A Subsidiary of SoundEarth Strategies
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March 27, 2020

Ms. Stacey Lange
Property Manager
American Life, Inc.
270 South Hanford Street
Seattle, Washington 98134

Re: Annual Groundwater and Indoor Vapor Monitoring—2020
North Lot
201 and 255 South King Street
Seattle, Washington 98134
Ecology Site ID 5378137

Dear Ms. Lange:

EHSI-International, Inc. (EHSI), behalf of American Life, Inc., has prepared this annual groundwater and indoor vapor monitoring report for the North Lot (site) located at 201 and 255 South King Street in Seattle, Washington (Figure 1). The purpose of the groundwater monitoring and indoor air sampling conducted at the site was to document groundwater and indoor air quality pursuant to Consent Decree No. 11-2-27892-1. The groundwater and indoor air monitoring at the site were conducted in accordance with the EHSI proposal Annual Groundwater and Indoor Air Monitoring Event, dated December 30, 2019.

BACKGROUND

The site, which is located in the Pioneer district of Seattle, Washington, consists of two rectangular parcels (Parcels A and B) covering approximately 3.87 acres of land. A 2011 remedial investigation by Landau Associates noted that the site was originally undeveloped tide flats of Elliott Bay (Landau 2011a). The site was filled and developed in the late 1890s and early 1900s with a rail yard that operated until the late 1960s. The site was initially developed with streets, buildings, and railroad tracks supported on wood pilings. The land was then filled between the pilings. The fill material consisted of remnants of the former rail yard operations and construction debris. Early site structures were engine maintenance buildings, sand houses, coal houses, oil houses, and material storage areas. Several sets of railroad tracks were also present on the site. King County purchased the site in the 1970s to facilitate construction of the former Kingdome stadium adjacent to the south. The Kingdome was later replaced by the existing Century Link Field. The site was used as a parking lot from the 1970s until redevelopment with the existing high-rise buildings in 2014. King Street LP purchased the property from North Lot Development in 2013 and built the existing high-rise hotel, residential, and commercial/retail buildings with below-grade parking.

Various subsurface investigations were completed at the site between 2008 and 2014. The subsurface materials encountered consisted of heterogeneous fill material to depths up to 20 feet below ground surface (bgs). The environmental investigations documented the nature and extent and concentration of total petroleum hydrocarbons, benzene, arsenic, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in the media of concern and identified exposure pathways for human health and the environment.

The site was entered into a prospective purchaser consent decree in August 2011. The eastern parcel (Parcel B) was subsequently entered into a different consent decree in 2014 that superseded the earlier prospective purchaser. Detailed discussions of past investigations, regulatory actions, cleanup, and monitoring requirements are provided in the Cleanup Action Plan (Ecology 2011), Feasibility Study (Landau 2011b), Remedial Investigation Report (Landau 2011a), and the Cleanup Action Plan Addendum (Landau 2013). The site-specific cleanup levels for the contaminants of concern in the media of concern are presented in the Cleanup Action Plan Addendum.

Remedial excavation work was done in 2015 in conjunction with the redevelopment of the site and mass removal of the soil (Rothman and Associates, Inc. 2019). A total of 57,007 tons of contaminated soil and debris was excavated and disposed of at the Republic Service facility, AAA Monroe Rock, and Waste Management for permitted landfill disposal. Following excavation, a protective cap was constructed across the site to prevent contact with remaining contaminated soil (if any). To mitigate risks associated with vapor intrusion, the building water barrier was also designed as a vapor barrier and the foundation was constructed with an impermeable seal-slab floor system.

MONITORING WELL SAMPLING

On January 21, 2020, EHSI mobilized to the site to perform annual groundwater monitoring. Prior to sampling, the five groundwater monitoring wells were opened and allowed to equilibrate to atmospheric pressure. The depth to groundwater was then measured at each well using an electronic water level sounder. Water levels were measured from a permanent mark the north side of the top of casing, and the bottom of the wells were sounded and measured for depth to water. Table A, below, summarizes the measurements.

TABLE A: EHSI GROUNDWATER LEVELS (FEET)
NORTH LOT SWLs—JANUARY 2020

Well ID	TOC Elevation (feet AMSL)	Depth to water (feet below TOC)	Groundwater Elevation (feet)
MW-16D	17.60	9.81	7.79
MW-18D	17.17	--	--
MW-19	17.49	5.64	11.96
MW-20	17.51	6.68	10.92
MW-21	17.17	9.15	8.45
MW-22	17.14	5.13	12.47

NOTES:
-- = not measured
AMSL = above mean sea level
SWL = static water level
TOC = top of casing

Groundwater Gradient and Direction

Figure 2 displays the groundwater levels across the site from the January 21, 2020, monitoring event. The groundwater flow across Parcel B appears to be toward the northeast at a gradient of approximately 0.02 feet/foot. The groundwater flow across Parcel A appears to be toward the west–southwest at a gradient of approximately 0.02 feet/foot.

Groundwater Sampling Procedures

Monitoring well MW-18D was not accessible for sampling due to parked vehicles. Following collection of static water levels, wells MW016D, MW-19, MW-20, MW-21, and MW-22 were sampled using a peristaltic pump and new polyethylene tubing. The polyethylene tubing was replaced between wells. Groundwater samples collected for dissolved metals analyses were field-filtered using a 0.45-micron membrane filter. A blind duplicate sample was collected for quality control purposes.

Prior to sample collection, each of the wells was purged with a flow-through cell and water quality meter. Water quality parameters of temperature, conductivity, dissolved oxygen (DO), pH, and oxidation-reduction potential (ORP) were measured during purging using a YSI Pro Plus water quality meter prior to sampling. Water samples were collected following achievement of stabilization of the water quality parameters. The groundwater sampling sheets display the measurements obtained and achievement of stabilization prior to sample collection (Attachment A).

