

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: 580-79055-1 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: 10/15/2018 1:21:24 PM Elaine Walker, Project Manager II (253)248-4972 elaine.walker@testamericainc.com

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

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### Job ID: 580-79055-1

#### Laboratory: TestAmerica Seattle

#### Narrative

## CASE NARRATIVE Client: AECOM Project: Portland Harbor Pre-Remedial Design Report Number: 580-79055-1

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 7/23/2018 2:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.6° C and 5.3° C.

A container for Atterberg limits was received for sample PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) however this analysis was not requested on the COC. The client requested we add the analysis on hold.

The following samples were activated by the client for all on hold analysis on 8/16/18:PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2)

All samples were frozen to preserve the holding times. Samples were originally received and frozen at TestAmerica Sacramento on 7/24/18. Frozen samples were shipped to the Seattle laboratory on 9/10/18 and received/frozen in Seattle on 9/11/18.

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.

#### SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) were analyzed for semivolatile organic compounds (GC-MS) in accordance with 8270D. The samples were prepared on 09/15/2018 and 09/19/2018 and analyzed on 09/20/2018 and 09/21/2018.

Bis(2-ethylhexyl) phthalate was detected in method blank MB 580-284043/1-A 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. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples were not performed.

Bis(2-ethylhexyl) phthalate was detected in method blank MB 580-284408/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and/or re-analysis of samples were not performed.

## 1 2 3 4 5 6 7 8 9 10 11

## Job ID: 580-79055-1 (Continued)

## Laboratory: TestAmerica Seattle (Continued)

Terphenyl-d14 (Surr) failed the surrogate recovery criteria high for MB 580-284408/1-A. Since the affected samples were within control limits and the method blank was ND for the affected analyte, the data is qualified and reported.

Bis(2-ethylhexyl) phthalate failed the recovery criteria high for the MS of sample PDI-SG-B472MS (580-79055-2) in batch 580-284567. Bis(2-ethylhexyl) phthalate failed the recovery criteria high for the MSD of sample PDI-SG-B472MSD (580-79055-2) in batch 580-284567. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The opening CCV for analytical batch 284567 was 1% above %D criteria for surrogate Terphenyl-d14. Since all samples and batch QC were well above 1% %R for this surrogate, the small bias has not caused any of the data to be artificially passing due to the instrument bias. Therefore the data is qualified and reported. The following samples are impacted: PDI-SG-B472 (580-79055-2) and (CCVIS 580-284567/3).

The opening CCV for analytical batch 284395 was 3% above %D criteria for surrogate Terphenyl-d14. Since all samples and batch QC were well above 3% of the lower %R limit for this surrogate, the small bias has not causing any of the data to be artificially passing due to the instrument bias. Therefore the data is qualified and reported. The following samples are impacted: PDI-SG-B471 (580-79055-1), (CCVIS 580-284395/3), and (MB 580-284043/1-A).

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2 were preserved by freezing within holding time. Samples were removed from the freezer 9/14/2018 and 9/18/2018. Therefore the samples are in hold and H-flags have been removed.

Samples PDI-SG-B471 (580-79055-1)[25X] and PDI-SG-B472 (580-79055-2)[10X] required dilution prior to analysis due to the nature of the sample matrix. The reporting limits have been adjusted accordingly.

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

### SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with SW846 8270D\_SIM. The samples were prepared on 09/15/2018 and 10/09/2018 and analyzed on 09/19/2018 and 10/11/2018.

Fluoranthene, Phenanthrene and Pyrene were detected in method blank MB 580-284059/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples were not performed.

Fluoranthene was detected in method blank MB 580-286035/1-A 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. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples were not performed.

Indeno[1,2,3-cd]pyrene failed the recovery criteria high for the MS of sample PDI-SG-B472MS (580-79055-2) in batch 580-286213. Indeno[1,2,3-cd]pyrene failed the recovery criteria high for the MSD of sample PDI-SG-B472MSD (580-79055-2) in batch 580-286213. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) were frozen immediately after acquisition from the job site and transported to Sacramento, then to Seattle frozen. The samples were removed in the evening on 09/14/2018 and 10/8/2018. The samples were extracted within hold time; therefore, the H flags on these samples are removed.

Samples PDI-SG-B471 (580-79055-1)[50X] and PDI-SG-B472 (580-79055-2)[25X] required dilution prior to analysis due to the nature of the sample matrix. The reporting limits have been adjusted accordingly.

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

## Job ID: 580-79055-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

#### **ORGANOTINS BY GC/MS**

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) were analyzed for Organotins by GC/MS in accordance with the Krone Method. The samples were prepared on 09/15/2018 and 09/26/2018 and analyzed on 09/23/2018 and 10/09/2018.

The following samples were received frozen at the laboratory: PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2). Therefore the extraction was in hold and the H-flags have been removed. The samples were received from the freezer on 9/14/2018 and 9/25/2018.

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

#### DIESEL AND EXTENDED RANGE ORGANICS

Samples PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2) were analyzed for diesel and extended range organics in accordance with Method NWTPH-Dx. The samples were prepared on 09/19/2018 and analyzed on 09/22/2018.

The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2).

The following samples were thawed on the evening of 09/18/2018: PDI-SG-B471 (580-79055-1) and PDI-SG-B472 (580-79055-2). These samples were processed within holding time and the h-flags have been removed.

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

#### METALS (ICPMS)

Sample PDI-SG-B471 (580-79055-1) was analyzed for Metals (ICPMS) in accordance with 6020A\_LL. The samples were prepared on 08/23/2018 and analyzed on 08/24/2018.

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

#### TOTAL MERCURY

Sample PDI-SG-B471 (580-79055-1) was analyzed for total mercury in accordance with EPA SW-846 Method 7471A. The samples were prepared and analyzed on 08/23/2018.

