

SR 520 Bridge Replacement and HOV Program



MEMORANDUM

То:	Ron Paananen, HDR	Contract & Task Order:	DA Deliverable 4.1.17
From:	Joseph Sawdey, LG, LHG Meg Strong, LG, LHG Shannon & Wilson	File Code:	
Date:	March 30, 2023		
Copies To:	Robyn Boyd Dave Becher Margaret Kucharski		

Subject: Groundwater Monitoring Memorandum – Quarter No. 4, Voluntary Cleanup Program NW3242, Montlake Gas Station, Seattle, Washington

Background

In 2019, the Washington State Department of Transportation (WSDOT) entered the Former Montlake Gas Station property located in Seattle, Washington (site), into the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP).

As part of the VCP application, Shannon & Wilson submitted a Remedial Investigation (RI) work plan and a subsequent RI report to Ecology, on behalf of WSDOT. The RI report included investigation data that was used to characterize the nature and extent of petroleum hydrocarbon contamination in soil and groundwater associated with historic fueling operations at the site (Shannon & Wilson, 2020).

In 2021, PBS Engineering and Environmental prepared and submitted to Ecology a Remedial Action Plan detailing the proposed remediation excavation activities (PBS, 2021a). In August and September 2021, PBS oversaw the closure and removal of the site's underground storage tanks and piping, as well as the excavation of the associated petroleum contaminated soil source zone (source zone), as documented in the Remedial Action Completion Report (PBS, 2021b). Soil compliance has been achieved at the site, as documented by confirmation sampling performed by PBS during the remedial excavation.

Groundwater compliance is currently being evaluated. On April 19 and 20, 2022, Shannon & Wilson installed additional compliance groundwater monitoring (CGM) wells at the site following Ecology recommendations (Shannon & Wilson, 2022a). The CGM well network

DocuSign Tower 999 Third Ave., Suite 2200 Seattle, WA 98104 Phone: 206-770-3500 Fax: 206-770-3569 for the site consists of six monitoring wells: MW-2-19, MW-3-19, MW-6-22, MW-7-22, MW-8-22, and MW-9-22. The monitoring wells have been surveyed and locations are depicted in Exhibit 1. This memorandum presents the results of Quarter No. 4 CGM and documents the continued effect(s) of the source zone removal on site groundwater quality. Results of the Quarter Nos. 1, 2, and 3 CGM have been presented previously under a separate cover (Shannon & Wilson, 2022b, 2022c, and 2023).

Quarter No. 4 Groundwater Monitoring Activities

Well Gauging

On February 14, 2023, Shannon & Wilson gauged each of the CGM wells to monitor for the presence of free product and to measure groundwater elevations. Measurable free product was not encountered within any of the six CGM wells during Quarter No. 4; however, a petroleum odor and sheen were observed at MW-3-19.

Groundwater Sampling

On February 14, 2023, Shannon & Wilson purged each of the CGM wells using a peristaltic pump with a flow-through cell and a water quality meter to measure the following field parameters: temperature, oxidation-reduction potential, pH, conductivity, dissolved oxygen, turbidity, salinity, and total dissolved solids. Field parameters collected during purging of the CGM wells can be found in Attachment 1 – Groundwater Sampling Field Forms.

Upon stabilization of the field parameters during well purging (indicating steady groundwater flow to the well), groundwater samples were collected from each of the six CGM wells by discharging groundwater from the end of the peristaltic tubing into clean, laboratory-supplied containers. Collected groundwater samples were immediately put on ice and stored within an insulated cooler. Groundwater samples from each of the CGM wells were delivered to OnSite Environmental Inc., of Redmond, Washington, under standard chain-of-custody procedures and analyzed for:

- Gasoline-range petroleum hydrocarbons using Ecology's Northwest Total Petroleum Hydrocarbon (NWTPH)-Gasoline Extended Method;
- Benzene, toluene, ethylbenzene, and xylene (BTEX) by U.S. Environmental Protection Agency (EPA) 8260 Method;
- Diesel- and oil-range petroleum hydrocarbons using Ecology's NWTPH-Diesel Extended Method; and
- Total and dissolved arsenic by EPA Method 200.8.

For complete details on the groundwater sampling methodology, refer to the Sample Collection and Chemical Testing sections of the Work Plan (Shannon & Wilson, 2019).

Quarter No. 4 Results and Interpretation

Groundwater Elevation and Flow Directions

Measured groundwater elevations for Quarter No. 4 are reported in Exhibit 2 and displayed in Exhibit 1. Groundwater elevations in North American Vertical Datum (of 1988) during February 2023 ranged from as low as 41.6 feet (MW-3-19) to as high as 49.8 feet above mean sea level (MW-2-19). Using the measured groundwater elevations, a groundwater potentiometric surface was interpolated with associated groundwater flow directions inferred to occur perpendicular to the equipotentials comprising the potentiometric surface (see Exhibit 1). The groundwater elevation measured at MW-3-19 was again significantly lower with less seasonal fluctuation compared to the other CGM wells (see Exhibit 2). The much lower and static nature of the groundwater elevations monitored at MW-3-19 is suggestive of hydraulic isolation from the more uniform groundwater flow regime encountered across the site.