The samples were placed in an iced cooler and kept at temperatures below 4 degrees Celsius until delivery to Friedman & Bruya, Inc. (FBI) analytical laboratory.

Analysis

Groundwater samples were tested for the following chemicals:

- Gasoline-range petroleum hydrocarbons by Washington State Department of Ecology (Ecology) Method NWTPH-Gx
- Diesel-range petroleum hydrocarbons and oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by US Environmental Protection Agency (EPA) Method 8021B
- Metals by EPA Method 6020B
- cPAHs by EPA Method 8270E SIM

Groundwater Sampling Results

The groundwater sampling results reported by FBI were compared to the applicable site-specific cleanup levels for groundwater. Copies of the laboratory analytical reports are included in Attachment B. Analytical results for the primary contaminants of concern for the site are summarized in the attached Table 1. Analytical results are as follows:

- Gasoline-range petroleum hydrocarbons and BTEX were not detected above the laboratory practical quantitation limit (PQL) in groundwater samples collected from the wells.
- Diesel- and oil-range petroleum hydrocarbons were not detected above the site-specific cleanup levels.
- Cadmium, chromium, copper, lead, mercury, or zinc were not detected above the laboratory PQLs in groundwater samples.
- Arsenic was detected at concentrations ranging from non-detect to 2.05 micrograms per liter (µg/L). The reported concentrations of arsenic were below the site-specific cleanup action level.
- Analysis for cPAH compounds did not disclose results above the laboratory PQLs or the site-specific cleanup levels.

These results are consistent with previous groundwater monitoring events.

INDOOR AIR SAMPLING

During the most recent round of indoor air sampling on conducted on January 21, 2020, three samples of indoor and ambient air were collected for analysis from the subgrade parking garage area, the basement hotel office, and the roof of the north hotel tower.

The samples were analyzed for the presence of benzene by EPA Method TO-15. Results from the samples were compared to applicable Washington State Model Toxics Control Act (MTCA) Method B Indoor Air cleanup level for residential exposure.

The January 21, 2020, sampling locations are provided in Figure 3. The field sampling data sheets are included in Attachment A. Indoor air sampling locations were as follow:

- Sample 11354-03RT was collected from the rooftop of the north hotel tower and beneath an air intake for the HVAC system. This sample location was chosen to sample background ambient outdoor air entering the building.
- Sample 11354-03BP was collected at parking space 58 in the building basement parking garage. This sample location was selected to assess indoor air quality within the underground parking garage.
- Sample 11354-03HO was collected inside the basement hotel office and elevated approximately 4 feet off the floor. This sample location was chosen to assess indoor air quality in the hotel office and potentially exposed personnel there.

Indoor and ambient air sampling was conducted in accordance with the Washington State Department of Ecology (Ecology) document entitled *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (2018), especially Chapter 3, "VI Assessment during the Remedial Investigation (Tiers I and II)."

Air samples were collected in three certified, evacuated, 6-liter SUMMA canisters supplied by the laboratory. Sampling of indoor air began at 10:00 PM and continued for approximately 8 hours at a flow rate of approximately 125 milliliters per minute. The initial canister pressure for sample 11354-03RT was –30 inches of mercury (" Hg) and the final pressure was –20" Hg. The initial canister pressure for sample 11354-03BP was –29" Hg and the final pressure was –22" Hg. The initial canister pressure for sample 11354-03HO was –30" Hg and the final pressure was –21.5" Hg. The collected samples were transferred to FBI under chain-of-custody control.

Indoor and Ambient Air Sampling Analytical Results and Discussion

Table B, below, provides the analytical results from indoor and ambient sampling at the site on January 21, 2020. Benzene was detected in indoor air samples at the site and in the outdoor ambient air sample collected on the rooftop. Results from the indoor and outdoor ambient air samples show that concentrations of benzene in the indoor air samples exceed the MTCA Method B indoor air cleanup level for the protection of human health via the indoor exposure pathway (Table B). However, a concentration of 0.38 µg/m^3 benzene was detected in the outdoor ambient air sample collected from the rooftop. The presence of benzene in the outdoor ambient air suggests off-site sources of benzene may impact indoor air concentrations. Following Ecology's 2018 guidance document, the vapor intrusion contribution for indoor air is the difference between the indoor measurement and the ambient measurement. The adjusted indoor air concentration for benzene in sample 11354-03BP collected in the underground parking garage exceeds the MTCA Method B indoor air cleanup level, and the adjusted concentration of benzene in the hotel office did not exceed the MTCA Method B cleanup level.

TABLE B: AIR SAMPLING RESULTS—BENZENE
Results Reported as µg/m^3

Sample ID	Location	Benzene	Adjusted Benzene
11354-03RT	**Rooftop**	0.38[fb]	--
11354-03BP	**Basement Parking**	1.1[fb]	0.72
11354-03HO	**Hotel Office**	0.48[fb]	0.1
CLARC Air, Method B, Carcinogen		**0.32**	

NOTES:
µg/m^3 = micrograms per cubic meter
CLARC = Cleanup Levels and Risk Calculation
Laboratory Note:
[fb]Analyte detected in the method blank

Benzene was detected in the method blank as a laboratory contaminant at a concentration of 0.04 µg/m^3. Following EPA guidance document *Laboratory Data Validation Function Guidelines for Evaluating Organic*

Analysis, because benzene is present in the laboratory blank, benzene indoor air results are considered estimates (EPA 1994).

The laboratory analytical report is included in Attachment B.

CONCLUSION

This report documents the 2020 groundwater and air monitoring at the site pursuant to the consent decree. The groundwater samples did not contain concentrations of contaminants of concern above site-specific groundwater cleanup levels.

