2019 Riverfront Park Soil Management Report

Riverfront Park
Spokane, Washington

for
City of Spokane Parks and Recreation

May 4, 2020

GeoEngineers
Earth Science + Technology

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2019 Riverfront Park Soil Management Report

Riverfront Park
Spokane, Washington

File No. 0110-148-06

May 4, 2020

Prepared for:

City of Spokane
Parks and Recreation
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Attention: Berry Ellison

Prepared by:

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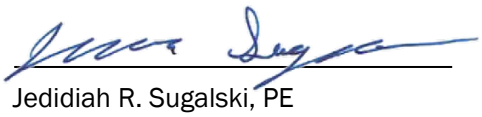

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1.0 INTRODUCTION

This report documents results of soil sampling and earth work activities conducted in 2019 and early 2020 at Riverfront Park (the Park) in Spokane, Washington. Two areas of the Park, the North Bank and Havermale Island, were under construction during this time period.

Before the Park was established as part of the World's Fair of 1974 (Expo '74), it was occupied by many industrial facilities and as a result, contaminants of concern (COCs) associated with historical industrial use have been identified in soil throughout the Park. Soil sampling conducted in the Park (GeoEngineers 2016b and c) has identified the following COCs greater than the Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs):

- Polycyclic Aromatic Hydrocarbons (PAHs);
- Lead;
- Cadmium;
- Arsenic; and
- Diesel- and oil-range petroleum hydrocarbons (DRPH and ORPH).

In 2014, the city of Spokane (City) passed a $64 million bond for the revitalization of the Park. The city of Spokane Parks and Recreation Department (Parks) expected to encounter contamination because of the historical uses and decided to engage regulatory agencies to ensure soil management was conducted with regulatory approval. Riverfront Park was entered into the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) under Site CSID 13026, VCP project number EA0318. To manage contaminated soil at the site in a manner protective of human health and the environment, a Soil Management Plan (SMP) was developed to provide guidance for the Park revitalization projects. The SMP included requirements to collect characterization samples of soil left in place and to document contaminated soil uses at the site. This report describes soil handling and characterization activities for the Riverfront Park revitalization projects during the 2019 and January 2020 calendar year.

2.0 SITE DESCRIPTION AND BACKGROUND

The following sections provide information on the historical use of the site and previous environmental investigations and reports.

2.1. Site History

The project site is located at 507 North Howard Street, in Spokane, Washington and is bound by Spokane Falls Boulevard to the south, Post Street to the west, Division Street to the east and West Cataldo Avenue to the north. The property is currently owned by the City and used as a public park and outdoor recreation area. The site includes portions of Havermale Island, Snxwɔ Meme Island and areas on the north and south banks of the Spokane River (Vicinity Map, Figure 1).

Development in the Park area began in the late 1870s. The falls were the source of early power for industries in the city, then known as Spokane Falls. Factories, mills (flour and lumber) and various

commercial, industrial and railroad properties near the project site were constructed in the 1880s to harness the power of the falls.

Development and building density on Havermale Island and the North Bank started in the late 1800's and occurred until about 1910. From 1910 through 1970, the building density in these areas remained similar, though the occupants of some buildings changed. By 1929, the area currently occupied by the Park was almost completely developed with buildings and railroad infrastructure. Howard Street went through the Park from north to south and Havermale Avenue connected Howard Street to Washington Street on Havermale Island. Mill activities utilized the channel between the South Bank and Havermale Island to transport logs down the river and store them for mill use. In a 1952 Sanborn map, an auto service station was present at the northeast corner of the intersection of Howard Street and Havermale Avenue and a laundry facility was present on the west side of Howard Street located on Snxwʔ Meme Island. A 1960 photograph shows that many of the buildings on Havermale Island had been demolished and parking areas occupied most of the island. By 1970, a railroad depot was located on Havermale Island. The City acquired the railroad properties in the Park in 1972. The railroad yards and industrial structures on Havermale Island were removed by 1973, according to documents from the Spokane Public Library's Northwest Room.

Riverfront Park as it is today was constructed to host Expo '74. Construction for Expo '74 began in 1973 and the existing structures on the islands, North Bank and South Bank were demolished except for the clock tower on Havermale Island. Plans for Expo '74 called for a radical alteration of the Park, including site elevations (Youngs 1996). Large amounts of fill (including topsoil) were brought in to grade the Park and according to one source (Youngs 1996), at least 200,000 cubic yards (CY) of fill were used in support of construction. It is not documented how much fill was used, but aerial photographs and Sanborn maps indicate that large portions of the Park were altered with fill. Temporary buildings constructed for Expo '74 were demolished within about a year after Expo '74. Relatively few changes were made to the Park between removal of the temporary buildings from Expo '74 and 2016, except for the removal of almost 17 acres of asphalt, concrete and pavement that covered the subject property at the time of Expo '74.

2.2. Previous Investigations and Reports

GeoEngineers has conducted environmental and geotechnical sampling at the site in support of redevelopment activities. Reports documenting previous investigations and soil characterization include:

- Access Road from Post Street to the Sister Cities Garden (GeoEngineers 2016a);
- Ice Ribbon (GeoEngineers 2016b);
- Looff Carrousel (GeoEngineers 2016c);
- North Bank (GeoEngineers 2016e);
- Canada Island (GeoEngineers 2016e);
- Central Green (GeoEngineers 2016e);
- Theme Stream (GeoEngineers 2016e);
- 2016 and 2017 Soil Management Report (GeoEngineers 2018a);
- US Pavilion (GeoEngineers 2018b); and
- 2018 Soil Management Report (GeoEngineers 2019b).

Soil sample locations and laboratory analytical results are provided in the referenced reports.

3.0 SUMMARY OF 2019/2020 EARTH MOVING ACTIVITIES AND ENVIRONMENTAL SAMPLING

In 2019 and early 2020, revitalization construction took place primarily on the North Bank and Havermale Island. The following sections describe earthwork activities, soil sampling conducted in support for the construction projects and soil sampling results. Results are described as follows:

- Contaminated – concentrations for one or more COCs are greater than MTCA Method A cleanup levels
- Impacted – concentrations for one or more COCs are less than MTCA Method A cleanup levels, but are greater than the laboratory reporting limits. For metals, concentrations are less than MTCA Method A cleanup levels, but more than twice the background concentrations.
- Clean – concentrations for COCs are less than laboratory reporting limits. For metals, concentrations are less than twice the background concentrations.

Analytical reports and a data validation report for the soil samples collected are provided in Appendix A.

3.1. North Bank

Construction activities in 2019 and early 2020 for the North Bank generally included moving stockpiled soil from the the North Bank to the Sportsplex project. The stockpiled soil was placed on the North Bank in 2017 and originated from the Ice Ribbon and Looff Carrousel construction projects along the south bank. Soil excavated during installation of utilities along the north bank of the Howard Street Promenade was also added to the pile. The soil was processed using a screen and particles larger than 4 inches in diameter were removed and disposed off-site as inert construction debris in 2018. Approximately 20,000 CY of the processed soil was moved to Pavilion in 2018 and about 5,500 CY remained stockpiled on the North Bank.

Approximately 2,000 CY of the stockpiled and processed soil was used to construct a ramp from the North Bank up to the Sportsplex site. The ramp was then covered in approximately 12 inches of crushed basalt, that was produced from blasting and processing the basalt outcrop to the north of the site as part of the Sportsplex construction project. Approximately 3,000 CY of soil was then hauled to the the Sportsplex project site using the ramp between December 11, 2019 and January 6, 2020.

The soil was placed and compacted under the Sportsplex building footprint and within tax parcel 35181.4206 as shown on Spokane Sportsplex Riverfront Park Fill, Figure 2. The soil was placed between Elevation 1,894 and 1,901. The finished floor slab of the building is designed for Elevation 1,905. Tax parcel 35181.4206 was sampled as part of previous environmental investigations and a geotechnical investigation for the Sportsplex building. During these investigations, metals and PAHs were detected in soil samples at concentrations greater than the MTCA Method A cleanup levels within the parcel boundaries (GeoEngineers 2019a). Because of the parcel's proximity to Riverfront Park, and historical uses of the Sportsplex property and Riverfront Park, the sources of these contaminants are likely the same. Therefore, the contaminated site as defined in MTCA includes both the Sportsplex Parcels and Riverfront Park.

After removal of the soil from the North Bank for the Sportsplex, approximately 300 to 500 CY remained at the site in two separate stockpiles and the ramp was left in place. The ramp will be reworked when a staircase and ramp system is constructed between the North Bank and Sportsplex project.

3.2. Havermale Island

Havermale Island construction included the Sister Cities Garden and Pavilion/Howard Street Promenade.