The groundwater setting at the site observed during Quarter No. 4 is consistent with that observed during the RI and previous quarterly CGM events (Shannon & Wilson, 2020, 2022b, 2022c, and 2023). In general, groundwater elevations measured in Quarter No. 4 were higher by approximately 1 to 2 feet, compared to groundwater elevations measured during Quarter 3. The higher groundwater elevations observed likely reflect shallow groundwater recharge via infiltration during the local wet season.

The groundwater elevation observed at MW-3-19 only increased 0.1 feet between Quarter No. 3 and 4 of the groundwater monitoring (November 2022 to February 2023). This relatively low fluctuation in groundwater elevation, as discussed above, suggests a groundwater flow regime in the vicinity of MW-3-19 that is hydraulically isolated from the other CGM wells.

The estimated groundwater flow direction for Quarter No. 4 is uniformly north to northwest, consistent with previous monitoring events when MW-3-19 was included as part of the potentiometric surface (Shannon & Wilson, 2022b).

Groundwater Sampling Results

The laboratory analytical results for collected groundwater samples are summarized in Exhibit 3. The laboratory report is included as Attachment 2. Exhibit 1 indicates which monitoring wells had groundwater sample contaminant concentrations that exceed applicable cleanup levels (CULs) during the February 2023 sampling event.

Groundwater Sampling Interpretation

Groundwater samples collected from the CGM wells located within the property boundary of the site (MW-2-19, MW-6-22, MW-7-22, MW-8-22, and MW-9-22) had non-detectable concentrations of petroleum hydrocarbons (gasoline-, diesel-, and oil-range) and BTEX. MW-8-22 and MW-9-22 had detectable concentration of dissolved arsenic and total arsenic, respectively; however, the concentrations were below applicable CULs.

Groundwater samples from one CGM well, MW-3-19, contained contaminant concentrations that exceeded applicable CULs (Exhibits 1 and 3). During Quarter Nos. 2 and 3, groundwater

samples from MW-3-19 were not collected because measurable free product was detected in the well. During Quarter No. 4, a petroleum sheen was observed but with no measurable product, and thus, groundwater samples were collected and analyzed. Concentrations of gasoline- and diesel-range petroleum hydrocarbons and total arsenic increased at MW-3-19 compared to Quarter No. 1 (May 2022). Oil-range petroleum hydrocarbon and BTEX concentrations decreased since Quarter No. 1. MW-3-19 is the most downgradient CGM well at the site, the furthest from the remedial excavation area, and is located outside the property boundary of the site. The contaminant concentrations observed at MW-3-19 may be related to the observed degree of hydraulic isolation in the vicinity of MW-3-19, which would impact timing for the remedial action to manifest near the this well.

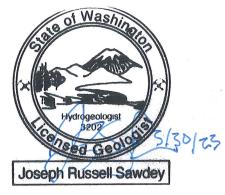
The concentration of gasoline-range petroleum hydrocarbons measured in the CGM wells over time have been summarized in trend plots, included as Exhibit 4.

The concentration of diesel-range plus oil-range petroleum hydrocarbons measured in the CGM wells over time have been summarized in trend plots, included as Exhibit 5.

We appreciate this opportunity to provide environmental services to you for this project. If you have questions regarding this letter, please contact the undersigned at (206) 632-8020.

Sincerely,

Shannon & Wilson



Joseph Sawdey, LG, LHG Senior Hydrogeologist

Meg Strong, LG, LHG Senior Consultant

JXS:MJS:JNB/jxs:mrh

References

- PBS Engineering and Environmental, 2021a, Remedial action plan, Montlake Gas Station, State Route 520 Montlake to Lake Washington Interchange and Bridge Replacement Project, Seattle, Washington: Report prepared by PBS, Seattle, Wash., 41221.003, for Graham Contracting Ltd, Bellevue, Wash., March Seattle, Wash., March.
- PBS Engineering and Environmental, 2021b, Remedial action completion report, Montlake Gas Station, State Route 520 Montlake to Lake Washington Interchange and Bridge Replacement Project, Seattle, Washington: Report prepared by PBS, Seattle, Wash., 41221.003, for Graham Contracting Ltd., Bellevue, Wash., December.
- Shannon & Wilson, 2019, Data gaps investigation work plan/sampling and analysis plan for Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Workplan prepared by Shannon & Wilson, Seattle, Wash., 21-1-22242-101, for Washington State Department of Transportation, July.
- Shannon & Wilson, 2020, Remedial investigation report for Montlake Gas Station, SR 520
 Bridge Replacement and HOV Program, Seattle, Washington: Report prepared by Shannon
 & Wilson, Seattle, Wash., 21-1-22242-104, for Washington State Department of
 Transportation, March.
- Shannon & Wilson, 2022a, Compliance groundwater monitoring well installation exhibit for Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Exhibit prepared by Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Washington State Department of Transportation, May 2022.
- Shannon & Wilson, 2022b, Groundwater monitoring memorandum quarter no. 1, voluntary cleanup program NW3242, Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Memorandum prepared by Joseph Sawdey and Meg Strong, Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Ron Paananen, HDR, June 27.
- Shannon & Wilson, 2022c, Groundwater monitoring memorandum quarter no. 2, voluntary cleanup program NW3242, Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Memorandum prepared by Joseph Sawdey and Meg Strong, Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Ron Paananen, HDR, October 6.
- Shannon & Wilson, 2023, Groundwater monitoring memorandum quarter no. 3, voluntary cleanup program NW3242, Montlake Gas Station, SR 520 Bridge Replacement and HOV Program, Seattle, Washington: Memorandum prepared by Joseph Sawdey and Meg Strong, Shannon & Wilson, Seattle, Wash., 21-1-22242-104, for Ron Paananen, HDR, January 5.

