

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: 580-79555-3

Client Project/Site: Portland Harbor Pre-Remedial Design Revision: 1

## For:

AECOM 1111 Third Ave Suite 1600 Seattle, Washington 98101

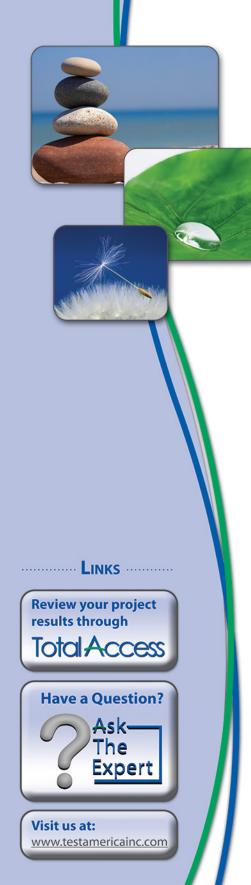
Attn: Amy Dahl

M. Elaine Walker

Authorized for release by: 1/4/2019 10:02:01 AM Elaine Walker, Project Manager II (253)248-4972 elaine.walker@testamericainc.com

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.



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### Job ID: 580-79555-3

### Laboratory: TestAmerica Seattle

Narrative

### CASE NARRATIVE Client: AECOM Project: Portland Harbor Pre-Remedial Design Report Number: 580-79555-3

#### **REVISION 1: JANUARY 4, 2019**

This revision was required because the Atterberg Limits calculation for sample PDI-SC-S007-2to4 (580-79555-8) was not performed using whole numbers for the Plasticity Limit.

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.

#### <u>RECEIPT</u>

The samples were received on 8/13/2018 3:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 8 coolers at receipt time were 0.5° C, 0.7° C, 0.8° C, 1.0° C, 2.1° C, 2.2° C, 2.5° C and 3.6° C.

This report contains results for Atterberg Limits, performed by TestAmerica Burlington.

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.

#### LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Sample PDI-SC-S007-2to4 (580-79555-8) was analyzed for Liquid Limit, Plastic Limit and Plasticity Index of Soils in accordance with ASTM D4318. The samples were analyzed on 08/22/2018.

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

### Glossary

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
Percent Recovery
Contains Free Liquid
Contains No Free Liquid
Duplicate Error Ratio (normalized absolute difference)
Dilution Factor
Detection Limit (DoD/DOE)
Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
Decision Level Concentration (Radiochemistry)
Estimated Detection Limit (Dioxin)
Limit of Detection (DoD/DOE)
Limit of Quantitation (DoD/DOE)
Minimum Detectable Activity (Radiochemistry)
Minimum Detectable Concentration (Radiochemistry)
Method Detection Limit
Minimum Level (Dioxin)
Not Calculated
Not Detected at the reporting limit (or MDL or EDL if shown)
Practical Quantitation Limit
Quality Control
Relative Error Ratio (Radiochemistry)
Reporting Limit or Requested Limit (Radiochemistry)
Relative Percent Difference, a measure of the relative difference between two points
Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

# **Client Sample Results**

08/22/18 16:18

08/22/18 16:18

5

1

1

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

40

35

**Plastic Limit** 

**Plasticity Index** 

Client Sample ID: PDI-SC Date Collected: 08/10/18 10:50	S007-2to4				Li	ab Sampl	e ID: 580-79 Matrix	<b>555-8</b> : Solid
Date Received: 08/13/18 15:00 Method: D4318 - Liquid Limit, Analyte	Plastic Limit and Plastic Result Qualifier	city Index o	of Soils	Unit	D	Prepared	Analyzed	Dil Fac
Liquid Limit	<u>75</u>			NONE		Tiepuleu	08/22/18 16:18	1

NONE

NONE

# Lab Chronicle

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

Client Sam Date Collecte Date Receive	d: 08/10/18 1		4				Lab S	ample ID	: 580-79555-8 Matrix: Solid
-	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	D4318		1	133195	08/22/18 16:18	MAP	TAL BUR	
Laboratory Ref		ton, 30 Community D	)rive, Suite 11	, South Burling	jton, VT 054(	03, TEL (802)660	-1990		
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#### Laboratory References:

