - 328
13C-2,3,7,8-TCDD	77		20 - 175
13C-2,3,7,8-TCDF	71		22 - 152
13C-OCDD	69		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl4-2,3,7,8-TCDD	100		31 - 191

# Lab Chronicle

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

TestAmerica Job ID: 580-79389-2

## Client Sample ID: PDI-SC-S203-0to2

Date Collected: 08/03/18 14:05

Date Received: 08/06/18 15:00

## Lab Sample ID: 580-79389-1

Matrix: Solid

Percent Solids: 43.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241645	08/23/18 16:21	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 17:23	AS	TAL SAC

## Client Sample ID: PDI-SC-S203-4to6

Date Collected: 08/03/18 14:15

Date Received: 08/06/18 15:00

## Lab Sample ID: 580-79389-2

Matrix: Solid

Percent Solids: 69.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 03:59	AS	TAL SAC

## Client Sample ID: PDI-SC-S203-12to13.8

Date Collected: 08/03/18 14:35

Date Received: 08/06/18 15:00

## Lab Sample ID: 580-79389-3

Matrix: Solid

Percent Solids: 70.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 04:45	AS	TAL SAC

## Client Sample ID: PDI-SC-S203-2to4

Date Collected: 08/03/18 14:10

Date Received: 08/06/18 15:00

## Lab Sample ID: 580-79389-4

Matrix: Solid

Percent Solids: 51.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 05:31	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 18:01	AS	TAL SAC

## Client Sample ID: PDI-SC-S203-8to10

Date Collected: 08/03/18 14:25

Date Received: 08/06/18 15:00

## Lab Sample ID: 580-79389-5

Matrix: Solid

Percent Solids: 67.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 06:17	AS	TAL SAC

# Lab Chronicle

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S203-10to12**

**Lab Sample ID: 580-79389-6**

**Date Collected: 08/03/18 14:30**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 68.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 07:03	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-0to2**

**Lab Sample ID: 580-79389-7**

**Date Collected: 08/06/18 09:40**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 54.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241791	08/24/18 09:48	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-2to4**

**Lab Sample ID: 580-79389-8**

**Date Collected: 08/06/18 09:45**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**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			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 14:15	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 22:00	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-4to6**

**Lab Sample ID: 580-79389-9**

**Date Collected: 08/06/18 09:50**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 57.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241214	08/22/18 03:24	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	241775	08/23/18 14:18	ALM	TAL SAC

**Client Sample ID: PDI-SC-S257-6to8**

**Lab Sample ID: 580-79389-10**

**Date Collected: 08/06/18 09:55**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 58.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 15:01	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 22:38	AS	TAL SAC

TestAmerica Seattle

# Lab Chronicle

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S257-6to8D**

**Lab Sample ID: 580-79389-11**

**Date Collected: 08/06/18 09:55**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 57.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 15:47	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 23:16	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-8to10**

**Lab Sample ID: 580-79389-12**

**Date Collected: 08/06/18 10:00**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 61.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 16:33	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 23:54	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-10to12**

**Lab Sample ID: 580-79389-13**

**Date Collected: 08/06/18 10:05**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 63.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 18:39	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 01:29	AS	TAL SAC

**Client Sample ID: PDI-SC-S257-12to14.2**

**Lab Sample ID: 580-79389-14**

**Date Collected: 08/06/18 10:10**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 60.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 19:17	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 02:17	AS	TAL SAC

**Client Sample ID: PDI-SC-S203-6to8**

**Lab Sample ID: 580-79389-15**

**Date Collected: 08/03/18 14:20**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 67.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 03:06	AS	TAL SAC

TestAmerica Seattle



# Lab Chronicle

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-10to12**

**Lab Sample ID: 580-79389-16**

**Date Collected: 08/06/18 12:15**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 57.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 19:55	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 03:54	AS	TAL SAC

**Client Sample ID: PDI-SC-S254-0.3to2**

**Lab Sample ID: 580-79389-17**

**Date Collected: 08/06/18 11:50**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 53.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 20:32	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 04:43	AS	TAL SAC

**Client Sample ID: PDI-SC-S254-14to15.4**

**Lab Sample ID: 580-79389-18**

**Date Collected: 08/06/18 12:25**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 60.6**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/24/18 21:10	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241784	08/24/18 05:31	AS	TAL SAC

**Client Sample ID: PDI-SC-S254-2to4**

**Lab Sample ID: 580-79389-19**

**Date Collected: 08/06/18 11:55**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**Percent Solids: 52.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 17:19	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	242013	08/25/18 00:32	AS	TAL SAC