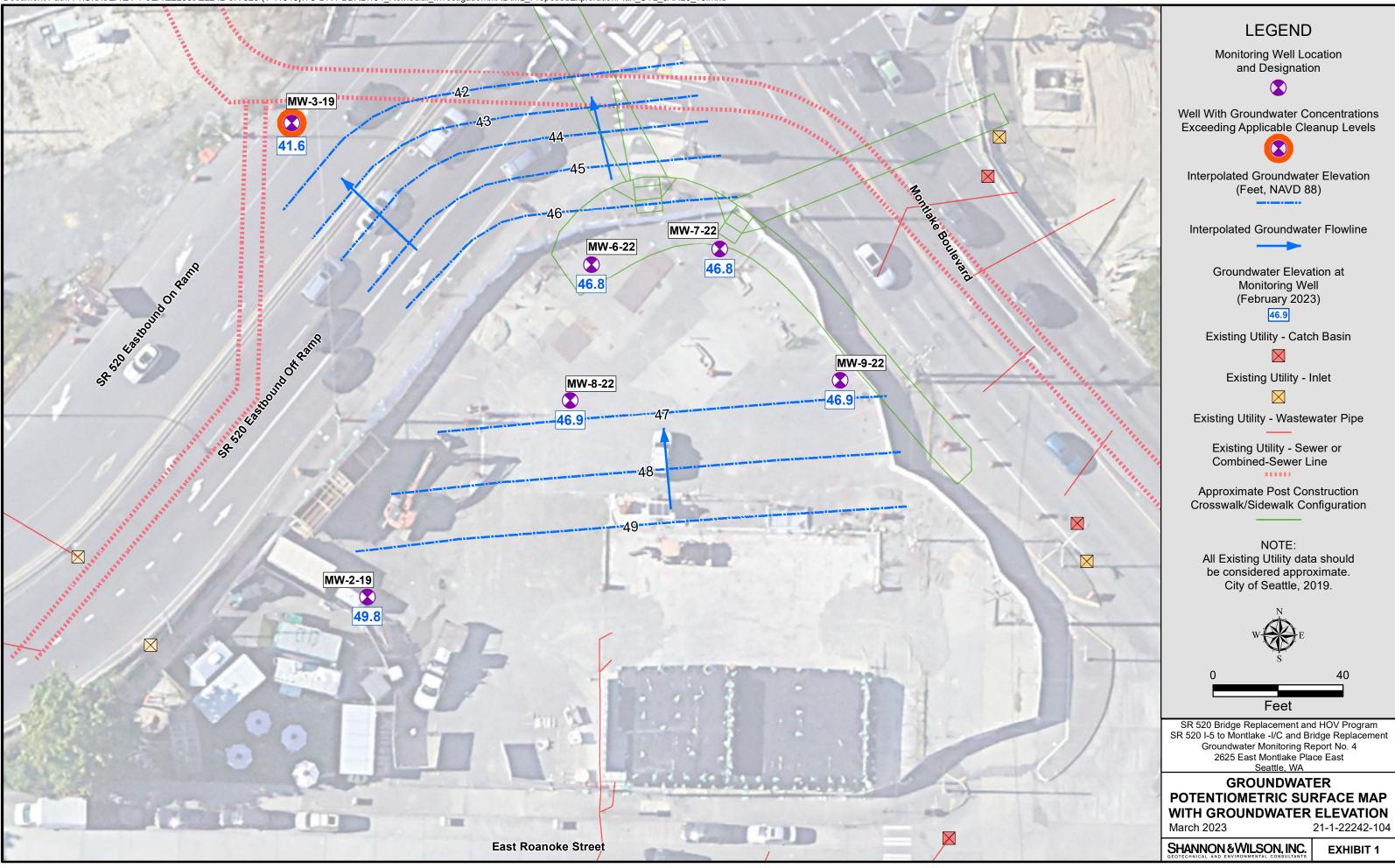
Exhibits

- Exhibit 1 Groundwater Potentiometric Surface Map with Groundwater Elevation
- Exhibit 2 Groundwater Level Measurements
- Exhibit 3 Summary of Groundwater Analytical Results
- Exhibit 4 Groundwater Concentration Trend Plots Gasoline
- Exhibit 5 Groundwater Concentration Trend Plots Diesel Plus Oil

