

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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TestAmerica Job ID: 580-77396-1

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM
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Attn: Karen Mixon

M. Elaine Walker

Authorized for release by:
6/22/2018 12:54:25 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.

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Case Narrative

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

TestAmerica Job ID: 580-77396-1

Job ID: 580-77396-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-77396-1

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

Six samples were received on 5/18/2018 1:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.3° 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.

DIESEL AND EXTENDED RANGE ORGANICS

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1 (580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for diesel and extended range organics in accordance with Method NWTPH-Dx. The samples were prepared on 05/21/2018 and analyzed on 05/22/2018.

Motor Oil (>C24-C36) exceeded the RPD limit for the duplicate of sample PDI-SG-B137-BL1DU (580-77396-1). The associated LCS/LCSD recoveries and RPD were within acceptance limits.

The %D of surrogate (o-Terphenyl) for CCV associated with batch 580-275088 was outside the lower control limits. All associated sample surrogate fell within acceptance criteria; therefore, the data have been reported. (CCVRT 580-275088/3).

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

DIESEL AND MOTOR OIL RANGE ORGANICS - Rinse Blank

Sample PDI-RB-VV-180517 (580-77396-3) was analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The sample was prepared on 05/30/2018 and analyzed on 05/31/2018.

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

METALS (ICPMS)

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1

Case Narrative

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

TestAmerica Job ID: 580-77396-1

Job ID: 580-77396-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

(580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for Metals (ICPMS) in accordance with 6020A_LL. The samples were prepared and analyzed on 06/06/2018.

Arsenic, Cadmium, Lead and Zinc exceeded the RPD limit for the duplicate of sample PDI-SG-B137-BL1DU (580-77396-1).

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

TOTAL MERCURY

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1 (580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for total mercury in accordance with EPA SW-846 Method 7471A. The samples were prepared and analyzed on 05/31/2018.

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

METALS (ICPMS) - Rinse Blank

Sample PDI-RB-VV-180517 (580-77396-3) was analyzed for Metals (ICPMS) in accordance with 6020A_LL. The sample was prepared and analyzed on 06/06/2018.

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

TOTAL MERCURY - Rinse Blank

Sample PDI-RB-VV-180517 (580-77396-3) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared and analyzed on 06/07/2018.

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

TOTAL ORGANIC CARBON

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1 (580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 05/24/2018 and 05/30/2018.

Total Organic Carbon - Duplicates was detected in method blank MB 580-275003/3 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.

TOTAL ORGANIC CARBON - Rinse Blank

Sample PDI-RB-VV-180517 (580-77396-3) was analyzed for total organic carbon in accordance with SM 5310B. The sample was analyzed on 06/05/2018.

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

GRAIN SIZE

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4) and PDI-SG-B225-BL1 (580-77396-5) were analyzed for grain size in accordance with D422. The samples were analyzed on 06/12/2018 and 06/14/2018.

Coarse Sand and Gravel exceeded the RPD limit for the duplicate of sample PDI-SG-B209-BL1DU (580-77396-4).

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

PERCENT SOLIDS

Samples PDI-SG-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1 (580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 05/21/2018.

Case Narrative

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

TestAmerica Job ID: 580-77396-1

Job ID: 580-77396-1 (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-B137-BL1 (580-77396-1), PDI-SG-B028-BL1 (580-77396-2), PDI-SG-B209-BL1 (580-77396-4), PDI-SG-B225-BL1 (580-77396-5) and PDI-SG-B225-BL1-D (580-77396-6) were analyzed for Total Solids @ 70C. The samples were analyzed on 06/19/2018, 06/20/2018 and 06/21/2018.

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

Definitions/Glossary

Client: AECOM

TestAmerica Job ID: 580-77396-1

Project/Site: Portland Harbor Pre-Remedial Design

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit
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
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F3	Duplicate RPD exceeds the control limit
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.

General Chemistry

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.
B	Compound was found in the blank and sample.

Geotechnical

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

Glossary

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B137-BL1

Lab Sample ID: 580-77396-1

Date Collected: 05/16/18 15:50

Matrix: Solid

Date Received: 05/18/18 13:10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	11000		2000	44	mg/Kg			05/24/18 14:07	1
Total Solids	57.8		0.1	0.1	%			05/21/18 09:06	1
Total Solids @ 70°C	60		0.10	0.10	%			06/19/18 06:55	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	13.2				%			06/12/18 14:11	1
Coarse Sand	0.6				%			06/12/18 14:11	1
Fine Sand	29.5				%			06/12/18 14:11	1
Gravel	4.0				%			06/12/18 14:11	1
Medium Sand	5.8				%			06/12/18 14:11	1
Silt	46.9				%			06/12/18 14:11	1

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B137-BL1

Date Collected: 05/16/18 15:50

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-1

Matrix: Solid

Percent Solids: 57.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	130		83	20	mg/Kg	☼	05/21/18 10:33	05/22/18 13:57	1
Motor Oil (>C24-C36)	310		83	29	mg/Kg	☼	05/21/18 10:33	05/22/18 13:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		50 - 150				05/21/18 10:33	05/22/18 13:57	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.3		0.25	0.051	mg/Kg	☼	06/06/18 09:37	06/06/18 12:11	5
Cadmium	0.20		0.20	0.039	mg/Kg	☼	06/06/18 09:37	06/06/18 12:11	5
Copper	31		0.51	0.11	mg/Kg	☼	06/06/18 09:37	06/06/18 12:11	5
Lead	8.3		0.25	0.024	mg/Kg	☼	06/06/18 09:37	06/06/18 12:11	5
Zinc	75		2.5	0.82	mg/Kg	☼	06/06/18 09:37	06/06/18 12:11	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.030	J	0.038	0.011	mg/Kg	☼	05/31/18 12:06	05/31/18 17:06	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B028-BL1

Lab Sample ID: 580-77396-2

Date Collected: 05/16/18 13:00

Matrix: Solid

Date Received: 05/18/18 13:10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	25000		2000	44	mg/Kg			05/24/18 14:12	1
Total Solids	38.1		0.1	0.1	%			05/21/18 09:06	1
Total Solids @ 70°C	38		0.10	0.10	%			06/19/18 06:55	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	12.2				%			06/12/18 14:11	1
Coarse Sand	0.0				%			06/12/18 14:11	1
Fine Sand	12.7				%			06/12/18 14:11	1
Gravel	0.0				%			06/12/18 14:11	1
Medium Sand	0.1				%			06/12/18 14:11	1
Silt	74.9				%			06/12/18 14:11	1

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B028-BL1

Date Collected: 05/16/18 13:00

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-2

Matrix: Solid

Percent Solids: 38.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	62	J	130	31	mg/Kg	☼	05/21/18 10:33	05/22/18 14:42	1
Motor Oil (>C24-C36)	620		130	45	mg/Kg	☼	05/21/18 10:33	05/22/18 14:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	107		50 - 150				05/21/18 10:33	05/22/18 14:42	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.8		0.50	0.10	mg/Kg	☼	06/06/18 09:37	06/06/18 13:05	5
Cadmium	0.35	J	0.40	0.078	mg/Kg	☼	06/06/18 09:37	06/06/18 13:05	5
Copper	47		1.0	0.22	mg/Kg	☼	06/06/18 09:37	06/06/18 13:05	5
Lead	14		0.50	0.048	mg/Kg	☼	06/06/18 09:37	06/06/18 13:05	5
Zinc	130		5.0	1.6	mg/Kg	☼	06/06/18 09:37	06/06/18 13:05	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.058		0.055	0.017	mg/Kg	☼	05/31/18 12:06	05/31/18 17:15	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-RB-VV-180517

Date Collected: 05/17/18 17:15

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-3

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.067	mg/L		05/30/18 09:20	05/31/18 23:08	1
Motor Oil (>C24-C36)	ND		0.36	0.099	mg/L		05/30/18 09:20	05/31/18 23:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	71		50 - 150				05/30/18 09:20	05/31/18 23:08	1

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		06/06/18 10:49	06/06/18 21:05	1
Cadmium	ND		0.00040	0.00010	mg/L		06/06/18 10:49	06/06/18 21:05	1
Copper	ND		0.0020	0.00060	mg/L		06/06/18 10:49	06/06/18 21:05	1
Lead	ND		0.00080	0.00020	mg/L		06/06/18 10:49	06/06/18 21:05	1
Zinc	ND		0.0070	0.0019	mg/L		06/06/18 10:49	06/06/18 21:05	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		06/07/18 10:52	06/07/18 18:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.23	J	1.0	0.19	mg/L			06/05/18 13:23	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B209-BL1

Lab Sample ID: 580-77396-4

Date Collected: 05/17/18 12:12

Matrix: Solid

Date Received: 05/18/18 13:10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	4700	B	2000	44	mg/Kg			05/30/18 11:53	1
Total Solids	72.7		0.1	0.1	%			05/21/18 09:06	1
Total Solids @ 70°C	72		0.10	0.10	%			06/20/18 16:06	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	4.0				%			06/14/18 09:43	1
Coarse Sand	1.3				%			06/14/18 09:43	1
Fine Sand	69.3				%			06/14/18 09:43	1
Gravel	1.1				%			06/14/18 09:43	1
Medium Sand	18.0				%			06/14/18 09:43	1
Silt	6.3				%			06/14/18 09:43	1

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B209-BL1

Date Collected: 05/17/18 12:12

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-4

Matrix: Solid

Percent Solids: 72.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		64	16	mg/Kg	☼	05/21/18 10:33	05/22/18 15:04	1
Motor Oil (>C24-C36)	200		64	22	mg/Kg	☼	05/21/18 10:33	05/22/18 15:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	108		50 - 150				05/21/18 10:33	05/22/18 15:04	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.4		0.21	0.041	mg/Kg	☼	06/06/18 09:37	06/06/18 13:09	5
Cadmium	0.12	J	0.16	0.032	mg/Kg	☼	06/06/18 09:37	06/06/18 13:09	5
Copper	17		0.41	0.091	mg/Kg	☼	06/06/18 09:37	06/06/18 13:09	5
Lead	21		0.21	0.020	mg/Kg	☼	06/06/18 09:37	06/06/18 13:09	5
Zinc	79		2.1	0.66	mg/Kg	☼	06/06/18 09:37	06/06/18 13:09	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.032		0.029	0.0088	mg/Kg	☼	05/31/18 12:06	05/31/18 17:17	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B225-BL1

Lab Sample ID: 580-77396-5

Date Collected: 05/17/18 14:40

Matrix: Solid

Date Received: 05/18/18 13:10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	31000	B	2000	44	mg/Kg			05/30/18 11:58	1
Total Solids	39.6		0.1	0.1	%			05/21/18 09:06	1
Total Solids @ 70°C	40		0.10	0.10	%			06/20/18 16:06	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	10.8				%			06/14/18 09:43	1
Coarse Sand	0.2				%			06/14/18 09:43	1
Fine Sand	15.1				%			06/14/18 09:43	1
Gravel	0.0				%			06/14/18 09:43	1
Medium Sand	0.2				%			06/14/18 09:43	1
Silt	73.7				%			06/14/18 09:43	1

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B225-BL1

Date Collected: 05/17/18 14:40

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-5

Matrix: Solid

Percent Solids: 39.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	90	J	120	30	mg/Kg	☼	05/21/18 10:33	05/22/18 15:26	1
Motor Oil (>C24-C36)	650		120	42	mg/Kg	☼	05/21/18 10:33	05/22/18 15:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	105		50 - 150				05/21/18 10:33	05/22/18 15:26	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.7		0.42	0.083	mg/Kg	☼	06/06/18 09:37	06/06/18 13:13	5
Cadmium	0.28	J	0.33	0.064	mg/Kg	☼	06/06/18 09:37	06/06/18 13:13	5
Copper	53		0.83	0.18	mg/Kg	☼	06/06/18 09:37	06/06/18 13:13	5
Lead	18		0.42	0.040	mg/Kg	☼	06/06/18 09:37	06/06/18 13:13	5
Zinc	130		4.2	1.3	mg/Kg	☼	06/06/18 09:37	06/06/18 13:13	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.064		0.052	0.016	mg/Kg	☼	05/31/18 12:06	05/31/18 17:20	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B225-BL1-D

Date Collected: 05/17/18 14:42

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-6

Matrix: Solid

Percent Solids: 39.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	110	J	120	30	mg/Kg	☼	05/21/18 10:33	05/22/18 15:48	1
Motor Oil (>C24-C36)	790		120	42	mg/Kg	☼	05/21/18 10:33	05/22/18 15:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		50 - 150				05/21/18 10:33	05/22/18 15:48	1

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.9		0.41	0.081	mg/Kg	☼	06/06/18 09:37	06/06/18 13:18	5
Cadmium	0.25	J	0.33	0.063	mg/Kg	☼	06/06/18 09:37	06/06/18 13:18	5
Copper	49		0.81	0.18	mg/Kg	☼	06/06/18 09:37	06/06/18 13:18	5
Lead	15		0.41	0.039	mg/Kg	☼	06/06/18 09:37	06/06/18 13:18	5
Zinc	120		4.1	1.3	mg/Kg	☼	06/06/18 09:37	06/06/18 13:18	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.070		0.050	0.015	mg/Kg	☼	05/31/18 12:06	05/31/18 17:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	31000	B	2000	44	mg/Kg	—		05/30/18 12:04	1
Total Solids	39.3		0.1	0.1	%			05/21/18 09:06	1
Total Solids @ 70°C	40		0.10	0.10	%			06/21/18 10:25	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

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

Lab Sample ID: MB 580-274266/1-A

Matrix: Solid

Analysis Batch: 274352

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 274266

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		50	12	mg/Kg		05/21/18 10:33	05/22/18 12:51	1
Motor Oil (>C24-C36)	ND		50	18	mg/Kg		05/21/18 10:33	05/22/18 12:51	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	108		50 - 150				05/21/18 10:33	05/22/18 12:51	1

Lab Sample ID: LCS 580-274266/2-A

Matrix: Solid

Analysis Batch: 274352

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 274266

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits		
#2 Diesel (C10-C24)	500	527		mg/Kg		105	70 - 125		
Motor Oil (>C24-C36)	500	552		mg/Kg		110	70 - 129		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
o-Terphenyl	105		50 - 150						

Lab Sample ID: LCSD 580-274266/3-A

Matrix: Solid

Analysis Batch: 274352

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 274266

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
#2 Diesel (C10-C24)	500	521		mg/Kg		104	70 - 125	1	16
Motor Oil (>C24-C36)	500	524		mg/Kg		105	70 - 129	5	16
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	108		50 - 150						

Lab Sample ID: 580-77396-1 DU

Matrix: Solid

Analysis Batch: 274352

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 274266

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
#2 Diesel (C10-C24)	130		173		mg/Kg	☼	26	35
Motor Oil (>C24-C36)	310		516	F3	mg/Kg	☼	49	35
Surrogate	DU %Recovery	DU Qualifier	Limits					
o-Terphenyl	102		50 - 150					

Lab Sample ID: MB 580-274949/1-A

Matrix: Water

Analysis Batch: 275088

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 274949

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.065	mg/L		05/30/18 09:20	05/31/18 14:19	1
Motor Oil (>C24-C36)	ND		0.35	0.096	mg/L		05/30/18 09:20	05/31/18 14:19	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

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

Lab Sample ID: MB 580-274949/1-A

Matrix: Water

Analysis Batch: 275088

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 274949

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150	05/30/18 09:20	05/31/18 14:19	1

Lab Sample ID: LCS 580-274949/2-A

Matrix: Water

Analysis Batch: 275088

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 274949

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	2.00	1.33		mg/L		67	50 - 120
Motor Oil (>C24-C36)	2.00	1.79		mg/L		89	64 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl	70		50 - 150				

Lab Sample ID: LCSD 580-274949/3-A

Matrix: Water

Analysis Batch: 275088

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 274949

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
#2 Diesel (C10-C24)	2.00	1.36		mg/L		68	50 - 120	2	26
Motor Oil (>C24-C36)	2.00	1.74		mg/L		87	64 - 120	3	24
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl	84		50 - 150						

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-275499/22-A

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 275499

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25	0.050	mg/Kg		06/06/18 09:37	06/06/18 11:58	5
Cadmium	ND		0.20	0.039	mg/Kg		06/06/18 09:37	06/06/18 11:58	5
Copper	ND		0.50	0.11	mg/Kg		06/06/18 09:37	06/06/18 11:58	5
Lead	ND		0.25	0.024	mg/Kg		06/06/18 09:37	06/06/18 11:58	5
Zinc	ND		2.5	0.81	mg/Kg		06/06/18 09:37	06/06/18 11:58	5

Lab Sample ID: LCS 580-275499/23-A

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 275499

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	214		mg/Kg		107	80 - 120
Cadmium	5.00	5.54		mg/Kg		111	80 - 120
Copper	25.0	25.4		mg/Kg		102	80 - 120
Lead	50.0	52.6		mg/Kg		105	80 - 120
Zinc	200	209		mg/Kg		104	80 - 120

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-275499/24-A

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 275499

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	200	210		mg/Kg		105	80 - 120	2	20
Cadmium	5.00	5.60		mg/Kg		112	80 - 120	1	20
Copper	25.0	25.5		mg/Kg		102	80 - 120	0	20
Lead	50.0	51.5		mg/Kg		103	80 - 120	2	20
Zinc	200	212		mg/Kg		106	80 - 120	1	20

Lab Sample ID: 580-77396-1 MS

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275499

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	4.3		277	307		mg/Kg	✱	109	80 - 120		
Cadmium	0.20		6.91	7.80		mg/Kg	✱	110	80 - 120		
Copper	31		34.6	70.2		mg/Kg	✱	112	80 - 120		
Lead	8.3		69.1	82.0		mg/Kg	✱	107	80 - 120		
Zinc	75		277	380		mg/Kg	✱	110	80 - 120		

Lab Sample ID: 580-77396-1 MSD

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275499

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	4.3		242	280		mg/Kg	✱	114	80 - 120	9	20
Cadmium	0.20		6.04	6.99		mg/Kg	✱	112	80 - 120	11	20
Copper	31		30.2	66.1		mg/Kg	✱	115	80 - 120	6	20
Lead	8.3		60.4	77.3		mg/Kg	✱	114	80 - 120	6	20
Zinc	75		242	359		mg/Kg	✱	118	80 - 120	6	20

Lab Sample ID: 580-77396-1 DU

Matrix: Solid

Analysis Batch: 275606

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275499

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Arsenic	4.3		3.22	F3	mg/Kg	✱	29	20
Cadmium	0.20		0.146	J F5	mg/Kg	✱	30	20
Copper	31		27.8		mg/Kg	✱	12	20
Lead	8.3		6.20	F3	mg/Kg	✱	29	20
Zinc	75		60.5	F3	mg/Kg	✱	22	20

Lab Sample ID: MB 580-275516/22-A

Matrix: Water

Analysis Batch: 275608

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 275516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		06/06/18 10:49	06/06/18 18:38	1
Cadmium	ND		0.00040	0.00010	mg/L		06/06/18 10:49	06/06/18 18:38	1
Copper	ND		0.0020	0.00060	mg/L		06/06/18 10:49	06/06/18 18:38	1
Lead	ND		0.00080	0.00020	mg/L		06/06/18 10:49	06/06/18 18:38	1
Zinc	ND		0.0070	0.0019	mg/L		06/06/18 10:49	06/06/18 18:38	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

Lab Sample ID: LCS 580-275516/23-A

Matrix: Water

Analysis Batch: 275608

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 275516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.06		mg/L		102	80 - 120
Cadmium	0.100	0.0988		mg/L		99	80 - 120
Copper	0.500	0.497		mg/L		99	80 - 120
Lead	1.00	0.985		mg/L		98	80 - 120
Zinc	4.00	3.92		mg/L		98	80 - 120

Lab Sample ID: LCSD 580-275516/24-A

Matrix: Water

Analysis Batch: 275608

Client Sample ID: Lab Control Sample Dup

Prep Type: Total Recoverable

Prep Batch: 275516

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	4.00	4.12		mg/L		103	80 - 120	1	20
Cadmium	0.100	0.101		mg/L		101	80 - 120	2	20
Copper	0.500	0.499		mg/L		100	80 - 120	0	20
Lead	1.00	0.989		mg/L		99	80 - 120	0	20
Zinc	4.00	3.96		mg/L		99	80 - 120	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-275647/21-A

Matrix: Water

Analysis Batch: 275758

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 275647

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		06/07/18 10:52	06/07/18 17:03	1

Lab Sample ID: LCS 580-275647/22-A

Matrix: Water

Analysis Batch: 275758

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 275647

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00183		mg/L		91	80 - 120

Lab Sample ID: LCSD 580-275647/23-A

Matrix: Water

Analysis Batch: 275758

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 275647

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.00200	0.00185		mg/L		93	80 - 120	1	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-275095/22-A

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 275095

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		05/31/18 12:06	05/31/18 16:59	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

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

Lab Sample ID: LCS 580-275095/23-A

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 275095

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.163		mg/Kg		98	80 - 120

Lab Sample ID: LCSD 580-275095/24-A

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 275095

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.167	0.156		mg/Kg		94	80 - 120	5	20

Lab Sample ID: 580-77396-1 MS

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275095

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.030	J	0.232	0.300		mg/Kg	☼	116	80 - 120

Lab Sample ID: 580-77396-1 MSD

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275095

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.030	J	0.259	0.319		mg/Kg	☼	111	80 - 120	6	20

Lab Sample ID: 580-77396-1 DU

Matrix: Solid

Analysis Batch: 275149

Client Sample ID: PDI-SG-B137-BL1

Prep Type: Total/NA

Prep Batch: 275095

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.030	J	0.0317	J	mg/Kg	☼	4	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-274638/3

Matrix: Solid

Analysis Batch: 274638

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	44	mg/Kg			05/24/18 09:55	1

Lab Sample ID: LCS 580-274638/4

Matrix: Solid

Analysis Batch: 274638

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	4620	5120		mg/Kg		111	68 - 149

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

Method: 9060_PSEP - TOC (Puget Sound) (Continued)

Lab Sample ID: LCSD 580-274638/5
Matrix: Solid
Analysis Batch: 274638

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	4620	4520		mg/Kg		98	68 - 149	13	32

Lab Sample ID: MB 580-275003/3
Matrix: Solid
Analysis Batch: 275003

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	351	J	2000	44	mg/Kg			05/30/18 11:04	1

Lab Sample ID: LCS 580-275003/4
Matrix: Solid
Analysis Batch: 275003

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	4620	4860		mg/Kg		105	68 - 149		

Lab Sample ID: LCSD 580-275003/5
Matrix: Solid
Analysis Batch: 275003

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	4620	4910		mg/Kg		106	68 - 149	1	32

Lab Sample ID: 580-77396-6 MS
Matrix: Solid
Analysis Batch: 275003

Client Sample ID: PDI-SG-B225-BL1-D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	31000	B	120000	135000		mg/Kg		86	68 - 149		

Lab Sample ID: 580-77396-6 MSD
Matrix: Solid
Analysis Batch: 275003

Client Sample ID: PDI-SG-B225-BL1-D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	31000	B	120000	144000		mg/Kg		94	68 - 149	7	32

Lab Sample ID: 580-77396-6 DU
Matrix: Solid
Analysis Batch: 275003

Client Sample ID: PDI-SG-B225-BL1-D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Duplicates	31000	B	31000		mg/Kg		1	50

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77396-1

Method: 9060_PSEP - TOC (Puget Sound) (Continued)

Lab Sample ID: 580-77396-6 TRL

Matrix: Solid

Analysis Batch: 275003

Client Sample ID: PDI-SG-B225-BL1-D

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	TRL Result	TRL Qualifier	Unit	D	RSD	Limit
Total Organic Carbon - Duplicates	31000	B	30900		mg/Kg		0.7	20

Method: Moisture 70C - Percent Moisture, 70 C

Lab Sample ID: 580-77396-4 DU

Matrix: Solid

Analysis Batch: 276864

Client Sample ID: PDI-SG-B209-BL1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Solids @ 70°C	72		72		%		0.5	20

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 580-275501/3

Matrix: Water

Analysis Batch: 275501

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.19	mg/L			06/05/18 13:23	1

Lab Sample ID: LCS 580-275501/4

Matrix: Water

Analysis Batch: 275501

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	10.2		mg/L		102	85 - 115

Lab Sample ID: 580-77396-3 MS

Matrix: Water

Analysis Batch: 275501

Client Sample ID: PDI-RB-VV-180517

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.23	J	10.0	9.28		mg/L		91	85 - 115

Lab Sample ID: 580-77396-3 MSD

Matrix: Water

Analysis Batch: 275501

Client Sample ID: PDI-RB-VV-180517

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Total Organic Carbon	0.23	J	10.0	9.40		mg/L		92	85 - 115	1	20

Lab Sample ID: 580-77396-3 DU

Matrix: Water

Analysis Batch: 275501

Client Sample ID: PDI-RB-VV-180517

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Organic Carbon	0.23	J	0.207	J	mg/L		10	20

TestAmerica Seattle

QC Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-77396-1

Method: D7928/D6913 - ASTM D7928/D6913

Lab Sample ID: 580-77396-4 DU

Matrix: Solid

Analysis Batch: 276217

Client Sample ID: PDI-SG-B209-BL1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Clay	4.0		3.8		%		5	20
Coarse Sand	1.3		2.8	F3	%		73	20
Fine Sand	69.3		69.4		%		0.1	20
Gravel	1.1		0.0	F3	%		200	20
Medium Sand	18.0		17.6		%		2	20
Silt	6.3		6.4		%		2	20

Lab Chronicle

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B137-BL1

Date Collected: 05/16/18 15:50

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	274638	05/24/18 14:07	MP	TAL SEA
Total/NA	Analysis	D 2216		1	274249	05/21/18 09:06	KMS	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276629	06/19/18 06:55	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	276050	06/12/18 14:11	DB	TAL SEA