TestAmerica Seattle

# Accreditation/Certification Summary

EPA Region

10

9

8

9

10

10

Identification Number

17-024

L2236

L2236

2901

N/A

C553

WA000502019-1

WA100007

LE058448-0

P330-14-00126

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

Laboratory: TestAmerica Seattle

Authority

ANAB

ANAB

California

Nevada

Oregon

USDA

Washington

Montana (UST)

US Fish & Wildlife

Alaska (UST)

### TestAmerica Job ID: 580-79555-3

**Expiration Date** 

01-19-19

01-19-19

01-19-19

11-05-19

04-30-20

07-31-19

11-05-19

07-31-19

02-10-20

02-17-19

Laboratory: TestAmerica Burlington

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

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Program

DoD ELAP

State Program

ISO/IEC 17025

State Program

State Program

State Program

State Program

NELAP

Federal

Federal

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	DoD ELAP		L2336	02-25-20
Connecticut	State Program	1	PH-0751	09-30-19
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-01-19 *
Florida	NELAP	4	E87467	06-30-19
Maine	State Program	1	VT00008	04-17-19
Minnesota	NELAP	5	050-999-436	12-31-18 *
New Hampshire	NELAP	1	2006	12-18-18 *
New Jersey	NELAP	2	VT972	06-30-19
New York	NELAP	2	10391	04-01-19
Pennsylvania	NELAP	3	68-00489	04-30-19
Rhode Island	State Program	1	LAO00298	12-30-18 *
US Fish & Wildlife	Federal		LE-058448-0	07-31-19
USDA	Federal		P330-11-00093	07-24-20
Vermont	State Program	1	VT-4000	12-31-18 *
Virginia	NELAP	3	460209	12-14-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Sample Summary

TestAmerica Job ID: 580-79555-3

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79555-8	PDI-SC-S007-2to4	Solid	08/10/18 10:50	08/13/18 15:00