The results from recent testing of indoor air indicate that benzene is only present in the indoor air sample collected from the underground parking garage at a concentration above the MTCA Method B indoor air cleanup level. The presence of the elevated concentrations of benzene in the underground parking garage can likely be attributed to the presence of cars during the sampling. The presence of the vapor barrier installed beneath the underground parking garage sub-slab likely inhibits benzene vapors from impacting indoor air quality, as results from any residual contamination that may be beneath the development. Furthermore, any potential exposure to benzene vapor in the parking garage would be acute given that tenants do not linger in the garage, the office in the underground parking garage is not continuously occupied, and an air exchange system is operated in the underground parking garage.

CLOSING

Thank you for the opportunity to assist you in this matter. If you have any questions regarding the project, please do not hesitate to contact us.

Respectfully submitted,

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Principal Geochemist
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Attachments: Figure 1, Site Location Map
Figure 2, Sample Location Map—Groundwater
Figure 3, Sample Location Map—Indoor Air for Parcel B
Table 1, Groundwater Data
A, Groundwater and Air Sampling Sheets
B, Laboratory Analytical Reports and Chain of Custody

JSC/TJC:dnm

REFERENCES

Landau Associates. 2011a. *Remedial Investigation, North Lot Development, Seattle, Washington*. May 23.

_____. 2011b. *Feasibility Study, North Lot Development, Seattle, Washington*. May 23.

_____. 2013. *Cleanup Action Plan Addendum, North Lot Development, Seattle, Washington*. September 18.

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Washington State Department of Ecology (Ecology). 2011. Cleanup Action Plan North Lot Redevelopment Property, Seattle, Washington.

_____. 2018. *Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*. Publication No. 09-09-047. April.

US Environmental Protection Agency (EPA). 1994. *Laboratory Data Validation Function Guidelines for Evaluating Organic Analysis*. Publication 9240.1-27. EPA/540/R/94/082. December.

SHEET/FIGURE		GROUNDWATER AND INDOOR AIR QUALITY EVENT 201 AND 255 SOUTH KING STREET SEATTLE, WASHINGTON
1	PROJECT MANAGER: J CASS	
	EHSI PROJECT #: 11354-01	
	PREPARED BY: F DIMALANTA	
	ISSUE DATE: 03/06/20	
	SCALE: SHOWN	SITE LOCATION MAP

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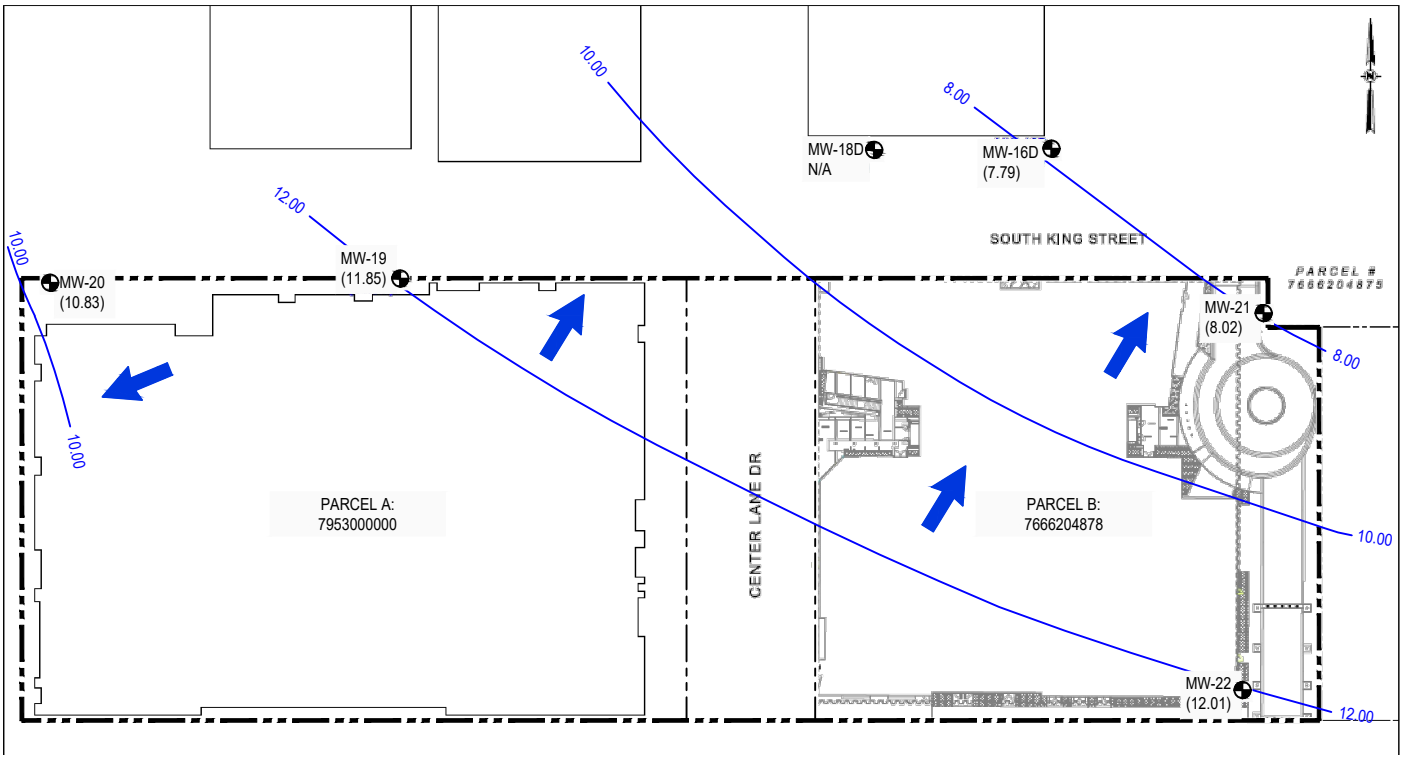
IMAGE REF: ROTHMAN & ASSOCIATES, 2018



LEGEND:

MW-X (X.XX)	MONITORING WELL w/ GROUNDWATER ELEV. TAKEN 01/21/2020
N/A	NOT ACCESSIBLE
	2-FOOT INTERVAL GROUNDWATER CONTOUR
	SITE BOUNDARY
	PARCEL BOUNDARY
	GROUNDWATER FLOW DIRECTION ARROW

ALL LOCATIONS ARE APPROXIMATE. FOR ILLUSTRATIVE PURPOSES ONLY.