Client Sample ID: PDI-SG-B137-BL1

Date Collected: 05/16/18 15:50

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-1

Matrix: Solid

Percent Solids: 57.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			274266	05/21/18 10:33	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274352	05/22/18 13:57	NMI	TAL SEA
Total/NA	Prep	3050B			275499	06/06/18 09:37	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275606	06/06/18 12:11	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:06	PAB	TAL SEA

Client Sample ID: PDI-SG-B028-BL1

Date Collected: 05/16/18 13:00

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	274638	05/24/18 14:12	MP	TAL SEA
Total/NA	Analysis	D 2216		1	274249	05/21/18 09:06	KMS	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276629	06/19/18 06:55	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	276050	06/12/18 14:11	DB	TAL SEA

Client Sample ID: PDI-SG-B028-BL1

Date Collected: 05/16/18 13:00

Date Received: 05/18/18 13:10

Lab Sample ID: 580-77396-2

Matrix: Solid

Percent Solids: 38.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			274266	05/21/18 10:33	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274352	05/22/18 14:42	NMI	TAL SEA
Total/NA	Prep	3050B			275499	06/06/18 09:37	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275606	06/06/18 13:05	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:15	PAB	TAL SEA

TestAmerica Seattle

Lab Chronicle

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-RB-VV-180517

Lab Sample ID: 580-77396-3

Date Collected: 05/17/18 17:15

Matrix: Water

Date Received: 05/18/18 13:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			274949	05/30/18 09:20	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	275088	05/31/18 23:08	CJ	TAL SEA
Total Recoverable	Prep	3005A			275516	06/06/18 10:49	CJB	TAL SEA
Total Recoverable	Analysis	6020B		1	275608	06/06/18 21:05	FCW	TAL SEA
Total/NA	Prep	7470A			275647	06/07/18 10:52	CJB	TAL SEA
Total/NA	Analysis	7470A		1	275758	06/07/18 18:03	FCW	TAL SEA
Total/NA	Analysis	SM 5310B		1	275501	06/05/18 13:23	ASJ	TAL SEA

Client Sample ID: PDI-SG-B209-BL1

Lab Sample ID: 580-77396-4

Date Collected: 05/17/18 12:12

Matrix: Solid

Date Received: 05/18/18 13:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	275003	05/30/18 11:53	SPP	TAL SEA
Total/NA	Analysis	D 2216		1	274249	05/21/18 09:06	KMS	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276864	06/20/18 16:06	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	276217	06/14/18 09:43	DB	TAL SEA

Client Sample ID: PDI-SG-B209-BL1

Lab Sample ID: 580-77396-4

Date Collected: 05/17/18 12:12

Matrix: Solid

Date Received: 05/18/18 13:10

Percent Solids: 72.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			274266	05/21/18 10:33	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274352	05/22/18 15:04	NMI	TAL SEA
Total/NA	Prep	3050B			275499	06/06/18 09:37	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275606	06/06/18 13:09	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:17	PAB	TAL SEA

Client Sample ID: PDI-SG-B225-BL1

Lab Sample ID: 580-77396-5

Date Collected: 05/17/18 14:40

Matrix: Solid

Date Received: 05/18/18 13:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	275003	05/30/18 11:58	SPP	TAL SEA
Total/NA	Analysis	D 2216		1	274249	05/21/18 09:06	KMS	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276864	06/20/18 16:06	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	276217	06/14/18 09:43	DB	TAL SEA

TestAmerica Seattle

Lab Chronicle

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

TestAmerica Job ID: 580-77396-1

Client Sample ID: PDI-SG-B225-BL1

Lab Sample ID: 580-77396-5

Date Collected: 05/17/18 14:40

Matrix: Solid

Date Received: 05/18/18 13:10

Percent Solids: 39.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			274266	05/21/18 10:33	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274352	05/22/18 15:26	NMI	TAL SEA
Total/NA	Prep	3050B			275499	06/06/18 09:37	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275606	06/06/18 13:13	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:20	PAB	TAL SEA

Client Sample ID: PDI-SG-B225-BL1-D

Lab Sample ID: 580-77396-6

Date Collected: 05/17/18 14:42

Matrix: Solid

Date Received: 05/18/18 13:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	275003	05/30/18 12:04	SPP	TAL SEA
Total/NA	Analysis	D 2216		1	274249	05/21/18 09:06	KMS	TAL SEA
Total/NA	Analysis	Moisture 70C		1	276926	06/21/18 10:25	HJM	TAL SEA