3.2.1. Sister Cities Garden

On February 21, 2019, two test pits were excavated in the Sister Cities Garden before construction commenced. An excavator was used to dig through the upper foot of imported soil and one soil sample from each test pit was collected from about 1 to 1½ feet below ground surface (bgs). Sample HSP-16C(1-1.5) was analyzed and exceeded the MTCA Method A cleanup levels for lead and PAHs. Analysis results for sample HSP-17C(1-1.75) indicated that metals concentrations were less than twice estimated background concentrations and other analytes were less than the respective MTCA Method A cleanup levels. Analytical results are provided in Table 1.

Construction at the Sister Cities Garden consisted of removing the soil in place and leveling out the area. A concrete surface art feature was then installed and 12 inches of imported cover soil were placed around the concrete surface where grass and landscape was installed. The soil removed from the Sister Cities Garden was stockpiled near the theme stream and will be used in future projects at the park.

3.2.2. Pavilion/Howard Street Promenade

Work at the Pavilion in 2019 primarily consisted of landscaping both inside and outside of the Pavilion. The northwestern exterior of the Pavilion was paved and the southwestern exterior was graded, and then covered with 12 inches of sand and sod adjacent to the Howard Street Promenade. Work on the interior of the Pavilion primarily included:

- Remodeling the office spaces along the west ring wall.
- Installing the Pavilion floor, finishing the elevated experience viewing platform, installing concrete bench seating and stairs and grading the imported soil from the North Bank stockpile, installing a visual indicator and covering the soil with 12 inches of clean soil and sod.

Rough grading was completed in early July 2019 and orange construction fence (visual indicator) was installed over the soil imported from the North Bank stockpile. The construction fencing was installed as a visual indicator and if it is exposed in the future, park maintenance crews will note that potentially metal and PAH-contaminated soil is present below the indicator layer. A minimum of 12 inches of imported cover soil (sand) was placed over the visual indicator and then sod was installed over the cover soil. Photos of the visual barrier and cover soil are provided in Appendix B.

On July 15, 2019, GeoEngineers collected four soil samples from planting features along the Howard Street Promenade and adjacent to the Pavilion as shown on Soil Sample Locations – 2019, Figure 3. Soil underneath the rock cover surface of the features was removed and the underlying soil was sampled. Analysis results of soil samples HSP-16C, HSP-17C, HSP-18C and HSP-19C collected from the features indicated metals and PAHs were less than the MTCA Method A cleanup levels. The soil samples were not analyzed for petroleum because field screening did not indicate petroleum was present in the soil.

4.0 SUMMARY

In 2019, construction projects at the Park occurred at the North Bank and Havermale Island. Remaining stockpiled soil on the North Bank was used to benefit construction of the neighboring Sportsplex project to the north of the North Bank area. Approximately 2,000 CY of soil was used to construct a ramp from the North Bank to the Sportsplex project and an additional 3,000 CY of soil was used as fill under the Sportsplex building footprint. The soil from the North Bank stockpile was used at the Sportsplex site because it was determined to likely have been contaminated from the same sources and industrial activities and the same contaminants had been identified at the Sportsplex site within Tax parcel 35181.4206.

Soil from the North Bank stockpile that was placed into the Pavilion in 2018 was graded, covered with a visual indicator and buried with 12 inches of cover soil and turf. The Sister Cites Garden and remaining portions of the Howard Street Promenade on Havermale Island were also landscaped and covered with 12 inches of soil. Soil removed from the Sister Cities Garden and Howard Street Promenade was temporarily stockpiled and will be used for future projects on west Havermale Island.

Characterization samples of soil left in place after construction activities were collected and are summarized in Table 2. A geographic information system (GIS) database has been developed for this project to document soil samples collected during construction activities. The database is maintained by GeoEngineers and can be utilized by the city to identify contaminated soil left in place at Riverfront Park in the future.

5.0 REFERENCES

GeoEngineers, Inc. 2016a. "Memorandum: Analytical Results for the Howard Street Bridge, Riverfront Park." GEI File No. 0110-148-04.

GeoEngineers, Inc. 2016b. "Geotechnical Engineering Evaluation and Environmental Site Assessment, Riverfront Park Ice Ribbon and Skyride Facility, Spokane, Washington." GEI File No. 0110-148-04.

GeoEngineers, Inc. 2016c. "Geotechnical Engineering Evaluation and Environmental Site Assessment, Riverfront Park Looff Carousel, Spokane, Washington." GEI File No. 0110-148-04.

GeoEngineers, Inc. 2016d. "Soil Stockpile Management Plan" GEI File No. 0110-148-06.

GeoEngineers, Inc. 2016e. "Phase II Assessment Report, Riverfront Park, Spokane, Washington." GEI File No. 0110-148-06.

GeoEngineers, Inc. 2017. "Soil Management Plan – Revision 1, Riverfront Park Redevelopment, Spokane, Washington." GEI File No. 0110-148-04.

GeoEngineers, Inc. 2018a. "2016 and 2017 Riverfront Park Soil Management Report, Riverfront Park, Spokane, Washington." GEI File No. 0100-148-06.

GeoEngineers, Inc. 2018b. "Geotechnical Engineering Evaluation and Environmental Site Assessment, Riverfront Park, Spokane, Washington." GEI File No. 0110-148-06.

GeoEngineers, Inc. 2019a. "Geotechnical Engineering Evaluation." GEI File No. 12088-006-03. March 6, 2019.

GeoEngineers, Inc. 2019b. "2018 Riverfront Park Soil Management Report, Riverfront Park, Spokane, Washington." GEI File No. 0100-148-06. June 7, 2019

Washington State Department of Ecology. 1994. "Natural Background Soil Metals Concentrations in Washington State." Toxics Cleanup Program, Washington State Department of Ecology, Publication #94-115, October 1994.

Youngs, J. William T. 1996. "The Fair and the Falls: Spokane's Expo '74 – Transforming an American Environment."

TABLES

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Table 1

Soil Chemical Analytical Data - TPH, Metals, and PAHs[1]

Riverfront Park

Spokane, Washington

Analyte Group	Analyte	Units	Twice the Spokane Basin Background Metal Concentration[2]	MTCA Method A CUL[3]	Location ID, Date, and Depth Interval					
					HSP-16C (1-1.5) 2/21/2019 1 - 1.5 ft	HSP-17C (1-1.75) 2/21/2019 1 - 1.75 ft	HSP-16C 7/15/2019 0 - 6 in	HSP-17C 7/15/2019 0 - 6 in	HSP-18C 7/15/2019 0 - 6 in	HSP-19C 7/15/2019 0 - 6 in
				Justification	Characterization Sample	Characterization Sample	Characterization Sample	Characterization Sample	Characterization Sample	Characterization Sample
				Fate	Left in Place	Left in Place	Left in Place	Left in Place	Left in Place	Left in Place
TPH[4]	Diesel-range hydrocarbons	mg/Kg	NA	2,000	**17**	10 U	--	--	--	--
	Lube oil-range hydrocarbons	mg/Kg	NA	2,000	**96**	26 U	--	--	--	--
Metals[5]	Arsenic	mg/Kg	18.68	20	**15**	**5.7**	--	--	--	--
	Barium	mg/Kg	NE	NE	**57**	**56**	--	--	--	--
	Cadmium	mg/Kg	1.4	2	**1.6**	0.78 U	0.91 U	1.0 U	0.76 U	0.71 U
	Chromium	mg/Kg	35.6	2,000[6]	**10**	**6.7**	--	--	--	--
	Lead	mg/Kg	29.8	250	**670**	**6.4**	**9.8**	**12**	**11**	**11**
	Mercury	µg/kg	40	2,000	**500**	**6.8 J**	--	--	--	--
	Selenium	mg/Kg	NE	NE	8.0 U	**4.7**	--	--	--	--
	Silver	mg/Kg	NE	NE	**2.2**	**0.20 J**	--	--	--	--
PAHs[7]	1-Methylnaphthalene	µg/kg	NA	NE	**6.9 J**	11 U	10 U	11 U	11 U	12 U
	2-Methylnaphthalene	µg/kg	NA	NE	**8.5 J**	11 U	10 U	11 U	11 U	12 U
	Naphthalene	µg/kg	NA	NE	**11**	11 U	10 U	11 U	11 U	12 U
	Total Naphthalene	µg/kg	NA	5,000[8]	**26.4 J**	11 U	10 U	11 U	11 U	12 U
	Acenaphthene	µg/kg	NA	NE	**12**	11 U	10 U	11 U	11 U	12 U
	Acenaphthylene	µg/kg	NA	NE	**81**	11 U	10 U	11 U	11 U	12 U
	Anthracene	µg/kg	NA	NE	**70**	11 U	10 U	11 U	11 U	**3.1 J**
	Benzo(a)anthracene	µg/kg	NA	NE	**230**	**3.2 J**	**2.3 J**	**3.2 J**	**2.5 J**	**9.1 J**
	Benzo(a)pyrene	µg/kg	NA	100	**360**	11 U	10 U	11 U	11 U	**11 J**
	Benzo(b)fluoranthene	µg/kg	NA	NE	**440**	**4.5 J**	**4.4 J**	**7.9 J**	**7.3 J**	**21**
	Benzo(g,h,i)perylene	µg/kg	NA	NE	**300**	**2.7 J**	10 U	**3.7 J**	**3.3 J**	**8.3 J**
	Benzo(k)fluoranthene	µg/kg	NA	NE	**140**	11 U	10 U	**3.1 J**	11 U	**7.9 J**
	Chrysene	µg/kg	NA	NE	**260**	**2.6 J**	**3.0 J**	**5.8 J**	**6.9 J**	**16**
	Dibenzo(a,h)anthracene	µg/kg	NA	NE	**67**	11 U	10 U	11 U	11 U	12 U
	Fluoranthene	µg/kg	NA	NE	**380**	**6.0 J**	**5.0 J**	**8.7 J**	**8.0 J**	**18**
	Fluorene	µg/kg	NA	NE	**15**	11 U	10 U	11 U	11 U	12 U

