TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Seattle 5755 8th Street East Tacoma, WA 98424 Tel: (253)922-2310

TestAmerica Job ID: 580-77290-1

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM 1111 Third Ave **Suite 1600** Seattle, Washington 98101

Attn: Karen Mixon

M. Elaine Walker

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

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----- LINKS -----

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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.

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-77290-1

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

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 2.9° 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.

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

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.

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Definitions/Glossary

Client: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
T	Popult is loss than the PL but greater than or equal to the MDL and the concentration is an approxi

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.						
¤	isted 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)						
DI 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)	
100	Limit of Quantitation (DoD/DOE)	

LOQ	LITTIL OF QUANTILIATION (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)
שוו	Not belected at the reporting limit (or MDL or LDL if Showin)

PQL Practical Quant	itation Limit
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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)

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Client: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-B077-BL1 Lab Sample ID: 580-77290-1

Date Collected: 05/11/18 10:50 **Matrix: Solid**

Date Received: 05/14/18 15:10

General Chemistry								
Analyte	Result Qual	lifier 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

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: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-B077-BL1 Lab Sample ID: 580-77290-1

Date Collected: 05/11/18 10:50 **Matrix: Solid** Date Received: 05/14/18 15:10 Percent Solids: 36.5

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 (CP/MS)								
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3	F2	0.54	0.11	mg/Kg	<u></u>	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	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

Client: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-B380-BL1

Lab Sample ID: 580-77290-2 Date Collected: 05/13/18 10:45 **Matrix: Solid**

Date Received: 05/14/18 15:10

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

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: AECOM TestAmerica Job ID: 580-77290-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-B380-BL1

Lab Sample ID: 580-77290-2 Date Collected: 05/13/18 10:45 **Matrix: Solid**

Date Received: 05/14/18 15:10 Percent Solids: 54.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	81	J	88	22	mg/Kg	<u> </u>	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
Arsenic Cadmium	3.8 0.25		0.25 0.20	0.050 0.038	mg/Kg mg/Kg	<u>∓</u>	05/31/18 14:21 05/31/18 14:21	06/01/18 12:35 06/01/18 12:35	5 5
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
						ψ.			
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	0 0	1 2	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	y (CVAA)								
Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

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Project/Site: Portland Harbor Pre-Remedial Design

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

Lab Sample ID: MB 580-273957/1-A

Matrix: Solid

Client: AECOM

Analysis Batch: 274092

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

Prep Batch: 273957

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

MB MB

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

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 273957

Lab Sample ID: MB 580-273957/1-B **Matrix: Solid**

Analysis Batch: 274092

MB MB RL **MDL** Unit n Dil Fac **Analyte** Result Qualifier Prepared Analyzed #2 Diesel (C10-C24) $\overline{\mathsf{ND}}$ 50 12 mg/Kg 05/16/18 09:30 05/17/18 18:12 Motor Oil (>C24-C36) ND 50 05/16/18 09:30 05/17/18 18:12 18 mg/Kg

MB MB

Surrogate %Recovery Qualifier I imits Prepared Analyzed Dil Fac o-Terphenyl 116 50 - 150 <u>05/16/18 09:30</u> <u>05/17/18 18:12</u>

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 %Rec.

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

LCS LCS

Surrogate %Recovery 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 Batch: 273957

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

Spike

LCS LCS

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

Lab Sample ID: LCSD 580-273957/3-A

Motor Oil (>C24-C36)

Client Sample ID: Lab Control Sample Dup **Matrix: Solid** Prep Type: Total/NA **Analysis Batch: 274092 Prep Batch: 273957** LCSD LCSD Spike %Rec. **RPD** Added Result Qualifier Unit %Rec Limits **RPD** Limit Analyte #2 Diesel (C10-C24) 500 508 mg/Kg 102 70 - 125

524

mg/Kg

LCS LCS

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500

70 - 119

105

Project/Site: Portland Harbor Pre-Remedial Design

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

Spike

Added

LCSD LCSD

MDL Unit

0.050 mg/Kg

0.039 mg/Kg

LCS LCS

199

4.85

24.9

48.4

190

Result Qualifier

Unit

mg/Kg

mg/Kg

mg/Kg

mg/Kg

mg/Kg

Lab Sample ID: LCSD 580-273957/3-A

Matrix: Solid

Client: AECOM

Analysis Batch: 274092

LCSD LCSD

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

Lab Sample ID: LCSD 580-273957/3-B

Matrix: Solid

Analysis Batch: 274092

Analyte

#2 Diesel (C10-C24) Motor Oil (>C24-C36)