The following sample was prepared outside of preparation holding time due to client requesting analysis after holding time expired: PDII-SG-B471.

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

#### TOTAL ORGANIC CARBON

Sample PDI-SG-B471 (580-79055-1) was analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 09/19/2018.

Total Organic Carbon - Duplicates was detected in method blank MB 580-284391/5 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. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples were not performed.

Sample PDI-SG-B471 (580-79055-1) was preserved by freezing within holding time. The sample was removed from the freezer 9/18/2018. Therefore the sample is in hold and H-flags have been removed.

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

#### TOTAL SOLIDS @ 70C

Sample PDI-SG-B471 (580-79055-1) was analyzed for Total Solids @ 70C. The samples were analyzed on 09/13/2018.

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

## Qualifiers

GC/	MS	Semi	VOA
00		00111	

Qualifier	Qualifier Description	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
В	Compound was found in the blank and sample.	
F1	MS and/or MSD Recovery is outside acceptance limits.	
Х	Surrogate is outside control limits	
GC Semi \	/OA	
Qualifier	Qualifier Description	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
Metals		
Qualifier	Qualifier Description	9
Н	Sample was prepped or analyzed 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.	
General C	hemistry	
Qualifier	Qualifier Description	
Н	Sample was prepped or analyzed beyond the specified holding time	

## B Sample was prepped or analyzed beyond the s B Compound was found in the blank and sample.

D	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## 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 Sample Results**

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

#### D: 580-79055-1 Matrix: Solid rcent Solids: 51.7

5

Dil Fac

50

50

50

50

50

50 50

50

50

50

50

50

50

50

50

50

50

50

25

25

1

1

1

1

1

Dil Fac

Client Sample ID: PDI- Date Collected: 07/21/18 10 Date Received: 07/23/18 14	):45					L		e ID: 580-79 Matrix Percent Solid
- Method: 8270D SIM - Sem	ivolatile Organi	c Compou	inds (GC/MS	SIM)				
Analyte		Qualifier	RL		Unit	D	Prepared	Analyzed
2-Methylnaphthalene	21		90	8.1	ug/Kg	<u></u>	09/15/18 16:23	
Acenaphthene	14		90	11	ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Acenaphthylene	13	J	90		ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Anthracene	25	J	90	11	ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Benzo[a]anthracene	76		90		ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Benzo[a]pyrene	65	J	90	7.2	ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Benzo[b]fluoranthene	100		90	11		¢.	09/15/18 16:23	09/19/18 16:47
Benzo[g,h,i]perylene	54	J	90	9.0	ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Benzo[k]fluoranthene	34		90	11	ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Chrysene	98		90		ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Dibenz(a,h)anthracene	ND		90		ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Fluoranthene	190	в	90		ug/Kg	¢		09/19/18 16:47
Fluorene	17		90		ug/Kg	¢	09/15/18 16:23	09/19/18 16:47
Indeno[1,2,3-cd]pyrene	53		90		ug/Kg	₽		09/19/18 16:47
Naphthalene	42		90		ug/Kg	¢		09/19/18 16:47
Phenanthrene	110		90		ug/Kg	÷		09/19/18 16:47
Pyrene	180		90		ug/Kg	¢		09/19/18 16:47
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed
Terphenyl-d14	119		57 - 120				09/15/18 16:23	09/19/18 16:47
Method: 8270D - Semivola	atile Organic Co	mpounds	(GC/MS)					
Analyte	-	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed
Bis(2-ethylhexyl) phthalate	ND		1400	160	ug/Kg	<u> </u>	09/15/18 08:47	09/20/18 02:49
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed
Terphenyl-d14 (Surr)	83		58 - 120				09/15/18 08:47	09/20/18 02:49
Method: Organotins - Org	anotins. PSEP	(GC/MS)						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed
Tributyltin	ND		140	38	ug/Kg	<u> </u>	09/15/18 09:00	09/23/18 01:28
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed
Tripentyltin	50		10 - 113				09/15/18 09:00	09/23/18 01:28
Method: NWTPH-Dx - Nor	thwest - Somi W	olatilo Pot	roloum Prod	ucte (Gl	<b>~</b> )			
Analyte		Qualifier	RL	•	Unit	D	Prepared	Analyzed
#2 Diesel (C10-C24)	190		88	22	mg/Kg		09/19/18 16:08	09/22/18 15:55
Motor Oil (>C24-C36)	720		88	31	mg/Kg	☆	09/19/18 16:08	09/22/18 15:55
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed
o-Terphenyl	111		50 - 150				09/19/18 16:08	09/22/18 15:55
Method: 6020B - Metals (I	CP/MS)							
Analyte	Result	Qualifier	RL	MDI	Unit	D	Prepared	Analvzed

Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.3	0.34	0.068	mg/Kg	₩ Å	08/23/18 17:18	08/24/18 16:08	5
Cadmium	0.21 J	0.27	0.052	mg/Kg	₽	08/23/18 17:18	08/24/18 16:08	5
Copper	35	0.68	0.15	mg/Kg	¢	08/23/18 17:18	08/24/18 16:08	5
Lead	15	0.34	0.032	mg/Kg	¢	08/23/18 17:18	08/24/18 16:08	5
Manganese	750	0.68	0.31	mg/Kg	¢	08/23/18 17:18	08/24/18 16:08	5
Zinc	210	3.4	1.1	mg/Kg	¢	08/23/18 17:18	08/24/18 16:08	5

## **Client Sample Results**

Client: AECOM Project/Site: Portland Harbor Pre-Remedial Design TestAmerica Job ID: 580-79055-1

