

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: 580-78377-1

Client Project/Site: Portland Harbor Pre-Remedial Design

Revision: 1

For:

AECOM 1111 Third Ave Suite 1600 Seattle, Washington 98101

Attn: Karen Mixon

M. Elaine Walker

Authorized for release by: 7/19/2018 3:44:48 PM

Elaine Walker, Project Manager II (253)248-4972

elaine.walker@testamericainc.com

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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: 580-78377-1

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Job ID: 580-78377-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE Client: AECOM

Project: Portland Harbor Pre-Remedial Design Report Number: 580-78377-1

REVISION 1: JULY 19, 2018

This revision was required to remove reference to PSEP in the TOC section of the narrative.

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

One sample was received on 6/27/2018 2:11 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

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.

TOTAL ORGANIC CARBON

Sample PDI-SG-S175 (580-78377-1) was analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The sample was analyzed on 07/03/2018.

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

GRAIN SIZE

Sample PDI-SG-S175 (580-78377-1) was analyzed for grain size in accordance with ASTM D7928/D6913. The sample was analyzed on 07/05/2018.

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

PERCENT SOLIDS

Sample PDI-SG-S175 (580-78377-1) was analyzed for percent solids in accordance with ASTM D2216. The sample was analyzed on 07/10/2018.

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

TOTAL SOLIDS @ 70C

Sample PDI-SG-S175 (580-78377-1) was analyzed for Total Solids @ 70C. The sample was analyzed on 07/11/2018.

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Job ID: 580-78377-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

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

Definitions/Glossary

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Qualifiers

General Chemistry

Qualifier Qualifier Descriptio

Sample was prepped or analyzed beyond the specified holding time

Glossary

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

Decision Level Concentration (Radiochemistry) DLC **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)

RLReporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin) **TEQ**

Client Sample Results

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-S175 Lab Sample ID: 580-78377-1

Date Collected: 06/25/18 09:46 Matrix: Solid

Date Received: 06/27/18 14:11

General Chemistry	Decell Conflict	ъ.	MDI	11-14	_	B	A	D!! E
Analyte	Result Qualifier	RL	MDL	Unit	ט	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	21000	2000	44	mg/Kg			07/03/18 17:04	1
Total Solids	47.5	0.1	0.1	%			07/10/18 15:35	1
Total Solids @ 70°C	46 H	0.10	0.10	%			07/11/18 08:06	1

Analyte	Result (Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	11.3				%			07/05/18 13:11	1
Coarse Sand	0.4				%			07/05/18 13:11	1
Fine Sand	19.8				%			07/05/18 13:11	1
Gravel	0.0				%			07/05/18 13:11	1
Medium Sand	6.0				%			07/05/18 13:11	1
Silt	62.5				%			07/05/18 13:11	1

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QC Sample Results

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-278100/3

Matrix: Solid

Analysis Batch: 278100

Prep Type: Total/NA MB MB

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 2000 07/03/18 14:53 Total Organic Carbon - Duplicates ND 44 mg/Kg

Lab Sample ID: LCS 580-278100/4

Matrix: Solid

Analysis Batch: 278100

Spike LCS LCS %Rec. Added Limits Analyte Result Qualifier Unit %Rec Total Organic Carbon -4270 4000 mg/Kg 94 68 - 149 **Duplicates**

Lab Sample ID: LCSD 580-278100/5

Matrix: Solid

Analysis Batch: 278100

Spike LCSD LCSD %Rec. **RPD** Analyte Added Result Qualifier Unit D %Rec Limits RPD Limit 4270 3960 mg/Kg 93 68 - 149 Total Organic Carbon -1 **Duplicates**

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Type: Total/NA

TestAmerica Seattle

Lab Chronicle

Client: AECOM TestAmerica Job ID: 580-78377-1

Project/Site: Portland Harbor Pre-Remedial Design

Lab Sample ID: 580-78377-1

Matrix: Solid

Client Sample ID: PDI-SG-S175 Date Collected: 06/25/18 09:46

Date Received: 06/27/18 14:11

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP			278100	07/03/18 17:04	Z1T	TAL SEA
Total/NA	Analysis	D 2216		1	278582	07/10/18 15:35	BAH	TAL SEA
Total/NA	Analysis	Moisture 70C		1	279454	07/11/18 08:06	A1K	TAL SEA
Total/NA	Analysis	D7928/D6913		1	278174	07/05/18 13:11	KAB	TAL SEA

Laboratory References:

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

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TestAmerica Seattle

Accreditation/Certification Summary

Client: AECOM TestAmerica Job ID: 580-78377-1

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	07-31-18
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 Harber Pro Remedia