**Client Sample ID: PDI-SC-S254-8to10**

**Lab Sample ID: 580-79389-20**

**Date Collected: 08/06/18 12:10**

**Matrix: Solid**

**Date Received: 08/06/18 15:00**

**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			240515	08/17/18 11:36	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241944	08/24/18 18:08	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240515	08/17/18 11:36	SR1	TAL SAC

TestAmerica Seattle

# Lab Chronicle

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

TestAmerica Job ID: 580-79389-2

**Client Sample ID: PDI-SC-S254-8to10**

**Lab Sample ID: 580-79389-20**

Date Collected: 08/06/18 12:10

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1613B	RA	1	242013	08/25/18 01:10	AS	TAL SAC

**Client Sample ID: PDI-SC-S254-4to6**

**Lab Sample ID: 580-79389-21**

Date Collected: 08/06/18 12:00

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 57.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241214	08/22/18 04:10	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	241775	08/23/18 14:56	ALM	TAL SAC

**Client Sample ID: PDI-SC-S254-6to8**

**Lab Sample ID: 580-79389-22**

Date Collected: 08/06/18 12:05

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 56.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241214	08/22/18 04:56	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	241775	08/23/18 15:33	ALM	TAL SAC

**Client Sample ID: PDI-SC-S254-12to14**

**Lab Sample ID: 580-79389-23**

Date Collected: 08/06/18 12:20

Matrix: Solid

Date Received: 08/06/18 15:00

Percent Solids: 59.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B		1	241214	08/22/18 05:42	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		240531	08/17/18 13:00	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	241775	08/23/18 16:11	ALM	TAL SAC

**Client Sample ID: PDI-RB-SS-180806-1100**

**Lab Sample ID: 580-79389-24**

Date Collected: 08/06/18 11:00

Matrix: Water

Date Received: 08/06/18 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			238927	08/09/18 08:30	ITH	TAL SAC
Total/NA	Analysis	1613B		1	239905	08/15/18 03:22	AS	TAL SAC

**Laboratory References:**

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

TestAmerica Seattle

# Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-79389-2

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	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

TestAmerica Job ID: 580-79389-2

Project/Site: Portland Harbor Pre-Remedial Design

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79389-1	PDI-SC-S203-0to2	Solid	08/03/18 14:05	08/06/18 15:00
580-79389-2	PDI-SC-S203-4to6	Solid	08/03/18 14:15	08/06/18 15:00
580-79389-3	PDI-SC-S203-12to13.8	Solid	08/03/18 14:35	08/06/18 15:00
580-79389-4	PDI-SC-S203-2to4	Solid	08/03/18 14:10	08/06/18 15:00
580-79389-5	PDI-SC-S203-8to10	Solid	08/03/18 14:25	08/06/18 15:00
580-79389-6	PDI-SC-S203-10to12	Solid	08/03/18 14:30	08/06/18 15:00
580-79389-7	PDI-SC-S257-0to2	Solid	08/06/18 09:40	08/06/18 15:00
580-79389-8	PDI-SC-S257-2to4	Solid	08/06/18 09:45	08/06/18 15:00
580-79389-9	PDI-SC-S257-4to6	Solid	08/06/18 09:50	08/06/18 15:00
580-79389-10	PDI-SC-S257-6to8	Solid	08/06/18 09:55	08/06/18 15:00
580-79389-11	PDI-SC-S257-6to8D	Solid	08/06/18 09:55	08/06/18 15:00
580-79389-12	PDI-SC-S257-8to10	Solid	08/06/18 10:00	08/06/18 15:00
580-79389-13	PDI-SC-S257-10to12	Solid	08/06/18 10:05	08/06/18 15:00
580-79389-14	PDI-SC-S257-12to14.2	Solid	08/06/18 10:10	08/06/18 15:00
580-79389-15	PDI-SC-S203-6to8	Solid	08/03/18 14:20	08/06/18 15:00
580-79389-16	PDI-SC-S254-10to12	Solid	08/06/18 12:15	08/06/18 15:00
580-79389-17	PDI-SC-S254-0.3to2	Solid	08/06/18 11:50	08/06/18 15:00
580-79389-18	PDI-SC-S254-14to15.4	Solid	08/06/18 12:25	08/06/18 15:00
580-79389-19	PDI-SC-S254-2to4	Solid	08/06/18 11:55	08/06/18 15:00
580-79389-20	PDI-SC-S254-8to10	Solid	08/06/18 12:10	08/06/18 15:00
580-79389-21	PDI-SC-S254-4to6	Solid	08/06/18 12:00	08/06/18 15:00
580-79389-22	PDI-SC-S254-6to8	Solid	08/06/18 12:05	08/06/18 15:00
580-79389-23	PDI-SC-S254-12to14	Solid	08/06/18 12:20	08/06/18 15:00
580-79389-24	PDI-RB-SS-180806-1100	Water	08/06/18 11:00	08/06/18 15:00



