



Analytical Resources, Incorporated
Analytical Chemists and Consultants

17 September 2018

Karen Mixon
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: Portland Harbor Pre-Remedial Design

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
18H0421

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record



Client Information (Sub Contract Lab)		Sampler:		Lab PM: Walker, Elaine M		Carrier Tracking No(s):		COC No: 580-58768.1			
Client Contact: Shipping/Receiving		Phone:		E-Mail: elaine.walker@testamericainc.com		State of Origin: Oregon		Page: Page 1 of 1			
Company: Analytical Resources, Inc				Accreditations Required (See note):				Job #: 580-79862-1			
Address: 4611 South 134th Place, Suite 100,		Due Date Requested: 9/12/2018		Analysis Requested				Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:			
City: Tukwila		TAT Requested (days):									
State, Zip: WA, 98168		PO #:		Field Filtered Sample (Yes or No) ☒		Perform MS/MSD (Yes or No) ☒		SUB (8041A Pentachlorophenol) 8041A Pentachlorophenol		Total Number of containers	
Phone: 206-695-6200(Tel)		WO #: ARI: 184 0421									
Email:		Project #: 58012120		Preservation Code:		☒		☒		☒	
Project Name: Portland Harbor Pre-Remedial Design		SSOW#:									
Site:											
Sample Identification - Client ID		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Special Instructions/Note:	
PDI-WS-T03-1808		8/22/18		17:55 Pacific				Water			
PDI-WS-T04-1808		8/23/18		10:20 Pacific				Water			
PDI-WS-T04-1808-D		8/23/18		10:20 Pacific				Water			
PDI-WS-T07-1808		8/23/18		18:20 Pacific				Water			
PDI-WS-T07-1808		8/23/18		18:20 Pacific		MS		Water			
PDI-WS-T07-1808		8/23/18		18:20 Pacific		MSD		Water			
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 the laboratory does not 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. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.											
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
Unconfirmed						☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)						Primary Deliverable Rank: 2					
						Special Instructions/QC Requirements:					
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:			
Relinquished by: 		Date/Time: 8/30/18 1500		Company: TASEA		Received by: Stephanie Fisher		Date/Time: 8-30-18 1500		Company: ARI	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.: N/A				Cooler Temperature(s) °C and Other Remarks: 3.5					



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Project: Portland Harbor Pre-Remedial Design
Project Number: 58012120
Project Manager: Karen Mixon

Reported:
17-Sep-2018 11:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PDI-WS-T03-1808	18H0421-01	Water	22-Aug-2018 17:55	30-Aug-2018 15:01
PDI-WS-T04-1808	18H0421-02	Water	23-Aug-2018 10:20	30-Aug-2018 15:01
PDI-WS-T04-1808-D	18H0421-03	Water	23-Aug-2018 10:20	30-Aug-2018 15:01
PDI-WS-T07-1808	18H0421-04	Water	23-Aug-2018 18:20	30-Aug-2018 15:01



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Case Narrative

Sample receipt

Samples as listed on the preceding page were received August 30, 2018 under ARI work order 18H0421. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Pentachlorophenol - EPA Method SW8041A

Sample PDI-WS-T03-1808 was received outside of the 7 day recommended holding time and has been flagged with an "H" qualifier.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and matrix spike duplicate were prepared in conjunction with sample PDI-WS-T07-1808. The matrix spike duplicate has high spike recovery. The source sample was non-detect. The results are advisory. No corrective action was taken.