Attachments

Attachment 1 – Groundwater Sampling Field Forms

Attachment 2 – Laboratory Report and Chain-of-Custody Form



Montlake Gas Station Monitoring Well	Screened Interval (feet bgs)	Surveyed Monitoring Well Elevation ¹ (feet)	TOC Elevation (feet)	Date	Depth to Water (feet below TOC)	Groundwater Elevation (feet)
				10/17/2019	10.1	48.0
				5/2/2022	8.3	49.8
MW-2-19	10 to 20	58.87	58.12	8/16/2022	9.4	48.7
				11/15/2022	9.9	48.2
				2/14/2023	8.4	49.8
			59.01	10/17/2019	17.4	41.6
				5/2/2022	17.3	41.8
MW-3-19	10 to 25	59.29		8/16/2022	17.4	41.6
				11/15/2022	17.5	41.5
				2/14/2023	17.5	41.6
MW-6-22				5/2/2022	12.2	47.2
	11 to 26	59.71	59.36	8/16/2022	13.9	45.5
10100-0-22	111026	59.71	33.30	11/15/2022	14.9	44.4
				2/14/2023	12.5	46.8
		59.68	59.18	5/2/2022	12.1	47.1
MW-7-22	10.5 to 25.5			8/17/2022	13.8	45.4
10100-7-22	10.5 to 25.5	59.00		11/15/2022	14.8	44.4
				2/14/2023	12.4	46.8
				5/2/2022	11.3	47.2
MW-8-22	10.5 to 25.5	58.90	58.55	8/16/2022	13.0	45.6
10100-22	10.5 10 25.5	50.50	00.00	11/15/2022	14.0	44.5
				2/14/2023	11.6	46.9
				5/2/2022	12.4	47.2
MW-9-22	10 to 25	59.93	59.58	8/17/2022	14.1	45.5
• ==				11/15/2022	15.1	44.5
				2/14/2023	12.7	46.9

NOTES:

1 Monitoring well elevation was surveyed from the center of the well monument lid.

The reference vertical datum is the North American Vertical Datum (of 1988).

bgs = below ground surface; TOC = top of casing

		Pe	troleum Hydrocarbons (µ	g/L)		Vo	latile Organic Compounds (µg/L) ³		Metals	s (μg/L) ⁴
Montlake Gas Station Monitoring Well	Sample Date	Gasoline Range Organics ¹	Diesel Range Organics ²	Lube Oil Range Organics ²	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Total Arsenic	Dissolved Arsenic
	10/17/2019	<100	<260	<420	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<180	<240	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-2-19	8/16/2022	<100	<130	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	2/14/2023	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	10/17/2019	1400	630	660	98	<4	24	9.3	1.1	17	7.4
MW-3-19 ⁵	5/2/2022	5800	1300 M	500	170	<10	190	220	3.2	16	11
	2/14/2023	7300	2100 M	320	140	<5.0	72	94	2.3	22	13
	5/2/2022	<100	210	330	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-6-22	8/16/2022	<100	<130	290	<0.20	<1.0	<0.20	<0.40	<0.20	6.3	4.5
10100-0-22	11/15/2022	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	7.3	4.6
	2/14/2023	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<170	<230	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/17/2022	<100	<130	250	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-7-22	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	11/15/2022	<100	<210	220	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	2/14/2023	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<170	<220	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	5/2/2022	<100	<170	240	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	8/16/2022	<100	<130	360	<0.20	<1.0	<0.20	<0.40	<0.20	6.6	3.8
MW-8-22	8/16/2022	<100	<140	340	<0.20	<1.0	<0.20	<0.40	<0.20	6.5	4.3
	11/15/2022	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	6	5.7
	2/14/2023	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	4.2	<3.0
	2/14/2023	<100	<200	<200	<0.20	<1.0	<0.20	<0.40	<0.20	4.4	<3.0
	5/2/2022	<100	<160	<220	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
MW-9-22	8/17/2022	<100	1900	<300	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
10100-9-22	11/15/2022	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	<3.0
	2/14/2023	<100	<210	<210	<0.20	<1.0	<0.20	<0.40	<0.20	<3.3	3.0
	5/2/2022	<100			<0.20	<1.0	<0.20	<0.40	<0.20		
Trip Blank	8/18/2022	<100			<0.20	<1.0	<0.20	<0.40	<0.20		
пр Банк	11/15/2022	<100			<0.20	<1.0	<0.20	<0.40	<0.20		
	2/14/2023	<100			<0.20	<1.0	<0.20	<0.40	<0.20		
MTCA Method A CUL for U	nrestricted Land Use	1000/800*	500	500	5.00	1000	700	1000†	1000†	20§	20§

NOTES:

1 Gasoline-range petroleum hydrocarbons using Washington State Department of Ecology's (Ecology's) NWTPH-Gasoline Extended Method

2 Diesel- and oil-range petroleum hydrocarbons using Ecology's NWTPH-Diesel Extended Method

3 Volatile organic compounds by EPA Method 8260D

4 Total and dissolved arsenic by EPA Method 200.8

5 In August and November 2022, MW-3-19 had measurable free product and was not sampled.

Highlighted text indicates the analyte was detected above the MTCA Method A cleanup level.