LCSD LCSD Surrogate %Recovery Qualifier

Limits o-Terphenyl 112 50 - 150

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-275114/22-A

Matrix: Solid

Cadmium

Analysis Batch: 275273

MB MB

Analyte Result Qualifier Arsenic $\overline{\mathsf{ND}}$

Copper ND 0.50 0.11 mg/Kg ND Lead 0.25 0.024 mg/Kg Zinc ND 2.5 0.81 mg/Kg

ND

Lab Sample ID: LCS 580-275114/23-A

Matrix: Solid

Analyte

Lead

Zinc

Analysis Batch: 275273

Arsenic Cadmium Copper

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: 273957

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA Prep Batch: 273957

%Rec. **RPD** Limits RPD Limit

Result Qualifier Unit D %Rec mg/Kg 108 70 - 125 3 16 mg/Kg 113 70 - 119 16 3

Prepared

500 540 500 566

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 275114

Analyzed

Client Sample ID: Lab Control Sample

05/31/18 14:21 06/01/18 12:23

05/31/18 14:21 06/01/18 12:23

05/31/18 14:21 06/01/18 12:23

05/31/18 14:21 06/01/18 12:23 05/31/18 14:21 06/01/18 12:23

Prep Type: Total/NA

Prep Batch: 275114 %Rec.

%Rec Limits 100 80 - 120 97 80 - 120 100 80 - 120 97 80 - 120 95 80 - 120

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA Prep Batch: 275114

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	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

RL

0.25

0.20

Spike

Added

200

5.00

25.0

50.0

200

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Project/Site: Portland Harbor Pre-Remedial Design

Client: AECOM

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

Lab Sample ID: 580-77290-1 MS	Client Sample ID: PDI-SG-B077-BL1
Matrix: Solid	Prep Type: Total/NA
Analysis Batch: 275273	Prep Batch: 275114

Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Unit D %Rec Limits **Analyte** ₩ 5.3 F2 276 100 Arsenic 282 mg/Kg 80 - 120 Cadmium 0.36 JF2 6.90 7.47 ₩ 103 mg/Kg 80 - 120 ☼ Copper 43 F1 34.5 84.2 mg/Kg 118 80 - 120Lead 69.0 ₩ 102 14 F2 84.4 mg/Kg 80 - 120Zinc 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

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Result Qualifier Added Unit D %Rec Limits RPD Limit ₩ 5.3 F2 354 371 F4 103 80 - 120 20 Arsenic mg/Kg 27 ₩ Cadmium 0.36 JF2 8.85 9.42 F4 mg/Kg 102 80 - 120 20 23 ☼ 43 F1 20 44.2 100 F1 128 17 Copper mg/Kg 80 - 120 88.5 105 F4 ₽ 103 20 Lead 14 F2 mg/Kg 80 - 120 22 Zinc 354 488 F4 mg/Kg 107 80 - 120 110 F2 22 20

Lab Sample ID: 580-77290-1 DU

Client Sample ID: PDI-SG-B077-BL1

Matrix: Solid

Prep Type: Total/NA

Matrix: Solid Prep Type: Total/NA
Analysis Batch: 275273 Prep Batch: 275114

Alialysis Datcil. 21 3213							r rep Daten. Z	70117
-	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Arsenic	5.3	F2	5.47		mg/Kg	-		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

MB MB Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac

 Analyte
 Result
 Qualifier
 RL
 MDL
 Unit
 D
 Prepared
 Analyzed
 Dil Factory

 Mercury
 ND
 0.030
 0.030
 0.0090
 mg/Kg
 05/31/18 12:06
 05/31/18 16:59

Lab Sample ID: LCS 580-275095/23-A

Matrix: Solid

Analysis Batch: 275149

Spike

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

Prep Batch: 275095

Rec.

