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: 580-80635-6
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
AECOM
1111 Third Ave
Suite 1600
Seattle, Washington 98101

Attn: Amy Dahl

M. Elaine Walker

Authorized for release by:
10/8/2018 5:58:08 PM

Elaine Walker, Project Manager II
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Table of Contents

Job ID: 580-80635-6

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-80635-6

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

Four samples were received on 9/27/2018 12:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were -11.0º C and 3.3º C.

Containers for the following samples were received from the Portland service center on dry ice at -10.0°C in the Seattle lab and were placed in CSU-19 at 10:10 on 9/28/18: PDI-SG-B436 (580-80635-1), PDI-SG-B474 (580-80635-2), PDI-SG-B480 (580-80635-3) and PDI-SG-B481 (580-80635-4)

This report contains results for Grain Size analysis only. All other analyses are on hold per client request.

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.

GRAIN SIZE

Samples PDI-SG-B436 (580-80635-1), PDI-SG-B474 (580-80635-2), PDI-SG-B480 (580-80635-3) and PDI-SG-B481 (580-80635-4) were analyzed for grain size in accordance with ASTM D7928/D6913. The samples were analyzed on 10/01/2018.

Coarse Sand and Medium Sand exceeded the RPD limit for the duplicate of sample PDI-SG-B436DU (580-80635-1).

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

Definitions/Glossary

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

TestAmerica Job ID: 580-80635-6

Qualifiers

Geotechnical

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

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: 580-80635-6

Client Sample ID: PDI-SG-B436
Date Collected: 08/16/18 11:40
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-1
Matrix: Solid

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	6.6				%			10/01/18 08:16	1
Coarse Sand	0.2				%			10/01/18 08:16	1
Fine Sand	55.8				%			10/01/18 08:16	1
Gravel	0.0				%			10/01/18 08:16	1
Medium Sand	0.4				%			10/01/18 08:16	1
Silt	36.9				%			10/01/18 08:16	1

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

TestAmerica Job ID: 580-80635-6

Client Sample ID: PDI-SG-B474
Date Collected: 08/17/18 15:53
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-2
Matrix: Solid

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	2.1				%			10/01/18 08:16	1
Coarse Sand	0.0				%			10/01/18 08:16	1
Fine Sand	84.3				%			10/01/18 08:16	1
Gravel	0.0				%			10/01/18 08:16	1
Medium Sand	2.0				%			10/01/18 08:16	1
Silt	11.6				%			10/01/18 08:16	1

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

TestAmerica Job ID: 580-80635-6

Client Sample ID: PDI-SG-B480
Date Collected: 08/17/18 11:05
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-3
Matrix: Solid

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	1.0				%			10/01/18 08:16	1
Coarse Sand	0.7				%			10/01/18 08:16	1
Fine Sand	75.5				%			10/01/18 08:16	1
Gravel	2.1				%			10/01/18 08:16	1
Medium Sand	16.7				%			10/01/18 08:16	1
Silt	4.1				%			10/01/18 08:16	1

Client Sample ID: PDI-SG-B481
Lab Sample ID: 580-80635-4
Date Collected: 07/27/18 13:30
Matrix: Solid
Date Received: 09/27/18 12:55

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	5.9				%			10/01/18 08:16	1
Coarse Sand	0.8				%			10/01/18 08:16	1
Fine Sand	66.0				%			10/01/18 08:16	1
Gravel	1.9				%			10/01/18 08:16	1
Medium Sand	2.1				%			10/01/18 08:16	1
Silt	23.3				%			10/01/18 08:16	1

Method: D7928/D6913 - ASTM D7928/D6913

Lab Sample ID: 580-80635-1 DU
Matrix: Solid
Analysis Batch: 285330

Client Sample ID: PDI-SG-B436
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Clay	6.6			6.7		%				2	20
Coarse Sand	0.2			0.1	F3	%				67	20
Fine Sand	55.8			53.9		%				3	20
Gravel	0.0			0.0		%				NC	20
Medium Sand	0.4			0.5	F3	%				22	20
Silt	36.9			38.8		%				5	20

Lab Chronicle

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

TestAmerica Job ID: 580-80635-6

Client Sample ID: PDI-SG-B436
Date Collected: 08/16/18 11:40
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D7928/D6913		1	285330	10/01/18 08:16	JKM	TAL SEA