0 40 80
SCALE in FEET

NORTH

SHEET/FIGURE		GROUNDWATER AND INDOOR AIR QUALITY EVENT 201 AND 255 SOUTH KING STREET SEATTLE, WASHINGTON
2	PROJECT MANAGER: J CASS EHSI PROJECT #: 11354-01 PREPARED BY: F DIMALANTA ISSUE DATE: 03/06/20 SCALE: SHOWN	SAMPLE LOCATION MAP - GROUNDWATER

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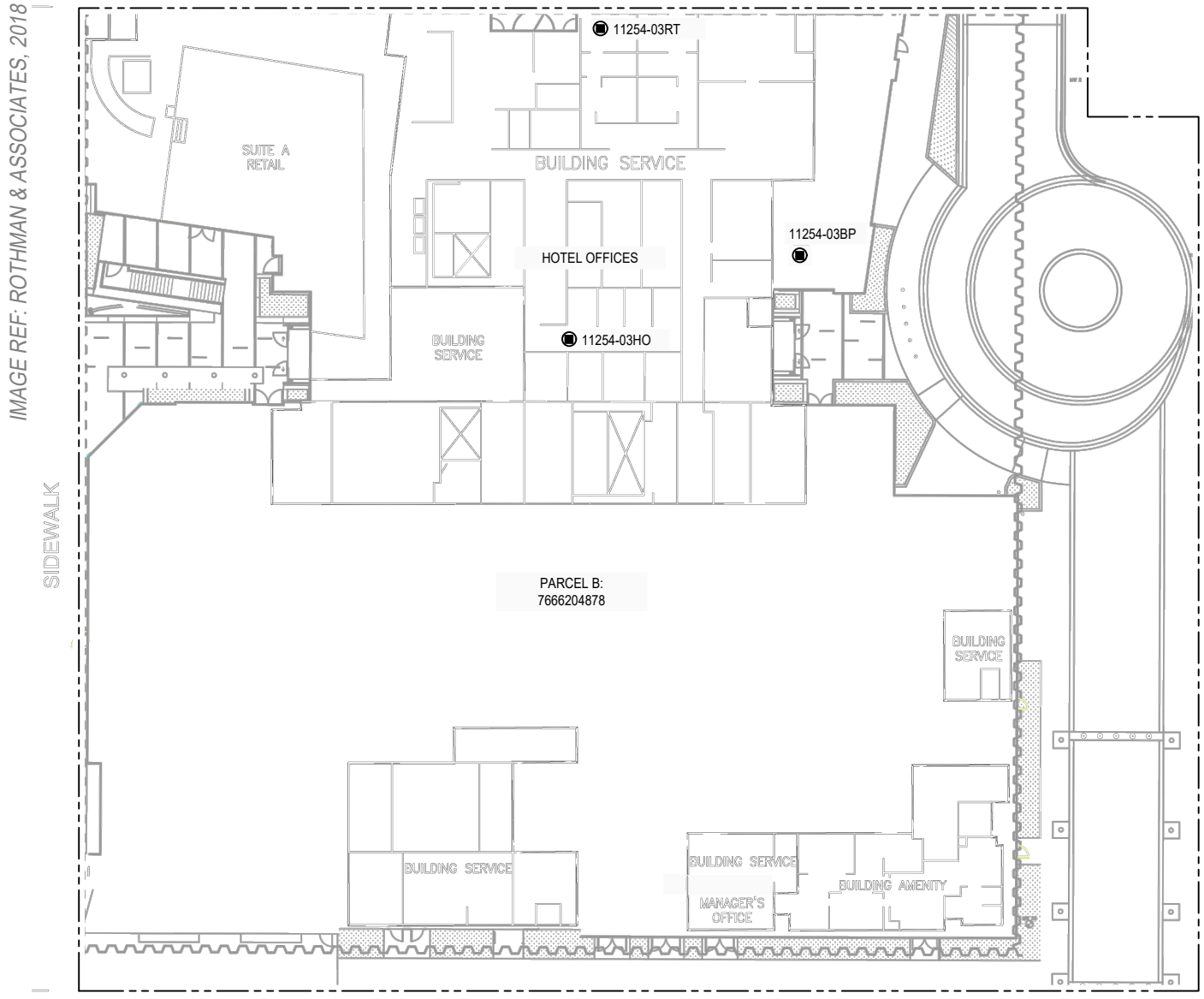

ALL LOCATIONS ARE APPROXIMATE. FOR ILLUSTRATIVE PURPOSES ONLY.