Analyte Group	Analyte	Units	Twice the Spokane Basin Background Metal Concentration[2]	MTCA Method A CUL[3]	Location ID, Date, and Depth Interval											
					HSP-16C (1-1.5) 2/21/2019 1 - 1.5 ft		HSP-17C (1-1.75) 2/21/2019 1 - 1.75 ft		HSP-16C 7/15/2019 0 - 6 in		HSP-17C 7/15/2019 0 - 6 in		HSP-18C 7/15/2019 0 - 6 in		HSP-19C 7/15/2019 0 - 6 in	
				Justification	Characterization Sample		Characterization Sample		Characterization Sample		Characterization Sample		Characterization Sample		Characterization Sample	
				Fate	Left in Place		Left in Place		Left in Place		Left in Place		Left in Place		Left in Place	
PAHs[7]	Indeno(1,2,3-c,d)pyrene	µg/kg	NA	NE	**230**		11	U	10	U	11	U	11	U	**6.4**	**J**
	Phenanthrene	µg/kg	NA	NE	**170**		11	U	10	U	11	U	11	U	**6.7**	**J**
	Pyrene	µg/kg	NA	NE	**450**		**6.2**	**J**	**4.3**	**J**	**7.3**	**J**	**6.8**	**J**	**18**	
	Total cPAH TEQ[9] (ND=0.5RL)[10]	µg/kg	NA	100	**473.3**		**7.9**		**7.2**		**8.1**		**8.2**		**16.2**	

Notes:

[1]Samples analyzed by Eurofins TestAmerica Laboratories, Inc. located in Spokane Valley, Washington.

[2]Background level used for metals in soil is the Washington State Department of Ecology Natural Background 90th Percentile Value for the Spokane Basin (Ecology 1994).

[3]Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels (CUL).

[4]Total Petroleum Hydrocarbons (TPH) analyzed using Method Northwest TPH-Dx.

[5]Metals analyzed using Environmental Protection Agency (EPA) Method 6010C. Mercury by EPA Method 7471B.

[6]Chromium III cleanup level. MTCA Method A cleanup level for Chromium VI is 19 mg/kg.

[7]Polycyclic aromatic hydrocarbons analyzed using EPA Method 8270DSIM.

[8]Sum total value for naphthalene, 1-methyl naphthalene and 2-methyl naphthalene.

[9]Carcinogenic PAH (cPAH) toxic equivalency (TEQ) calculated using toxicity equivalency factors (TEF) from MTCA Table 708-2, based on methodology described in MTCA Cleanup Regulation Washington Administrative Code (WAC) 173-340-708.

[10]The TEQ reported was calculated using half the laboratory reporting limits for cPAHs less than reporting limits.

mg/kg = milligrams per kilogram; NE = not established; µg/kg = micrograms per kilogram; U = analyte was not detected above the laboratory reporting limit; J = estimated result; NA = Not Applicable; ft = feet; in = inches

Bold indicates that the analyte was detected above the reporting limit.

Shading indicates that the analyte was detected above the MTCA Method A CUL.

Blue shading indicates the reported concentration was greater than twice the Spokane Basin background metals concentration (Ecology 1994).

Table 2

Soil Sample Summary - 2019

Riverfront Park

Spokane, Washington

Location	Date	Depth (feet)	Sample Number	Petroleum Hydrocarbons	Metals	PAHs	Contaminants
Havermale Island - Sister Cities Garden	02/21/19	1-1.5	HSP-16C(1-1.5)	Impacted	Contaminated	Contaminated	Lead, cPAHs
	02/21/19	1-1.75	HSP-17C(1-1.75)	Clean	Clean	Clean	NA
Havermale Island - Howard Street Promenade	07/15/19	0-0.5	HSP-16C	Not Tested	Clean	Impacted	NA
	07/15/19	0-0.5	HSP-17C	Not Tested	Clean	Impacted	NA
	07/15/19	0-0.5	HSP-18C	Not Tested	Clean	Impacted	NA
	07/15/19	0-0.5	HSP-19C	Not Tested	Clean	Impacted	NA

Notes:

cPAH = Carcinogenic polycyclic aromatic hydrocarbons ; PAH = Polycyclic aromatic hydrocarbons

NA = Not applicable

FIGURES

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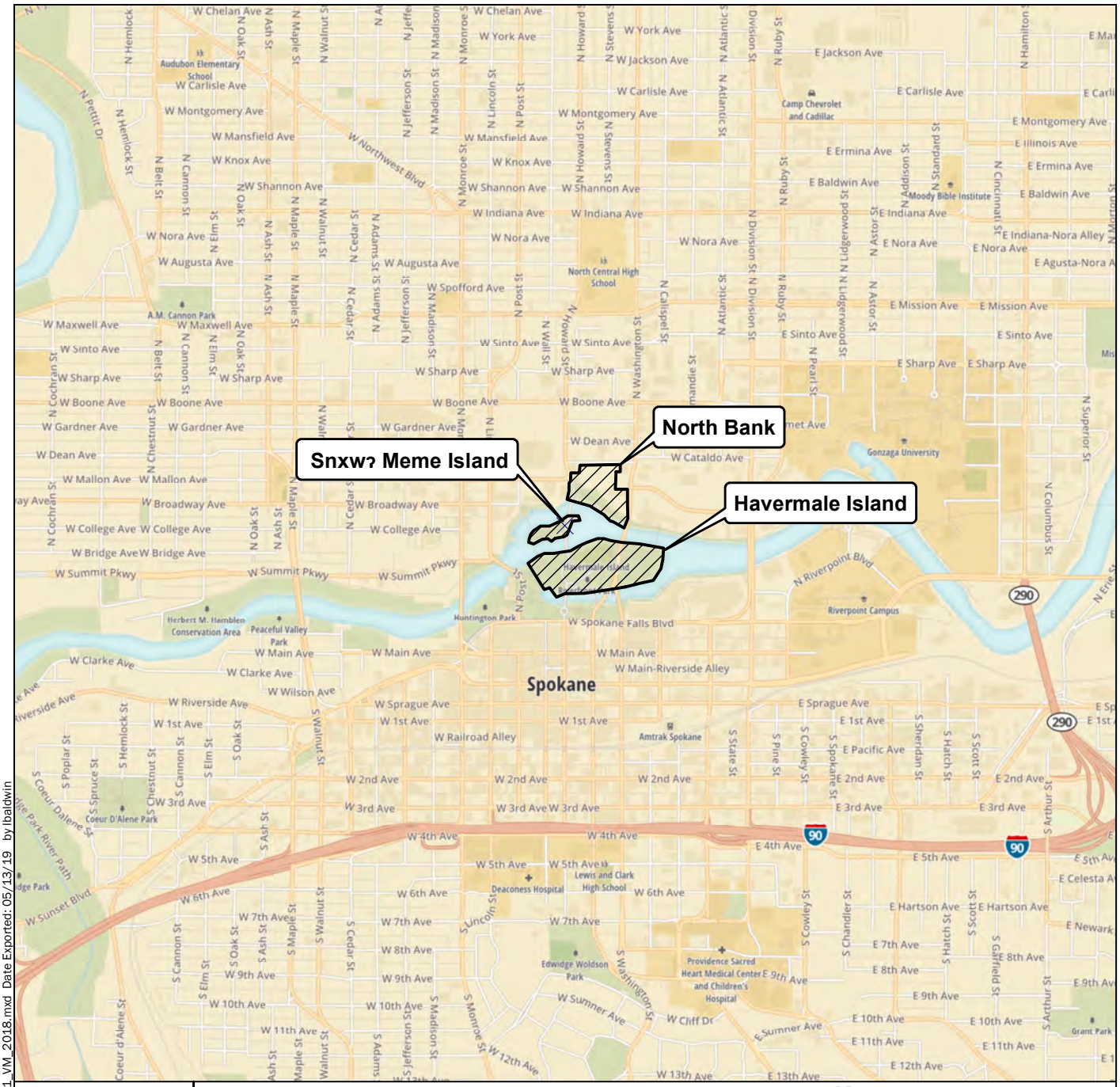

