

Groundwater Monitoring Report

Second Quarter 2019



Property:

North Lot Property
255 South King Street
Seattle, Washington

Prepared for:

255 S King Street LP
270 South Hanford Street, Suite 100
Seattle, Washington

August 8, 2019



Groundwater Monitoring Report

Second Quarter 2019

North Lot Property

Washington State Department of Ecology Facility ID 5378137
255 South King Street
Seattle, Washington

Prepared for:

255 S King Street LP
270 South Hanford Street, Suite 100
Seattle, Washington

Prepared by:

A handwritten signature in blue ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

Erin K. Rothman, M.S.
Managing Principal

Rothman & Associates
505 Broadway East, Ste 115
Seattle, Washington

August 8, 2019

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1.0 INTRODUCTION

Rothman & Associates has prepared this Second Quarter 2019 Groundwater Monitoring Report for the North Lot Property, located at 201 and 255 South King Street in Seattle, Washington (the Site), on behalf of 255 S. King Street LP to demonstrate compliance with the specific requirements of the cleanup action completed at the North Lot Property as part of a Prospective Purchaser Consent Decree.

2.0 BACKGROUND

This section provides a description of the Site features and location, a summary of historical land use, and a description of the local geology and hydrogeology of the Site and adjoining parcels.

2.1 Site Location and Description

The Site, which is located at 201 and 255 South King Street in the Pioneer Square neighborhood of Seattle, Washington, includes two rectangularly-shaped tax parcels (King County Parcel Nos. 766620-4878 and 795300-0000) that cover approximately 168,573 square feet (3.87 acres) of land.

The location of the Site is shown on Figure 1. Figure 2 depicts a plan view/layout of the Site and locations of the compliance monitoring wells.

2.2 Land Use History of the Site

Based on a review of historical records and the findings of the Remedial Investigation (RI) completed by Landau Associates in 2011, the Site was originally undeveloped tide flats of Elliott Bay. The Site was filled in the late 1890s and early 1900s and operated as a rail yard from the late 1800s until the late 1960s. The fill material underlying the Site is composed of remnants of the former rail yard operations and construction debris (i.e., brick, metal, and concrete). Prior to filling, the Site was initially developed with streets, buildings, and railroad tracks elevated on and supported by pilings. Several sets of railroad tracks were formerly present on the Site. Structures associated with the rail yard included engine maintenance buildings, sand houses, coal houses, oil houses, and materials storage areas. King County purchased the Site in the 1970s to facilitate construction of the Kingdome stadium to the south of the Site, which was later demolished and replaced with the current CenturyLink Field and Event Center development. The Site was used as a parking lot since the 1970s. 255 S. King Street LP purchased the Property from NLD in August 2013 and redeveloped it with a high-rise hotel, residential, and commercial/retail buildings with belowground parking in 2014 and 2017. Construction of the hotel was completed in February 2018.

2.3 Regional Hydrogeology

The geology of the region is generally characterized by a thick sequence of glacial soil overlying tertiary bedrock, with local areas of exposed surficial bedrock. In general, the glacial stratigraphic sequence of the Puget Lowland consists of generally fine-grained, low-energy, non-glacial and glacial lacustrine and fluvial deposits overlain by glacial advance sand. The advance sand is overlain by glacial till, which, in turn is locally overlain by glacial recessional sand, where present, as well as organic-rich peat, lacustrine, and alluvial deposits. Where exposed, the glacial soil has been modified by mass wasting, stream erosion and deposition, and anthropogenic modifications (Booth et al. 2009).

The hydrogeology of the Puget lowland and Quaternary glacial soil includes near-surface, non-glacial alluvial deposits, perched water-bearing zones atop and within the glacial till soil or other consolidated fine-grained or cemented glacial deposits, and more persistent and higher yielding water-bearing zones present within the underlying glacial advance sands and older granular glacial and non-glacial deposits. The advance sands can be an important source of potable water supplies, particularly in suburban and rural locations within the Puget Lowland, while the water-bearing zones within the glacial till are not often exploited as a potable source as a result of significant seasonal fluctuations, low yield, and susceptibility to water quality degradation (Booth et al. 2009).

3.0 GROUNDWATER MONITORING EVENT

The groundwater monitoring event was conducted on June 20 and July 14, 2019, and included collecting depth to groundwater in five of the six monitoring wells and sampling two monitoring wells.

3.1 Depth to Groundwater

Prior to sampling, five of the six wells were opened and allowed to equilibrate to atmospheric pressure. MW-18D was not accessible at any point during the day because a car was parked over it. Depth to water in the accessible wells was measured using an electronic interface probe and ranged from 5.84 feet (MW-19) and 10.159 feet (MW-16D) below the top of the well casings (Table 1).