TestAmerica-Seattle  
5755 5th Street-East  
Tacoma, WA 98424-1317  
Ph: 253-922-2310 Fax: 253-922-5047

# SUBSURFACE SEDIMENT CHAIN OF CUSTODY

**Client Contact**  
AECOM  
11111 3rd Ave Suite 1600  
Seattle, WA 98101  
Phone: (206) 438-2700 Fax: 1+(866) 495-5288  
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling  
Portland, OR  
Project #: 60566335 Study: Subsurface Sediment  
Sample Type:

**Project Contact:** Amy Dahl / Chelsey Cook  
Tel: (206) 438-2261 / (206) 438-2010  
Analysis Turnaround Time  
Calendar (C) or Work Days (W) - W  
 21 days  
 Other

**Site Contact:** Jennifer Ray  
Date: 8/6/18  
Carrier: Courier  
COC No. 1 of pages

**Laboratory Contact:** Elaine Walker  
Atterberg Limits ASTM D4318  
Total Solids 8082A, 8270D-SIM, 9060, 160.3  
PCB Aroclors, PAHs, Total Organic Carbon, 160.3  
Grain Size ASTM D7928/D6913  
Archive  
PCDDs 1613B  
Fraction

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.
PDI-SC-S203 - 0 to 2	8/3/2018	14:05	SC		ED	4
PDI-SC-S203 - 4 to 6	8/3/2018	14:15	SC		ED	4
PDI-SC-S203 - 12 to 13.8	8/3/2018	14:35	SC		ED	4
PDI-SC-S203 - 2 to 4	8/3/2018	14:10	SC		ED	4
PDI-SC-S203 - 8 to 10	8/3/2018	14:25	SC		ED	4
PDI-SC-S203 - 10 to 12	8/3/2018	14:30	SC		ED	4
PDI-SC-S257 - 0 to 2	8/6/2018	9:40	SC		ED	4
PDI-SC-S257 - 2 to 4	8/6/2018	9:45	SC		ED	5
PDI-SC-S257 - 4 to 6	8/6/2018	9:50	SC		ED	4
PDI-SC-S257 - 6 to 8	8/6/2018	9:55	SC		ED	4
PDI-SC-S257 - 6 to 8D	8/6/2018	9:55	SC		ED	3
PDI-SC-S257 - 8 to 10	8/6/2018	10:00	SC		ED	4



580-79389 Chain of Custody

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

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

Relinquished by: *[Signature]* Company: *AECOM* Date/Time: 8/6/18 1415  
 Relinquished by: *[Signature]* Company: *M.E.* Date/Time: 8/16/18 1500  
 Relinquished by: *[Signature]* Company: *TAPOR* Date/Time: 8/16/18 1500