Client Sample ID: PDI-SG-B474
Date Collected: 08/17/18 15:53
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D7928/D6913		1	285330	10/01/18 08:16	JKM	TAL SEA

Client Sample ID: PDI-SG-B480
Date Collected: 08/17/18 11:05
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D7928/D6913		1	285330	10/01/18 08:16	JKM	TAL SEA

Client Sample ID: PDI-SG-B481
Date Collected: 07/27/18 13:30
Date Received: 09/27/18 12:55

Lab Sample ID: 580-80635-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D7928/D6913		1	285330	10/01/18 08:16	JKM	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: 580-80635-6
Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

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

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

Sample Summary

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

TestAmerica Job ID: 580-80635-6

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-80635-1	PDI-SG-B436	Solid	08/16/18 11:40	09/27/18 12:55
580-80635-2	PDI-SG-B474	Solid	08/17/18 15:53	09/27/18 12:55
580-80635-3	PDI-SG-B480	Solid	08/17/18 11:05	09/27/18 12:55
580-80635-4	PDI-SG-B481	Solid	07/27/18 13:30	09/27/18 12:55

SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**9/26/2018** COC No: 1 1 of 1 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 Sample Type: D/U	**Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ ☐ 21 days ☒ Other _ASAP_____		**Carrier: Courier** 580-80635 Chain of Custody

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Krom/Unger	ATTRIBUTES	Sample Specific Notes:
PDI-SG-B436	8/16/2018	11:40	SS		MM	8		H	H	H	x	H	H	H	H	ALL FROZEN (EXCEPT GRAIN SIZE) 8/10 @ 1405 ↓ FROZEN 7/30 @ 0805
PDI-SG-B474	8/17/2018	15:53	SS		MM	7		H	H	H	x	H	H	H		
PDI-SG-B480	8/17/2018	11:05	SS		MM	7		H	H	H	x	H	H	H		
PDI-SG-B481	7/27/2018	1330	SS		MM	7		H	H	H	x	H	H	H		

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

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

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

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

Special Instructions/QC Requirements & Comments:
Analyze samples for grain size ASAP, Hold (H) remaining analyses pending further instruction.
Separate reports for each lab.
KEEP FROZEN SAMPLES UPON RECEIPT -11.0 3.3

Relinquished by:	Company: AECOM	Date/Time: 9/26/18 1215	Received by:	Company: M.E.	Date/Time: 9/26/18 1215
Relinquished by:	Company: M.E.	Date/Time: 9/26/18 1255	Received by:	Company: TA-POR	Date/Time: 9/26/18 1255
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**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**9/26/2018** COC No: 1 **Carrier: Courier** 1 of 1 COCs

Client Contact	Analysis Turnaround Time
AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: **Surface Sediment** Sample Type: D/U	Calendar (C) or Work Days (W) _____ ☐ 21 days ☒ Other _ASAP_____

580-80635 Chain of Custody

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kron/Unger	ATOSSCS46	Sample Specific Notes:
PDI-SG-B436	8/16/2018	11:40	SS		MM	18		H	H	H	x	H	H	H		All frozen (except est Amount 8/19 @ 1405 ↓ Frozen 7/30 COBUS
PDI-SG-B474	8/17/2018	15:53	SS		MM	7		H	H	H	x	H	H	H	H	
PDI-SG-B480	8/17/2018	11:05	SS		MM	7		H	H	H	x	H	H	H		
PDI-SG-B481	7/27/2018	1330	SS		MM	7		H	H	H	x	H	H	H		

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

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

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

Sample Disposal

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

Special Instructions/QC Requirements & Comments:

Analyze samples for grain size ASAP, Hold (H) remaining analyses pending further instruction.

Separate reports for each lab.

KEEP FROZEN SAMPLES UPON RECEIPT -11.0 3.3

Relinquished by:	Company: RECOM	Date/Time: 9/26/18 1215	Received by:	Company: M.E.	Date/Time: 9/26/18 1215
Relinquished by:	Company: M.E.	Date/Time: 9/26/18 1255	Received by:	Company: TA-POR	Date/Time: 9/26/18 1255
Relinquished by:	Company:	Date/Time:	Received by: Tom Blanford	Company: TA-Sea	Date/Time: 9/28/18 0930

IR4 -10.0/-10.0

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-80635-6

Login Number: 80635
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.	False	Refer to Job Narrative for details.
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	