

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: 580-78432-1

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM 1111 Third Ave Suite 1600 Seattle, Washington 98101

Attn: Karen Mixon

Shuid crug

Authorized for release by: 7/25/2018 6:31:32 PM
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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

Client: AECOM

TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Job ID: 580-78432-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE Client: AECOM

Project: Portland Harbor Pre-Remedial Design Report Number: 580-78432-1

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 06/27/2018; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were -2.1° C and -1.7° 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.

TOTAL ORGANIC CARBON

Samples PDI-SG-S072 (580-78432-1) and PDI-SG-S120 (580-78432-2) were analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 07/06/2018.

Total Organic Carbon - Duplicates was detected in method blank MB 580-278318/3 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

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

GRAIN SIZE

Samples PDI-SG-S072 (580-78432-1) and PDI-SG-S120 (580-78432-2) were analyzed for grain size in accordance with ASTM D7928/D6913. The samples were analyzed on 07/05/2018.

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

PERCENT SOLIDS

Samples PDI-SG-S072 (580-78432-1) and PDI-SG-S120 (580-78432-2) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 07/10/2018.

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Case Narrative

Client: AECOM TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Job ID: 580-78432-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

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

TOTAL SOLIDS @ 70C

Samples PDI-SG-S072 (580-78432-1) and PDI-SG-S120 (580-78432-2) were analyzed for Total Solids @ 70C. The samples were analyzed on 07/11/2018.

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: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Reporting Limit or Requested Limit (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

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

Qualifiers

General Chemistry

B Compound was found in the blank and sample.		
b compound that found in the blank and cample.	blank and sample.	
H Sample was prepped or analyzed beyond the specified holding time	yzed beyond the specified holding time	
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	t greater than or equal to the MDL and the concentration is an approximate value.	

Glossary

RL

RPD

TEF TEQ

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

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Client Sample Results

Client: AECOM Project/Site: Portland Harbor Pre-Remedial Design TestAmerica Job ID: 580-78432-1

Lab Sample ID: 580-78432-1 Client Sample ID: PDI-SG-S072

Date Collected: 06/02/18 13:40 **Matrix: Solid**

Date Received: 06/27/18 13:45

	General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
=	Total Organic Carbon - Duplicates	4300	В	2000	44	mg/Kg			07/06/18 14:41	1
•	Total Solids	62.1		0.1	0.1	%			07/10/18 15:35	1
	Total Solids @ 70°C	65	H	0.10	0.10	%			07/11/18 08:08	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	15.9				%			07/05/18 13:11	1
Coarse Sand	0.7				%			07/05/18 13:11	1
Fine Sand	12.8				%			07/05/18 13:11	1
Gravel	0.0				%			07/05/18 13:11	1
Medium Sand	2.2				%			07/05/18 13:11	1
Silt	68.4				%			07/05/18 13:11	1

Client Sample Results

Client: AECOM TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-S120

Lab Sample ID: 580-78432-2 Date Collected: 06/03/18 11:30 **Matrix: Solid**

Date Received: 06/27/18 13:45

General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	1600	J B	2000	44	mg/Kg			07/06/18 14:46	1
Total Solids	76.5		0.1	0.1	%			07/10/18 15:35	1
Total Solids @ 70°C	78	Н	0.10	0.10	%			07/11/18 08:09	1

Method: D7928/D6913 - ASTM D7928/D6913									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	0.7				%			07/05/18 13:11	1
Coarse Sand	2.8				%			07/05/18 13:11	1
Fine Sand	56.0				%			07/05/18 13:11	1
Gravel	8.9				%			07/05/18 13:11	1
Medium Sand	28.2				%			07/05/18 13:11	1
Silt	3.4				%			07/05/18 13:11	1

QC Sample Results

Client: AECOM TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-278318/3

Matrix: Solid

Analysis Batch: 278318

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 07/06/18 14:11 Total Organic Carbon - Duplicates 198 J

Lab Sample ID: LCS 580-278318/4

Matrix: Solid

Analysis Batch: 278318

Analyte Total Organic Carbon -

Duplicates

Lab Sample ID: LCSD 580-278318/5

Matrix: Solid

Analysis Batch: 278318

Analyte

Total Organic Carbon -**Duplicates**

MB MB

2000

Spike

Added

4270

Spike

Added

4270

LCS LCS

LCSD LCSD

4540

Result Qualifier

4690

Result Qualifier

44 mg/Kg

Unit

Unit

mg/Kg

%Rec

110

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

%Rec.