3.2 Groundwater Sampling

Two of the monitoring wells (MW-19 and MW-22) were sampled using a peristaltic pump and single-use polyethylene tubing using low-flow sampling techniques in accordance with *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (U.S. EPA 2017). Samples were collected directly from the sampling equipment and stored on ice in a cooler. Groundwater samples collected from monitoring wells were designated with the well number (e.g., MW-19) and date, and the samples were logged on a chain-of-custody form and submitted to Friedman & Bruya, Inc. in Seattle, Washington, following proper chain-of-custody protocols.

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method 8021; gasoline-range total petroleum hydrocarbons (GRPH) and diesel-range total petroleum hydrocarbons (DRPH) by Northwest Total Petroleum Hydrocarbon (NWTPH) Method NWTPH-Gx and NWTPH-Dx; low-level polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM; and dissolved metals (arsenic, cadmium, chromium, lead, mercury, copper, and zinc) by EPA Method 200.8 or EPA Method 7471 (mercury). Groundwater samples collected for analysis of dissolved metals were field-filtered using a 0.45-micron membrane filter.

A blind duplicate sample was collected for quality control purposes.

3.3 Results

The following subsections summarize the results of the Second Quarter 2019 groundwater monitoring event. *Note that the samples labeled MW-22 in the June 2019 laboratory analytical report were collected from MW-21; MW-22 was resampled in July 2019.

3.3.1 Groundwater Elevation and Flow Direction

Groundwater elevations ranged from 7.45 feet (MW-16D) to 11.76 feet (MW-19) above mean sea level. The local groundwater gradient and flow patterns across the Site are variable, which is common within shallow, unconfined aquifers that consist of fill material, especially in urban areas where subgrade constructed features can affect the immediately surrounding groundwater table.

In general, there is a localized area of relatively lower groundwater elevations (i.e., groundwater low) roughly between the corner of South King Street and King Street Station to the east, and an area of relatively higher groundwater elevations (i.e., groundwater high) surrounding monitoring well MW-19 near the central portion of the Site. This is consistent with prior evaluations of groundwater flow and gradient (Landau 2011).

3.3.2 Groundwater Sample Results

None of the groundwater samples contained concentrations of any of the analytes in excess of their respective cleanup levels.

- ORPH, GRPH, benzene, toluene, ethylbenzene, and total xylenes were not detected in either of the samples submitted for analysis. DRPH was detected below the cleanup level in groundwater collected from MW-22.
- Arsenic was detected in groundwater collected from both MW-19 and MW-22; neither of the arsenic concentrations exceeded the cleanup levels.
- PAHs were not detected in any of the samples collected.

4.0 CONCLUSIONS

The results of the Second Quarter 2019 groundwater monitoring event indicate that the groundwater quality at the point of compliance for the North Lot Property meets the requirements set forth in the Consent Decree.

5.0 LIMITATIONS

The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. No warranty, express or implied, is made regarding the information and recommendations provided in this report.

6.0 REFERENCES

Booth, Troost, Goetz, and Schimel. 2009. Geologic map of northeastern Seattle (part of the Seattle North 7.5' x 15' quadrangle), King County, Washington: U.S. Geological Survey Scientific Investigations Map 3065, scale 1:12000 and database.

Landau Associates. 2011a. Remedial Investigation Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011b. Feasibility Study Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011c. Cleanup Action Plan, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. July 1.

Landau Associates. 2011d. Engineering Design Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. July 5.

Landau Associates. 2012. Feasibility Study Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. September 27.

Landau Associates. 2013. Cleanup Action Plan Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. September 18.