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Sample Disposal	Sample Disposal Return To Client X sposal By Lab	Container Type: WMG=Wide Mouth Glass Jar, P.	HDPE, PP:	Polyprop	vlene, AG	=amber glas	s, G=glass,	RC=Resin		AG		_					
X Sposal by Lau		Preservative: HCI = Hydrocnloric Acid, H3PO4 = Fraction: D = Dissolved, PRT = Particulate, T = Total (	Phosphoric (unfiltered)	Acia, HN		C ACID			Sam	ple Dist	To Client		X sposal By La		or 12 Months		
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000     4 10 (     100	Sample Identification	Sample Date		Matrix	QC Sample	Sampler's Initials	Total No. of Cont.			PCB Aro	Atterberg			Sample S	ocific Notes
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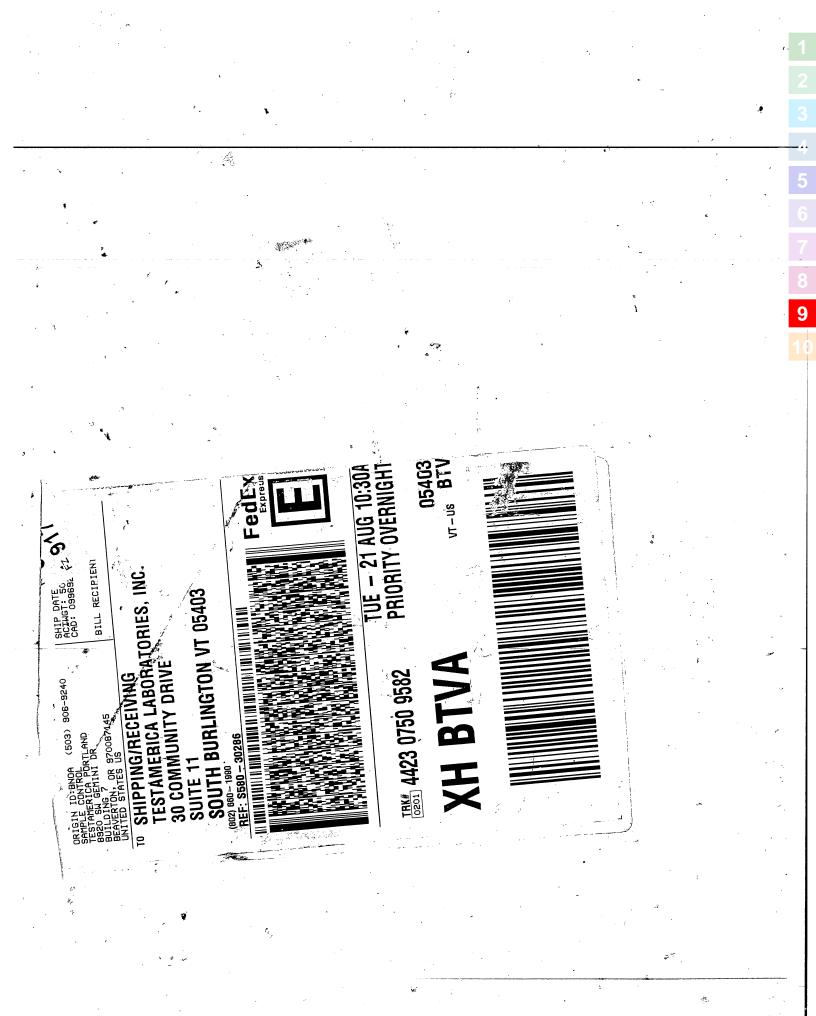
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Phone: (206) 438-2700 Fax: 1*(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling		21	l days							13	PCB Aroclors, PAHS, Total Organic Carbon. Total Solids 8082A, 8270D-SIM, 9060, 160.3	ASTM D4318													
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Project #: 60566335 Study: Subsurface Sediment										7928	.Hs, A, 82	AST								1					
Sample Type:								613B		ASTM D7928/D6913	ders, PA ds 8082/	Limits .													
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Graîn size .	PCB Aros Total Soli	Atterberg Limits												Sample St	ecific Notes:
PDI-SC-S009 - 4 to 6	8/10/2018	16:00	SC		ED	4		x	x	x	x	1									P07				
PDI-SC-S009 - 6 to 8	8/10/2018	16:05	SC	MS/MSD	ED	6		x	x	x	x														
PDI-SC-S009 - 8 to 10	8/10/2018	16:10	SC		ED	4		x	x	x	x														
PDI-SC-S009 - 10 to 11.4	8/10/2018	16:15	SC	1	ED	4		x	x	x	x														
PDI-SC-S011 - 0 to 2	8/10/2018	16:40	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 2 to 4	8/10/2018	16:45	SC	1	ED	4		x	x	x	x														
PDI-SC-S011 - 4 to 6	8/10/2018	16:50	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 6 to 8	8/10/2018	16:55	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 8 to 10	8/10/2018	17:00	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 10 to 12	8/10/2018	17:05	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 12 to 14.5	8/10/2018	17:10	sc		ED	4		x	x	x	x							1						<u></u>	
PDI-SC-S011 - 14.5 to 16.8	8/10/2018	17:15	sc		ED	4		x	x	x	x							Ī							
Container Type: WMG=Wide Mouth Glass Jar,					s, G≠glass,	RC=Resin	Col	AG	AG	WMG	WMG	AG													
Preservative: HCI = Hydrochloric Acid, H3PO4 Fraction: D = Dissolved, PRT = Particulate, T = Tota		c Acid, Hl	NO3 = Nitrie	c Acid				0									]								
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Tacoma, WA 98424-1317							or	<b>.</b>		n a	W T CHEN	00	<b>x</b> 7												
Ph: 253-922-2310 Fax: 253-922-5047							CL	1AI	NU	F C	UST	OD	Y												
Client Contact		Project	Contact: An	ny Dahi / Che	elsey Cook		Site	Conta	ct: Je	nnifer I	kay					Date:	8/13/1	8						COC No: 1	
AECOM		Tel:	(206) 438-22	261 / (206) 43	8-2010		Lab	orator	ory Contact: Elaine-Walker Carrier:								er: Cot	rier						of	pages
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Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	L.	21	days								Aroclors, PAHs, Total Organic Carbon Solids 8082A, 8270D-SIM, 9060, 160.3														
Portland, OR		Other								D7928/D6913	Total Or 270D-SIA	ASTM D4318							Ì						