Limits

68 - 149

Client Sample ID: Method Blank

Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

%Rec. **RPD** D %Rec Limits RPD mg/Kg 106 68 - 149

Limit 3

TestAmerica Seattle

7/25/2018

Lab Chronicle

Client: AECOM TestAmerica Job ID: 580-78432-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-SG-S072 Lab Sample ID: 580-78432-1

Date Collected: 06/02/18 13:40 Matrix: Solid

Date Received: 06/27/18 13:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP			278318	07/06/18 14:41	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 08:08	A1K	TAL SEA
Total/NA	Analysis	D7928/D6913		1	278174	07/05/18 13:11	KAB	TAL SEA

Client Sample ID: PDI-SG-S120 Lab Sample ID: 580-78432-2

Date Collected: 06/03/18 11:30 Matrix: Solid

Date Received: 06/27/18 13:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP			278318	07/06/18 14:46	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 08:09	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: 580-78432-1

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 Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78432-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78432-1	PDI-SG-S072	Solid	06/02/18 13:40	06/27/18 13:45
580-78432-2	PDI-SG-S120	Solid	06/03/18 11:30	06/27/18 13:45

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Ph: 253-922-2310 Fax: 253-922-5047							\mathbf{C}	HAI	N O	FC	CUS	TOI	ΟY										1
Client Contact AECOM	Į			my Dahl / Ch			Sic	e Conta	ct: Jei	nifer	Ray				D.	ite: 6/2	7/18						COC No: 6
HIII 3rd Ave Suite 1600	<u> </u>	Tel		261 / (206) 4				borator				Valker					Courier						
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Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design	!]					1 \$		1 1	- 1		ı					1	Į.
Investigation and Baseline Sampling	l 😠	21	days								15	solids 9											
Portland, OR		Other									Ě		1										ĺ
Project #: 60566335 Study: Surface Sediment									ا ر		2	1 2	Ü							1			l .
Sample Type: SMA/Co-Loc		****							ers 1668,	86138	ASTM D7928/D6913	ic carbon, Total	Archive -20										
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	raction		PCB Conges	PCDD/Fs 86	Grein size /	Total organic	Archive Ara										
PDI-SG-S072	6/2/2018	13:40	SS		MM	5	4-3	-		4	9	Ė	<		_	-	4_	┼					Sample Specific Notes:
PDI-SG-\$120	6/3/2018	11:30	SS	-	MM	5	Н	-		х .	X	x	x					<u> </u>					Sample frozen 6/2/18 @ 16:00
1233011	0/3/2018	11.50	36		IATIAT	,	Н		<u>*</u>	x	x	x	x					<u> </u>					Sample frozen 6/4/18 @ 11:20
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ontainer Type: WMG=Wide Mouth Glass Jar, P=HDPE, P reservative: HCl = Hydrochloric Acid, H3PO4 = Phospho	P=Polypro	pylene, A(≔amber gi	ass, G=gles	s, RC=Res	n Column									1							-	
raction: 1) "Dissolved, PRT = Particulate, T " Total (unfiltered)	nc Acid, H	NO3 = Niu	ic Acid						L							1				$\neg \uparrow$		\dashv	
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Record
Custody
Chain of