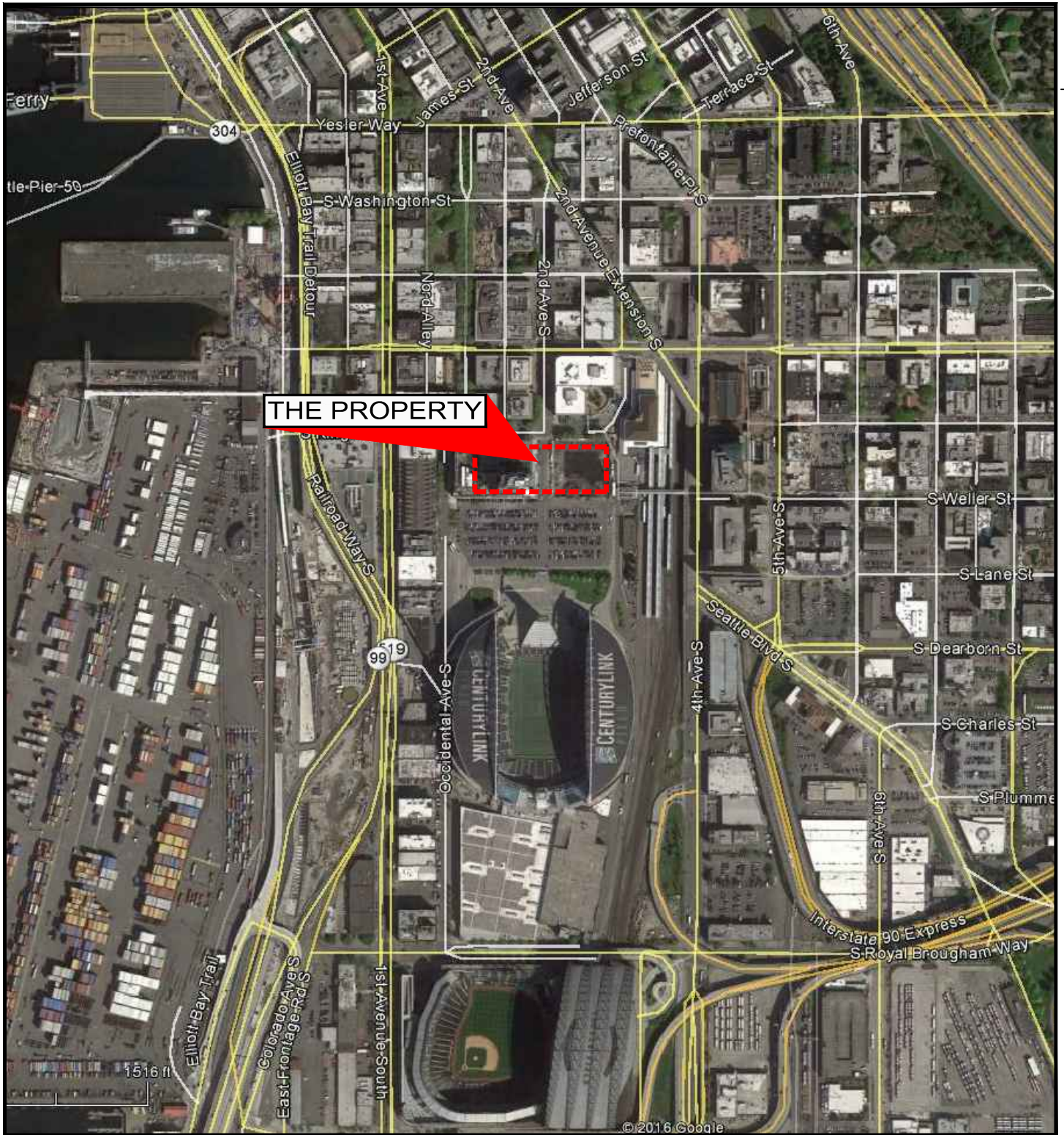
Landau Associates. 2014. Engineering Design Report Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. February 28.

United States Environmental Protection Agency. 2017. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. EQASOP-GW4 Region 1 Low-Stress (Low-Flow) SOP, Revision Number 4. September 19.

Washington Department of Ecology. 2014. Table D-1 of the Consent Decree, Cleanup Action Schedule, North Lot Property, Seattle, Washington. January 14.

Washington State Department of Ecology. 2015. Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs). Implementation Memo #10. April 20.