 Analyte
 Added Mercury
 Result Qualifier 0.163
 Unit mg/Kg
 D 98
 80 - 120

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80 - 120

Project/Site: Portland Harbor Pre-Remedial Design

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

Lab Sample ID: LCSD 580-275095/24-A			Client Sa	ample ID: Lab			•
Matrix: Solid					Prep Ty	pe: Tot	al/NA
Analysis Batch: 275149					Prep Ba	atch: 27	75095
	Spike	LCSD LCSD			%Rec.		RPD
Analyte	Added	Result Qualifier	r Unit	D %Rec	Limits	RPD	Limit

0.156

mg/Kg

0.167

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-274333/3 Client Sample ID: Method Blank **Matrix: Solid** Prep Type: Total/NA

Analysis Batch: 274333

Client: AECOM

Mercury

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

Lab Sample ID: LCS 580-274333/4 **Client Sample ID: Lab Control Sample Matrix: Solid** Prep Type: Total/NA **Analysis Batch: 274333**

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

Duplicates

Lab Sample ID: LCSD 580-274333/5 Client Sample ID: Lab Control Sample Dup **Matrix: Solid** Prep Type: Total/NA

Analysis Batch: 274333

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

Duplicates

Lab Sample ID: MB 580-274350/3 **Client Sample ID: Method Blank**

Matrix: Solid

Analysis Batch: 274350

MR MR Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Total Organic Carbon - Duplicates $\overline{\mathsf{ND}}$ 2000 44 mg/Kg 05/21/18 16:09

Lab Sample ID: LCS 580-274350/4 **Client Sample ID: Lab Control Sample Matrix: Solid** Prep Type: Total/NA

Analysis Batch: 274350

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

Duplicates Lab Sample ID: LCSD 580-274350/5 Client Sample ID: Lab Control Sample Dup **Matrix: Solid** Prep Type: Total/NA

Analysis Batch: 274350

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

Duplicates

TestAmerica Seattle

6/19/2018

Prep Type: Total/NA

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-B077-BL1 Lab Sample ID: 580-77290-1

Date Collected: 05/11/18 10:50 **Matrix: Solid**

Date Received: 05/14/18 15:10

Client: AECOM

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP			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 Lab Sample ID: 580-77290-1

Date Collected: 05/11/18 10:50 **Matrix: Solid** Date Received: 05/14/18 15:10 Percent Solids: 36.5

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	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

Lab Sample ID: 580-77290-2 Client Sample ID: PDI-SG-B380-BL1

Date Collected: 05/13/18 10:45 **Matrix: Solid**

Date Received: 05/14/18 15:10

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP			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

Lab Sample ID: 580-77290-2 Client Sample ID: PDI-SG-B380-BL1

Date Collected: 05/13/18 10:45 Matrix: Solid Date Received: 05/14/18 15:10 Percent Solids: 54.1

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	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

TestAmerica Seattle

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

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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

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Part 1317 1320 1320 1317 1320		
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Content Tel. (Content Te		4/25/2018 COC No:
1000 1000	Site Contact: Jennifer Ray	
100 Fac 14860 495-5288	Laboratory Contact: Elaine-Walker	
100 Free 14860 495 5288 Calendar (C) or Work Days (W)	ime	
Sample Sempling Sample Semple Sample Semple Sample Semple Semple Sample Semple Semple Sample Semple	×q-1	
Company Comp	£16	
Sundy: Surface Sediment Sample Identification Date Time Marix OC Sample Sampler's Total No. SG-B9380-BL1 SG-B9	9 0 \826	
Study: Surface Sediment	iuoq.	
Sampler's Total No. Initials of Cont. AM 6	detals, STM	
BD S X X X X X X X X X	Sampler's Total No. Fraction PCDD/Fs 1643 TPH Disset A. Fraction Fracti	Sample Specific Notes:
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Date Time: Date T		
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Date/Time: Date/Time: Sample Disposal X Sposal By Lab		
Company: Com Date Time: 18 1400	lient X jsposal By Lab	X rchive For 12 Months
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	0017/ 81-	Commany Date/Time:
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Clear Counter Project Connects Away Daily Cheber Cooks Sec Counters Serving Counter Elizabeth Value 1909 Audativis Forestroad Trans								Ci	IAL	N O)F C	USI	COD	Y														
Marie 100			Project Contact: Amy Dahl / Chelsey Cook Site Contact: Jennifer Ray										4/25/2018								B COC No:							
Sample New Person Harmon Person	AECOM					***************************************	Lab	Laboratory Contact: Elaine-Walker Carri										······································						1	of3	coc	5	
Process Name Perturn Hall Hard Pre-Keredel Perugnic Process Name Perugnic Proces	ITTL 3rd Ave Suite 1600			Analysis Tu	rnaround Ti	me	7																					
PDI-SG-B07-BL1 5/11/2018 10-50 8S AM 6 X X X X X X X X X X X X X X X X X X	Seattle, WA 98101		Calendar	r (C) or Wo	rk Days (W)				-		á		8						İ									
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PDI-SG-B380-BL1 5/13/2018 10-45 SS IED 6 X X X X X X X X X X X X X X X X X X	Sample Identification			Matrix	QC Sample			Fraction	genera	PCDD/Fs 16138	TPH Diesel, Met 6029B, 7471A	Grain size AST		Archive Archi											S	unple Spec	ific Note	·s:
PDI-SG-B380-BLI 513/2018	PDI-SG-B077-BL1	5/11/2018	10 50	SS		AM	6		х	x	X	Х	X	X										-				
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropytene, AG=amber glass, G=glass, RC=Resin Column Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Relianguished by: Special Instructions/OC Requirements & Comments: Septrate reports for each lab 2-9 Relianguished by: Company Company Company Disc*Time S-14-18 14-00 Received by Company Company Disc*Time Received by Company Disc*Time Received by Company Disc*Time Received by Company Disc*Time Received by Company Disc*Time Company Disc*Time Disc*Time Disc*Time Company Disc*Time Disc*Time Disc*Time Company Disc*Time Di	PDI-SG-B380-BL1	5/13/2018	10:45	SS		ED	6		Х	X	X	X	x	X										1			··········	*****************
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Client: AECOM Job Number: 580-77290-1