0 20 40
SCALE in FEET

LEGEND:

XXXX INDOOR AIR SAMPLE

PARCEL BOUNDARY

NORTH

SHEET/FIGURE		
3	PROJECT MANAGER:	J CASS
	EHSI PROJECT #:	11354-01
	PREPARED BY:	F DIMALANTA
	ISSUE DATE:	03/06/20
	SCALE:	SHOWN

GROUNDWATER AND INDOOR AIR QUALITY EVENT
201 AND 255 SOUTH KING STREET
SEATTLE, WASHINGTON

SAMPLE LOCATION MAP - INDOOR AIR FOR PARCEL B

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

Revised 3/27/2020

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	08/04/17	10.39	7.21	<50	<250	<100	<0.8	<1	<1	<3	0.0693	<1
TOC: 17.60'	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	1.0	<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	--	--	--	--	--	--	--	--	--
	01/21/20	9.81	7.79	<50	<250	<100	<0.8	<1	<1	<3	0.00655	1.06
MW-18D	08/02/17	11.09	6.08	<50	<250	<100	<0.8	<1	<1	<3	0.0693	7.01
TOC: 17.17'	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	--	--	--	--	--	--	--	--	--	--
	01/21/20	No Access	--	--	--	--	--	--	--	--	--	--
MW-19	08/02/17	6.32	11.17	<50	<250	<100	<0.8	<1	<1	<3	0.0693	2.61
TOC: 17.49'	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	36[x]	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	11.65	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.01
	01/21/20	5.64	11.85	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.05
Site-Specific Cleanup Levels for Groundwater[6]				**500**	**500**	**800**	**0.8**	**80**	**275**	**1,600**	**0.012[7]**	**5/21.3[8]**

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

Revised 3/27/2020

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-20	08/02/17	7.58	9.93	62[x]	<250	<100	<0.8	<1	<1	<3	0.0693	<1
TOC: 17.51'	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	42[x]	<150	<100	<0.8	<1	<1	<3	0.00655	<1
	05/10/18	7.33	10.18	92[x]	<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	53[x]	<250	<100	<0.8	<1	<1	<3	0.00655	<1
	03/20/19	3.72	13.79	--	--	--	--	--	--	--	--	--
	06/20/19	6.90	10.61	--	--	--	--	--	--	--	--	--
	01/21/20	6.68	10.83	<50	<250	<100	<0.8	<1	<1	<3	0.00655	<1
MW-21	08/02/17	9.73	7.44	<50	<250	<100	<0.8	<1	<1	<3	0.0693	6.23
TOC: 17.17'	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	7.68	<50	<250	<100	<0.8	<1	<1	<3	0.00655	2.96
	01/21/20	9.15	8.02	<50	<250	<100	<0.8	<1	<1	<3	0.00655	1.47

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Table 1
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North Lot
201 and 255 South King Street
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Revised 3/27/2020

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	08/02/17	6.51	10.63	180[x]	<250	<100	<0.8	<1	<1	<3	0.0693	7.21
TOC: 17.14'	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***	310[x]	<100	<0.8	<1	<1	<3	0.00655	1.72
	05/10/18	5.97	11.17	***520*** [x]	480[x]	<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	180[x]	<250	<100	<0.8	<1	<1	<3	0.00655	1.53
	03/20/19	5.65	11.49	--	--	--	--	--	--	--	--	--
	07/14/19	6.18	10.96	170[x]	<250	<100	<0.8	<1	<1	<3	0.00655	2.07
	01/21/20	5.13	12.01	100 [x]	<250	<100	<0.8	<1	<1	<3	0.00655	1.27
Site-Specific Cleanup Levels for Groundwater[6]				**500**	**500**	**800**	**0.8**	**80**	**275**	**1,600**	**0.012**[7]	**5/21.3**[8]

NOTES:

Laboratory analyses performed by Friedman & Bruya, Inc. of Seattle, Washington.

Analytical data presented in micrograms per liter.

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

Bold italics indicates the concentration exceeds the cleanup level.

[1]Analyzed by Ecology Method NWTPH-Dx.

[2]Analyzed by Ecology Method NWTPH-Gx.

[3]Analyzed by EPA Method 8021B.

[4]Analyzed by EPA Method 8071D SIM or 8270E SIM.

[5]Analyzed by EPA Method 200.8 or 6020B.

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

[7]The 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 (Ecology guidance document: *Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs) . Implementation Memorandum #10,* April 20, 2015.). Data were corrected relative to the recommendations provided in the memorandum, 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.

[8]A 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).

Laboratory Note:

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

< = less than

-- = not analyzed, not sampled

µg/L = micrograms per liter

cPAH = carinogenic polycyclic aromatic hydrocarbon

DRPH = diesel-range petroleum hydrocarbons

Ecology = Washington State Department of Ecology

EPA = US Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

MSL = mean sea level

ORPH = oil-range petroleum hydrocarbons

PAH = polycyclic aromatic hydrocarbon

TEF = toxicity equivalency factor

TOC = top of casing

WAC = Washington Administrative Code

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Groundwater Sampling Field Data Sheet

Project Number:	11354.02	Well Identification:	MW-22
Project Name:	North Lot	Ecology Tag ID :	
Project Address:		EHSI Personnel:	JZ
Client Name:	Amer. Life	Date sampled:	1/21/20

Depth to Water (feet):	5.13' btoc	Date Measured:	1/21/20
Total Well Depth (feet):	btoc	Time Measured.:	
Reference Point (Surveyors notch, etc.):	North	Notes:	
Sampling Method / Pump Type:	Stabilization Parameters or 3 well vol. / peristaltic	Water Quality Meter:	
Volume of Water in Well:		3 well Volumes:	

Purging Data:

Time	t	gallons	Temp.	DO	Sp. Cond.	pH	ORP	Notes
11:25		0.1	13.5	3.98	1500	5.99	231.0	
11:32		0.5	13.7	0.28	1435	6.36	215.5	
11:40		1.0	13.9	0.24	1411	6.45	206.7	
11:45		1.5	14.0	0.20	1405	6.47	201.1	
11:50		2.0	14.1	0.17	1391	6.53	193.2	
11:55		2.25	14.0	0.19	1391	6.54	189.3	
12:00			13.9	0.26	1390	6.55	186.5	
12:06								Sample

Laboratory: Friedman and Bruya, Inc.	Date delivered to lab
Well integrity comments:	
Signature:	

ehsi
EHS–International, Inc.