FIGURES



Reference: Google Earth



TITLE
PROPERTY
LOCATION MAP

PROJECT
255 SOUTH KING STREET
SEATTLE, WASHINGTON

PROJECT NO.
1008.001

PREPARED FOR
255 S KING STREET LP
270 SOUTH HANFORD STREET
SUITE 100
SEATTLE, WASHINGTON 98134

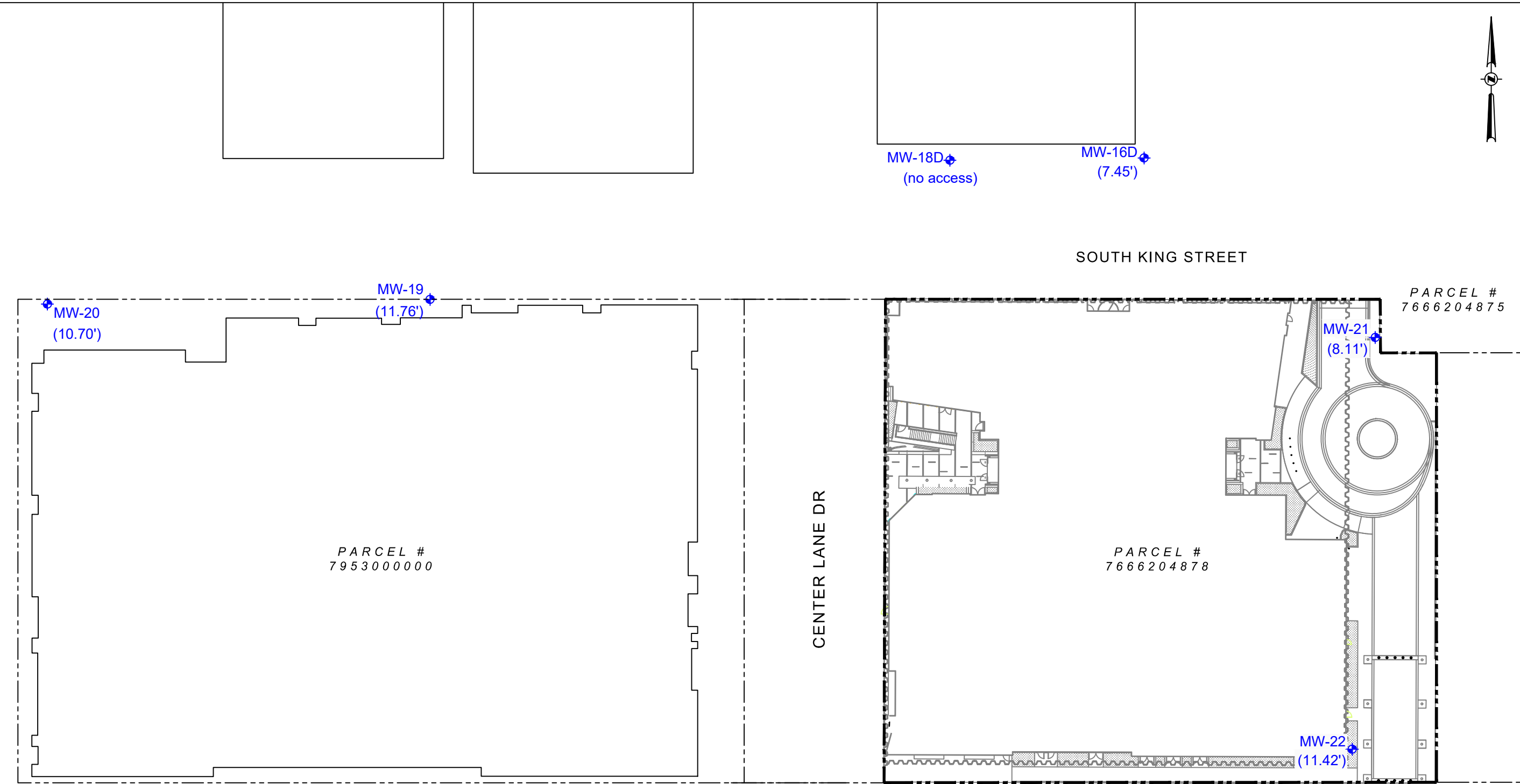
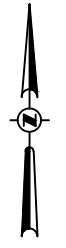
PREPARED BY
ROTHMAN & ASSOCIATES
505 BROADWAY EAST, STE 115
SEATTLE, WA 98102

SCALE
NO SCALE





DATE
08.21.2017

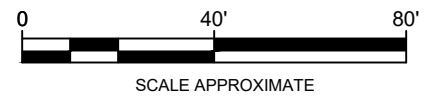
FIGURE

1



LEGEND:

-  MONITORING WELL
-  PROPERTY BOUNDARY
-  PARCEL BOUNDARY
-  (9.93') GROUNDWATER ELEVATION (JUNE 20, 2019)



PARCEL #
 7666204880

PARCEL #
 7953000000

PARCEL #
 7666204878

PARCEL #
 7666204875

TABLE



Table 1
Groundwater Data
North Lot Property
201 and 255 South King Street
Seattle, Washington