		Chain	of Cus	tody F	Shain of Custody Record			Test _{expeans}	TestAmerica
Client Information (Sub Contract Lab)	Sampler			Lab PM Walke	Walker, Elaine M		Carrier Tracking No(s):	COC No: 580-56754.1	
Client Contact: Shipping/Receiving	Phone:			E-Mail: elaine	E-Mait: elaine.walker@testamericainc.com	ricainc.com	State of Origin: Oregon	Page: Page 1 of 1	
Company. TestAmerica Laboratories, Inc.					Accreditations Required (See note).	d (See note):		Joh #- 580-78432-1	
Address: 880 Riverside Parkway	Due Date Requested: 7/16/2018	ted:				Analysis Requested	diested	Preservation Codes:	des:
Gity. West Sacramento	TAT Requested (days):	lays):			101			B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State, Zp: CA, 95605								D - Nitric Acid E - NaHSO4	P - Na204S Q - Na2SO3
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	# Od				T olw 1			G - Amehior H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrate
Email:	WO#:				(o) siJ llu				U - Acetone V - MCAA
Project Name: Portland Harbor Pre-Remedial Design	Project #: 58012120				Yes or M	-		THE RESIDENCE AND LABOUR.	W - pH 4-5 Z - other (specify)
Site:	SSOW#:				d_xo			of co Other:	
Sample Identification - Client ID (Lab ID)	Samole Date	Sample	Sample Type (C=comp, G=orab)	Matrix (Wewster, Sesolid, Owersteioli,	Field Filtered Perform MS/M B_28MЯН/BE181 Proofb1PFro			Total Number	Special Instructions/Note:
	$\left\langle \right\rangle$	X	Preserva	Preservation Code:	X				
PDI-SG-S072 (580-78432-1)	6/2/18	13:40 Pacific		Solid	×			2	
PDI-SG-S120 (580-78432-2)	6/3/18	11.30 Pacific		Solid	×			2,	
								510	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory of currently maintain accreditation in the State of Origin listed above for analysis-tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, inc.	Laboratories, Inc. places the reis/tests/matrix being analy; courrent to date, return the s	ownership of m zed, the sample signed Chain of	rethod, analyte s must be ship Custody attest	& accreditation ped back to the ing to said com	ocompliance upon out se TestAmerica laboratory plicance to TestAmerica	ubcontract laboratones. or other instructions will Laboratories, Inc.	This sample shipment is forwarded be provided. Any changes to accre	under chain-of-custody. It editation status should be t	the laboratory does not rought to TestAmerica
Possible Hazard Identification Unconfirmed					Sample Disposal (A f	sal (A fee may be	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client Disposal By Lah	tained longer than '	month)
Deliverable Requested: 1, II, III, IV, Other (specify)	Primary Deliverable Rank: 2	able Rank: 2			Special Instruct	Special Instructions/QC Requirements:			
Empty Kit Belinguished by:		Date:			ime:	7	Method of Shipment:		
Relinquished by: Relinquished 5;	00/20/28/16	8 173	0	Company Company	Received by:	MAR	Date/Time:	1000 800	Company Company
Relinquished by:	Date/Time:			Company	Received by:	,	Date/Time:		Company
Custody Seals Intact: Custody Seal No.:					Cooler Temper	Cooler Temperature(s) °C and Other Remarks	- [V -	2	
									2100000000

Client: AECOM Job Number: 580-78432-1

Login Number: 78432 List Source: TestAmerica Seattle

List Number: 1

Creator: Presley, Kim A

Creator. Fresiey, Killi A		
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.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

the job folder with the COC.	Therm. ID: AK-2 / AK-3 / AK-6 / HACCP / Other_
otes:	
	Ice Wet Gel Other 1 vy (
	Cooler Custody Seal: Seal
	Sample Custody Seal:
	Cooler ID:
	Temp: Observed - 18,2
	From: Temp Blank □ Sample □
	NCM Filed: Yes □ No □
	Yes No NA
	Perchlorate has headspace?
	Alkalinity has no 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?
	du card
	Initials: Date: Time *Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Job: