TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77290-1
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Karen Mixon

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Authorized for release by:
6/19/2018 5:27:31 PM

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Job ID: 580-77290-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-77290-1

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

Two samples were received on 5/14/2018 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9º C.

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

This report contains results of all analyses performed by TestAmerica Seattle.

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.

DIESEL AND EXTENDED RANGE ORGANICS

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for diesel and extended range organics in accordance with Method NWTPH-Dx. The samples were prepared on 05/16/2018 and analyzed on 05/17/2018.

The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2).

The following CCV had surrogate o-Terphenyl 3% outside the upper %D limits (15%D): (CCV 580-274092/14). However since all affected samples and batch QC met acceptance criteria, the data is qualified and reported.

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

METALS (ICPMS)

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for Metals (ICPMS) in accordance with 6020A_LL. The samples were prepared on 05/31/2018 and analyzed on 06/01/2018.

Copper failed the recovery criteria high for the MSD of sample PDI-SG-B077-BL1MSD (580-77290-1) in batch 580-275273. Arsenic, Cadmium, Lead and Zinc exceeded the RPD limit.

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

Job ID: 580-77290-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

TOTAL MERCURY

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for total mercury in accordance with EPA SW-846 Method 7471A. The samples were prepared and analyzed on 05/31/2018.

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

TOTAL ORGANIC CARBON

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 05/21/2018.

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

GRAIN SIZE

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for grain size in accordance with D422. The samples were analyzed on 06/07/2018.

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

PERCENT SOLIDS

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 05/16/2018.

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

TOTAL SOLIDS @ 70C

Samples PDI-SG-B077-BL1 (580-77290-1) and PDI-SG-B380-BL1 (580-77290-2) were analyzed for Solids @ 70C. The samples were analyzed on 06/14/2018.

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

Definitions/Glossary

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

TestAmerica Job ID: 580-77290-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F2	MS/MSD RPD exceeds control limits
F1	MS and/or MSD Recovery is outside acceptance limits.
F4	MS/MSD RPD exceeds control limits due to sample size difference.

Glossary

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

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

TestAmerica Job ID: 580-77290-1

Client Sample ID: PDI-SG-B077-BL1
Date Collected: 05/11/18 10:50
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-1
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	27000		2000	44	mg/Kg			05/21/18 14:37	1
Total Solids	36.5		0.1	0.1	%			05/16/18 10:34	1
Total Solids @ 70°C	38		0.10	0.10	%			06/14/18 17:09	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	16.3				%			06/07/18 09:21	1
Coarse Sand	0.0				%			06/07/18 09:21	1
Fine Sand	11.8				%			06/07/18 09:21	1
Gravel	0.0				%			06/07/18 09:21	1
Medium Sand	0.4				%			06/07/18 09:21	1
Silt	71.6				%			06/07/18 09:21	1

Client Sample ID: PDI-SG-B077-BL1
Date Collected: 05/11/18 10:50
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-1
Matrix: Solid
Percent Solids: 36.5

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	49	J	130	32	mg/Kg	☼	05/16/18 09:30	05/17/18 16:44	1
Motor Oil (>C24-C36)	430		130	46	mg/Kg	☼	05/16/18 09:30	05/17/18 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*119*		*50 - 150*	*05/16/18 09:30*	*05/17/18 16:44*	*1*

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3	F2	0.54	0.11	mg/Kg	☼	05/31/18 14:21	06/01/18 12:39	5
Cadmium	0.36	J F2	0.43	0.083	mg/Kg	☼	05/31/18 14:21	06/01/18 12:39	5
Copper	43	F1	1.1	0.24	mg/Kg	☼	05/31/18 14:21	06/01/18 12:39	5
Lead	14	F2	0.54	0.052	mg/Kg	☼	05/31/18 14:21	06/01/18 12:39	5
Zinc	110	F2	5.4	1.7	mg/Kg	☼	05/31/18 14:21	06/01/18 12:39	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.049	J	0.060	0.018	mg/Kg	☼	05/31/18 12:06	05/31/18 17:29	1

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

TestAmerica Job ID: 580-77290-1

Client Sample ID: PDI-SG-B380-BL1
Date Collected: 05/13/18 10:45
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-2
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	17000		2000	44	mg/Kg			05/21/18 17:54	1
Total Solids	54.1		0.1	0.1	%			05/16/18 10:34	1
Total Solids @ 70°C	54		0.10	0.10	%			06/14/18 17:09	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	11.6				%			06/07/18 09:21	1
Coarse Sand	1.0				%			06/07/18 09:21	1
Fine Sand	28.2				%			06/07/18 09:21	1
Gravel	4.1				%			06/07/18 09:21	1
Medium Sand	6.0				%			06/07/18 09:21	1
Silt	49.1				%			06/07/18 09:21	1

Client Sample ID: PDI-SG-B380-BL1
Date Collected: 05/13/18 10:45
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-2
Matrix: Solid
Percent Solids: 54.1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	81	J	88	22	mg/Kg	☼	05/16/18 09:30	05/17/18 17:06	1
Motor Oil (>C24-C36)	390		88	31	mg/Kg	☼	05/16/18 09:30	05/17/18 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*100*		*50 - 150*	*05/16/18 09:30*	*05/17/18 17:06*	*1*

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.8		0.25	0.050	mg/Kg	☼	05/31/18 14:21	06/01/18 12:35	5
Cadmium	0.25		0.20	0.038	mg/Kg	☼	05/31/18 14:21	06/01/18 12:35	5
Copper	33		0.50	0.11	mg/Kg	☼	05/31/18 14:21	06/01/18 12:35	5
Lead	17		0.25	0.024	mg/Kg	☼	05/31/18 14:21	06/01/18 12:35	5
Zinc	90		2.5	0.80	mg/Kg	☼	05/31/18 14:21	06/01/18 12:35	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.089		0.044	0.013	mg/Kg	☼	05/31/18 12:06	05/31/18 17:31	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-273957/1-A
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		50	12	mg/Kg		05/16/18 09:30	05/17/18 15:38	1
Motor Oil (>C24-C36)	ND		50	18	mg/Kg		05/16/18 09:30	05/17/18 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*111*		*50 - 150*	*05/16/18 09:30*	*05/17/18 15:38*	*1*

Lab Sample ID: MB 580-273957/1-B
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		50	12	mg/Kg		05/16/18 09:30	05/17/18 18:12	1
Motor Oil (>C24-C36)	ND		50	18	mg/Kg		05/16/18 09:30	05/17/18 18:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*116*		*50 - 150*	*05/16/18 09:30*	*05/17/18 18:12*	*1*

Lab Sample ID: LCS 580-273957/2-A
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273957

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	500	496		mg/Kg		99	70 - 125
Motor Oil (>C24-C36)	500	512		mg/Kg		102	70 - 119

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*111*		*50 - 150*

Lab Sample ID: LCS 580-273957/2-B
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273957

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	500	522		mg/Kg		104	70 - 125
Motor Oil (>C24-C36)	500	551		mg/Kg		110	70 - 119

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*117*		*50 - 150*

Lab Sample ID: LCSD 580-273957/3-A
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 273957

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	500	508		mg/Kg		102	70 - 125	2	16
Motor Oil (>C24-C36)	500	524		mg/Kg		105	70 - 119	2	16

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 580-273957/3-A
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 273957

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*112*		*50 - 150*

Lab Sample ID: LCSD 580-273957/3-B
Matrix: Solid
Analysis Batch: 274092

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 273957

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	500	540		mg/Kg		108	70 - 125	3	16
Motor Oil (>C24-C36)	500	566		mg/Kg		113	70 - 119	3	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*112*		*50 - 150*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-275114/22-A
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 275114

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25	0.050	mg/Kg		05/31/18 14:21	06/01/18 12:23	5
Cadmium	ND		0.20	0.039	mg/Kg		05/31/18 14:21	06/01/18 12:23	5
Copper	ND		0.50	0.11	mg/Kg		05/31/18 14:21	06/01/18 12:23	5
Lead	ND		0.25	0.024	mg/Kg		05/31/18 14:21	06/01/18 12:23	5
Zinc	ND		2.5	0.81	mg/Kg		05/31/18 14:21	06/01/18 12:23	5

Lab Sample ID: LCS 580-275114/23-A
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 275114

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	199		mg/Kg		100	80 - 120
Cadmium	5.00	4.85		mg/Kg		97	80 - 120
Copper	25.0	24.9		mg/Kg		100	80 - 120
Lead	50.0	48.4		mg/Kg		97	80 - 120
Zinc	200	190		mg/Kg		95	80 - 120

Lab Sample ID: LCSD 580-275114/24-A
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 275114

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	200		mg/Kg		100	80 - 120	0	20
Cadmium	5.00	5.10		mg/Kg		102	80 - 120	5	20
Copper	25.0	25.5		mg/Kg		102	80 - 120	2	20
Lead	50.0	48.6		mg/Kg		97	80 - 120	0	20
Zinc	200	193		mg/Kg		96	80 - 120	2	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-77290-1 MS
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: PDI-SG-B077-BL1
Prep Type: Total/NA
Prep Batch: 275114