Monitoring Well ID	Sample Date	Depth to Groundwater (feet)	Groundwater Elevation (feet msl)	DRPH ¹	ORPH ¹	GRPH ²	Benzene ³	Toluene ³	Ethylbenzene ³	Total Xylenes ³	cPAHs ⁴	Arsenic ⁵
MW-16D TOC: 17.60'	08/04/17	10.39	7.21	<50	<250	<100	<0.8	<1	<1	<3	0.0693	<1
	11/08/17	10.12	7.48	<60	<300	<100	<0.8	<1	<1	<3	0.00655	<1
	02/08/18	9.50	8.10	<30	<150	<100	<0.8	<1	<1	<3	0.00655	<1
	05/10/18	10.15	7.45	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	09/28/18	10.07	7.53	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	12/19/18	9.83	7.77	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	03/20/19	10.11	7.49	--	--	--	--	--	--	--	--	--
06/20/19	10.15	7.45	--	--	--	--	--	--	--	--	--	
MW-18D TOC: 17.17'	08/02/17	11.09	6.08	<50	<250	<100	<0.8	<1	<1	<3	0.0693	7.01
	11/08/17	10.71	6.46	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.87
	02/08/18	10.64	6.53	<30	<150	<100	<0.8	1.1	<1	<3	0.00655	1.25
	05/10/18	10.75	6.42	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.44
	09/28/18	10.66	6.51	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	12/19/18	10.44	6.73	<50	<250	<100	<0.8	<1	<1	<3	0.00655	1.83
	03/20/19	10.79	6.38	--	--	--	--	--	--	--	--	--
06/20/19	No Access	--	--	--	--	--	--	--	--	--	--	
MW-19 TOC: 17.49'	08/02/17	6.32	11.17	<50	<250	<100	<0.8	<1	<1	<3	0.0693	2.61
	11/08/17	6.18	11.31	<65	<320	<100	<0.8	<1	<1	<3	0.01335	2.14
	02/08/18	7.65	9.84	36x	150	<100	<0.8	1.2	<1	<3	0.02668	2.42
	05/10/18	6.01	11.48	<50	<250	<100	<0.8	<1	<1	<3	0.019914	2.10
	09/28/18	5.99	11.50	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.10
	12/19/18	5.83	11.66	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.10
	03/20/19	5.80	11.69	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.02
06/20/19	5.84	11.76	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.01	
MW-20 TOC: 17.51'	08/02/17	7.58	9.93	62x	<250	<100	<0.8	<1	<1	<3	0.0693	<1
	11/08/17	7.59	9.92	<75	<380	<100	<0.8	<1	<1	<3	0.00655	<1
	02/08/18	9.45	8.06	42x	<150	<100	<0.8	<1	<1	<3	0.00655	<1
	05/10/18	7.33	10.18	92x	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	09/28/18	7.49	10.02	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	12/19/18	6.69	10.82	53x	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	03/20/19	3.72	13.79	--	--	--	--	--	--	--	--	--
06/20/19	6.90	10.70	--	--	--	--	--	--	--	--	--	
MW-21 TOC: 17.17'	08/02/17	9.73	7.44	<50	<250	<100	<0.8	<1	<1	<3	0.0693	6.23
	11/08/17	9.45	7.72	<60	<300	<100	<0.8	<1	<1	<3	0.00655	4.34
	02/08/18	9.34	7.83	<30	<150	<100	<0.8	1.0	<1	<3	0.00655	1.74
	05/10/18	9.53	7.64	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.06
	09/28/18	9.43	7.74	<50	<250	<100	<0.8	<1	<1	<3	0.00655	5.42
	12/20/18	9.16	8.01	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.64
	03/20/19	9.46	7.71	<50	<250	<100	<0.8	<1	<1	<3	0.00655	1.67
06/20/19	9.49	8.11	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.96	



Table 1
Groundwater Data
North Lot Property
201 and 255 South King Street
Seattle, Washington

Revised 8/9/2019

Monitoring Well ID	Sample Date	Depth to Groundwater (feet)	Groundwater Elevation (feet msl)	DRPH ¹	ORPH ¹	GRPH ²	Benzene ³	Toluene ³	Ethylbenzene ³	Total Xylenes ³	cPAHs ⁴	Arsenic ⁵
MW-22 TOC: 17.14'	08/02/17	6.51	10.63	180x	<250	<100	<0.8	<1	<1	<3	0.0693	7.21
	11/08/17	6.10	11.04	330	<300	<100	<0.8	<1	<1	<3	0.00655	5.97
	02/08/18	5.27	11.87	640	310x	<100	<0.8	<1	<1	<3	0.00655	1.72
	05/10/18	5.97	11.17	520x	480x	<100	<0.8	<1	<1	<3	0.00655	1.34
	09/28/18	6.43	10.71	<50	<250	<100	<0.8	<1	<1	<3	0.00655	4.58
	12/20/18	4.76	12.38	180x	<250	<100	<0.8	<1	<1	<3	0.00655	1.53
	03/20/19	5.65	11.49	--	--	--	--	--	--	--	--	--
	07/14/19	6.18	11.42	170x	<250	<100	<0.8	<1	<1	<3	0.00655	2.07
Site-Specific Cleanup Levels for Groundwater⁶				500	500	800	0.8	80	275	1,600	0.012^a	5/21.3^b

640 = bold italics indicated that the concentration exceeds the cleanup level

Analytical data presented in micrograms per liter (µg/L)

DRPH = diesel-range petroleum hydrocarbons

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

msl = mean sea level

ORPH = oil-range petroleum hydrocarbons

PAHs = polycyclic aromatic hydrocarbons

TOC = top of casing elevation (feet) relative to mean sea level as measured by D.R. Strong Consulting Engineers on August 18, 2017

¹Analyzed by Northwest Method NWTPH-Dx.

²Analyzed by Northwest Method NWTPH-Gx.