Login Number: 77290 List Source: TestAmerica Seattle

List Number: 1

Creator: O'Connell, Jason I

Creator. O Connen, Jason I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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	



THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica

	Therm. ID: AK-2 / AK-3 / AK-4 / KK-5 / HACCP	2 / Ot	her								
Notes:											
	Ice Wet Gel Other										
	Cooler Custody Seal:										
	Sample Custody Seal:										
	Cooler ID:										
	Temp: Observed	5	°C								
	From: Temp Blank D Sample 🖾										
	NCM Filed: Yes □ No □										
	Yes	No	NA								
	Perchlorate has headspace?		A								
	CoC is complete w/o discrepancies?										
	CoC is complete w/o discrepancies? Samples received within holding time?										
	Sample preservatives verified?		AC								
	Cooler compromised/tampered with?	A									
	Samples compromised/tampered with?	R									
	Samples w/o discrepancies?										
	Sample containers have legible labels?										
	Containers are not broken or leaking?										
	Samples w/o discrepancies? Sample containers have legible labels? Containers are not broken or leaking? Sample date/times are provided. Appropriate containers are used?										
	Appropriate containers are used?										
	Sample bottles are completely filled? Zero headspace?*		0								
			4								
	Multiphasic samples are not present?										
	Sample temp OK?										
	Sample out of temp?	20									
	Initials: GVG Date: 05-16-18 Time	17/2	50								

Job:

F2E@1767 F10C@1800

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QA-812 RKE 01/26/2018



Sacramento Sample Receiving Notes

Therm. ID: AK-2 / AK-3 / AK-4 / AK-5 / HAC	CP / Ot	her								
Ice V Wet Y Gel Oth	er									
5000										
Cooler Custody Seal:										
Sample Custody Seal:										
+31 cm (7										
Temp: Observed_ 5.8c	Temp: Observed 5.8c									
From: Temp Blank D Sample										
NCM Filed: Yes □ No □										
Vo	. No	NΑ								
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	6.									
Samples w/o discrepancies?	ם	Д								
	ם									
Sample date/times are provided.										
Appropriate containers are used?										
Sample bottles are completely filled?										
Zero headspace?*		Þ								
Sample out of temp?	D									
	Cooler Custody Seal:	Cooler Custody Seal: Seal Seal								

Job:_

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QA-812 RKE 01/26/2018

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6/19/2018

Sacramento Sample Receiving Notes

	Therm. ID: AK-2 / AK-3 / AK-4 / AK-5 / HACCP / Other_									
Notes:										
	Cooler Custody Seal:									
	Sample Custody Seal:									
	Cooler ID: 3 4 3 of 3									
	Tomp: Observed 5.46									
	Terrip. Observed									
	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?									

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QA-812 RKE 01/26/2018

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