Client Sample ID: PDI-SG-B471 Date Collected: 07/21/18 10:45 Date Received: 07/23/18 14:35							Lab Sample ID: 580 Ma Percent So				
Method: 7471A - Mercury (CVAA Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Mercury	0.11	H	0.038	0.011	mg/Kg	<u>Å</u>	08/23/18 10:12	08/23/18 15:04	1		
General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Total Organic Carbon - Duplicates	27000	В	2000	44	mg/Kg			09/19/18 13:36	1		
Total Solids @ 70°C	54	н	0.10	0.10	%			09/13/18 02:08	1		

## **Client Sample Results**

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

## Client Sample ID: PDI-SG-B472

Date Collected: 07/21/18 12:20 Date Received: 07/23/18 14:35

Lab Sample ID: {	580-79055-2
	Matrix: Solid
Percer	nt Solids: 55.4

5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		45	4.0	ug/Kg	<u>Å</u>	10/09/18 16:09	10/11/18 13:56	25
Acenaphthene	ND		45	5.4	ug/Kg	₽	10/09/18 16:09	10/11/18 13:56	25
Acenaphthylene	ND		45	4.5	ug/Kg	₽	10/09/18 16:09	10/11/18 13:56	25
Anthracene	5.4	J	45	5.4	ug/Kg	¢	10/09/18 16:09	10/11/18 13:56	25
Benzo[a]anthracene	27	J	45	6.8	ug/Kg	₽	10/09/18 16:09	10/11/18 13:56	25
Benzo[a]pyrene	24	J	45	3.6	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Benzo[b]fluoranthene	36	J	45	5.3	ug/Kg	¢	10/09/18 16:09	10/11/18 13:56	25
Benzo[g,h,i]perylene	ND		45	4.5	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Benzo[k]fluoranthene	8.4	J	45	5.4	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Chrysene	ND		45	13	ug/Kg	¢	10/09/18 16:09	10/11/18 13:56	25
Dibenz(a,h)anthracene	ND		45	6.5	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Fluoranthene	40	JB	45	13	ug/Kg	₽	10/09/18 16:09	10/11/18 13:56	25
Fluorene	5.1	J	45	4.5	ug/Kg	¢	10/09/18 16:09	10/11/18 13:56	25
Indeno[1,2,3-cd]pyrene	30	J F1	45	5.4	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Naphthalene	ND		45	7.2	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Phenanthrene	18	J	45	6.2	ug/Kg	¢	10/09/18 16:09	10/11/18 13:56	25
Pyrene	40	J	45	8.7	ug/Kg	☆	10/09/18 16:09	10/11/18 13:56	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	93		57 - 120				10/09/18 16:09	10/11/18 13:56	25

#### Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte Bis(2-ethylhexyl) phthalate	• •	Qualifier	RL 540	 Unit ug/Kg	<b>D</b> ☆	Prepared 09/19/18 17:04	Analyzed 09/21/18 14:04	Dil Fac 10
<b>Surrogate</b> Terphenyl-d14 (Surr)	%Recovery 116	Qualifier	Limits			<b>Prepared</b> 09/19/18 17:04	Analyzed 09/21/18 14:04	Dil Fac 10

Method: Organotins - Organo	otins, PSEP (GC/MS)							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND	130	33	ug/Kg	₩ <del> </del>	09/26/18 09:35	10/09/18 21:26	1
						- ·		
Surrogate	%Recovery Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	16	10 - 113				09/26/18 09:35	10/09/18 21:26	1

#### Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	63	J	86	21	mg/Kg	<u>\$</u>	09/19/18 16:08	09/22/18 16:16	1
Motor Oil (>C24-C36)	300		86	30	mg/Kg	¢	09/19/18 16:08	09/22/18 16:16	1
Surrogate o-Terphenyl	%Recovery 102	Qualifier	Limits				<b>Prepared</b> 09/19/18 16:08	Analyzed 09/22/18 16:16	Dil Fac

Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

# . . . . . .... 5 6

Lab Sample ID: MB 580-28 Matrix: Solid	34043/1-A							CI	ient Sam	ple ID: Metho Prep Type: 1	
Analysis Batch: 284395	MB	MB								Prep Batch:	
Analyte	Result	Qualifier	RL		MDL	Unit		D	Prepared	Analyzed	Dil Fa
Bis(2-ethylhexyl) phthalate	3.89	J			3.6	ug/Kg		- 09	/15/18 08:4	7 09/19/18 17:23	3
	МВ	MB									
Surrogate	%Recovery		Limits						Prepared	Analyzed	Dil Fa
Terphenyl-d14 (Surr)	107		58 - 120						•	7 09/19/18 17:23	
	04040/0 4						0114				0
Lab Sample ID: LCS 580-2 Matrix: Solid	284043/2-A						Cile	ent Sa	ample ID	: Lab Control	
Analysis Batch: 284567										Prep Type: 1 Prep Batch:	
Analysis Batch. 204307			Spike	LCS	LCS					%Rec.	20404
Analyte			Added	Result			Unit		) %Rec	Limits	
Bis(2-ethylhexyl) phthalate	······		50.0	46.4			ug/Kg		93	59 - 123	
( ) - ) / F		_					5.5				
	LCS LC										
Surrogate	%Recovery Qu	alifier	Limits								
Terphenyl-d14 (Surr)	113		58 - 120								
Lab Sample ID: MB 580-28	34408/1-A							CI	ient Sam	ple ID: Metho	d Blan
Matrix: Solid										Prep Type: 1	
Analysis Batch: 284567										Prep Batch:	
	MB	MB									
Analyte	Result	Qualifier	RL		MDL	Unit		D	Prepared	Analyzed	Dil Fa
Bis(2-ethylhexyl) phthalate	5.71	J	30		3.6	ug/Kg		09	/19/18 17:0	4 09/21/18 13:15	5
	МВ	MB									
Surrogate	%Recovery	v Qualifier	Limits						Prepared	Analyzed	Dil Fa
Terphenyl-d14 (Surr)		$\overline{X}$	58 - 120						•	4 09/21/18 13:15	
Lab Sample ID: LCS 580-2	004400/2 4						CIL	nt C	ompio ID	: Lab Control	Sample
Matrix: Solid	.04400/2-A						Cite	ant S		Prep Type: 1	
Analysis Batch: 284567										Prep Batch:	
Analysis Baton. 204007			Spike	LCS	LCS					%Rec.	20440
Analyte			Added	Result	Qua	lifier	Unit	0	D %Rec	Limits	
Bis(2-ethylhexyl) phthalate			50.0	48.6			ug/Kg		97	59 - 123	
	LCS LC	<i>د</i>									
Surrogate	%Recovery Qu		Limits								
Terphenyl-d14 (Surr)	<u>99</u>		58 - 120								
Lab Sample ID: 580-79055	5-2 MS							C	lient San	nple ID: PDI-S	
Matrix: Solid										Prep Type: 1	
Analysis Batch: 284567	_									Prep Batch:	28440
	Sample Sa		Spike		MS					%Rec.	
Analyte	Result Qu	alifier	Added	Result			Unit		0 %Rec	Limits	
Bis(2-ethylhexyl) phthalate	ND F1		88.9	131	J F1		ug/Kg	X	× 147	59 - 123	
	MS MS										
	1/13 1/13	)									