³Analyzed by EPA Method 8021B.

⁴Analyzed by EPA Method 8071D SIM for low-level analysis of cPAHs.

⁵Analyzed by EPA Method 200.8.

⁶Site-Specific Cleanup Levels established in Cleanup Plan Addendum, North Lot Property, Seattle, Washington. Prepared by Landau Associates on September 18, 2013.

Laboratory Notes:

x=the sample chromatographic pattern does not resemble the fuel standard used for quantitation

^aThe total concentration that all cPAHs meet using the toxicity equivalency methodology in WAC 173-340-708(8). Italics indicate a toxicity equivalency based entirely or in part upon non-detectable concentrations of PAHs. For those PAHs that have not been detected at the Site and are below detection limits, a value of 0 was used for the TEF calculations (Washington State Department of Ecology. 2015. Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs). Implementation Memo #10. April 20.). Data were corrected relative to the recommendations provided in the memo, and the table was updated in May 2018. If concentrations of detected benzo(a)pyrene and/or TEFs of additional detected PAHs exceed the cleanup level, results are presented in bold italic font.

^bA cleanup level of 5 µg/L was agreed upon by Ecology for the western portion of the Site (MW-19 and MW-20). A background concentration of 21.3 µg/L will be used as the cleanup level for the eastern portion of the Site (MW-16D, MW-18D, MW-21, and MW-22).

APPENDIX A

Laboratory Analytical Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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July 1, 2019

Erin Rothman, Principal
Rothman & Associates
505 Broadway E., Suite 115
Seattle, WA 98102

Dear Ms Rothman:

Included are the results from the testing of material submitted on June 21, 2019 from the North Lot, F&BI 906433 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
RAA0701R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 21, 2019 by Friedman & Bruya, Inc. from the Rothman & Associates North Lot, F&BI 906433 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Rothman & Associates</u>
906433 -01	MW-19
906433 -02	MW-22
906433 -03	Trip Blank

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19
Date Received: 06/21/19
Project: North Lot, F&BI 906433
Date Extracted: 06/21/19
Date Analyzed: 06/21/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-19 906433-01	<0.8	<1	<1	<3	<100	109
MW-22 906433-02	<0.8	<1	<1	<3	<100	106
Trip Blank 906433-03	<0.8	<1	<1	<3	<100	106
Method Blank 09-1411 MB	<0.8	<1	<1	<3	<100	107

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19
Date Received: 06/21/19
Project: North Lot, F&BI 906433
Date Extracted: 06/21/19
Date Analyzed: 06/21/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 47-140)
MW-19 906433-01	<50	<250	106
MW-22 906433-02	<50	<250	115
Method Blank 09-1468 MB	<50	<250	90

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-19	Client:	Rothman & Associates
Date Received:	06/21/19	Project:	North Lot, F&BI 906433
Date Extracted:	06/25/19	Lab ID:	906433-01 1/0.25
Date Analyzed:	06/26/19	Data File:	062620.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	31	160
Benzo(a)anthracene-d12	83	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.005
Acenaphthene	<0.005
Fluorene	<0.005
Phenanthrene	<0.005
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	<0.005
Benz(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)pyrene	<0.005
Benzo(b)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Indeno(1,2,3-cd)pyrene	<0.005
Dibenz(a,h)anthracene	<0.005
Benzo(g,h,i)perylene	<0.005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-22	Client:	Rothman & Associates
Date Received:	06/21/19	Project:	North Lot, F&BI 906433
Date Extracted:	06/25/19	Lab ID:	906433-02 1/0.25
Date Analyzed:	06/26/19	Data File:	062621.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	31	160
Benzo(a)anthracene-d12	81	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.005
Acenaphthene	<0.005
Fluorene	<0.005
Phenanthrene	<0.005
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	<0.005
Benz(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)pyrene	<0.005
Benzo(b)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Indeno(1,2,3-cd)pyrene	<0.005
Dibenz(a,h)anthracene	<0.005
Benzo(g,h,i)perylene	<0.005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Rothman & Associates
Date Received:	Not Applicable	Project:	North Lot, F&BI 906433
Date Extracted:	06/25/19	Lab ID:	09-1481 mb 1/0.25
Date Analyzed:	06/26/19	Data File:	062607.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	31	160
Benzo(a)anthracene-d12	100	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.005
Acenaphthene	<0.005
Fluorene	<0.005
Phenanthrene	<0.005
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	<0.005
Benz(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)pyrene	<0.005
Benzo(b)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Indeno(1,2,3-cd)pyrene	<0.005
Dibenz(a,h)anthracene	<0.005
Benzo(g,h,i)perylene	<0.005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-19	Client:	Rothman & Associates
Date Received:	06/21/19	Project:	North Lot, F&BI 906433
Date Extracted:	06/27/19	Lab ID:	906433-01
Date Analyzed:	06/27/19	Data File:	906433-01.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.01
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-22	Client:	Rothman & Associates
Date Received:	06/21/19	Project:	North Lot, F&BI 906433
Date Extracted:	06/27/19	Lab ID:	906433-02
Date Analyzed:	06/27/19	Data File:	906433-02.047
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.96
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Rothman & Associates
Date Received:	NA	Project:	North Lot, F&BI 906433
Date Extracted:	06/27/19	Lab ID:	I9-397 mb
Date Analyzed:	06/27/19	Data File:	I9-397 mb.042
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19