24 ~~8/6/18~~ 8/16/18  
 300  
 403





# SUBSURFACE SEDIMENT CHAIN OF CUSTODY

<b>TestAmerica-Seattle</b> 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047	<b>Client Contact</b> AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Subsurface Sediment Sample Type:	<b>Project Contact:</b> Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) W <input checked="" type="checkbox"/> 21 days <input type="checkbox"/> Other	<b>Site Contact:</b> Jennifer Ray Laboratory Contact: Elaine-Walker Date: 8/6/18 Carrier: Courier COC No. 1 of pages											
Fraction														
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Archive	Grain size ASTM D7928/D6913	PCB Analytes, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 1603	Atterberg Limits ASTM D4318	Carrier	Date	Sample Specific Notes:	
PDI-SC-S257 - 10 to 12	8/6/2018	10:05	SC		ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-S257 - 12 to 14.2	8/6/2018	10:10	SC		ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-253-6408	8/13/18	14:20	SC		ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-104012	8/16/18	12:15	SC		ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-234-03302	11:50	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-14015.4	12:25	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-2724	11:53	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-84010	12:40	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-4406	12:02	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-6408	12:05	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-SC-254-124014	12:20	SC			ED	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
PDI-128-55-180806-1102	11:00	W			ED	7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Col Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Fractions: D = Dissolved, PRT = Particulate, T = Total (unfiltered)														
Special Instructions/QC Requirements & Comments: <b>Separate reports for each lab</b>														
Sample Disposal <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Sposal By Lab <input checked="" type="checkbox"/> Archive For 12 Months														
Relinquished by:	Company:	Date/Time:	Relinquished by:	Company:	Date/Time:	Relinquished by:	Company:	Date/Time:	Relinquished by:	Company:	Date/Time:	Relinquished by:	Company:	Date/Time:
<i>[Signature]</i>	AECOM	8/6/18 1415	<i>[Signature]</i>	M.E.	8/6/18 1415	<i>[Signature]</i>	M.E.	8/6/18 1415	<i>[Signature]</i>	M.E.	8/6/18 1415	<i>[Signature]</i>	M.E.	8/6/18 1415
<i>[Signature]</i>	M.E.	8/6/18 1500	<i>[Signature]</i>	M.E.	8/6/18 1500	<i>[Signature]</i>	M.E.	8/6/18 1500	<i>[Signature]</i>	M.E.	8/6/18 1500	<i>[Signature]</i>	M.E.	8/6/18 1500

24<sup>th</sup> 8/6/18







TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		SUBSURFACE SEDIMENT CHAIN OF CUSTODY																				
Client Contact		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010				Site Contact: Jennifer Ray Laboratory Contact: Elaine-Walker				Date: 8/6/18		COC No: 1 of _____ pages										
AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project # 60566335 Study: Subsurface Sediment Sample Type:		Analysis Turnaround Time Calendar ( C ) or Work Days ( W ) W <input checked="" type="checkbox"/> 21 days <input type="checkbox"/> Other _____				Carrier: Courier																
Sample Identification		Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/FS 1613B	Archive	Grain Size ASTM D7928/D6913	PCB Aroclors, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 160.3	Alterberg Limits ASTM D4318	WQ-BREA	WQ-PAHs	WQ-DIF	WQ-TOC	Sample Specific Notes:				
PDI-SC-S257 - 10 to 12		8/6/2018	10:05	SC		ED	4		x	x	x	x										
PDI-SC-S257 - 12 to 14.2		8/6/2018	10:10	SC		ED	4		x	x	x	x										
PDI-SC-203-6to8		8/3/18	14:20	SC		ED	4		x	x	x	x										
PDI-SC-254-10to12		8/6/18	12:15	SC		ED	4		x	x	x	x										
PDI-SC-254-0.3to2		}	11:50	SC		ED	4		x	x	x	x										
PDI-SC-254-14to15.4			12:25	SC		ED	4		x	x	x	x										
PDI-SC-254-2to4			11:53	SC		ED	4		x	x	x	x										
PDI-SC-254-8to10			12:10	SC		ED	4		x	x	x	x										
PDI-SC-254-4to6			12:00	SC		ED	4		x	x	x	x										
PDI-SC-254-6to8			12:05	SC		ED	4		x	x	x	x										
PDI-SC-254-12to14			12:20	SC		ED	4		x	x	x	x										
PDI-RB-SS-180806-1100			↓	11:00	W		ED	7							x	x	x	x				
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Coil								AG	AG	WMG	WMG	AG										
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid								Sample Disposal														
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)								<input type="checkbox"/> Return To Client		<input checked="" type="checkbox"/> Sposal By Lab		<input checked="" type="checkbox"/> Archive For 12 Months										
Special Instructions/QC Requirements & Comments: Separate reports for each lab																						
Relinquished by:	Company: AECOM	Date/Time: 8/6/18 1415	Relinquished by:	Company: M.E.	Date/Time: 8/6/18 1500	Relinquished by:	Company: TAOR	Date/Time: 8/6/18 1700	Relinquished by:	Company: TAOR	Date/Time: 8/6/18 0930	8/6/18 8/6/18 8/6/18										



**Chain of Custody Record**

Client Information (Sub Contract Lab)		Lab Pk:		Carrier Tracking No(s):		
Client Contact: Shipping/Receiving		Walker, Elaine M		590-57870.1		
Company: TestAmerica Laboratories, Inc.		E-Mail: elaine.walker@testamericainc.com		Page: Page 1 of 3		
Address: 880 Riverside Parkway, City: West Sacramento State, Zip: CA, 95605		Phone: 916-373-5600(Tel) 916-372-1059(Fax)		Job #: 580-79389-1		
PO #: WO #: Project #: 58012120		Accreditations Required (See note):		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 Other:		
Site: Portland Harbor Pre-Remedial Design		Due Date Requested: 8/22/2018		Analysis Requested:		
TAT Requested (days):		1613B/HRMS_Sox_P (MOD) Full List w/o Totals		M - Hexane N - None O - AshNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		
Field Filtered Sample (Yes or No)		1613B/HRMS_Sox_P (MOD) Full List w/o Totals		Total Number of Containers		
Autoclave/ PH Frozen Archive Container billed @ 50.		1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals				
Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/solid, BT=BIOSUB, A=AP)	Preservation Code	Special Instructions/Note:
PDI-SC-S203-0to2 (580-79389-1)	8/3/18	14:05 Pacific	Solid	Solid	X	2
PDI-SC-S203-4to6 (580-79389-2)	8/3/18	14:15 Pacific	Solid	Solid	X	2
PDI-SC-S203-12to13.8 (580-79389-3)	8/3/18	14:35 Pacific	Solid	Solid	X	2
PDI-SC-S203-2to4 (580-79389-4)	8/3/18	14:10 Pacific	Solid	Solid	X	2
PDI-SC-S203-8to10 (580-79389-5)	8/3/18	14:25 Pacific	Solid	Solid	X	2
PDI-SC-S203-10to12 (580-79389-6)	8/3/18	14:30 Pacific	Solid	Solid	X	2
PDI-SC-S257-0to2 (580-79389-7)	8/6/18	09:40 Pacific	Solid	Solid	X	2
PDI-SC-S257-2to4 (580-79389-8)	8/6/18	09:45 Pacific	Solid	Solid	X	2
PDI-SC-S257-4to6 (580-79389-9)	8/6/18	09:50 Pacific	Solid	Solid	X	2

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months  
 Special Instructions/QC Requirements:

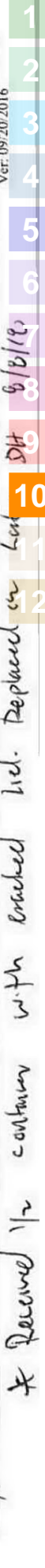
Primary Deliverable Rank: 2

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_

Custody Seal No.: \_\_\_\_\_  
 Yes  No

\* Received 1/2 container with cracked lid. Replaced on 8/8/18

Company: TA-Sac  
 Date: 8/18/18 930  
 Date: 8/8/18  
 Date: 8/8/18  
 Date: 8/8/18  
 Cooler Temperature(s) °C and Other Remarks: 4x 2.6 4.4 4.1 8.7





# Chain of Custody Record

<b>Client Information (Sub Contract Lab)</b>		Lab Pk: Walker, Elaine M		Carrier Tracking No(s):							
Client Contact: Shipping/Receiving		E-Mail: elaine.walker@testamericainc.com		State of Origin: Oregon							
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		COC No: 580-57870.2							
Address: 880 Riverside Parkway, West Sacramento, CA 95605		Due Date Requested: 8/22/2018		Page: Page 2 of 3							
City: West Sacramento		TAT Requested (days):		Job #: 580-79389-1							
State, Zip: CA, 95605		PO #:		Preservation Codes:							
Phone: 916-373-5600(Tel) 916-372-1059(Fax)		WO #:		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 Other:							
Project Name: Portland Harbor Pre-Remedial Design		Project #: 58012120		M - Hexane N - None O - AshNaO2 P - NaZOMS Q - NaZSO3 R - NaZSO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
Site:		SSOW#:		Total Number of containers							
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soils, BT=Tissue, A=At)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Analysis Requested	Special Instructions/Note:
PDI-SC-S257-6to8 (580-79389-10)	8/6/18	09:55 Pacific		Solid		X	X				
PDI-SC-S257-6to8D (580-79389-11)	8/6/18	09:55 Pacific		Solid		X	X				
PDI-SC-S257-8to10 (580-79389-12)	8/6/18	10:00 Pacific		Solid		X	X				
PDI-SC-S257-10to12 (580-79389-13)	8/6/18	10:05 Pacific		Solid		X	X				
PDI-SC-S257-12to14.2 (580-79389-14)	8/6/18	10:10 Pacific		Solid		X	X				
PDI-SC-S203-6to8 (580-79389-15)	8/3/18	14:20 Pacific		Solid		X	X				
PDI-SC-S254-10to12 (580-79389-16)	8/6/18	12:15 Pacific		Solid		X	X				
PDI-SC-S254-0.3to2 (580-79389-17)	8/6/18	11:50 Pacific		Solid		X	X				
PDI-SC-S254-14to15.4 (580-79389-18)	8/6/18	12:25 Pacific		Solid		X	X				
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I											
<b>Possible Hazard Identification</b>											
Unconfirmed											
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2											
Special Instructions/QC Requirements:											
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)											
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Empty Kit Relinquished by:											
Relinquished by: [Signature] Date: 8/27/18 Time: 1400											
Relinquished by: [Signature] Date: 8/27/18 Time: 1400											
Relinquished by: [Signature] Date: 8/27/18 Time: 1400											
Custody Seals Intact: [Signature] Custody Seal No.: 45 28 49 41 57											
Cooler Temperature(s) °C and Other Remarks: 4.5 2.8 4.9 4.1 5.7											



**Chain of Custody Record**

<b>Client Information (Sub Contract Lab)</b>		Lab P#:	Walker, Elaine M	Carrier Tracking No(s):	COC No:						
Shipping/Receiving		Phone:	elaine.walker@testamericainc.com	State of Origin:	580-57870.3						
Company:		Accreditations Required (See note):		Page:	Page 3 of 3						
TestAmerica Laboratories, Inc.				Job #:	580-79389-1						
Address:		Due Date Requested:	8/22/2018	Preservation Codes:							
880 Riverside Parkway,		TAT Requested (days):		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2OAS E - Nitric Acid Q - Na2SO3 F - MeOH R - Na2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water K - EDTA L - EDA Other:							
City:		PO #:		V - NCA W - pH 4-5 Z - other (Specify)							
State, Zip:		WO #:									
CA, 95605		Project #:	58012120								
Phone:		SSOW#:									
916-373-5600(Tel) 916-372-1059(Fax)											
Email:											
Project Name:											
Portland Harbor Pre-Remedial Design											
Site:											
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Semi-solid, Other)	Field Filtered Sample (Yes or No)	Perfrom MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	Auto/PH Frozen Archive Container billed @ \$0.	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Total Number of Containers	Special Instructions/Note:
PDI-SC-S254-21b4 (580-79389-19)	8/6/18	11:55 Pacific	Solid	Solid	X	X				2	
PDI-SC-S254-81b10 (580-79389-20)	8/6/18	12:10 Pacific	Solid	Solid	X	X				2	
PDI-SC-S254-41b6 (580-79389-21)	8/6/18	12:00 Pacific	Solid	Solid	X	X				2	
PDI-SC-S254-61b8 (580-79389-22)	8/6/18	12:05 Pacific	Solid	Solid	X	X				2	
PDI-SC-S254-121b14 (580-79389-23)	8/6/18	12:20 Pacific	Solid	Solid	X	X				2	
PDI-RB-SS-180806-1100 (580-79389-24)	8/6/18	11:00 Pacific	Water	Water				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											
<b>Possible Hazard Identification</b>											
Unconfirmed											
Deliverable Requested: I, II, III, IV, Other (specify) _____											
Primary Deliverable Rank: 2											
Empty Kit Relinquished by: _____ Date: _____ Time: _____											
Relinquished by: <i>Allyson</i> Date: 8/16/18 Time: 1400 Company: TAPIR Company: TA-Sac											
Relinquished by: _____ Date: _____ Time: _____ Company: _____											
Relinquished by: _____ Date: _____ Time: _____ Company: _____											
Custody Seals Intact: _____ Custody Seal No.: _____											
* Received 1/2 container with Amkel Ltd. Replaced in Lab PH 8/6/18											
Cooler Temperature(s) °C and Other Remarks: 4-5 2.8 4.4 4.1 5.7											
Special Instructions/QC Requirements: _____											
Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)											
Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											

# Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79389-2

**Login Number: 79389**

**List Source: TestAmerica Seattle**

**List Number: 1**

**Creator: Antonson, Angeline D**

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: 580-79389-2

**Login Number: 79389**

**List Number: 2**

**Creator: Her, David A**

**List Source: TestAmerica Sacramento**

**List Creation: 08/08/18 04:29 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.5c, 2.8c, 4.4c, 4.1c, 5.7c
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.	False	Refer to Job Narrative for details.
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 <math><6\text{mm}</math> (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: 580-79389-2