Bold text indicates the analyte was detected above laboratory practical quantitation limit.

M flag indicates hydrocarbons in the gasoline range are impacting the diesel range result.

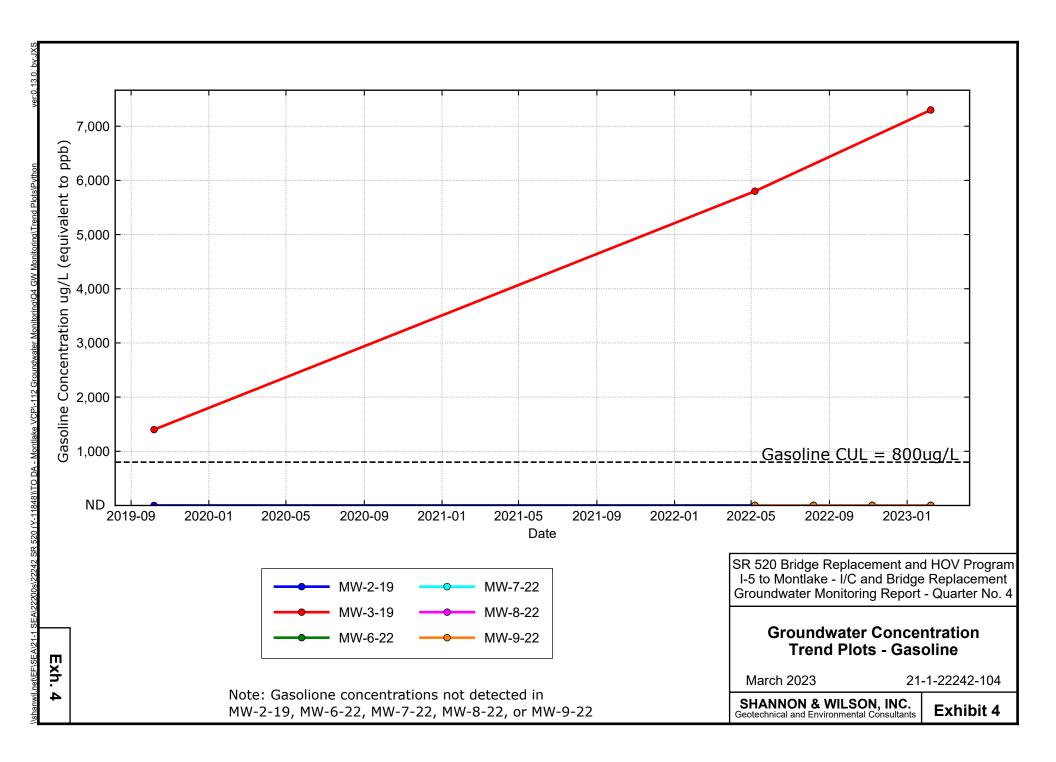
* Cleanup level (CUL) for gasoline-range organics is 1,000 micrograms (µg) without the presence of benzene and 800 µg with the presence of benzene.

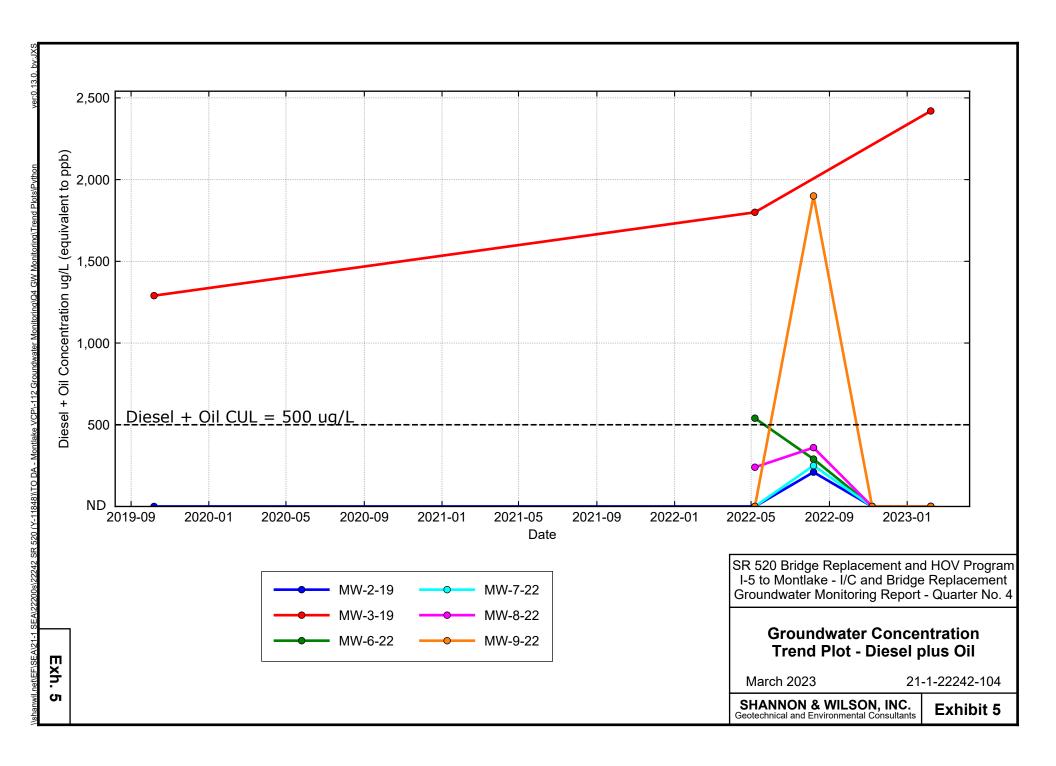
† MTCA Method A CUL for total xylenes is used because a MTCA Method A CUL is not established for the isomers of m-, p-, or o-xylene.