Project #: 60566335 Study: Subsurface Sediment										82640	AHs, A, 82	AST													
Sample Type:								1613B		ASTM	clors, P. ds 8082	Limits													
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Grain size	PCB Aro Total Soli	Alterberg								f				Sample Spe	zific Notes:
PDI-SC-S011 - 14.5 to 16.8D	8/10/2018	17:15	SC	<u> </u>	ED	¥3		x	x	x	x														
PDI-SC-S011 - 16.8 to 17.9	8/10/2018	17:20	SC		ED	4		x	x	x	x														
PDI-SC-S011 - 17.9 to 18.9	8/10/2018	17:25	SC		ED	4		x	x	x	x	1	1												
PDI-SC-S004 - 0 to 2	8/10/2018	18:30	SC		ED	4		x	x	x	x														
PDI-SC-S004 - 2 to 4	8/10/2018	18:35	SC		ED	4		x	x	x	x														
PDI-SC-S004 - 4 to 6	8/10/2018	18:40	sc		ED	4		x	x	x	x														
PDI-SC-S004 - 6 to 7.3	8/10/2018	18:45	sc		ED	4		x	x	x	x														
PDI-SC-S004 - 7.3 to 9.1	8/10/2018	18:50	SC		ED	4		x	x	x	x														
PDI-SC-S004 - 9.1 to 10.3	8/10/2018	18:55	SC		ED	4		x	x	x	x														
PDI-SC-S015 - 0 to 2	8/13/2018	9:05	SC		ED	4		<u>x</u>	x	x	x														
PDI-SC-S015 - 2 to 4	8/13/2018	9:10	SC	MS/MSD	ED	6		x	<u>x</u>	x	x														
PDI-SC-S015 - 4 to 6	8/13/2018	9:15	SC		ED	4		x	x	x	x								1						
Container Type: WMG=Wide Mouth Glass Jar,	P=HDPE, PF	P=Polyprop	oylene, AG	∝amber glas	ss, G=glass	, RC=Resin	Col	AG	AG	WMG	WMG	AG													
Preservative: HCl = Hydrochloric Acid, H3PO4		ic Acid, Hi	VO3 = Nitrie	c Acid																					
Fraction: D = Dissolved, PRT = Particulate, T = Tota	ıl (unfiltered)							•	le Disj			<b>—</b> —					_								
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Ph: 253-922-2310 Fax: 253-922-5047						- C	CH.	AIN	N OI	FC	UST	OD	Y												
Client Contact		Project	Contact: Ar	ny Dahl / Che	lsev Cook	l s	ite C	ontac	t- Jen	nifer F	201					Date	8/13/18							COC No: 1	
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Project #: 60566335 Study: Subsurface Sediment	1									£1690/82620	115. 83	AST													
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Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	2	PCDD/Fs 1613B	Archive	Grain size ASTM	PCB Aroclors, PAHs, Total Organic Carbon Total Solids 8082A, 8270D-SIM, 9060, 160.3	Atterberg Limits ASTM D4318	WQ-PCBA	wQ-PAHs	WQ-D/F	WQ-TOC			f						
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PDI-SC-S015 - 6 to 8	8/13/2018	9:20	SC		ED	4	4	<u>x</u>	<u>x</u>	x	<u>x</u>			ļ											
PDI-SC-S015 - 8 to 10	8/13/2018	9:25	SC		ED	4	_	x	x	<u>x</u>	<u>x</u>					ļ									
PDI-SC-S015 - 10 to 11.4	8/13/2018	9:30	SC		ED	4		x	<u>x</u>	x	x				L										, <u></u>
PDI-SC-S015 - 11.4 to 12.4	8/13/2018	9:35	SC		ED	4		<u>x</u>	x	x	x														
PDI-RB-SS-180810 - / 200	8/10/2018	12:00	W		ED	17							x	x	x	x									
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Container Type: WMG≠Wide Mouth Glass Jar,	P=HDPE, PF	-Polypro	pylene, AG	amber glas	ss, G≃glass	, RC≈Resin C	ol /	AG	AG	WMG	WMG	AG													
Preservative: HCI = Hydrochloric Acid, H3PO4		ic Acid, Hi	NO3 = Nitri	c Acid																					
Fraction: D = Dissolved, PRT = Particulate, T = Tota	ul (unfiltered)						Sé	ample																	
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		of Custody Record		HE LEADER IN ENVIRONMENTAL TESTING
Client Information (Sub Contract Lab)	Sampler. Drivne.	Lab PM: Walker, Elaine M E Most.	Chain of	JC No: J0-58266.1