**Login Number: 79389**

**List Number: 3**

**Creator: Her, David A**

**List Source: TestAmerica Sacramento**

**List Creation: 08/08/18 04:40 PM**

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



# Isotope Dilution Summary

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

TestAmerica Job ID: 580-79389-2

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

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-79389-1	PDI-SC-S203-0to2	43	40	32	49	50	50	52	50
580-79389-1 - RA	PDI-SC-S203-0to2								
580-79389-2	PDI-SC-S203-4to6	34	28	34	36	37	38	37	42
580-79389-3	PDI-SC-S203-12to13.8	35	28	37	37	38	40	38	43
580-79389-4	PDI-SC-S203-2to4	31	27 *	19 *	46	47	44	45	47
580-79389-4 - RA	PDI-SC-S203-2to4								
580-79389-5	PDI-SC-S203-8to10	31	25 *	33	37	37	37	37	44
580-79389-6	PDI-SC-S203-10to12	29	23 *	31	33	32	33	33	41
580-79389-7	PDI-SC-S257-0to2	44	38	44	43	45	47	46	50
580-79389-8	PDI-SC-S257-2to4	38	37	38	46	48	49	50	51
580-79389-8 - RA	PDI-SC-S257-2to4								
580-79389-9	PDI-SC-S257-4to6	30	28	25 *	40	41	42	43	46
580-79389-9 - RA	PDI-SC-S257-4to6								
580-79389-10	PDI-SC-S257-6to8	29	27 *	30	36	39	36	39	44
580-79389-10 - RA	PDI-SC-S257-6to8								
580-79389-11	PDI-SC-S257-6to8D	36	34	35	40	41	42	44	43
580-79389-11 - RA	PDI-SC-S257-6to8D								
580-79389-12	PDI-SC-S257-8to10	33	31	24 *	51	50	50	52	54
580-79389-12 - RA	PDI-SC-S257-8to10								
580-79389-13	PDI-SC-S257-10to12	26	20 *	29	29 *	25 *	29	24 *	33
580-79389-13 - RA	PDI-SC-S257-10to12								
580-79389-14	PDI-SC-S257-12to14.2	45	38	45	47	41	46	39	50
580-79389-14 - RA	PDI-SC-S257-12to14.2								
580-79389-15	PDI-SC-S203-6to8	36	30	42	39	32	36	31	41
580-79389-16	PDI-SC-S254-10to12	29	22 *	33	31 *	27	31	26	35
580-79389-16 - RA	PDI-SC-S254-10to12								
580-79389-17	PDI-SC-S254-0.3to2	71	61	70	57	49	58	50	58
580-79389-17 - RA	PDI-SC-S254-0.3to2								
580-79389-18	PDI-SC-S254-14to15.4	58	52	60	54	46	53	46	56
580-79389-18 - RA	PDI-SC-S254-14to15.4								
580-79389-19	PDI-SC-S254-2to4	46	46	39	53	55	55	57	56
580-79389-19 - RA	PDI-SC-S254-2to4								
580-79389-20	PDI-SC-S254-8to10	30	30	29	44	45	44	45	49
580-79389-20 - RA	PDI-SC-S254-8to10								
580-79389-21	PDI-SC-S254-4to6	37	36	38	45	49	46	51	53
580-79389-21 - RA	PDI-SC-S254-4to6								
580-79389-22	PDI-SC-S254-6to8	78	73	77	72	73	71	73	77
580-79389-22 - RA	PDI-SC-S254-6to8								
580-79389-23	PDI-SC-S254-12to14	48	44	42	54	55	55	58	58
580-79389-23 - RA	PDI-SC-S254-12to14								
MB 320-240515/1-A	Method Blank	68	64	60	61	63	69	67	63
MB 320-240531/1-A	Method Blank	84	80	79	71	77	78	81	78

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)						
		PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-79389-1	PDI-SC-S203-0to2	53	49	52	49	53		32
580-79389-1 - RA	PDI-SC-S203-0to2						52	
580-79389-2	PDI-SC-S203-4to6	39	39	39	42	52	52	22
580-79389-3	PDI-SC-S203-12to13.8	42	41	40	44	57	55	22