N
W E
S

2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 11N

Vicinity Map

Riverfront Park
Spokane, Washington

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Figure 1

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Legend

RFP Fill Outline 1894' to 1900'

RFP Fill Outline 1900' to 1901'

N
W E
S

30 0 30

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Current Imagery flown by Spokane Regional Orthophoto Consortium .
Streets and parcels from Spokane County GIS.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Spokane Sportsplex Riverfront Park Fill

Riverfront Park
Spokane, Washington

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Figure 2

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Legend

- Approximate Utility Corridor Alignment
- Contaminated – Concentration greater than MTCA Method A Cleanup Level for one or more COC analyzed
- Impacted – Concentration less than MTCA Method A Cleanup Levels and greater than laboratory reporting limits or twice the available background metals concentration for one or more COC analyzed
- Clean – Concentration less than laboratory reporting limits or less than twice the available background metals concentrations for each COC analyzed

- TPH
- Metals
- PAHs

N W E S

100 0 100

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Locations are not exact. Points were adjusted for cartographic clarity.

Data Source: Google Earth

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Soil Sample Locations – 2019

Riverfront Park
Spokane, Washington

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Figure 3

APPENDICES

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APPENDIX A
Soil Laboratory Reports and Data Validation Report

GeoEngineers

523 East Second Avenue, Spokane, Washington 99202, Telephone: 509.363.3125 www.geoengineers.com

Data Validation Report

Project:	City of Spokane –Riverfront Park Howard Street Promenade February and July 2019 Soil Samples
GEI File No:	00110-148-14
Date:	March 4, 2020

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2A data validation (EPA Document 540-R-08-005; EPA, 2009) of analytical data from the analyses of soil samples collected as part of the February and July 2019 sampling events, and the associated laboratory quality control (QC) samples. The samples were obtained from the Riverfront Park Howard Street Promenade site located in Spokane, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the EPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (EPA, 2017a) and Inorganic Superfund Methods Data Review (EPA, 2017b) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix A of the Work Plan, Riverfront Park Geotechnical and Environmental Services (GeoEngineers, 2016), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery groups (SDGs) listed below in Table A-1.

TABLE A-1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
590-10446-1	HSP-16C (1-1.5), HSP-17C (1-1.75)
590-11403-1	HSP-16C, HSP-17C, HSP-18C, HSP-19C

CHEMICAL ANALYSIS PERFORMED

Eurofins TestAmerica Laboratories, Inc. (TestAmerica), located in Spokane, Washington, performed laboratory analyses on the samples using one or more of the following methods:

- Petroleum Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Polycyclic Aromatic Hydrocarbons (PAHs) by Method SW8270D-SIM; and
- Total Metals by Methods EPA6010C/7471B.

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

TestAmerica provided the required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and the identified anomalies were discussed in the relevant laboratory case narrative.

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the laboratory.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for each analysis. The sample coolers arrived at the laboratory within the appropriate temperatures of between 2 and 6 degrees Celsius, with the exception noted below.

SDG 590-11403-1: The sample cooler temperature recorded at the laboratory was 14.8 degrees Celsius. It was determined through professional judgment that since the samples were received on ice at the laboratory the same day they were collected, and the cooling process had begun, this temperature should likely not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated

following analysis. The surrogate percent recoveries for field samples were within the laboratory control limits.

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For each sample batch, method blanks for the applicable methods were analyzed at the required frequency. None of the analytes of interest were detected in the method blanks.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery and RPD values were within the proper control limits.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery values were within the proper control limits.

Miscellaneous

SDG 590-10446-1: (NWTPH-Dx) The positive result for diesel-range hydrocarbons in Sample HSP-16C (1-1.5) may be influenced by the relative concentration of lube oil-range hydrocarbons in the sample. For this reason, the positive result for diesel-range hydrocarbons was qualified as estimated (J) in this sample, in order to signify a potential high bias.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD percent recovery values. Precision was acceptable, as demonstrated by the MS/MSD RPD values.

The data are acceptable for the intended use, with the following qualification listed below in Table A-2.

TABLE A-2: SUMMARY OF QUALIFIED SAMPLES

Sample ID	Analyte	Qualifier	Reason
HSP-16C (1-1.5)	Diesel-range hydrocarbons	J	See Miscellaneous

REFERENCES

GeoEngineers, Inc. 2016. "Work Plan, Riverfront Park Geotechnical and Environmental Services," prepared for City of Spokane. April 1, 2016.

U.S. Environmental Protection Agency (EPA). 2009. "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (EPA). 2017a. "Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review," EPA-540-R-2017-002. January 2017.

U.S. Environmental Protection Agency (EPA). 2017b. "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review," EPA-540-R-2017-001. January 2017.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

TestAmerica Job ID: 590-10446-1
Client Project/Site: Riverfront Park (0110-148-14)

For:
GeoEngineers Inc
523 East Second Ave
Spokane, Washington 99202

Attn: JR Sugalski

Authorized for release by:
2/25/2019 4:28:05 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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

Table of Contents

Case Narrative

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Job ID: 590-10446-1

Laboratory: TestAmerica Spokane

Narrative

Receipt
The samples were received on 2/21/2019 11:18 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.1° C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to oil overlap in the following sample: HSP-16C (1-1.5) (590-10446-1).

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

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

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

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

Sample Summary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-10446-1	HSP-16C (1-1.5)	Solid	02/21/19 09:50	02/21/19 11:18
590-10446-2	HSP-17C (1-1.75)	Solid	02/21/19 10:05	02/21/19 11:18

Definitions/Glossary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Qualifiers

GC/MS Semi VOA

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
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 ID: HSP-16C (1-1.5)

Date Collected: 02/21/19 09:50
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-1

Matrix: Solid
Percent Solids: 92.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	11		11	2.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
2-Methylnaphthalene	8.5	J	11	3.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
1-Methylnaphthalene	6.9	J	11	2.4	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Acenaphthylene	81		11	3.6	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Acenaphthene	12		11	2.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Fluorene	15		11	2.4	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Phenanthrene	170		11	3.9	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Anthracene	70		11	2.1	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Fluoranthene	380		11	2.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Pyrene	450		11	4.1	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Benzo[a]anthracene	230		11	2.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Chrysene	260		11	1.6	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Benzo[b]fluoranthene	440		11	3.8	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Benzo[k]fluoranthene	140		11	2.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Benzo[a]pyrene	360		11	4.5	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Indeno[1,2,3-cd]pyrene	230		11	3.2	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Dibenz(a,h)anthracene	67		11	3.1	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1
Benzo[g,h,i]perylene	300		11	2.5	ug/Kg	☼	02/21/19 13:23	02/21/19 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*23 - 120*	*02/21/19 13:23*	*02/21/19 16:04*	*1*
2-Fluorobiphenyl (Surr)	*86*		*38 - 123*	*02/21/19 13:23*	*02/21/19 16:04*	*1*
p-Terphenyl-d14	*99*		*68 - 136*	*02/21/19 13:23*	*02/21/19 16:04*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	17		10	4.2	mg/Kg	☼	02/22/19 14:34	02/22/19 18:04	1
Residual Range Organics (RRO) (C25-C36)	96		25	5.1	mg/Kg	☼	02/22/19 14:34	02/22/19 18:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*02/22/19 14:34*	*02/22/19 18:04*	*1*
n-Triacontane-d62	*97*		*50 - 150*	*02/22/19 14:34*	*02/22/19 18:04*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	15		2.0	0.79	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Barium	57		2.0	0.53	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Cadmium	1.6		1.6	0.094	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Chromium	10		2.0	0.28	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Lead	670		4.8	2.3	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Selenium	ND		8.0	4.8	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2
Silver	2.2		2.0	0.21	mg/Kg	☼	02/21/19 14:18	02/25/19 14:21	2

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	500		36	2.6	ug/Kg	☼	02/25/19 09:04	02/25/19 14:47	1

Client Sample ID: HSP-17C (1-1.75)

Date Collected: 02/21/19 10:05
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-2