58 - 120

## Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-79055 Matrix: Solid Analysis Batch: 284567	5-2 MSD						Cli	ent Sai	mple ID: P Prep Tyj Prep Ba	be: Tot	al/NA
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Bis(2-ethylhexyl) phthalate	ND	F1	88.3	128	J F1	ug/Kg	<u></u>	145	59 - 123	2	13
	MSD	MSD									
Surrogate	%Recovery	Qualifier	Limits								
Terphenyl-d14 (Surr)	100		58 - 120								

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-284 Matrix: Solid Analysis Batch: 284623	059/1-A							le ID: Method Prep Type: To Prep Batch: :	otal/NA
	МВ	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		1.0	0.090	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Acenaphthene	ND		1.0	0.12	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Acenaphthylene	ND		1.0	0.10	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Anthracene	ND		1.0	0.12	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Benzo[a]anthracene	ND		1.0	0.15	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Benzo[a]pyrene	ND		1.0	0.080	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Benzo[b]fluoranthene	ND		1.0	0.12	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Benzo[g,h,i]perylene	ND		1.0	0.10	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Benzo[k]fluoranthene	ND		1.0	0.12	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Chrysene	ND		1.0	0.30	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Dibenz(a,h)anthracene	ND		1.0		ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Fluoranthene	0.373	J	1.0	0.28	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Fluorene	ND		1.0		ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Indeno[1,2,3-cd]pyrene	ND		1.0		ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Naphthalene	ND		1.0	0.16	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
Phenanthrene	0.734	J	1.0		ug/Kg		09/15/18 16:23	09/21/18 17:08	
Pyrene	0.314	J	1.0	0.19	ug/Kg		09/15/18 16:23	09/21/18 17:08	1
	MB	МВ							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	91		57 - 120				09/15/18 16:23	09/21/18 17:08	1

09/15/18 16:23 09/21/18 17:08 1

#### Lab Sample ID: LCS 580-284059/2-A **Matrix: Solid** Analysis Batch: 284415

#### **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Prep Batch: 284059 %Rec.
Limits
68 - 120
68 - 120
68 - 120
73 - 125
66 - 120
72 - 124
63 - 121
63 - 120
63 - 123

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

**Client Sample ID: Method Blank** 

Prepared

Prep Type: Total/NA Prep Batch: 286035

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580- Matrix: Solid Analysis Batch: 284415	284059/2-A					Clie	nt Sai	mple ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 284059
Analysis Datch. 204415			Spike	LCS	LCS				%Rec.
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits
Chrysene			200	210		ug/Kg		105	69 - 120
Dibenz(a,h)anthracene			200	232		ug/Kg		116	70 - 125
Fluoranthene			200	200		ug/Kg		100	74 - 125
Fluorene			200	189		ug/Kg		95	73 - 120
Indeno[1,2,3-cd]pyrene			200	239		ug/Kg		120	65 - 121
Naphthalene			200	177		ug/Kg		89	70 - 120
Phenanthrene			200	189		ug/Kg		94	73 - 120
Pyrene			200	198		ug/Kg		99	70 - 120
	LCS	LCS							
Surrogate	%Recovery	Qualifier	Limits						
Terphenyl-d14	107		57 - 120						

#### Lab Sample ID: MB 580-286035/1-A Matrix: Solid Analysis Batch: 286213

								. Top Batom	
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		1.0	0.090	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Acenaphthene	ND		1.0	0.12	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Acenaphthylene	ND		1.0	0.10	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Anthracene	ND		1.0	0.12	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Benzo[a]anthracene	ND		1.0	0.15	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Benzo[a]pyrene	ND		1.0	0.080	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Benzo[b]fluoranthene	ND		1.0	0.12	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Benzo[g,h,i]perylene	ND		1.0	0.10	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Benzo[k]fluoranthene	ND		1.0	0.12	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Chrysene	ND		1.0	0.30	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Dibenz(a,h)anthracene	ND		1.0	0.14	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Fluoranthene	0.386	J	1.0	0.28	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Fluorene	ND		1.0	0.10	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Indeno[1,2,3-cd]pyrene	ND		1.0	0.12	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Naphthalene	ND		1.0	0.16	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Phenanthrene	ND		1.0	0.14	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
Pyrene	ND		1.0	0.19	ug/Kg		10/09/18 16:09	10/11/18 12:14	1
	МВ	MB							