TestAmerica Seattle

# Isotope Dilution Summary

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

TestAmerica Job ID: 580-79389-2

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

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)						
		PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-79389-4	PDI-SC-S203-2to4	51	46	47	49	49		20
580-79389-4 - RA	PDI-SC-S203-2to4						61	
580-79389-5	PDI-SC-S203-8to10	43	42	40	46	58	56	18
580-79389-6	PDI-SC-S203-10to12	40	40	36	44	57	57	17
580-79389-7	PDI-SC-S257-0to2	46	45	48	49	61	60	32
580-79389-8	PDI-SC-S257-2to4	49	50	50	52	58		26
580-79389-8 - RA	PDI-SC-S257-2to4						55	
580-79389-9	PDI-SC-S257-4to6	47	49	45	51	55		21
580-79389-9 - RA	PDI-SC-S257-4to6						56	
580-79389-10	PDI-SC-S257-6to8	42	44	40	46	52		18
580-79389-10 - RA	PDI-SC-S257-6to8						52	
580-79389-11	PDI-SC-S257-6to8D	40	41	43	41	49		25
580-79389-11 - RA	PDI-SC-S257-6to8D						46	
580-79389-12	PDI-SC-S257-8to10	57	56	54	57	64		21
580-79389-12 - RA	PDI-SC-S257-8to10						63	
580-79389-13	PDI-SC-S257-10to12	39	41	29	48	47		20
580-79389-13 - RA	PDI-SC-S257-10to12						52	
580-79389-14	PDI-SC-S257-12to14.2	55	56	45	59	55		39
580-79389-14 - RA	PDI-SC-S257-12to14.2						58	
580-79389-15	PDI-SC-S203-6to8	45	45	34	50	52	57	27
580-79389-16	PDI-SC-S254-10to12	39	41	31	46	45		25
580-79389-16 - RA	PDI-SC-S254-10to12						50	
580-79389-17	PDI-SC-S254-0.3to2	61	60	54	60	57		76
580-79389-17 - RA	PDI-SC-S254-0.3to2						55	
580-79389-18	PDI-SC-S254-14to15.4	60	59	49	60	56		62
580-79389-18 - RA	PDI-SC-S254-14to15.4						57	
580-79389-19	PDI-SC-S254-2to4	51	50	55	50	55		34
580-79389-19 - RA	PDI-SC-S254-2to4						51	
580-79389-20	PDI-SC-S254-8to10	48	50	47	53	57		19
580-79389-20 - RA	PDI-SC-S254-8to10						60	
580-79389-21	PDI-SC-S254-4to6	49	52	50	53	58		26
580-79389-21 - RA	PDI-SC-S254-4to6						53	
580-79389-22	PDI-SC-S254-6to8	71	69	73	69	74		67
580-79389-22 - RA	PDI-SC-S254-6to8						67	
580-79389-23	PDI-SC-S254-12to14	57	57	57	58	63		34
580-79389-23 - RA	PDI-SC-S254-12to14						60	
MB 320-240515/1-A	Method Blank	61	56	65	55	65	58	53
MB 320-240531/1-A	Method Blank	69	69	76	67	76	72	68

### 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

# Isotope Dilution Summary

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

TestAmerica Job ID: 580-79389-2

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

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

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		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 320-240515/2-A	Lab Control Sample	63	59	57	57	59	62	63	58
LCS 320-240531/2-A	Lab Control Sample	82	78	79	70	74	76	78	75
LCSD 320-240515/3-A	Lab Control Sample Dup	61	56	54	52	53	57	58	57
LCSD 320-240531/3-A	Lab Control Sample Dup	85	79	80	72	77	78	80	76

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)						
		PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-240515/2-A	Lab Control Sample	56	52	59	52	61	54	50
LCS 320-240531/2-A	Lab Control Sample	68	67	75	65	75	71	69
LCSD 320-240515/3-A	Lab Control Sample Dup	54	51	57	48	59	53	48
LCSD 320-240531/3-A	Lab Control Sample Dup	69	68	77	67	77	71	69

### Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-79389-24	PDI-RB-SS-180806-1100	71	68	70	66	66	68	68	66
MB 320-238927/1-A	Method Blank	88	86	86	83	84	88	87	83

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)						
		PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-79389-24	PDI-RB-SS-180806-1100	64	63	67	64	69	66	69
MB 320-238927/1-A	Method Blank	78	76	86	79	83	81	84

TestAmerica Seattle

# Isotope Dilution Summary

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

TestAmerica Job ID: 580-79389-2

## Surrogate Legend

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

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

Matrix: Water

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 320-238927/2-A	Lab Control Sample	78	75	77	71	74	76	76	75
LCS 320-238927/3-A	Lab Control Sample Dup	78	79	80	77	79	80	81	79

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-238927/2-A	Lab Control Sample	73	71	75	73	75	74	75
LCS 320-238927/3-A	Lab Control Sample Dup	77	73	82	77	78	78	73

## 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