Matrix: Solid
Percent Solids: 93.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		11	2.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
2-Methylnaphthalene	ND		11	3.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
1-Methylnaphthalene	ND		11	2.4	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Acenaphthylene	ND		11	3.5	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Acenaphthene	ND		11	2.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Fluorene	ND		11	2.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Phenanthrene	ND		11	3.9	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Anthracene	ND		11	2.1	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Fluoranthene	**6.0**	**J**	11	2.6	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Pyrene	**6.2**	**J**	11	4.0	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Benzo[a]anthracene	**3.2**	**J**	11	2.3	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Chrysene	**2.6**	**J**	11	1.6	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Benzo[b]fluoranthene	**4.5**	**J**	11	3.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Benzo[k]fluoranthene	ND		11	2.7	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Benzo[a]pyrene	ND		11	4.5	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Indeno[1,2,3-cd]pyrene	ND		11	3.2	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Dibenz(a,h)anthracene	ND		11	3.0	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1
Benzo[g,h,i]perylene	**2.7**	**J**	11	2.5	ug/Kg	☼	02/21/19 13:23	02/21/19 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*76*		*23 - 120*	*02/21/19 13:23*	*02/21/19 16:31*	*1*
2-Fluorobiphenyl (Surr)	*89*		*38 - 123*	*02/21/19 13:23*	*02/21/19 16:31*	*1*
p-Terphenyl-d14	*104*		*68 - 136*	*02/21/19 13:23*	*02/21/19 16:31*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10	4.4	mg/Kg	☼	02/22/19 14:34	02/22/19 18:23	1
Residual Range Organics (RRO) (C25-C36)	ND		26	5.2	mg/Kg	☼	02/22/19 14:34	02/22/19 18:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*50 - 150*	*02/22/19 14:34*	*02/22/19 18:23*	*1*
n-Triacontane-d62	*86*		*50 - 150*	*02/22/19 14:34*	*02/22/19 18:23*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.7**		0.97	0.39	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Barium	**56**		0.97	0.26	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Cadmium	ND		0.78	0.046	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Chromium	**6.7**		0.97	0.14	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Lead	**6.4**		2.3	1.1	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Selenium	**4.7**		3.9	2.3	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1
Silver	**0.20**	**J**	0.97	0.10	mg/Kg	☼	02/21/19 14:18	02/25/19 13:55	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	**6.8**	**J**	28	2.0	ug/Kg	☼	02/25/19 09:04	02/25/19 14:49	1

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

Lab Sample ID: MB 590-21039/1-A
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21039

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		10	2.2	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
2-Methylnaphthalene	ND		10	3.1	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
1-Methylnaphthalene	ND		10	2.2	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Acenaphthylene	ND		10	3.3	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Acenaphthene	ND		10	2.5	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Fluorene	ND		10	2.2	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Phenanthrene	ND		10	3.6	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Anthracene	ND		10	2.0	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Fluoranthene	ND		10	2.5	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Pyrene	ND		10	3.8	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Benzo[a]anthracene	ND		10	2.1	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Chrysene	ND		10	1.5	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Benzo[b]fluoranthene	ND		10	3.5	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Benzo[k]fluoranthene	ND		10	2.5	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Benzo[a]pyrene	ND		10	4.2	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Indeno[1,2,3-cd]pyrene	ND		10	3.0	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Dibenz(a,h)anthracene	ND		10	2.8	ug/Kg		02/21/19 13:23	02/21/19 14:19	1
Benzo[g,h,i]perylene	ND		10	2.4	ug/Kg		02/21/19 13:23	02/21/19 14:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*39*		*23 - 120*	*02/21/19 13:23*	*02/21/19 14:19*	*1*
2-Fluorobiphenyl (Surr)	*67*		*38 - 123*	*02/21/19 13:23*	*02/21/19 14:19*	*1*
p-Terphenyl-d14	*105*		*68 - 136*	*02/21/19 13:23*	*02/21/19 14:19*	*1*

Lab Sample ID: LCS 590-21039/2-A
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21039

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	267	134		ug/Kg		50	41 - 121
2-Methylnaphthalene	267	177		ug/Kg		67	39 - 132
1-Methylnaphthalene	267	189		ug/Kg		71	46 - 131
Acenaphthylene	267	211		ug/Kg		79	56 - 123
Acenaphthene	267	199		ug/Kg		75	43 - 140
Fluorene	267	223		ug/Kg		83	54 - 131
Phenanthrene	267	226		ug/Kg		85	55 - 141
Anthracene	267	236		ug/Kg		89	60 - 129
Fluoranthene	267	243		ug/Kg		91	63 - 141
Pyrene	267	244		ug/Kg		91	62 - 139
Benzo[a]anthracene	267	237		ug/Kg		89	61 - 136
Chrysene	267	235		ug/Kg		88	57 - 144
Benzo[b]fluoranthene	267	241		ug/Kg		90	66 - 141
Benzo[k]fluoranthene	267	250		ug/Kg		94	63 - 150
Benzo[a]pyrene	267	237		ug/Kg		89	60 - 133
Indeno[1,2,3-cd]pyrene	267	238		ug/Kg		89	55 - 142
Dibenz(a,h)anthracene	267	239		ug/Kg		90	60 - 150
Benzo[g,h,i]perylene	267	243		ug/Kg		91	58 - 147

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

Lab Sample ID: LCS 590-21039/2-A
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21039

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*79*		*23 - 120*
2-Fluorobiphenyl (Surr)	*97*		*38 - 123*
p-Terphenyl-d14	*105*		*68 - 136*

Lab Sample ID: 590-10446-1 MS
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: HSP-16C (1-1.5)
Prep Type: Total/NA
Prep Batch: 21039

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	11		286	181		ug/Kg	☼	59	41 - 121
2-Methylnaphthalene	8.5	J	286	209		ug/Kg	☼	70	39 - 132
1-Methylnaphthalene	6.9	J	286	213		ug/Kg	☼	72	46 - 131
Acenaphthylene	81		286	339		ug/Kg	☼	90	56 - 123
Acenaphthene	12		286	230		ug/Kg	☼	76	43 - 140
Fluorene	15		286	238		ug/Kg	☼	78	54 - 131
Phenanthrene	170		286	410		ug/Kg	☼	85	55 - 141
Anthracene	70		286	307		ug/Kg	☼	83	60 - 129
Fluoranthene	380		286	687		ug/Kg	☼	106	63 - 141
Pyrene	450		286	769		ug/Kg	☼	112	62 - 139
Benzo[a]anthracene	230		286	532		ug/Kg	☼	105	61 - 136
Chrysene	260		286	542		ug/Kg	☼	99	57 - 144
Benzo[b]fluoranthene	440		286	714		ug/Kg	☼	97	66 - 141
Benzo[k]fluoranthene	140		286	466		ug/Kg	☼	112	63 - 150
Benzo[a]pyrene	360		286	700		ug/Kg	☼	119	60 - 133
Indeno[1,2,3-cd]pyrene	230		286	537		ug/Kg	☼	107	55 - 142
Dibenz(a,h)anthracene	67		286	304		ug/Kg	☼	83	60 - 150
Benzo[g,h,i]perylene	300		286	630		ug/Kg	☼	117	58 - 147

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Nitrobenzene-d5	*69*		*23 - 120*
2-Fluorobiphenyl (Surr)	*84*		*38 - 123*
p-Terphenyl-d14	*99*		*68 - 136*

Lab Sample ID: 590-10446-1 MSD
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: HSP-16C (1-1.5)
Prep Type: Total/NA
Prep Batch: 21039

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	11		286	155		ug/Kg	☼	51	41 - 121	15	35
2-Methylnaphthalene	8.5	J	286	200		ug/Kg	☼	67	39 - 132	4	35
1-Methylnaphthalene	6.9	J	286	211		ug/Kg	☼	71	46 - 131	1	35
Acenaphthylene	81		286	341		ug/Kg	☼	91	56 - 123	1	35
Acenaphthene	12		286	236		ug/Kg	☼	78	43 - 140	3	35
Fluorene	15		286	274		ug/Kg	☼	90	54 - 131	14	35
Phenanthrene	170		286	452		ug/Kg	☼	100	55 - 141	10	35
Anthracene	70		286	345		ug/Kg	☼	96	60 - 129	12	35
Fluoranthene	380		286	749		ug/Kg	☼	128	63 - 141	9	35
Pyrene	450		286	836		ug/Kg	☼	135	62 - 139	8	35