§ Site specific CUL for arsenic (total and dissolved) based on statistical analysis of natural background levels of arsenic in groundwater.

-- = not analyzed; < = not detected above laboratory reporting limit; $\mu g/L$ = micrograms per liter; CUL = cleanup level; EPA = U.S. Environmental Protection Agency; MTCA = Model Toxics Control Act; NWTPH = Northwest Total Petroleum Hydrocarbon

SR 520 Bridge Replacement and HOV Program SR 520 I-5 to Montlake - I/C and Bridge Replacement Groundwater Monitoring Memorandum - Quarter No. 4





Attachment 1

Contents:

Groundwater Sampling Field Forms (8 Sheets)

BEATTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Project:

Montake Gas Station

JOB NO .: 21-1-22242-112 Conducted by: M/LH Weather: SUNNY, High 305

WATER LEVEL MEASUREMENTS

			Measuring Point	Depth to Water from	VWP Re Digits	eading °C	Comments (i.e. pressure change when opend, inaccesibility, etc.)
Location ID	Date	Time	(MP)	MP (feet)	Digits	0	BLT 996
MW-2-19 MW-7-22	2 14 23	0820 0830	NTOC	12.42			BNV 409
MM-3-22		0832		11.62			BN V 406
MW-6-22		0835		12.53			BNV 407
MW-9-22		0937		12,46			BNV 409
MN-3-19	\vee	0855	V	17.45			BLT 937
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Comments:

Checked By:

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. WELL CASING VOLUMES

Gal/ft $1-1/4^{"}=0.077$ $2^{"}=0.16$ $3^{"}=0.37$ $4^{"}=0.65$ $1-1/2^{"}=0.10$ $2-1/2^{"}=0.24$ $3-1/2^{"}=0.50$ $6^{"}=1.46$

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After Sampling EVACUATION PUMP INTAKI PURGE WATI WATER QUAL SAMPLING ME SAMPLING PE REMARKS (e.g	12.69				· ·	•	1 <u>.</u>	•		
EVACUATION	METHOD:			stall	puw		-1' bg	<u></u>	• • •	
PUMP INTAK			#):	Mid- SI Prum	.0h 8	it.			n on fu	ry Wahu
WATER QUAL	ITY (e.g., sheer ITY METER(S)	n, odor):) USED; CALII	Per BRATION DAT	<u>Yoiwn</u> Te/TIME: LOW	oder Aqua Flow	Troll	1 <u>Slight</u> 500		14/23.0	
WATER QUAL SAMPLING ME		17 1	VIA							

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. WELL CASING VOLUMES Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.65 1-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

	OWNER/LOCATION: For may Montlok well NO: MW-6-22 SAMPLE NO: MW-6-2 WEATHER: MOSNY UDULY MI WELL SITE CONDITIONS / MP DEFINITION: N (MP is typically the north PVC nm)	2:021423 ECOLOG	<u>Station</u> By Tag NO: 1 <u>C Rim</u>	BNV 40	DATE:	CATE NO;	No E
	(MP is typically the north PVC nm)	SAMPLING D	АТА	. <u></u>	•		
╞	1210	<u> </u>	LNAPL	THICKNESS	·		Sạmple
	IIME STARTED,				3:	ft.	Sample 🗌
	PID HEAD SPACE	36 #		• -			
	MP DISTANCE ABOVE / BELOW GROUND SURFACE: ったのり	· · · · · · · · · · · · · · · · · · ·			SAMPLE CON	TAINERS Type ·	Pres.
	TOTAL DEPTH OF WELL BELOW MP:レッール	IL H	· Númb	er	Size		
	DTWBELOW.MP: 12,05	^{IL} .	. <u></u>		· · · · · · · · · · · · · · · · · · ·	<u> </u>	
	WATER COLDIVIN IN WELL	1L		······			-
:	CASING DIAMETER:	în.	·		· ·		
;	GALLONS PER FOOT: 0.16	•	······				
ļ	GALLONS IN WELL: 2.15	· .	•		·		
-	TIME PURGING STARTED: 1211				`		
_		FIELD PARAME	TERS	· ·			• •
	NØ fl.		TURBIDITY	SALINITY	TDS		TIME
Ī		DND. D.O. os / cm) (mg / L)	(NTU)	(%) PW	(g/L)	COLOR	1212
ł	Initial 13,25 20.1 7.73 69	50.47 0.00	0.33	0.33	0,46	CLEAN	1215
ľ	0,5 13.23. 11.6 7.75 66	9.00 0.42	0.01	0:23	0.44	(lear	1213
	1.0 13.36 6.8 7.15 6	AUZ 0.27	0.00	0.33	0.44	itenv.	1221
ŀ	1.5 13.51 2.3 7.74 67	2.06 0.12	0.41	0:33	0.44	clear	1224
ŀ		2.46 0.00		0.33	0.45:	clear	12277
ŀ	2.3 1394 -12.1 7.74 68	1.19 0.05	0.00	0134	0.45	CLAN	1230
┢	31 342 -14.6. 7.75 60	7.69.0,03	0.00	0.34	0.45	clear	1233
	3.4 13.94 -161 7.74 68	5.16 0.03	0.00	0.34			1050
A	fter Sampling		L		L		
F٦	VACUATION METHOD: Peristal		f		•		•
	Mid	- screen			•	• · · · · · · · · · · · · · · · · · · ·	
	IRGE WATER DISPOSITION (e.g., drum#):	1m0h 81	<u>K.</u>		•		
-1	ATER QUALITY (e.g., sheen, odor): No	odor	. or 9	sheen	<u> </u>		
N	ATER QUALITY (e.g., sneen, odor).	E Aqua	Tholl	500	j. 2/14	123 P	0930
-					SAMPLE	TIME: 124	10.
	MPLING METHOD: <u>EYA</u> LUV			•		TE "TIME":	~