Groundwater Sampling Field Data Sheet

Project Number:	11354-02	Well Identification:	MW-21
Project Name:		Ecology Tag ID :	
Project Address:		EHSI Personnel:	JZ
Client Name:		Date sampled:	1/21/20

Depth to Water (feet):	btoc	Date Measured:	
Total Well Depth (feet):	btoc	Time Measured.:	
Reference Point (Surveyors notch, etc.):	North	Notes:	
Sampling Method / Pump Type:	Stabilization Parameters or 3 well vol. / peristaltic	Water Quality Meter:	
Volume of Water in Well:		3 well Volumes:	

Purging Data:

Time	t	gallons	Temp.	DO	Sp. Cond.	pH	ORP	Notes
12:45		0.1	14.3	7.39	471.4	6.47	169.2	
12:50		0.25	14.1	0.32	430.2	6.14	169.5	
12:55		0.5	14.1	0.25	419.7	6.14	170.7	
13:00		1.0	14.2	0.25	415.0	6.11	172.6	
13:05		1.25	14.1	0.24	417.6	6.12	170.5	
13:09								Sample

Laboratory: Friedman and Bruya, Inc.	Date delivered to lab
Well integrity comments:	
Signature:	

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EHS-International, Inc.

Groundwater Sampling Field Data Sheet

Project Number:	11354.02	Well Identification:	MW-20
Project Name:		Ecology Tag ID :	
Project Address:		EHSI Personnel:	
Client Name:		Date sampled:	6/21/20

Depth to Water (feet):	btoc	Date Measured:	
Total Well Depth (feet):	btoc	Time Measured.:	
Reference Point (Surveyors notch, etc.):	North	Notes:	
Sampling Method / Pump Type:	Stabilization Parameters or 3 well vol. / peristaltic	Water Quality Meter:	
Volume of Water in Well:		3 well Volumes:	

Purging Data:

Time	t	gallons	Temp.	DO	Sp. Cond.	pH	ORP	Notes
14:50		0.1	13.0	1.26	902	6.57	-49.2	
14:55		0.5	13.2	0.23	913	6.64	-70.7	
15:00		1.0	13.2	0.17	805	6.65	-81.7	
15:05		1.25	13.3	0.15	876	6.65	-88.6	
15:10		1.75	13.3	0.14	855	6.64	-95.1	
15:15								Sample ID 8 VOAs 1 500 1 1L 1 250

Laboratory: Friedman and Bruya, Inc.	Date delivered to lab
Well integrity comments:	
Signature:	

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Groundwater Sampling Field Data Sheet

Project Number:	11354-02	Well Identification:	MW16D
Project Name:	North Lot	Ecology Tag ID :	
Project Address:		EHSI Personnel:	
Client Name:		Date sampled:	1/21/20

Depth to Water (feet):	btoc	Date Measured:	
Total Well Depth (feet):	btoc	Time Measured.:	
Reference Point (Surveyors notch, etc.):	North	Notes:	
Sampling Method / Pump Type:	Stabilization Parameters or 3 well vol. / peristaltic	Water Quality Meter:	
Volume of Water in Well:		3 well Volumes:	

Purging Data:

Time	t	gallons	Temp.	DO	Sp. Cond.	pH	ORP	Notes
13:50		0.1	15.9	5.63	1102	6.51	5.4	
14:00		0.5	15.7	0.37	1047	6.70	-36.3	
14:05		1.0	15.8	0.32	1045	6.71	-49.1	
14:10		1.25	15.7	0.31	1048	6.71	-55.6	
14:15		1.50	15.8	0.27	1054	6.70	-61.6	
14:20								Sample

Laboratory: Friedman and Bruya, Inc.	Date delivered to lab
Well integrity comments:	
Signature:	

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EHS–International, Inc.

Groundwater Sampling Field Data Sheet

Project Number:	1354-02	Well Identification:	MW-9
Project Name:	North Lot	Ecology Tag ID :	
Project Address:		EHSI Personnel:	JK
Client Name:	Amer. Life	Date sampled:	1/21/20

Depth to Water (feet):	5.64 btoc	Date Measured:	1/21/20
Total Well Depth (feet):	btoc	Time Measured.:	
Reference Point (Surveyors notch, etc.):	North	Notes:	
Sampling Method / Pump Type:	Stabilization Parameters or 3 well vol. / peristaltic	Water Quality Meter:	
Volume of Water in Well:		3 well Volumes:	

Purging Data:

Time	t	gallons	Temp.	DO	Sp. Cond.	pH	ORP	Notes
15:55		0.1	13.4	1.33	179.3	6.86	-95.9	
16:00		0.25	13.4	0.35	175.8	6.86	-102.6	
16:05		0.50	13.4	0.20	171.4	6.89	-103.2	
16:10		0.75	13.4	0.15	172.8	6.89	-103.0	
16:15		1.1	13.5	0.14	170.3	6.89	-102.2	
16.20								Sample

Laboratory: Friedman and Bruya, Inc.	Date delivered to lab
Well integrity comments:	
Signature:	

EHS-International, Inc.
1011 SW Klickitat Way, Ste. 104
Seattle, WA 98134
Tel: 206-381-1128
Fax: 206-254-4279

Date 1/21/20
EHSI Project No. 11354-003
Project Name North Lot
Technician JC
Analyte

SUMMA CANISTER AIR MONITORING SAMPLING SHEET

Sample #	Location	Summa ID#	Regulator ID #	Pressures "Hg Initial	Pressures "Hg Final	On / Off	Elapsed Time (min.)	Activities/Comments
11354-03RT	Rooftop	23231		-30	-20	9:50 / 7:32		Rain & wind 23231 wind no rain
11354-03BP	Basement Park	18574		-29	-22	9:55 / 7:26		18574
11354-03HO	Hotel office	21437		-30	-21.5	10:13 / 7:23		21437

Technician Certification:

I certify that the above samples were taken in compliance with applicable standards, regulations and project specifications.