Surrogate	%Recovery	Qualifier	Limits
Terphenyl-d14	101		57 - 120

#### Lab Sample ID: LCS 580-286035/2-A Matrix: Solid Analysis Batch: 286213

Analysis Batch: 286213	Spike	LCS	LCS				Prep Batch: 286035 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
2-Methylnaphthalene	200	166		ug/Kg		83	68 - 120
Acenaphthene	200	160		ug/Kg		80	68 - 120
Acenaphthylene	200	157		ug/Kg		79	68 - 120
Anthracene	200	199		ug/Kg		100	73 - 125
Benzo[a]anthracene	200	211		ug/Kg		106	66 - 120

**TestAmerica Seattle** 

Analyzed

Prep Type: Total/NA

10/09/18 16:09 10/11/18 12:14

**Client Sample ID: Lab Control Sample** 

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Dil Fac

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

Client Sample ID: PDI-SG-B472

Prep Type: Total/NA

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-286035/2-A Matrix: Solid				: Lab Control Sample Prep Type: Total/NA			
Analysis Batch: 286213	Spike	LCS	LCS				Prep Batch: 286035 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzo[a]pyrene	200	204		ug/Kg		102	72 - 124
Benzo[b]fluoranthene	200	202		ug/Kg		101	63 - 121
Benzo[g,h,i]perylene	200	189		ug/Kg		95	63 - 120
Benzo[k]fluoranthene	200	194		ug/Kg		97	63 - 123
Chrysene	200	189		ug/Kg		95	69 - 120
Dibenz(a,h)anthracene	200	211		ug/Kg		105	70 - 125
Fluoranthene	200	202		ug/Kg		101	74 - 125
Fluorene	200	172		ug/Kg		86	73 - 120
Indeno[1,2,3-cd]pyrene	200	223		ug/Kg		112	65 - 121
Naphthalene	200	157		ug/Kg		78	70 - 120
Phenanthrene	200	181		ug/Kg		91	73 - 120
Pyrene	200	193		ug/Kg		97	70 - 120

	200	200	
Surrogate	%Recovery	Qualifier	Limits
Terphenyl-d14	91		57 - 120

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#### Lab Sample ID: 580-79055-2 MS Matrix: Solid Analysis Batch: 286213

Terphenyl-d14

Analysis Batch: 286213	Sample	Sample	Spike	MS	MS				Prep Batch: 286035 %Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
2-Methylnaphthalene	ND		355	302		ug/Kg	\ ₽	85	68 - 120
Acenaphthene	ND		355	321		ug/Kg	¢	90	68 - 120
Acenaphthylene	ND		355	312		ug/Kg	¢	88	68 - 120
Anthracene	5.4	J	355	386		ug/Kg	¢	107	73 - 125
Benzo[a]anthracene	27	J	355	391		ug/Kg	¢	103	66 - 120
Benzo[a]pyrene	24	J	355	356		ug/Kg	¢	94	72 - 124
Benzo[b]fluoranthene	36	J	355	359		ug/Kg	¢	91	63 - 121
Benzo[g,h,i]perylene	ND		355	320		ug/Kg	¢	90	63 - 120
Benzo[k]fluoranthene	8.4	J	355	322		ug/Kg	¢	88	63 - 123
Chrysene	ND		355	341		ug/Kg	¢	96	69 - 120
Dibenz(a,h)anthracene	ND		355	408		ug/Kg	¢	115	70 - 125
Fluoranthene	40	JB	355	407		ug/Kg	¢	103	74 - 125
Fluorene	5.1	J	355	351		ug/Kg	¢	97	73 - 120
Indeno[1,2,3-cd]pyrene	30	J F1	355	482	F1	ug/Kg	¢	127	65 - 121
Naphthalene	ND		355	272		ug/Kg	¢	77	70 - 120
Phenanthrene	18	J	355	375		ug/Kg	¢	101	73 - 120
Pyrene	40	J	355	404		ug/Kg	☆	103	70 - 120
	MS	MS							
Surrogate	%Recovery	Qualifier	Limits						
Torphopyl d11	05		57 120						

Lab Sample ID: 580-79055 Matrix: Solid	2 MSD						Cli	ent Sai	mple ID: P Prep Tyj		
Analysis Batch: 286213									Prep Ba	atch: 28	86035
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
2-Methylnaphthalene	ND		351	288		ug/Kg	<u>Å</u>	82	68 - 120	5	12

57 - 120

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## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 580-7905	5-2 MSD						Cli	ent Sai	nple ID: F	DI-SG-	- <b>B472</b>
Matrix: Solid									· Prep Ty		
Analysis Batch: 286213									Prep Ba	atch: 28	36035
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Acenaphthene	ND		351	301		ug/Kg	¢	86	68 - 120	6	12
Acenaphthylene	ND		351	290		ug/Kg	¢	83	68 - 120	7	12
Anthracene	5.4	J	351	355		ug/Kg	¢	100	73 - 125	8	12
Benzo[a]anthracene	27	J	351	381		ug/Kg	¢	101	66 - 120	3	14
Benzo[a]pyrene	24	J	351	341		ug/Kg	¢	90	72 - 124	4	12
Benzo[b]fluoranthene	36	J	351	343		ug/Kg	₽	87	63 - 121	5	10
Benzo[g,h,i]perylene	ND		351	307		ug/Kg	¢	87	63 - 120	4	14
Benzo[k]fluoranthene	8.4	J	351	300		ug/Kg	¢	83	63 - 123	7	15
Chrysene	ND		351	327		ug/Kg	₽	93	69 - 120	4	10
Dibenz(a,h)anthracene	ND		351	366		ug/Kg	¢	104	70 - 125	11	13
Fluoranthene	40	JB	351	411		ug/Kg	₽	106	74 - 125	1	13
Fluorene	5.1	J	351	324		ug/Kg	₽	91	73 - 120	8	13
Indeno[1,2,3-cd]pyrene	30	J F1	351	458	F1	ug/Kg	¢	122	65 - 121	5	15
Naphthalene	ND		351	280		ug/Kg	¢	80	70 - 120	3	12
Phenanthrene	18	J	351	360		ug/Kg	¢	97	73 - 120	4	11
Pyrene	40	J	351	404		ug/Kg	¢	104	70 - 120	0	12
	MSD	MSD									
Surrogate	%Recovery	Qualifier	Limits								
Terphenyl-d14	89		57 - 120								