Client Sample ID: PDI-SG-B225-BL1-D

Lab Sample ID: 580-77396-6

Date Collected: 05/17/18 14:42

Matrix: Solid

Date Received: 05/18/18 13:10

Percent Solids: 39.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			274266	05/21/18 10:33	TTN	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	274352	05/22/18 15:48	NMI	TAL SEA
Total/NA	Prep	3050B			275499	06/06/18 09:37	CJB	TAL SEA
Total/NA	Analysis	6020B		5	275606	06/06/18 13:18	FCW	TAL SEA
Total/NA	Prep	7471A			275095	05/31/18 12:06	CJB	TAL SEA
Total/NA	Analysis	7471A		1	275149	05/31/18 17:27	PAB	TAL SEA

Laboratory References:

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

TestAmerica Seattle

Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-77396-1

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	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Sample Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-77396-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77396-1	PDI-SG-B137-BL1	Solid	05/16/18 15:50	05/18/18 13:10
580-77396-2	PDI-SG-B028-BL1	Solid	05/16/18 13:00	05/18/18 13:10
580-77396-3	PDI-RB-VV-180517	Water	05/17/18 17:15	05/18/18 13:10
580-77396-4	PDI-SG-B209-BL1	Solid	05/17/18 12:12	05/18/18 13:10
580-77396-5	PDI-SG-B225-BL1	Solid	05/17/18 14:40	05/18/18 13:10
580-77396-6	PDI-SG-B225-BL1-D	Solid	05/17/18 14:42	05/18/18 13:10



TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		SURFACE SEDIMENT CHAIN OF CUSTODY		580-77396 Chain of Custody	
Client Contact		Project Contact: Amy Dahl / Chelsey Cook		Site Contact: Jennifer Ray / Michaela McCoog	
AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone (206) 438-2700 Fax: 1-(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Sediment		Tel: (206) 438-2261 / (206) 438-2010		Laboratory Contact: Elaine-Walker	
Analysis Turnaround Time		Carrier: Courier		5/18/2018 COC No. 2	
Calendar (C) or Work Days (W)		I of page(s)			
Sample Identification		Sample Date		Sample Time	
Matrix		QC Sample		Sampler's Initials	
Total No. of Cont.		Fraction		PCB Congeners 1668A	
				PCDD/Fs 1613B	
				TPH Diesel, Metals, Mercury, NWTPH-Dx, 6020B, 7471A	
				Grain Size ASTM D7928/D6913	
				Total organic carbon, Total solids 9060	
				Archive Archive -20 C	
				WQ - PCB Congeners 1668A	
				WQ - PCDD/Fs 1613B	
				WQ - TPH Diesel NWTPH-Dx	
				WQ - Metals, Mercury 6020B, 7470	
				WQ - Total Organic Carbon SNE510B	
				Sample Specific Notes:	
PDI-SG-B137-BL1	5/16/2018	15:50	SS	JH	6
PDI-SG-B028-BL1	5/16/2018	13:00	SS	JH	6
PDI-RB-VV-180517	5/17/2018	17:15	W	ED	8
PDI-SG-B209-BL1	5/17/18	12:12	SS	MT	6
PDI-SG-B225-BL1	5-17-18	1440	SS	MT	6
PDI-SG-B225-BL1-D	5-17-18	1442	SS	MT	5
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column					
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid					
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)					
Sample Disposal					
Return To Client ☐ Disposal By Lab ☒ Archive For 12 Months ☒					
Special Instructions/QC Requirements & Comments: Separate reports for each lab					
Relinquished by: Michael M	Company: AECOM	Date/Time: 5-18-18 12:17	Received by: Jennifer Ray	Company: M-E	Date/Time: 5/18/18 12:17
Relinquished by: Jennifer Ray	Company: M-E	Date/Time: 5/18/18 13:10	Received by: J. Ray	Company: TAPOR	Date/Time: 5/18/18 13:10
Relinquished by: J. Ray	Company: TAPOR	Date/Time: 5/18/18 17:00	Received by: J. Ray	Company: TAPOR	Date/Time: 5/19/18 11:30

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77396-1

Login Number: 77396

List Source: TestAmerica Seattle

List Number: 1

Creator: O'Connell, Jason I

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	