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

Lab Sample ID: 590-10446-1 MSD
Matrix: Solid
Analysis Batch: 21033

Client Sample ID: HSP-16C (1-1.5)
Prep Type: Total/NA
Prep Batch: 21039

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[a]anthracene	230		286	567		ug/Kg	☼	117	61 - 136	6	35
Chrysene	260		286	593		ug/Kg	☼	117	57 - 144	9	35
Benzo[b]fluoranthene	440		286	763		ug/Kg	☼	114	66 - 141	7	35
Benzo[k]fluoranthene	140		286	504		ug/Kg	☼	125	63 - 150	8	35
Benzo[a]pyrene	360		286	708		ug/Kg	☼	121	60 - 133	1	35
Indeno[1,2,3-cd]pyrene	230		286	525		ug/Kg	☼	102	55 - 142	2	35
Dibenz(a,h)anthracene	67		286	313		ug/Kg	☼	86	60 - 150	3	35
Benzo[g,h,i]perylene	300		286	580		ug/Kg	☼	100	58 - 147	8	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Nitrobenzene-d5	*62*		*23 - 120*
2-Fluorobiphenyl (Surr)	*85*		*38 - 123*
p-Terphenyl-d14	*104*		*68 - 136*

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

Lab Sample ID: MB 590-21069/1-A
Matrix: Solid
Analysis Batch: 21057

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21069

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10	4.2	mg/Kg		02/22/19 14:34	02/22/19 16:08	1
Residual Range Organics (RRO) (C25-C36)	ND		25	5.0	mg/Kg		02/22/19 14:34	02/22/19 16:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*02/22/19 14:34*	*02/22/19 16:08*	*1*
n-Triacontane-d62	*78*		*50 - 150*	*02/22/19 14:34*	*02/22/19 16:08*	*1*

Lab Sample ID: LCS 590-21069/2-A
Matrix: Solid
Analysis Batch: 21057

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21069

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics (DRO) (C10-C25)			66.7	63.1		mg/Kg		95	50 - 150		
Residual Range Organics (RRO) (C25-C36)			66.7	68.5		mg/Kg		103	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*93*		*50 - 150*
n-Triacontane-d62	*93*		*50 - 150*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 590-21045/2-A
Matrix: Solid
Analysis Batch: 21085

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21045

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.3	0.50	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Barium	ND		1.3	0.34	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Cadmium	ND		1.0	0.059	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Chromium	ND		1.3	0.18	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Lead	ND		3.0	1.5	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Selenium	ND		5.0	3.0	mg/Kg		02/21/19 14:18	02/25/19 13:10	1
Silver	ND		1.3	0.13	mg/Kg		02/21/19 14:18	02/25/19 13:10	1

Lab Sample ID: LCS 590-21045/1-A
Matrix: Solid
Analysis Batch: 21085

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21045

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.2		mg/Kg		96	80 - 120
Barium	100	101		mg/Kg		101	80 - 120
Cadmium	50.0	48.9		mg/Kg		98	80 - 120
Chromium	50.0	49.4		mg/Kg		99	80 - 120
Lead	50.0	51.0		mg/Kg		102	80 - 120
Selenium	100	98.3		mg/Kg		98	80 - 120
Silver	5.00	4.92		mg/Kg		98	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-21071/9-A
Matrix: Solid
Analysis Batch: 21086

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21071

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	3.6	ug/Kg		02/25/19 09:04	02/25/19 14:15	1

Lab Sample ID: LCS 590-21071/8-A
Matrix: Solid
Analysis Batch: 21086

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21071

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	200	210		ug/Kg		105	80 - 120

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Client Sample ID: HSP-16C (1-1.5)
Date Collected: 02/21/19 09:50
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			21038	02/21/19 13:16	MO	TAL SPK

Client Sample ID: HSP-16C (1-1.5)
Date Collected: 02/21/19 09:50
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-1
Matrix: Solid
Percent Solids: 92.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.05 g	2 mL	21039	02/21/19 13:23	MO	TAL SPK
Total/NA	Analysis	8270D SIM		1			21033	02/21/19 16:04	NMI	TAL SPK
Total/NA	Prep	3550C			15.97 g	5 mL	21069	02/22/19 14:34	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			21057	02/22/19 18:04	NMI	TAL SPK
Total/NA	Prep	3050B			1.35 g	50 mL	21045	02/21/19 14:18	JSP	TAL SPK
Total/NA	Analysis	6010C		2			21085	02/25/19 14:21	JSP	TAL SPK
Total/NA	Prep	7471B			0.74 g	50 mL	21071	02/25/19 09:04	JSP	TAL SPK
Total/NA	Analysis	7471B		1			21086	02/25/19 14:47	JSP	TAL SPK

Client Sample ID: HSP-17C (1-1.75)
Date Collected: 02/21/19 10:05
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			21038	02/21/19 13:16	MO	TAL SPK

Client Sample ID: HSP-17C (1-1.75)
Date Collected: 02/21/19 10:05
Date Received: 02/21/19 11:18

Lab Sample ID: 590-10446-2
Matrix: Solid
Percent Solids: 93.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.07 g	2 mL	21039	02/21/19 13:23	MO	TAL SPK
Total/NA	Analysis	8270D SIM		1			21033	02/21/19 16:31	NMI	TAL SPK
Total/NA	Prep	3550C			15.29 g	5 mL	21069	02/22/19 14:34	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			21057	02/22/19 18:23	NMI	TAL SPK
Total/NA	Prep	3050B			1.37 g	50 mL	21045	02/21/19 14:18	JSP	TAL SPK
Total/NA	Analysis	6010C		1			21085	02/25/19 13:55	JSP	TAL SPK
Total/NA	Prep	7471B			0.95 g	50 mL	21071	02/25/19 09:04	JSP	TAL SPK
Total/NA	Analysis	7471B		1			21086	02/25/19 14:49	JSP	TAL SPK

Laboratory References:
TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Laboratory: TestAmerica Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C569	01-06-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

TestAmerica Job ID: 590-10446-1

Method	Method Description	Protocol	Laboratory
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
6010C	Metals (ICP)	SW846	TAL SPK
7471B	Mercury (CVAA)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
3050B	Preparation, Metals	SW846	TAL SPK
3550C	Ultrasonic Extraction	SW846	TAL SPK
7471B	Preparation, Mercury	SW846	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency
NWTPH = Northwest Total Petroleum Hydrocarbon
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Justin Orr	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-4381-1414.1
Client Contact: ~~Dave Lauder~~ JR Sugalski	Phone: (401) 890-1310	E-Mail: randee.arrington@testamericainc.com		Page: Page 1 of 1
Company: GeoEngineers Inc				Job #:
Address: 523 East Second Ave	Due Date Requested: 2/25/19			
City: Spokane	TAT Requested (days): 48 hr			
State, Zip: WA, 99202				
Phone: ~~509-209-2830(Tel)~~ (509) 363-3125	PO #: Purchase Order not required			
Email: ~~dlauder@geoengineers.com~~ jsugalski@geoengineers.com	WO #:			
Project Name: 0110-148-06 Riverfront Park (~~0110-148-14~~)	Project #: 59000877			
Site: Riverfront Park	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH_Gx_MS - Gx by GCMS	6010C, 7471B, 8270D_SIM, NWTPH_Dx	Total Number of containers	Special Instructions/Note:
			Preservation Code:				F	N		
HSP-16C (1-1.5)	2/21/19	0950	G	Solid				X	1	
HSP-17C (1-1.75)	2/21/19	1005	G	Solid				X	1	
				Solid						
				Solid						
				Solid						
				Solid						

590-10446 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Justin Orr	2-21-19/ 1120	GEI	Maria O'Toole	2/21/19 11:18	TA SPO
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		3.11° C

Ver: 08/04/2016

2/25/2019

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-10446-1

Login Number: 10446
List Number: 1
Creator: Kratz, Sheila J

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
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	Sample is soild
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

Laboratory Job ID: 590-11403-1
Client Project/Site: Riverfront Park (0110-148-14)

For:
GeoEngineers Inc
523 East Second Ave
Spokane, Washington 99202

Attn: JR Sugalski

Authorized for release by:
7/22/2019 4:36:26 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

Table of Contents

Case Narrative

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Job ID: 590-11403-1

Laboratory: Eurofins TestAmerica, Spokane

Narrative

Receipt
The samples were received on 7/15/2019 4:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 14.8º C.

Receipt Exceptions
The following sample were received at the laboratory outside the required temperature criteria: HSP-16C (590-11403-1), HSP-17C (590-11403-2), HSP-18C (590-11403-3) and HSP-19C (590-11403-4). The samples are considered acceptable since they were collected and submitted to the laboratory on the same day and there is evidence that the chilling process has begun.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

General Chemistry
Method Moisture: The sample duplicate (DUP) precision for analytical batch 590-23043 was outside control limits. Sample non-homogeneity is suspected.

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

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

Sample Summary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
590-11403-1	HSP-16C	Solid	07/15/19 15:10	07/15/19 16:35	
590-11403-2	HSP-17C	Solid	07/15/19 15:20	07/15/19 16:35	
590-11403-3	HSP-18C	Solid	07/15/19 15:30	07/15/19 16:35	
590-11403-4	HSP-19C	Solid	07/15/19 13:35	07/15/19 16:35	

Definitions/Glossary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Qualifiers

GC/MS Semi VOA

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.