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78377-1

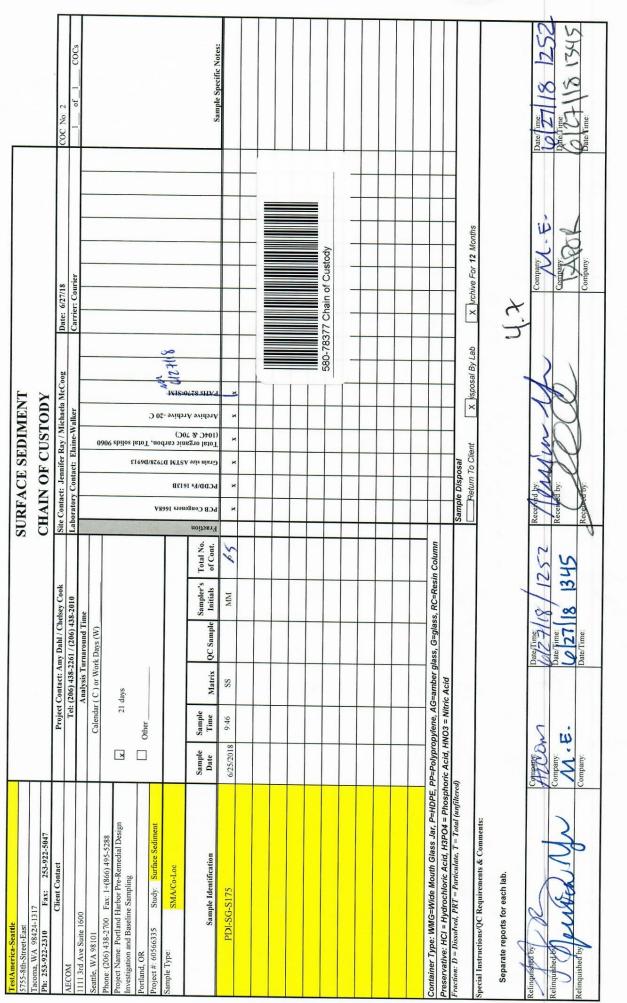
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78377-1	PDI-SG-S175	Solid	06/25/18 09:46	06/27/18 14:11

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AECOM	<u> </u>		· · · · · · · · · · · · · · · · · · ·	261 / (206) 43			Lat	erator	y Cont	act: El	aine-W	alker		1	1	Carrie	r: Couri	ier				_	i of	COC	Û s
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Phone: (206) 438-2700 Fax: 1+(866) 495-5288	_																					J	1		
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling		21	days								solj														
Portland, OR		0.1								169	ota										1				
Project #: 60566335 Study: Surface Sediment	نسنا	Other	*************					١,		D7928/D6913	į.) C							İ		İ				
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Sample Type: SMA/Co-Loc								thers.	16138	ASTM	anic c 70C)	rctiv	45-04	1111] "										
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No.	Fraction	PCB Cengeners	PCDD/F: 1613B	Grain size	Total organic carbon, Total solids (194C & 79C)	Archive Archive -20 C	PAHS 82	127									Sample S	pecific Note	les:
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Container Type: WMG=Wide Mouth Glass Jar, P=HDPE,	DD-Dolves	onulana A	G=ambar	vises Grain	se PC=Po	in Column														-				·····	
Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosph				71033, Q- <u>g</u> 10	35, NO-NE	mi Colum													_						
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltere		11103 - 1111	in Acid					Samp	le Disi	oosal	l					L					<u> </u>				-
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Special Instructions/QC Requirements & Comments:																							***************************************		·
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SURFACE SEDIMENT

TestAmerica-Seattle

Client Information (Sub Contract Lab)	Sampler			Walker,	Walker, Elaine M		Cerner Tracking NO(5).	ing No(s):	580-56702.1	
Client Contact:	Phone:			E-Mail:			State of Origin:	u:	Page:	
Shipping/Receiving				elaine.w	alker@te:	elaine.walker@testamericainc.com	Oregon		Page 1 of 1	
Company: TestAmerica Laboratories, Inc.				Acci	reditations	Accreditations Required (See note):			Job #: 580-78377-1	
Address: 880 Riverside Parkway,	Due Date Requested 7/16/2018					Analysis	Analysis Requested		Preservation Codes	des:
City. West Sacramento State, Zip:	TAT Requested (days):	;; (9			' sje	·0\$ @			B - NaOH C - Zn Acetate D - Nitric Acid	N - None O - A\$NaO2 P - Na2O4S
CA, 95605 Phone: 916-373-5600(Tel) 916-372-1059(Fax)	# 00				JoT olw	er billed			F - MeOH G - Amehlor H - Ascorbic Acid	R - Na2S203 S - H2S04 T - TSP Dodecahydd
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Site:	SSOW#:					aA nas			of cor	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample (Sample Type (C=comp, G=grab) BT	Matrix (Wewater, Septid, Onwasteloll, Onwasteloll, BT-Ticsue, A-Air)	Регбогт MS/M:	F1013 H9 (400)			Total Number Special Ir	Special Instructions/Note:
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PDI-SG-S175 (580-78377-1)	6/25/18	Pacific		Solid	×	×			2	
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Note: Since jaboratory accreditations are subject to change. TestAmerica Laboratories, inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory of other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, inc.	Laboratories, Inc. places the ow ilysisitesis/matrix being analyzed re current to date, return the sign	nership of mel, the samples in the Chain of Co	thod, analyte & must be shippe ustody attesting	accreditation com d back to the Test to said complicar	pliance upo Mmerica lat nce to Test	s the ownership of method, analyte & accreditation compliance upon out subcontract laborato inalyzed, the samples must be shipped back to the TestAmerica laboratory or other instruction the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.	ries. This sample shis will be provided. A	ipment is forwarded u	This sample shipment is forwarded under chain-of-custody. If the laboratory does not the provided. Any changes to accreditation status should be brought to TestAmerica	the laboratory does no rought to TestAmerica
Possible Hazard Identification					Sample [Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	be assessed if	samples are ret	ained longer than 1	month)
Unconfirmed					Re	Return To Client	Disposal By Lab		Archive For	Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverab	liverable Rank: 2			Special In	Special Instructions/QC Requirements:		,	,	
Empty Kit Relinquished by:	d	Date:		Time:		1 11 11	Method	Method of Shipmedi; 12.8	81/18	
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Custody Seals Intact: Custody Seal No.:	Ses				Cooler	Cooler Temperature(s) °C and Other Remarks.	her Remarks;			
200										

TestAmerica

Chain of Custody Record

Client: AECOM Job Number: 580-78377-1

Login Number: 78377 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	

TestAmerica Seattle