Shipping/Receiving Company:	201011	elaine.walker@testamericainc.com Arrraditations Requiring/ Cap rotery	icainc.com Oregon	Page: Page 1 of 1
TestAmerica Laboratories, Inc.			(ace note):	Job #: 580-79555-3
Address: 30 Community Drive, Suite 11,	Due Date Requested: 8/29/2018		Analysis Requested	ğ
city: South Burlington	TAT Requested (days):			B - NaOH C - Zn Acetate
State, Zip: VT, 05403				D - Nitric Acid E - NaHSO4
Рьоле: 802-660-1990(Tel) 802-660-1919(Fax)	PO #	6		F - MeOH R - Na2S203 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecabudrate
Email:	#OM			i - Ice J - Di Water
Project Name: Portland Harbor Pre-Remedial Design	Project #: 58012120	507.0 R		K - EDTA L - EDA
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	Sample Type Sample (C=comp,	Matrix 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		5.96driu/15.
Sample Identification - Client ID (Lab ID)		BT=Tissue, A=Air) i T		P Special Instructions/Note:
PDI-SC-S007-2to4 (580-79555-8)	8/10/18 10:50 Bacific	×		
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Note: Since laboratory 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 a currently maintain accreditation in the State of Origin listed abore 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 br 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.	aboratories, Inc. places the ownership of method, analyti iis/tests/matrix being analyzed, the samples must be shir current to date, return the signed Chain of Custody attes	te & accreditation compliance upon out st ipped back to the TestAmerica laboratory sting to said complicance to TestAmerica	bcontract laboratories. This sample shipment is forwarded or other instructions will be provided. Any changes to accr Laboratories, Inc.	I under chain-of-custody. If the laboratory does not editation status should be brought to TestAmerica
Possible Hazard Identification		Sample Dispos	ee may be	ŝ
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 2	Return 1o Client Special Instructions/QC	Return 1 o Cilent — Disposal By Lab Special Instructions/QC Requirements:	Archive For Months
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:	
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Custody Seals Intact: Custody Seal No.: VO	#5 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Cooler Temper	Cooler Temperature(s) $^{\circ}$ C and Other Remarks: $3, _{\circ}$	
			7 8 9 1	1 2 2 10 20 20 20 20 20 20 20 20 20 20 20 20 20
	-			



### Login Sample Receipt Checklist

### Client: AECOM

### Login Number: 79555 List Number: 1 Creator: Antonson, Angeline D

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	

Job Number: 580-79555-3

List Source: TestAmerica Seattle

### Client: AECOM

### Login Number: 79555 List Number: 4 Creator: Hall, Samuel C

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td>Lab does not accept radioactive samples.</td>	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Seal present with no number.
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	3.8°C
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?	N/A	Received project as a subcontract.
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.	N/A	
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	No analysis requiring residual chlorine check assigned.

Job Number: 580-79555-3

List Source: TestAmerica Burlington

List Creation: 08/22/18 02:37 PM