Cooler Receipt Form

ARI Client: test america

COC No(s): _____ NA

Assigned ARI Job No: 18H0421

Project Name: portland harbor

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.5

Time: 1501

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DC02565

Cooler Accepted by: Self Date: 8-30-18 Time: 1501

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: NA

Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

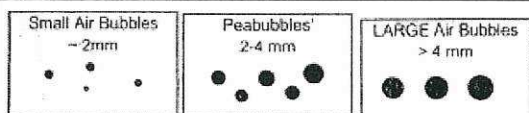
Samples Logged by: JTB Date: 8/30/18 Time: 1524

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)



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PDI-WS-T03-1808
18H0421-01 (Water)

Phenols

Method: EPA 8041A

Sampled: 08/22/2018 17:55

Instrument: ECD8 Analyst: YZ

Analyzed: 12-Sep-2018 16:27

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGH0819 Sample Size: 500 mL
Prepared: 30-Aug-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	H, U
Surrogate: 2,4,6-Tribromophenol				10-181 %	89.9	%	H
Surrogate: 2,4,6-Tribromophenol [2C]				10-181 %	71.7	%	H



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PDI-WS-T04-1808
18H0421-02 (Water)

Phenols

Method: EPA 8041A

Sampled: 08/23/2018 10:20

Instrument: ECD8 Analyst: YZ

Analyzed: 12-Sep-2018 16:45

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGH0819 Sample Size: 500 mL
Prepared: 30-Aug-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol				10-181 %	96.7	%	
Surrogate: 2,4,6-Tribromophenol [2C]				10-181 %	69.4	%	



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PDI-WS-T04-1808-D
18H0421-03 (Water)

Phenols

Method: EPA 8041A

Sampled: 08/23/2018 10:20

Instrument: ECD8 Analyst: YZ

Analyzed: 12-Sep-2018 17:03

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGH0819 Sample Size: 500 mL
Prepared: 30-Aug-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol				10-181 %	93.9	%	
Surrogate: 2,4,6-Tribromophenol [2C]				10-181 %	65.9	%	



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PDI-WS-T07-1808
18H0421-04 (Water)

Phenols

Method: EPA 8041A

Sampled: 08/23/2018 18:20

Instrument: ECD8 Analyst: YZ

Analyzed: 12-Sep-2018 17:21

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGH0819 Sample Size: 500 mL
Prepared: 30-Aug-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol				10-181 %	81.9	%	
Surrogate: 2,4,6-Tribromophenol [2C]				10-181 %	61.6	%	



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Phenols - Quality Control

Batch BGH0819 - EPA 3510C SepF

Instrument: ECD8 Analyst: YZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGH0819-BLK1)						Prepared: 30-Aug-2018 Analyzed: 12-Sep-2018 15:15					
Pentachlorophenol	ND	0.014	0.025	ug/L							U
Surrogate: 2,4,6-Tribromophenol	0.191			ug/L	0.250		76.5	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.170			ug/L	0.250		68.0	10-181			

LCS (BGH0819-BS1)						Prepared: 30-Aug-2018 Analyzed: 12-Sep-2018 15:33					
Pentachlorophenol	0.181	0.014	0.025	ug/L	0.250		72.4	36-159			
Surrogate: 2,4,6-Tribromophenol	0.208			ug/L	0.250		83.3	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.183			ug/L	0.250		73.4	10-181			

Matrix Spike (BGH0819-MS1)						Source: 18H0421-04 Prepared: 30-Aug-2018 Analyzed: 12-Sep-2018 17:38					
Pentachlorophenol	0.388	0.014	0.025	ug/L	0.250	ND	155	36-159			P1
Surrogate: 2,4,6-Tribromophenol	0.210			ug/L	0.250		84.0	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.160			ug/L	0.250		64.1	10-181			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BGH0819-MSD1)						Source: 18H0421-04 Prepared: 30-Aug-2018 Analyzed: 12-Sep-2018 17:56					
Pentachlorophenol	0.443	0.014	0.025	ug/L	0.250	ND	177	36-159	13.30	30	*, P1
Surrogate: 2,4,6-Tribromophenol	0.230			ug/L	0.250		91.9	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.176			ug/L	0.250		70.5	10-181			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Certified Analyses included in this Report

Analyte

Certifications

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019



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Notes and Definitions

*	Flagged value is not within established control limits.
H	Hold time violation - Hold time was exceeded.
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.