## Method: Organotins - Organotins, PSEP (GC/MS)

Lab Sample ID: MB 580-284 Matrix: Solid Analysis Batch: 284676									Cli		ole ID: Metho Prep Type: T Prep Batch:	otal/NA
		МВ МВ										
Analyte	Res	sult Qual	lifier	RL		MDL	Unit			Prepared	Analyzed	Dil Fac
Tributyltin		ND		75		20	ug/Kg		09/	15/18 09:00	09/22/18 18:04	1
		MB MB										
Surrogate	%Recov	ery Qual	lifier	Limits					- 1	Prepared	Analyzed	Dil Fac
Tripentyltin		52		10 - 113					09/	15/18 09:00	09/22/18 18:04	1
Lab Sample ID: LCS 580-28 Matrix: Solid Analysis Batch: 284676	84045/2-A			Spike	LCS	LCS	ì	Clie	nt Sa		Lab Control Prep Type: T Prep Batch: %Rec.	otal/NA
Analyte				Added	Result	Qua	lifier	Unit	D	%Rec	Limits	
Tributyltin				71.8	46.9			ug/Kg		65	14 - 150	
	LCS	LCS										
Surrogate	%Recovery	Qualifier	1	Limits								
Tripentyltin	64			10-113								

Tripentyltin

	le ID: Methoc Prep Type: To		
	Prep Batch:		5
Prepared 09/26/18 09:35	Analyzed 10/09/18 16:44	Dil Fac	6
Propared	Analyzod	Dil Fac	

## Method: Organotins - Organotins, PSEP (GC/MS) (Continued)

Lab Sample ID: MB 580-28 Matrix: Solid Analysis Batch: 285981	4918/1-A							Clie		ole ID: Method Prep Type: To Prep Batch:	otal/NA
· · · · · <b>,</b> · · · · · · · · · · · · · · · · · · ·	ME	B MB									
Analyte	Resul	t Qualifier	RL	M	IDL U	Jnit	D	P	repared	Analyzed	Dil Fac
Tributyltin	NE	<u> </u>	75		20 u	ıg/Kg		09/2	6/18 09:35	10/09/18 16:44	1
	МЕ	B MB									
Surrogate	%Recovery	/ Qualifier	Limits					P	repared	Analyzed	Dil Fac
Tripentyltin	54	4	10 - 113					09/2	26/18 09:35	10/09/18 16:44	1
Lab Sample ID: LCS 580-2 Matrix: Solid	84918/2-A						Clier	it Sa		Lab Control S Prep Type: To	
Analysis Batch: 285981										Prep Batch:	
•			Spike	LCS	LCS					%Rec.	
Analyte			Added	Result	Qualif	fier	Unit	D	%Rec	Limits	
Tributyltin			178	95.2			ug/Kg		53	14 - 150	
	LCS LC	s									
Surrogate	%Recovery Qu	alifier	Limits								

10-113

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

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Lab Sample ID: MB 580-24 Matrix: Solid Analysis Batch: 284670	84396/1-A									Clie		ole ID: Me Prep Type Prep Bat	e: Tot	al/NA
		MB												
Analyte	Re		Qualifier	RL			Unit		D		repared	Analyze		Dil Fac
#2 Diesel (C10-C24)		ND		50			mg/Kg	-			9/18 16:08			1
Motor Oil (>C24-C36)		ND		50		18	mg/Kg	9		09/1	9/18 16:08	09/22/18 1	4:52	1
		MВ	МВ											
Surrogate	%Recov	very	Qualifier	Limits						P	repared	Analyze	d	Dil Fac
o-Terphenyl		104		50 - 150						09/1	9/18 16:08	09/22/18 1	4:52	1
Analysis Batch: 284670 Analyte #2 Diesel (C10-C24)				Spike Added 500	Result 471	LCS Qua		Unit mg/Kg			<b>%Rec</b>	Prep Bat %Rec. Limits 70 - 125	ch: 2	84396
Motor Oil (>C24-C36)				500	484			mg/Kg			97	70 - 129		
	LCS	LCS												
Surrogate	%Recovery	Qua	lifier	Limits										
o-Terphenyl	97			50 - 150										
Lab Sample ID: LCSD 580 Matrix: Solid Analysis Batch: 284670	-284396/3-A			• "				lient S	am	nple		Control S Prep Type Prep Bat	e: Tot	al/NA 84396
A second a				Spike	LCSD		_	11		_	0/ <b>D</b>	%Rec.		RPD
Analyte				Added	Result	Qua	lifier	Unit			%Rec	Limits	RPD	Limit
#2 Diesel (C10-C24)				500	476			mg/Kg			95	70 - 125	1	16
Motor Oil (>C24-C36)				500	495			mg/Kg			99	70 - 129	2	16