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	5.3	F2	276	282		mg/Kg	☼	100	80 - 120
Cadmium	0.36	J F2	6.90	7.47		mg/Kg	☼	103	80 - 120
Copper	43	F1	34.5	84.2		mg/Kg	☼	118	80 - 120
Lead	14	F2	69.0	84.4		mg/Kg	☼	102	80 - 120
Zinc	110	F2	276	390		mg/Kg	☼	101	80 - 120

Lab Sample ID: 580-77290-1 MSD
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: PDI-SG-B077-BL1
Prep Type: Total/NA
Prep Batch: 275114

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	5.3	F2	354	371	F4	mg/Kg	☼	103	80 - 120	27	20
Cadmium	0.36	J F2	8.85	9.42	F4	mg/Kg	☼	102	80 - 120	23	20
Copper	43	F1	44.2	100	F1	mg/Kg	☼	128	80 - 120	17	20
Lead	14	F2	88.5	105	F4	mg/Kg	☼	103	80 - 120	22	20
Zinc	110	F2	354	488	F4	mg/Kg	☼	107	80 - 120	22	20

Lab Sample ID: 580-77290-1 DU
Matrix: Solid
Analysis Batch: 275273

Client Sample ID: PDI-SG-B077-BL1
Prep Type: Total/NA
Prep Batch: 275114

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	5.3	F2	5.47		mg/Kg	☼	3	20
Cadmium	0.36	J F2	0.320	J	mg/Kg	☼	13	20
Copper	43	F1	43.6		mg/Kg	☼	0.6	20
Lead	14	F2	14.7		mg/Kg	☼	3	20
Zinc	110	F2	115		mg/Kg	☼	4	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-275095/22-A
Matrix: Solid
Analysis Batch: 275149

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 275095

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		05/31/18 12:06	05/31/18 16:59	1

Lab Sample ID: LCS 580-275095/23-A
Matrix: Solid
Analysis Batch: 275149

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 275095

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.163		mg/Kg		98	80 - 120

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 580-275095/24-A
Matrix: Solid
Analysis Batch: 275149

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 275095

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.167	0.156		mg/Kg		94	80 - 120	5	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-274333/3
Matrix: Solid
Analysis Batch: 274333

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	44	mg/Kg			05/21/18 12:08	1

Lab Sample ID: LCS 580-274333/4
Matrix: Solid
Analysis Batch: 274333

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon - Duplicates			4620	5590		mg/Kg		121	68 - 149		

Lab Sample ID: LCSD 580-274333/5
Matrix: Solid
Analysis Batch: 274333

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates			4620	5530		mg/Kg		120	68 - 149	1	32

Lab Sample ID: MB 580-274350/3
Matrix: Solid
Analysis Batch: 274350

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	44	mg/Kg			05/21/18 16:09	1

Lab Sample ID: LCS 580-274350/4
Matrix: Solid
Analysis Batch: 274350

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon - Duplicates			4620	5020		mg/Kg		109	68 - 149		

Lab Sample ID: LCSD 580-274350/5
Matrix: Solid
Analysis Batch: 274350

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates			4620	5270		mg/Kg		114	68 - 149	5	32

Lab Chronicle

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

TestAmerica Job ID: 580-77290-1

Client Sample ID: PDI-SG-B077-BL1
Date Collected: 05/11/18 10:50
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	274333	05/21/18 14:37	MP	TAL SEA
Total/NA	Analysis	D 2216		1	273970	05/16/18 10:34	JSM	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276325	06/14/18 17:09	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	275623	06/07/18 09:21	HJM	TAL SEA

Client Sample ID: PDI-SG-B077-BL1
Date Collected: 05/11/18 10:50
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-1
Matrix: Solid
Percent Solids: 36.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			273957	05/16/18 09:30	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274092	05/17/18 16:44	ERZ	TAL SEA
Total/NA	Prep	3050B			275114	05/31/18 14:21	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275273	06/01/18 12:39	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:29	PAB	TAL SEA

Client Sample ID: PDI-SG-B380-BL1
Date Collected: 05/13/18 10:45
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	274350	05/21/18 17:54	MP	TAL SEA
Total/NA	Analysis	D 2216		1	273970	05/16/18 10:34	JSM	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276325	06/14/18 17:09	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	275623	06/07/18 09:21	HJM	TAL SEA