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. WELL CASING VOLUMES

Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.651-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

OWNER/LOCATION:	For mer Mo 2 SAMPLENO: L	IW-7-22:02	195 : Stati 1923 Ecology tag N	oh 10: BINV 41		LCATE NO;	23
WEATHER: WELL SITE CONDITIONS (MP is typically	SUNNY, SUNP DEFINITION: the north PVC rim)	Mid 40 North		iha.	MS <i>1</i>]	MSD? Yesl - ,	
		SAI	IPLING DATA		•		
TIME STARTED:	1050 D.D	p	· · ·	NAPL THICKNES			Sạmple [Sample [
MP DISTANCE ABOVE /	01	CE 0.5		lumber	SAMPLE CON Size	ITAINERS Type	Pres.
DTW BELOW MP:	- 96		.ft .ft în		•		
CASING DIAMETER: GALLONS PER FOOT: GALLONS IN WELL: TIME PURGING STARTED	0.16 2.072 1053	· · ·			· · ·		
		FIEI D	PARAMETERS	· · ·	· ·	<u> </u>	
$\begin{array}{c c} \hline \text{GALLONS} & \text{TEMP.} \\ \hline \text{REMOVED} & (C7) \\ \hline \text{Initial} & 13.49 \\ \hline 0.5 & 13.09 \\ \hline 0.75 & 13.05 \\ \hline \end{array}$	ину (ту) 64.4 7.77 56.8 7.77 52.1 7.76	COND. (µmhos/cm) - (179.19 - 074.59 - 074.59	D.O. (mg/1.) 4.27 JD.90 2.44 4.8 2.25 7.2°) (%)pr) 0,33 3 0,33 1 0.33	0,44 0,44 0,43	COLOR Clear Clear	TIME · 1057 1100 1103 ·
1.0 13.92 1.25. 13.97 1.5. 14.16 2.0 13.97	47.8 7.75 11.3 7.78 1.2 7.79 2.1 7.79	635.12	2.14. 26.2 1.95 76.7 1.30. 54.3 2.80 66.2	8:0.31 9 0.31	0.43 0.40 .0.41: 0.41	CLEAR CLEAR CLEAR CLEAR CLEAR	1106 1109 1116 1121
2.5 14.21 3.0 14.33 After Sampling	-1.6 7.70 -2.14 7.75 Sel	619.55	0.72 22.4		0.40 0.41	Clear Clear	1120
EVACUATION METHOD:	blicable):	Mid-scr Drum	pump een h site.	· · · · · · · · · · · · · · · · · · ·	•	,	
PUMP INTAKE DEPTH (if ap))N (e.g., drum#):	1	×.	un		102 0	AG251
PUMP INTAKE DEPTH (ITAP) PURGE WATER DISPOSITIO VATER QUALITY (e.g., sheer VATER QUALITY METER(S)	n, odor): <u>No</u>		Aqua Tro	11 500	; 2/1	4/23.@ TIME: 120	

WELL CASING VOLUMES Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.65 1-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