Technician Signature Jason Cass Date: 1/21/20

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.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 29, 2020

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on January 22, 2020 from the North Lot 11354-02, F&BI 001292 project. There are 23 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: EHSI A/P
EHS0129R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 22, 2020 by Friedman & Bruya, Inc. from the EHSI North Lot 11354-02, F&BI 001292 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
001292 -01	MW22012120
001292 -02	MW22012120 Dup.
001292 -03	MW21012120
001292 -04	MW16D012120
001292 -05	MW20012120
001292 -06	MW19012120

The 8270E laboratory control sample and laboratory control sample duplicate failed the relative percent difference for dibenz(a,h)anthracene. The analyte was not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292
Date Extracted: 01/23/20
Date Analyzed: 01/24/20

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)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW22012120 001292-01	<0.8	<1	<1	<3	<100	90
MW21012120 001292-03	<0.8	<1	<1	<3	<100	94
MW16D012120 001292-04	<0.8	<1	<1	<3	<100	94
MW20012120 001292-05	<0.8	<1	<1	<3	<100	92
MW19012120 001292-06	<0.8	<1	<1	<3	<100	94
Method Blank 00-044 MB	<0.8	<1	<1	<3	<100	94

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292
Date Extracted: 01/23/20
Date Analyzed: 01/24/20

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Surrogate (% Recovery) Limit (52-124)
MW22012120 Dup. 001292-02	<0.8	<1	<1	<3	95
Method Blank 00-044 MB	<0.8	<1	<1	<3	94

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292
Date Extracted: 01/22/20
Date Analyzed: 01/23/20

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)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW22012120 001292-01	<50	<250	108
MW21012120 001292-03	<50	<250	115
MW16D012120 001292-04	<50	<250	125
MW20012120 001292-05	<50	<250	119
MW19012120 001292-06	<50	<250	114
Method Blank 00-196 MB	<50	<250	128

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292
Date Extracted: 01/22/20
Date Analyzed: 01/22/20

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW22012120 001292-01	100 x	<250	106
MW21012120 001292-03	<50	<250	105
MW16D012120 001292-04	<50	<250	127
MW20012120 001292-05	<50	<250	110
MW19012120 001292-06	<50	<250	114
Method Blank 00-196 MB	<50	<250	114

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW22012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	001292-01
Date Analyzed:	01/22/20	Data File:	001292-01.091
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.27
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW21012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	001292-03
Date Analyzed:	01/22/20	Data File:	001292-03.092
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.47
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW16D012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	001292-04
Date Analyzed:	01/22/20	Data File:	001292-04.093
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.06
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW20012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	001292-05
Date Analyzed:	01/22/20	Data File:	001292-05.094
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

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW19012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	001292-06
Date Analyzed:	01/22/20	Data File:	001292-06.095
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.05
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/22/20	Lab ID:	I0-048 mb
Date Analyzed:	01/22/20	Data File:	I0-048 mb.067
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

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	MW22012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	001292-01 1/0.5
Date Analyzed:	01/24/20	Data File:	012413.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	31	160
Benzo(a)anthracene-d12	106	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	0.012
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	MW21012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	001292-03 1/0.5
Date Analyzed:	01/24/20	Data File:	012414.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	101	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	MW16D012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	001292-04 1/0.5
Date Analyzed:	01/24/20	Data File:	012415.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	0.10
Fluorene	<0.01
Phenanthrene	0.014
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	MW20012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	001292-05 1/0.5
Date Analyzed:	01/24/20	Data File:	012416.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	106	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	MW19012120	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	001292-06 1/0.5
Date Analyzed:	01/24/20	Data File:	012417.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	31	160
Benzo(a)anthracene-d12	113	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	North Lot 11354-02, F&BI 001292
Date Extracted:	01/23/20	Lab ID:	00-201 mb 1/0.5
Date Analyzed:	01/24/20	Data File:	012412.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	31	160
Benzo(a)anthracene-d12	111	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292

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: 001297-01 (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	86	65-118
Toluene	ug/L (ppb)	50	89	72-122
Ethylbenzene	ug/L (ppb)	50	91	73-126
Xylenes	ug/L (ppb)	150	85	74-118
Gasoline	ug/L (ppb)	1,000	90	69-134

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292

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

Laboratory Code: Laboratory Control Silica Gel Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	96	63-142	8

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292

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

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	104	96	63-142	8

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 001295-01 (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	4.49	97	98	75-125	1
Cadmium	ug/L (ppb)	5	<1	92	92	75-125	0
Chromium	ug/L (ppb)	20	<1	95	94	75-125	1
Copper	ug/L (ppb)	20	<5	89	88	75-125	1
Lead	ug/L (ppb)	10	<1	87	86	75-125	1
Mercury	ug/L (ppb)	5	<1	88	90	75-125	2
Zinc	ug/L (ppb)	50	<5	89	89	75-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	101	80-120
Cadmium	ug/L (ppb)	5	96	80-120
Chromium	ug/L (ppb)	20	93	80-120
Copper	ug/L (ppb)	20	94	80-120
Lead	ug/L (ppb)	10	89	80-120
Mercury	ug/L (ppb)	5	90	80-120
Zinc	ug/L (ppb)	50	89	80-120

Date of Report: 01/29/20
Date Received: 01/22/20
Project: North Lot 11354-02, F&BI 001292