Client Sample ID: PDI-SG-B380-BL1
Date Collected: 05/13/18 10:45
Date Received: 05/14/18 15:10

Lab Sample ID: 580-77290-2
Matrix: Solid
Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			273957	05/16/18 09:30	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274092	05/17/18 17:06	ERZ	TAL SEA
Total/NA	Prep	3050B			275114	05/31/18 14:21	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275273	06/01/18 12:35	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:31	PAB	TAL SEA

Laboratory References:
TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
TestAmerica Job ID: 580-77290-1
Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

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

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

Sample Summary

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

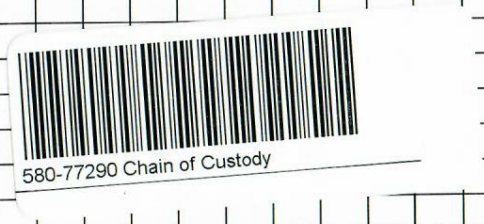
TestAmerica Job ID: 580-77290-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77290-1	PDI-SG-B077-BL1	Solid	05/11/18 10:50	05/14/18 15:10
580-77290-2	PDI-SG-B380-BL1	Solid	05/13/18 10:45	05/14/18 15:10

SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**4/25/2018** **Carrier: Courier**	COC No: 1 of 3 COCs
Client Contact AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Sediment	**Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ [x] 21 days [ ] Other _____			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060	Archive Archive -20 C	Sample Specific Notes:
PDI-SG-B077-BL1	5/11/2018	10:50	SS		AM	6		X	X	X	X	X	X	
PDI-SG-B380-BL1	5/13/2018	10:45	SS		ED	6		X	X	X	X	X	X	



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

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

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

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

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

2-9

Relinquished by: Michael Tilley	Company: AECOM	Date/Time: 5-14-18 1400	Received by:	Company: ME	Date/Time: 5-14-18 1400
Relinquished by:	Company: ME	Date/Time: 5-14-18 1510	Received by:	Company: TAPOR	Date/Time: 5/14/18 1510
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**			
Client Contact AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Sediment	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010** **Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ [x] 21 days [ ] Other _____	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**4/25/2018** **Carrier: Courier**	COC No: 1 of 3 COCs

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060	Archive Archive -20 C	Sample Specific Notes:
PDI-SG-B077-BL1	5/11/2018	10:50	SS		AM	6		X	X	X	X	X	X	
PDI-SG-B380-BL1	5/13/2018	10:45	SS		ED	6		X	X	X	X	X	X	

580-77290 Chain of Custody

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

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

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

Sample Disposal

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

Special Instructions/QC Requirements & Comments:

Separate reports for each lab

2-9

Relinquished by: Michael Tilly	Company: AECOM	Date/Time: 5-14-18 1400	Received by:	Company: ME	Date/Time: 5-14-18 1400
Relinquished by:	Company: ME	Date/Time: 5-14-18 1510	Received by:	Company: TAPOR	Date/Time: 5/14/18 1510
Relinquished by:	Company: TAPOR	Date/Time: 5/14/18 1700	Received by:	Company: TASC	Date/Time: 5-15-18 0930

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77290-1

Login Number: 77290
List Number: 1
Creator: O'Connell, Jason I

List Source: TestAmerica Seattle

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

580-77290 Field Sheet

Job:_____

Tracking #4423 0750 2978 (2-3) SO / (PO) / FO

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:_____

Therm. ID: **AK-2 / AK-3 / AK-4 / (AK-5) / HACCP / Other**_____

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: —

Temp: Observed 0.5 °C

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: CMT Date: 05-16-18 Time 09:10

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

F2E @ 1757
P10C @ 1800
W15D

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job:_____

Tracking # 442307502967 (1-3) SO / PO / FO

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Notes:_____

Therm. ID: **AK-2 / AK-3 / AK-4 / AK-5 / HACCP / Other**_____

Ice X Wet Y Gel _____ Other _____

Cooler Custody Seal: seal

Sample Custody Seal: —

Cooler ID: 10-13

Temp: Observed 5.0c

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: MR Date: 05-16-18 Time 9:10

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job:_____

Tracking # 442307502989 (3-3) SO / PO / FO

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Notes:_____

Therm. ID: **AK-2 / AK-3 / AK-4 / AK-5 / HACCP / Other**_____

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: Sent

Sample Custody Seal: —

Cooler ID: ~~5.4~~ 3 of 3

Temp: Observed 5.4c

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: DH Date: 5/16/18 Time 910

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