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 ID: HSP-16C

Lab Sample ID: 590-11403-1
Date Collected: 07/15/19 15:10
Matrix: Solid
Date Received: 07/15/19 16:35
Percent Solids: 93.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		10	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
2-Methylnaphthalene	ND		10	3.3	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
1-Methylnaphthalene	ND		10	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Acenaphthylene	ND		10	3.5	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Acenaphthene	ND		10	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Fluorene	ND		10	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Phenanthrene	ND		10	3.8	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Anthracene	ND		10	2.1	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Fluoranthene	**5.0**	**J**	10	2.6	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Pyrene	**4.3**	**J**	10	4.0	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Benzo[a]anthracene	**2.3**	**J**	10	2.2	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Chrysene	**3.0**	**J**	10	1.6	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Benzo[b]fluoranthene	**4.4**	**J**	10	3.7	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Benzo[k]fluoranthene	ND		10	2.6	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Benzo[a]pyrene	ND		10	4.4	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Indeno[1,2,3-cd]pyrene	ND		10	3.1	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Dibenz(a,h)anthracene	ND		10	3.0	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1
Benzo[g,h,i]perylene	ND		10	2.5	ug/Kg	☼	07/18/19 13:11	07/19/19 19:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77*		*31 - 120*	*07/18/19 13:11*	*07/19/19 19:47*	*1*
2-Fluorobiphenyl (Surr)	*87*		*46 - 120*	*07/18/19 13:11*	*07/19/19 19:47*	*1*
p-Terphenyl-d14	*115*		*61 - 136*	*07/18/19 13:11*	*07/19/19 19:47*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.91	0.054	mg/Kg	☼	07/16/19 09:04	07/16/19 17:09	1
Lead	**9.8**		2.7	1.3	mg/Kg	☼	07/16/19 09:04	07/16/19 17:09	1

Client Sample ID: HSP-17C

Lab Sample ID: 590-11403-2
Date Collected: 07/15/19 15:20
Matrix: Solid
Date Received: 07/15/19 16:35
Percent Solids: 88.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		11	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
2-Methylnaphthalene	ND		11	3.3	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
1-Methylnaphthalene	ND		11	2.4	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Acenaphthylene	ND		11	3.6	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Acenaphthene	ND		11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Fluorene	ND		11	2.4	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Phenanthrene	ND		11	3.9	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Anthracene	ND		11	2.2	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Fluoranthene	**8.7**	**J**	11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Pyrene	**7.3**	**J**	11	4.1	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Benzo[a]anthracene	**3.2**	**J**	11	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Chrysene	**5.8**	**J**	11	1.6	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Benzo[b]fluoranthene	**7.9**	**J**	11	3.8	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Benzo[k]fluoranthene	**3.1**	**J**	11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Benzo[a]pyrene	ND		11	4.5	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1

Client Sample ID: HSP-17C

Date Collected: 07/15/19 15:20
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-2
Matrix: Solid
Percent Solids: 88.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		11	3.2	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Dibenz(a,h)anthracene	ND		11	3.1	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1
Benzo[g,h,i]perylene	**3.7**	**J**	11	2.5	ug/Kg	☼	07/18/19 13:11	07/19/19 20:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*86*		*31 - 120*	*07/18/19 13:11*	*07/19/19 20:14*	*1*
2-Fluorobiphenyl (Surr)	*90*		*46 - 120*	*07/18/19 13:11*	*07/19/19 20:14*	*1*
p-Terphenyl-d14	*102*		*61 - 136*	*07/18/19 13:11*	*07/19/19 20:14*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.059	mg/Kg	☼	07/16/19 09:04	07/16/19 17:22	1
Lead	**12**		3.0	1.5	mg/Kg	☼	07/16/19 09:04	07/16/19 17:22	1

Client Sample ID: HSP-18C

Date Collected: 07/15/19 15:30
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-3
Matrix: Solid
Percent Solids: 92.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		11	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
2-Methylnaphthalene	ND		11	3.4	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
1-Methylnaphthalene	ND		11	2.4	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Acenaphthylene	ND		11	3.6	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Acenaphthene	ND		11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Fluorene	ND		11	2.4	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Phenanthrene	ND		11	3.9	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Anthracene	ND		11	2.2	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Fluoranthene	**8.0**	**J**	11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Pyrene	**6.8**	**J**	11	4.1	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Benzo[a]anthracene	**2.5**	**J**	11	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Chrysene	**6.9**	**J**	11	1.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Benzo[b]fluoranthene	**7.3**	**J**	11	3.8	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Benzo[k]fluoranthene	ND		11	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Benzo[a]pyrene	ND		11	4.6	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Indeno[1,2,3-cd]pyrene	ND		11	3.2	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Dibenz(a,h)anthracene	ND		11	3.1	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1
Benzo[g,h,i]perylene	**3.3**	**J**	11	2.6	ug/Kg	☼	07/18/19 13:11	07/19/19 20:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*86*		*31 - 120*	*07/18/19 13:11*	*07/19/19 20:40*	*1*
2-Fluorobiphenyl (Surr)	*93*		*46 - 120*	*07/18/19 13:11*	*07/19/19 20:40*	*1*
p-Terphenyl-d14	*107*		*61 - 136*	*07/18/19 13:11*	*07/19/19 20:40*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.76	0.045	mg/Kg	☼	07/16/19 09:04	07/16/19 17:26	1
Lead	**11**		2.3	1.1	mg/Kg	☼	07/16/19 09:04	07/16/19 17:26	1

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Client Sample ID: HSP-19C
Date Collected: 07/15/19 13:35
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-4
Matrix: Solid
Percent Solids: 83.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		12	2.5	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
2-Methylnaphthalene	ND		12	3.6	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
1-Methylnaphthalene	ND		12	2.6	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Acenaphthylene	ND		12	3.9	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Acenaphthene	ND		12	2.9	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Fluorene	ND		12	2.6	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Phenanthrene	**6.7**	**J**	12	4.2	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Anthracene	**3.1**	**J**	12	2.3	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Fluoranthene	**18**		12	2.9	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Pyrene	**18**		12	4.4	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Benzo[a]anthracene	**9.1**	**J**	12	2.5	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Chrysene	**16**		12	1.8	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Benzo[b]fluoranthene	**21**		12	4.1	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Benzo[k]fluoranthene	**7.9**	**J**	12	2.9	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Benzo[a]pyrene	**11**	**J**	12	4.9	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Indeno[1,2,3-cd]pyrene	**6.4**	**J**	12	3.5	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Dibenz(a,h)anthracene	ND		12	3.3	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1
Benzo[g,h,i]perylene	**8.3**	**J**	12	2.7	ug/Kg	☼	07/18/19 13:11	07/19/19 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*79*		*31 - 120*	*07/18/19 13:11*	*07/19/19 21:07*	*1*
2-Fluorobiphenyl (Surr)	*86*		*46 - 120*	*07/18/19 13:11*	*07/19/19 21:07*	*1*
p-Terphenyl-d14	*98*		*61 - 136*	*07/18/19 13:11*	*07/19/19 21:07*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.71	0.042	mg/Kg	☼	07/16/19 09:04	07/16/19 17:30	1
Lead	**11**		2.1	1.0	mg/Kg	☼	07/16/19 09:04	07/16/19 17:30	1

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

Lab Sample ID: MB 590-23097/1-A
Matrix: Solid
Analysis Batch: 23108

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 23097

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		10	2.2	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
2-Methylnaphthalene	ND		10	3.1	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
1-Methylnaphthalene	ND		10	2.2	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Acenaphthylene	ND		10	3.3	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Acenaphthene	ND		10	2.5	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Fluorene	ND		10	2.2	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Phenanthrene	ND		10	3.6	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Anthracene	ND		10	2.0	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Fluoranthene	ND		10	2.5	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Pyrene	ND		10	3.8	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Benzo[a]anthracene	ND		10	2.1	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Chrysene	ND		10	1.5	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Benzo[b]fluoranthene	ND		10	3.5	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Benzo[k]fluoranthene	ND		10	2.5	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Benzo[a]pyrene	ND		10	4.2	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Indeno[1,2,3-cd]pyrene	ND		10	3.0	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Dibenz(a,h)anthracene	ND		10	2.8	ug/Kg		07/18/19 13:11	07/19/19 11:01	1
Benzo[g,h,i]perylene	ND		10	2.4	ug/Kg		07/18/19 13:11	07/19/19 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*31 - 120*	*07/18/19 13:11*	*07/19/19 11:01*	*1*
2-Fluorobiphenyl (Surr)	*100*		*46 - 120*	*07/18/19 13:11*	*07/19/19 11:01*	*1*
p-Terphenyl-d14	*121*		*61 - 136*	*07/18/19 13:11*	*07/19/19 11:01*	*1*