Date Received: 06/21/19

Project: North Lot, F&BI 906433

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 906433-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	102	65-118
Toluene	ug/L (ppb)	50	108	72-122
Ethylbenzene	ug/L (ppb)	50	112	73-126
Xylenes	ug/L (ppb)	150	109	74-118
Gasoline	ug/L (ppb)	1,000	84	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19

Date Received: 06/21/19

Project: North Lot, F&BI 906433

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	96	61-133	13

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19

Date Received: 06/21/19

Project: North Lot, F&BI 906433

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.25	66	66	57-114	0
Acenaphthylene	ug/L (ppb)	0.25	71	73	65-119	3
Acenaphthene	ug/L (ppb)	0.25	72	73	66-118	1
Fluorene	ug/L (ppb)	0.25	74	77	64-125	4
Phenanthrene	ug/L (ppb)	0.25	77	79	67-120	3
Anthracene	ug/L (ppb)	0.25	81	84	65-122	4
Fluoranthene	ug/L (ppb)	0.25	86	90	65-127	5
Pyrene	ug/L (ppb)	0.25	78	80	62-130	3
Benz(a)anthracene	ug/L (ppb)	0.25	84	87	60-118	4
Chrysene	ug/L (ppb)	0.25	82	84	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	0.25	90	94	55-135	4
Benzo(k)fluoranthene	ug/L (ppb)	0.25	81	85	62-125	5
Benzo(a)pyrene	ug/L (ppb)	0.25	84	87	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.25	77	81	36-142	5
Dibenz(a,h)anthracene	ug/L (ppb)	0.25	71	79	37-133	11
Benzo(g,h,i)perylene	ug/L (ppb)	0.25	70	74	34-135	6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/01/19

Date Received: 06/21/19

Project: North Lot, F&BI 906433

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8**

Laboratory Code: 906433-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	2.01	90	88	70-130	2
Cadmium	ug/L (ppb)	5	<1	97	98	70-130	1
Chromium	ug/L (ppb)	20	<1	95	94	70-130	1
Copper	ug/L (ppb)	20	<5	90	92	70-130	2
Lead	ug/L (ppb)	10	<1	91	89	70-130	2
Mercury	ug/L (ppb)	5	<1	90	91	70-130	1
Zinc	ug/L (ppb)	50	<5	91	91	70-130	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	94	85-115
Cadmium	ug/L (ppb)	5	97	85-115
Chromium	ug/L (ppb)	20	99	85-115
Copper	ug/L (ppb)	20	99	85-115
Lead	ug/L (ppb)	10	96	85-115
Mercury	ug/L (ppb)	5	92	85-115
Zinc	ug/L (ppb)	50	98	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
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July 24, 2019

Erin Rothman, Principal
Rothman & Associates
505 Broadway E., Suite 115
Seattle, WA 98102

Dear Ms Rothman:

Included are the results from the testing of material submitted on July 15, 2019 from the North Lot, F&BI 907232 project. There are 15 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Jason Cass
RAA0724R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 15, 2019 by Friedman & Bruya, Inc. from the Rothman & Associates North Lot, F&BI 907232 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Rothman & Associates</u>
907232 -01	MW-22-20190714
907232 -02	Dup

Phenanthrene was detected in the 8270D SIM method blank and sample MW-22-20190714. The data were flagged accordingly.

Lead in the 6020A matrix spike and matrix spike duplicate failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19
Date Received: 07/15/19
Project: North Lot, F&BI 907232
Date Extracted: 07/15/19
Date Analyzed: 07/15/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Dup 907232-02	<0.8	<1	<1	<3	98
Method Blank 09-1592 MB	<0.8	<1	<1	<3	102

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19
Date Received: 07/15/19
Project: North Lot, F&BI 907232
Date Extracted:
Date Analyzed:

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-22-20190714 907232-01	<0.8	<1	<1	<3	<100	98
Method Blank 09-1592 MB	<0.8	<1	<1	<3	<100	102