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Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued) Lab Sample ID: LCSD 580-284396/3-A **Client Sample ID: Lab Control Sample Dup** Matrix: Solid Prep Type: Total/NA Analysis Batch: 284670 **Prep Batch: 284396** LCSD LCSD Surrogate %Recovery Qualifier Limits o-Terphenyl 50 - 150 96 Method: 6020B - Metals (ICP/MS) Lab Sample ID: MB 580-282341/22-A **Client Sample ID: Method Blank** Matrix: Solid Prep Type: Total/NA Analysis Batch: 282750 Prep Batch: 282341 MB MB Analyte **Result Qualifier** RL MDL Unit D Prepared Dil Fac Analyzed Arsenic ND 0.25 0.050 mg/Kg 08/23/18 17:18 08/24/18 14:19 5 ND Cadmium 0.20 08/23/18 17:18 08/24/18 14:19 5 0.039 mg/Kg Copper ND 0.50 0.11 mg/Kg 08/23/18 17:18 08/24/18 14:19 5 ND 0.25 5 Lead 0.024 mg/Kg 08/23/18 17:18 08/24/18 14:19 Manganese ND 0.50 0.23 mg/Kg 08/23/18 17:18 08/24/18 14:19 5 ND 2.5 0.81 mg/Kg 08/23/18 17:18 08/24/18 14:19 5 Zinc Lab Sample ID: LCS 580-282341/23-A **Client Sample ID: Lab Control Sample** Matrix: Solid Prep Type: Total/NA Analysis Batch: 282750 Prep Batch: 282341 Spike LCS LCS %Rec. Analyte Added **Result Qualifier** Unit D %Rec Limits Arsenic 200 199 100 80 - 120 mg/Kg Cadmium 5.00 5.21 104 80 - 120 mg/Kg 80 - 120 25.0 25.2 101 Copper mg/Kg Lead 50.0 47.6 mg/Kg 95 80 - 120 Manganese 50.0 48.5 mg/Kg 97 80 - 120 Zinc 200 195 mg/Kg 98 80 - 120 Lab Sample ID: LCSD 580-282341/24-A **Client Sample ID: Lab Control Sample Dup** Matrix: Solid Prep Type: Total/NA Analysis Batch: 282750 Prep Batch: 282341 Spike LCSD LCSD %Rec. RPD **Result Qualifier** Analyte Added %Rec Limits RPD Limit Unit D Arsenic 200 196 98 80 - 120 20 mg/Kg 1 Cadmium 5.00 mg/Kg 5 18 104 80 - 120 20 1 Copper 25.0 24.8 mg/Kg 99 80 - 120 2 20 Lead 50.0 47.4 mg/Kg 95 80 - 120 20 1 Manganese 50.0 47.7 mg/Kg 95 80 - 120 2 20 Zinc 200 195 97 80 - 120 0 20

#### Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-282266 Matrix: Solid Analysis Batch: 282350	6/22-A MB	МВ						le ID: Methoo Prep Type: To Prep Batch: :	otal/NA
Analyte Mercury	Result ND	Qualifier	RL 0.030	MDL 0.0090	Unit mg/Kg	D	Prepared 08/23/18 10:12	Analyzed 08/23/18 14:23	Dil Fac

mg/Kg

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

6

#### Method: 7471A - Mercury (CVAA) (Continued) Lab Sample ID: LCS 580-282266/23-A **Client Sample ID: Lab Control Sample Matrix: Solid** Prep Type: Total/NA Analysis Batch: 282350 Prep Batch: 282266 Spike LCS LCS %Rec. Analyte Added **Result Qualifier** Unit D %Rec Limits 0.167 80 - 120 0.163 mg/Kg 98 Mercury Lab Sample ID: LCSD 580-282266/24-A Client Sample ID: Lab Control Sample Dup Matrix: Solid **Prep Type: Total/NA** Analysis Batch: 282350 **Prep Batch: 282266** Spike LCSD LCSD %Rec. RPD Limits Added **Result Qualifier** RPD Analyte Limit Unit D %Rec Mercury 0.167 0.160 mg/Kg 96 80 - 120 2 20 Method: 9060 PSEP - TOC (Puget Sound) Lab Sample ID: MB 580-284391/5 **Client Sample ID: Method Blank** Matrix: Solid Prep Type: Total/NA Analysis Batch: 284391 MB MB Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac Total Organic Carbon - Duplicates 119 J 2000 44 mg/Kg 09/19/18 12:31 Lab Sample ID: LCS 580-284391/6 **Client Sample ID: Lab Control Sample** Matrix: Solid Prep Type: Total/NA Analysis Batch: 284391 LCS LCS Spike %Rec. Added **Result Qualifier** Limits Analyte Unit D %Rec 4270 4310 101 68 - 149 mg/Kg Total Organic Carbon -Duplicates Lab Sample ID: LCSD 580-284391/7 **Client Sample ID: Lab Control Sample Dup Matrix: Solid** Prep Type: Total/NA Analysis Batch: 284391 Spike LCSD LCSD %Rec. RPD Added **Result Qualifier** Limits Analyte Unit D %Rec RPD Limit Total Organic Carbon -4270 3680 mg/Kg 86 68 - 149 16 32 Duplicates

### Method: Moisture 70C - Percent Moisture, 70 C

Lab Sample ID: 580-79055- Matrix: Solid Analysis Batch: 283855	1 DU					Clier	 D: PDI-SG p Type: To	
	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Total Solids @ 70°C	54	Н	 54		%		 0.5	20

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

Lab Sample ID: 580-79055-1

Lab Sample ID: 580-79055-1

Matrix: Solid

Matrix: Solid

Percent Solids: 51.7

## 2 3 4 5 6 7 8 9

9 10

#### Client Sample ID: PDI-SG-B471 Date Collected: 07/21/18 10:45

Date	Received:	07/23/18	14:35	

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	284391	09/19/18 13:36	TTN	TAL SEA
Total/NA	Analysis	Moisture 70C		1	283855	09/13/18 02:08	HJM	TAL SEA