Lab Sample ID: LCS 590-23097/2-A
Matrix: Solid
Analysis Batch: 23108

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 23097

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	267	163		ug/Kg		61	33 - 120
2-Methylnaphthalene	267	194		ug/Kg		73	48 - 120
1-Methylnaphthalene	267	191		ug/Kg		71	55 - 120
Acenaphthylene	267	209		ug/Kg		79	47 - 120
Acenaphthene	267	209		ug/Kg		78	53 - 120
Fluorene	267	236		ug/Kg		88	54 - 120
Phenanthrene	267	253		ug/Kg		95	55 - 121
Anthracene	267	292		ug/Kg		110	60 - 129
Fluoranthene	267	265		ug/Kg		99	63 - 127
Pyrene	267	262		ug/Kg		98	62 - 125
Benzo[a]anthracene	267	270		ug/Kg		101	61 - 125
Chrysene	267	269		ug/Kg		101	57 - 127
Benzo[b]fluoranthene	267	273		ug/Kg		102	59 - 127
Benzo[k]fluoranthene	267	271		ug/Kg		101	63 - 127
Benzo[a]pyrene	267	268		ug/Kg		101	60 - 120
Indeno[1,2,3-cd]pyrene	267	272		ug/Kg		102	55 - 128
Dibenz(a,h)anthracene	267	275		ug/Kg		103	60 - 128
Benzo[g,h,i]perylene	267	268		ug/Kg		100	58 - 129

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

Lab Sample ID: LCS 590-23097/2-A
Matrix: Solid
Analysis Batch: 23108

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 23097

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*77*		*31 - 120*
2-Fluorobiphenyl (Surr)	*79*		*46 - 120*
p-Terphenyl-d14	*96*		*61 - 136*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 590-23022/2-A
Matrix: Solid
Analysis Batch: 23055

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 23022

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.059	mg/Kg		07/16/19 09:04	07/17/19 09:32	1
Lead	ND		3.0	1.5	mg/Kg		07/16/19 09:04	07/17/19 09:32	1

Lab Sample ID: LCS 590-23022/1-A
Matrix: Solid
Analysis Batch: 23055

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 23022

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	50.0	51.9		mg/Kg		104	80 - 120
Lead	50.0	53.4		mg/Kg		107	80 - 120

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Client Sample ID: HSP-16C
Date Collected: 07/15/19 15:10
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			23043	07/17/19 08:25	CWD	TAL SPK

Client Sample ID: HSP-16C
Date Collected: 07/15/19 15:10
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-1
Matrix: Solid
Percent Solids: 93.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.28 g	2 mL	23097	07/18/19 13:11	AMB	TAL SPK
Total/NA	Analysis	8270D SIM		1			23108	07/19/19 19:47	NMI	TAL SPK
Total/NA	Prep	3050B			1.17 g	50 mL	23022	07/16/19 09:04	JSP	TAL SPK
Total/NA	Analysis	6010C		1			23046	07/16/19 17:09	JSP	TAL SPK

Client Sample ID: HSP-17C
Date Collected: 07/15/19 15:20
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			23043	07/17/19 08:25	CWD	TAL SPK

Client Sample ID: HSP-17C
Date Collected: 07/15/19 15:20
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-2
Matrix: Solid
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.85 g	2 mL	23097	07/18/19 13:11	AMB	TAL SPK
Total/NA	Analysis	8270D SIM		1			23108	07/19/19 20:14	NMI	TAL SPK
Total/NA	Prep	3050B			1.14 g	50 mL	23022	07/16/19 09:04	JSP	TAL SPK
Total/NA	Analysis	6010C		1			23046	07/16/19 17:22	JSP	TAL SPK

Client Sample ID: HSP-18C
Date Collected: 07/15/19 15:30
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			23043	07/17/19 08:25	CWD	TAL SPK

Client Sample ID: HSP-18C
Date Collected: 07/15/19 15:30
Date Received: 07/15/19 16:35

Lab Sample ID: 590-11403-3
Matrix: Solid
Percent Solids: 92.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.02 g	2 mL	23097	07/18/19 13:11	AMB	TAL SPK
Total/NA	Analysis	8270D SIM		1			23108	07/19/19 20:40	NMI	TAL SPK
Total/NA	Prep	3050B			1.43 g	50 mL	23022	07/16/19 09:04	JSP	TAL SPK
Total/NA	Analysis	6010C		1			23046	07/16/19 17:26	JSP	TAL SPK

Lab Chronicle

Client: GeoEngineers Inc
Job ID: 590-11403-1
Project/Site: Riverfront Park (0110-148-14)

Client Sample ID: HSP-19C
Lab Sample ID: 590-11403-4
Date Collected: 07/15/19 13:35
Matrix: Solid
Date Received: 07/15/19 16:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			23043	07/17/19 08:25	CWD	TAL SPK

Client Sample ID: HSP-19C
Lab Sample ID: 590-11403-4
Date Collected: 07/15/19 13:35
Matrix: Solid
Date Received: 07/15/19 16:35
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.52 g	2 mL	23097	07/18/19 13:11	AMB	TAL SPK
Total/NA	Analysis	8270D SIM		1			23108	07/19/19 21:07	NMI	TAL SPK
Total/NA	Prep	3050B			1.69 g	50 mL	23022	07/16/19 09:04	JSP	TAL SPK
Total/NA	Analysis	6010C		1			23046	07/16/19 17:30	JSP	TAL SPK

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: GeoEngineers Inc
Job ID: 590-11403-1
Project/Site: Riverfront Park (0110-148-14)

Laboratory: Eurofins TestAmerica, Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C569	01-06-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: GeoEngineers Inc
Project/Site: Riverfront Park (0110-148-14)

Job ID: 590-11403-1

Method	Method Description	Protocol	Laboratory
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SPK
6010C	Metals (ICP)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
3050B	Preparation, Metals	SW846	TAL SPK
3550C	Ultrasonic Extraction	SW846	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

CHAIN OF CUSTODY RECORD

GeoEngineers
523 EAST SECOND AVE.
SPOKANE, WASHINGTON 99202
(509) 363-3125

DATE 7/15/19
PAGE 1 OF 1
LAB Test America
LAB NO. Spokane Valley

PROJECT NAME/LOCATION Riverfront Park
PROJECT NUMBER 0110-148-06
PROJECT MANAGER JR Sugalski
SAMPLED BY Justin Rice

SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF	ANALYSIS REQUIRED			NOTES/COMMENTS
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS	PAHs	Lead	Cadmium	(Preserved, filtered, etc.)
	HSP-16C	7/12/19	1510	Soil	2	X	X	X	
	HSP-17C	"	1520	"	"	"	"	"	Std
	HSP-18C	"	1530	"	"	"	"	"	
	HSP-19C	↓	1535	↓	↓	↓	↓	↓	

590-11403 Chain of Custody

RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM
SIGNATURE	GEI	SIGNATURE		SIGNATURE	
PRINTED NAME Justin Rice		PRINTED NAME		PRINTED NAME	
DATE 7/15/19 TIME 1635		DATE TIME		DATE TIME	
RECEIVED BY	**FIRM**	**RECEIVED BY**	**FIRM**	**RECEIVED BY**	**FIRM**
SIGNATURE	TASPO	SIGNATURE		SIGNATURE	
PRINTED NAME Mimia Groote		PRINTED NAME		PRINTED NAME	
DATE 7/15/19 TIME 16:35		DATE TIME		DATE TIME	

ADDITIONAL COMMENTS:

148

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-11403-1

Login Number: 11403
List Number: 1
Creator: O'Toole, Maria C

List Source: Eurofins TestAmerica, Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
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.	N/A	Received same day of collection; chilling process has begun.
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	No analysis requiring residual chlorine check assigned.

APPENDIX B
Pavilion Soil Cover Photograph Log

Photograph 1. Installation of the orange construction fencing , used as a visual indicator.

Photograph 2. Placement of cover soil over the orange construction fencing.

Site Photographs

Riverfront Park
Spokane, WA

GeoEngineers

Figure B-1

Photograph 3. Raking out the cover soil.

Photograph 4. Cover soil was deployed in two 6-inch lifts. The darker upper 6 inches was a turf builder product that had increased organics to enhance vegetation growth.

Site Photographs

Riverfront Park
Spokane, WA

GeoEngineers

Figure B-2

23084-001-00 Date Exported: 05/07/18

Photograph 5. Sod installed over the 12-inch cover soil.

Photograph 6. Installing soil cover and sod.

Site Photographs

Riverfront Park
Spokane, WA

GeoEngineers

Figure B-3

23084-001-00 Date Exported: 05/07/18

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