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270E 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	81	80	57-114	1
Acenaphthylene	ug/L (ppb)	1	95	89	65-119	7
Acenaphthene	ug/L (ppb)	1	87	85	66-118	2
Fluorene	ug/L (ppb)	1	108	100	64-125	8
Phenanthrene	ug/L (ppb)	1	91	88	67-120	3
Anthracene	ug/L (ppb)	1	95	95	65-122	0
Fluoranthene	ug/L (ppb)	1	94	91	65-127	3
Pyrene	ug/L (ppb)	1	92	94	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	98	101	60-118	3
Chrysene	ug/L (ppb)	1	94	95	66-125	1
Benzo(b)fluoranthene	ug/L (ppb)	1	86	81	55-135	6
Benzo(k)fluoranthene	ug/L (ppb)	1	84	85	62-125	1
Benzo(a)pyrene	ug/L (ppb)	1	86	86	58-127	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	79	82	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	65	80	37-133	21 vo
Benzo(g,h,i)perylene	ug/L (ppb)	1	68	77	34-135	12

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.

001292

SAMPLE CHAIN OF CUSTODY

ME 01/22/20 VW4/AIS/B04

Page # 1 of 1

Report To Jason Cass

Company EHSI

Address 1011 SW Klickitat Way, #104

City, State, ZIP Seattle, WA 98134

Phone 206-381-1128 Email

SAMPLERS (*signature*) Jason Cass

PROJECT NAME: North Lot

PO #: 11354-02

REMARKS: Benzene to 0.8 µg/L

Project specific RLs? - (Yes) / No

INVOICE TO

TURNAROUND TIME
- (✓) Standard turnaround
- ( ) RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ( ) Archive samples
- ( ) Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	Low-level PAHs EPA 8270	PCBs EPA 8082	Dissolved As, Cd, Cr, Pb, Hg, Cu, Zn				Notes
MW22012120	01A-F	1/21/20	12:00	1/20	6	X	X	X			X		X				Dx & Silica gel with & without
MW22012120 Dup.	02A-C		12:06		3			X									
MW21012120	03A-I		13:10		9	X	X	X			X		X				
MW16D012120	04A-F		14:20		6	X	X	X			X		X				
MW20012120	05A-I		15:15		(NP) 6 9	X	X	X			X		X				
MW19012120	06A-F		16:20		6	X	X	X			X		X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Jason Cass	Jason Cass	EHSI	1/22/20	12:00
Received by:	Eric Young	FEB	1/22/20	12:00
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

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.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 28, 2020

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on January 22, 2020 from the North Lot 11354-03, F&BI 001293 project. There are 7 pages included in this report.

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: EHSI A/P
EHS0128R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 22, 2020 by Friedman & Bruya, Inc. from the EHSI North Lot 11354-03, F&BI 001293 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
001293 -01	11354-03RT
001293 -02	11354-03BP
001293 -03	11354-03HO

Benzene was detected in the TO-15 method blank at a level greater than 1/10 the concentration present in the samples. The data were qualified accordingly.

All quality control requirements were acceptable.

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	11354-03RT	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-03, F&BI 001293
Date Collected:	01/22/20	Lab ID:	001293-01 1/4.4
Date Analyzed:	01/22/20	Data File:	012122.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration ug/m3	ppbv
Benzene	0.38 fb	0.12 fb

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	11354-03BP	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-03, F&BI 001293
Date Collected:	01/22/20	Lab ID:	001293-02 1/4.5
Date Analyzed:	01/22/20	Data File:	012123.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	107	70	130

Compounds:	Concentration ug/m3	ppbv
Benzene	1.1 fb	0.36 fb

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	11354-03HO	Client:	EHSI
Date Received:	01/22/20	Project:	North Lot 11354-03, F&BI 001293
Date Collected:	01/22/20	Lab ID:	001293-03 1/5
Date Analyzed:	01/22/20	Data File:	012124.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration ug/m3	ppbv
Benzene	0.48 fb	0.15 fb

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	North Lot 11354-03, F&BI 001293
Date Collected:	Not Applicable	Lab ID:	00-0181 mb
Date Analyzed:	01/22/20	Data File:	012120.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	102	70	130

	Concentration	
Compounds:	ug/m3	ppbv
Benzene	0.04 lc	0.013 lc

Date of Report: 01/28/20
Date Received: 01/22/20
Project: North Lot 11354-03, F&BI 001293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 001293-03 1/5 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ppbv	<0.5	<0.5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ppbv	5	102	70-130

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.

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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.

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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.

001293

SAMPLE CHAIN OF CUSTODY ME 01-22-20

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone 206-381-1128 Email

SAMPLERS (*signature*) Jason Cass
PROJECT NAME & ADDRESS: North Lot
PO #: 11354-03
NOTES:
INVOICE TO

Page # 1 of 1

TURNAROUND TIME
☒ Standard
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive Samples
☐ Other

SAMPLE INFORMATION / ANALYSIS REQUESTED

Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. ("Hg)	Field Final Time	TO15 Full Scan	TO15 ~~BTEXN~~	TO15 cVOCs	APH	Helium		Notes
11354-03RT	01	23231		(IA) / SG	1/21/20-1/22/20	-30	~~8:57~~ 21:50	-20	7:32		X					Benzene only per TC 1/22/20 ME
11354-03BP	02	18574		(IA) / SG	↓	-29	21:55	-22	7:26		✓					
11354-03HO	03	21437		(IA) / SG	↓	-30	22:13	-21.5	7:23		✓					
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												

Samples received at 18 °C

Friedman & Bruya, Inc.
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FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Jason Cass	Jason Cass	EHSI	1/22/20	12:00
Received by:	Eric Crecelius	FoB	1/22/20	1200
Relinquished by:				
Received by:				