#### Client Sample ID: PDI-SG-B471 Date Collected: 07/21/18 10:45 Date Received: 07/23/18 14:35

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3550B			284043	09/15/18 08:47	DB	TAL SEA
Total/NA	Analysis	8270D		25	284395	09/20/18 02:49	ERZ	TAL SEA
Total/NA	Prep	3546			284059	09/15/18 16:23	DB	TAL SEA
Total/NA	Analysis	8270D SIM		50	284415	09/19/18 16:47	CJ	TAL SEA
Total/NA	Prep	Organotin Prep			284045	09/15/18 09:00	KMS	TAL SEA
Total/NA	Analysis	Organotins		1	284676	09/23/18 01:28	ERZ	TAL SEA
Total/NA	Prep	3546			284396	09/19/18 16:08	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	284670	09/22/18 15:55	JCM	TAL SEA
Total/NA	Prep	3050B			282341	08/23/18 17:18	T1H	TAL SEA
Total/NA	Analysis	6020B		5	282750	08/24/18 16:08	FCW	TAL SEA
Total/NA	Prep	7471A			282266	08/23/18 10:12	T1H	TAL SEA
Total/NA	Analysis	7471A		1	282350	08/23/18 15:04	FCW	TAL SEA

#### Client Sample ID: PDI-SG-B472 Date Collected: 07/21/18 12:20 Date Received: 07/23/18 14:35

#### Lab Sample ID: 580-79055-2 Matrix: Solid Percent Solids: 55.4

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3550B			284408	09/19/18 17:04	SPS	TAL SEA
Total/NA	Analysis	8270D		10	284567	09/21/18 14:04	ERZ	TAL SEA
Total/NA	Prep	3546			286035	10/09/18 16:09	BAH	TAL SEA
Total/NA	Analysis	8270D SIM		25	286213	10/11/18 13:56	ADB	TAL SEA
Total/NA	Prep	Organotin Prep			284918	09/26/18 09:35	APR	TAL SEA
Total/NA	Analysis	Organotins		1	285981	10/09/18 21:26	ERZ	TAL SEA
Total/NA	Prep	3546			284396	09/19/18 16:08	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	284670	09/22/18 16:16	JCM	TAL SEA

#### Laboratory References:

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

## Accreditation/Certification Summary

EPA Region

10

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**Identification Number** 

17-024

L2236

L2236

2901

N/A

C553

WA000502019-1

WA100007

LE058448-0

P330-14-00126

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

Program

DoD ELAP

State Program

ISO/IEC 17025

State Program

State Program

State Program

State Program

NELAP

Federal

Federal

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: 580-79055-1

**Expiration Date** 

01-19-19

01-19-19

01-19-19

11-05-18

04-30-20

07-31-19

11-05-18

07-31-19

02-10-20

02-17-19

# -1 2 3 4 5 6 7

8 9 10

## Sample Summary

TestAmerica Job ID: 580-79055-1

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

Client: AECOM Project/Site: Portla	and Harbor Pre-Remedial Design		TestAmerica Job ID: 580-7	79055-1
Lab Sample ID	Client Sample ID	Matrix	Collected Re	ceived 3
580-79055-1	PDI-SG-B471	Solid		/18 14:35
580-79055-2	PDI-SG-B472	Solid	07/21/18 12:20 07/23	/18 14:35
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Cline 11, Line 100, Cline 1, Cline Cline 1			APC 000 1111 3rd Ave Suite 1600	-	1	el: (206) 43 Analysis	7-2261 / (206	1438-2010 Time		Labora	tory Con	tact: Ela	ine-Walk	er	-		arrier: Co	urier 	-	-	+	1 of	-	pages
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Phone: (206) 438-2700 Fax: 1+(866) 495-5288										NWTPB-Dx, 6020B.		0(10		8270	Na	[								
Project Name: Portland Harbor Pre-Remedial Design		21	days							Q-H-		s 906		SIM	Astm									
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					Sample Date	7/21/2018	3102/12/2						PP=Polypr	oric Acid,	4	ringe and a Way Million	ining anal	4	Company:	Company			
Territymetrice, Souther A.M. Schulter, 1995, Sub-Souther, 1995, Sub-Souther, 1997, Theorem, W.M. 2002, Link, Constant, 1995, 253, 922-5647, Constant, 253, 922-567, Constant, 253, 922-567, Constant, 253, 922-567, Constant,	ARCOM 1111 3rd Ave Suite 1600 Seatte, WA 98101	Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbert Pre-Remodial Design Investigation and Baseline Sampting.	Project #: 60560335 Study: Surface Sediment AAAAAA		Sampje Adentfürntlon	DD-SG-B471 AN ANALASTAN ANALASTAN	PDI-SG-B472 AND SAVEN SAVEN SAVEN						Container Type: WMG=Wide Mouth Glass Jar, PHDPE, PP=Polypropylene, AG=andber glass, G=gl	Preservative: HCi = Hydrochiaric Acid, H3PO4 = Phosphoric Acid, HNO3 = Ninic Acid	ved, PRT = Partirulane, T = Tour (unfiltere	Special Instructions/OC Requirements & Commeass	Ausura sampues for grain size ASAPA, itiold (H) remaining analyses pending further instruction. Separate reports for each jab.	1 1 20 M	and Mer	Marin -			

Revisio

10/15/2018

## Login Sample Receipt Checklist

#### Client: AECOM

#### Login Number: 79055 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.	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	

Job Number: 580-79055-1

List Source: TestAmerica Seattle