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19
Date Received: 07/15/19
Project: North Lot, F&BI 907232
Date Extracted: 07/16/19
Date Analyzed: 07/17/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx
Sample Extracts Passed Through a
Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152)
MW-22-20190714 907232-01	<50	<250	83
Method Blank 09-1678 MB2	<50	<250	101

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19
Date Received: 07/15/19
Project: North Lot, F&BI 907232
Date Extracted: 07/16/19
Date Analyzed: 07/16/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 47-140)
MW-22-20190714 907232-01	170 x	<250	100
Method Blank 09-1678 MB2	<50	<250	95

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-22-20190714	Client:	Rothman & Associates
Date Received:	07/15/19	Project:	North Lot, F&BI 907232
Date Extracted:	07/22/19	Lab ID:	907232-01
Date Analyzed:	07/22/19	Data File:	907232-01.065
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.07
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Rothman & Associates
Date Received:	NA	Project:	North Lot, F&BI 907232
Date Extracted:	07/22/19	Lab ID:	I9-440 mb
Date Analyzed:	07/22/19	Data File:	I9-440 mb.063
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-22-20190714	Client:	Rothman & Associates
Date Received:	07/15/19	Project:	North Lot, F&BI 907232
Date Extracted:	07/15/19	Lab ID:	907232-01 1/0.5
Date Analyzed:	07/17/19	Data File:	071709.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	61	31	160
Benzo(a)anthracene-d12	61	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.005
Acenaphthene	<0.005
Fluorene	<0.005
Phenanthrene	0.013 fb
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	0.013
Benz(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)pyrene	<0.005
Benzo(b)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Indeno(1,2,3-cd)pyrene	<0.005
Dibenz(a,h)anthracene	<0.005
Benzo(g,h,i)perylene	<0.005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Rothman & Associates
Date Received:	Not Applicable	Project:	North Lot, F&BI 907232
Date Extracted:	07/15/19	Lab ID:	09-1710 mb 1/0.5
Date Analyzed:	07/17/19	Data File:	071708.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.005
Acenaphthene	<0.005
Fluorene	<0.005
Phenanthrene	0.016 lc
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	<0.005
Benz(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)pyrene	<0.005
Benzo(b)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Indeno(1,2,3-cd)pyrene	<0.005
Dibenz(a,h)anthracene	<0.005
Benzo(g,h,i)perylene	<0.005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19

Date Received: 07/15/19

Project: North Lot, F&BI 907232

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 907219-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	100	72-122
Ethylbenzene	ug/L (ppb)	50	103	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	83	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19

Date Received: 07/15/19

Project: North Lot, F&BI 907232

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	76	63-142	15

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19

Date Received: 07/15/19

Project: North Lot, F&BI 907232

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	88	63-142	4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19

Date Received: 07/15/19

Project: North Lot, F&BI 907232

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8**

Laboratory Code: 907232-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	2.07	87	89	70-130	2
Cadmium	ug/L (ppb)	5	<1	100	100	70-130	0
Chromium	ug/L (ppb)	20	<1	100	100	70-130	0
Copper	ug/L (ppb)	20	<5	90	95	70-130	5
Lead	ug/L (ppb)	10	<1	68 vo	68 vo	70-130	0
Mercury	ug/L (ppb)	5	<1	72	73	70-130	1
Zinc	ug/L (ppb)	50	<5	85	86	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	88	85-115
Cadmium	ug/L (ppb)	5	98	85-115
Chromium	ug/L (ppb)	20	96	85-115
Copper	ug/L (ppb)	20	97	85-115
Lead	ug/L (ppb)	10	95	85-115
Mercury	ug/L (ppb)	5	93	85-115
Zinc	ug/L (ppb)	50	96	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/24/19

Date Received: 07/15/19

Project: North Lot, F&BI 907232

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample 1/0.5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	74	72	57-114	3
Acenaphthylene	ug/L (ppb)	1	80	80	65-119	0
Acenaphthene	ug/L (ppb)	1	81	81	66-118	0
Fluorene	ug/L (ppb)	1	80	82	64-125	2
Phenanthrene	ug/L (ppb)	1	81	82	67-120	1
Anthracene	ug/L (ppb)	1	83	83	65-122	0
Fluoranthene	ug/L (ppb)	1	86	90	65-127	5
Pyrene	ug/L (ppb)	1	89	91	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	91	93	60-118	2
Chrysene	ug/L (ppb)	1	90	91	66-125	1
Benzo(b)fluoranthene	ug/L (ppb)	1	83	87	55-135	5
Benzo(k)fluoranthene	ug/L (ppb)	1	84	88	62-125	5
Benzo(a)pyrene	ug/L (ppb)	1	81	83	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	79	82	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	78	81	37-133	4
Benzo(g,h,i)perylene	ug/L (ppb)	1	77	79	34-135	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The analyte is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits due to sample matrix effects.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