TIME COMPLETED: [C](

	WILL NO: MONTER MATER SAMPLINGLOG PAGE A OF 2 WELL NO: MONTER SAMPLE NO: ECOLOGY TAG NO: DUPLICATE NO: MONTER
	WELL NO MS/MSD? Yes WEATHER: No. MS/MSD? Yes WELL SITE CONDITIONS / MP DEFINITION: No. M. 2 V & Bim. (MP is typically the north PVC nm) No. M. 2 V & Bim.
	SAMPLING DATA
-	TIME STARTED:
	PID HEAD SPACE:
	WATER COLUMN IN WELL: ft.
	GALLONS PER FOOT:
Locin: sac	TIME PURGING STARTED:
	FIELD PARAMETERS
Date: '02-10-2011	GALLONS TEMP. (C') TEMP. (mV) THAT COND. (µmhos/cm) D.O. (mg/L) TURBIDITY (NTU) SALINITY (%) P(V) TDS (g/L) COLOR TIME D REMOVED (C') (mV) pH (cond) (mg/L) (NTU) (%) P(V) (g/L) COLOR TIME D
/	40 14.34 -50 1.11 000.00 0.11 12.19 0.20 0.40 Ukar 11.95
Ing Log.dwg	4.25 14.39 -5.7 7.75 100 F.95 0.49 5.03 0.30 0.40 Clear 1148 4.5 14.34 -6.0 7.75 604.68 0.48 5.03 0.30 0.40 Clear 1148
Vater Samp	4.75 M.33 -6.8 F.15 -500.01 0.50 (110 0.29 0.39 CLEAN 1154 5.0 14.39 -7.2 7.75 593.17 0.34 4.35 0.29 0.39 CLEAN 1154
llename: J'\Support\library\FIELD AND LAB FORMS\AutoCADLWater Sampling	After Sampling After of the sample of the samp
FORMEN	EVACUATION METHOD: Peristally PUMP
TAB	PUMP INTAKE DEPTH (if applicable):
LD ANI	PURGE WATER DISPOSITION (e.g. drum#): Drum ON EIF2
IJVFIE	WATER QUALITY (e.g., sheen, odor):
ortNibra	WATER QUALITY METER(S) USED; CALIBRATION DATE/TIME:
Suppo	SAMPLING METHOD: EFF COV (100 DUPLICATE "TIME" DUPLICATE "TIME" DUPLICATE "TIME"
5+1	
me: J	REMARKS (e.g., recovery rate):

. WELL CASING VOLUMES

Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.65 1-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

TIME COMPLETED:

•

Γ	SHANNONSWILSON, INC. WATE	Gas	PLING		DATE		123
	WELL NO: MW-8-22 SAMPLE NO: MW-8-2	2:021423 ECOLO	GY TAG NO:	BNV 4	06 .DUPL	ICATE NO: M	
ſ	Man Mid	405			MS/N	/ISD? Yes [I No R
	WEATHER	with PI	10 Rim	1		-	
	WELL SITE CONDITIONS / MP DEFINITION: No (MP is typically the north PVC nm)		•••	•		•	
		SAMPLING	DATA		•		
╞	THE OTADIED: 1250		LNAP	L THICKNESS	·	ft.	Sample [
	11WE STARTED,		• .	L THICKNESS	entratives	, ft.	Sample [
·	PID HEAD STACL	ppm	jin u	•			
	MP DISTANCE ABOVE / BELOW GROUND CONTAINE.	<u>і </u>			SAMPLE CON		Trog
	TOTAL DEPTH OF WELL BELOW MP:	1L	· · Numl)er	Size	Туре .	Pres.
	DTWBELOW.MP:		·	 		·	· · · · · · · · · · · · · · · · · · ·
	WATER COLUMN IN WELL: <u>14.43</u>	ft.		·			
	CASING DIAMETER:	în.					
	GALLONS PER FOOT: 0:16		·	_ :_			
	GALLONS IN WELL: 7.31						
	TIME PURGING STARTED: 1251						
							· .
Γ	27 A	FIELD PARAN	IETERS			1	1
h	GALLONS TEMP. CO	ND. D.O. s/cm) (mg/L)	TURBIDITY (NTU)	SALINITY (%) PSV	TDS (g/L)	COLOR	TIME
	REMOVED (C°) (mV) (1111100 Initial 12.79 -24.5 7.80 618		7.11.	0.30	0.40	clear	1251
	0,5 12.7923.6 7.81 616		. 8.71	0.30	0,40	<u>Clines</u>	1254
	10 12.98 -23.6 7.80 612.	41 0.00	18.18	0.30	0.40	dear (12)	1301
ľ	1.5 13,05 -22.5 7.79 614		18.63	0.30	0.40	Clear Clear	1304
	1.75 13.08 -23.3 1.79 (12		19.30	0.30	0,40	clear	1307
ŀ	2.0 13.04 -21.1. 7.18 621	44 0.00	10.89	0,30	0,40	clear	1310
-	6.63 13160 012 10 10 11	.74.0.00	10.57	0.30	0,40	cher	1313
$\left \right $	2.5 13.24 -26.0 + 1 61 7	63 0.00	11.01	0.30	0.40	Clear	1316.
\mathbf{F}	After Sampling		V		·	<u>, </u>	
L	Delessfalk	ic pun	npi ·	•			<u> </u>
		screen	1.	•	•	•	
•	UMP INTAKE DEPTIT (IT upprocessor)		it?	-	-		
	URGE WATER DISPOSITION (e.g., other s)	-		een		•	
	ATER QUALITY (e.g., sneen, buor).	1 4.1.	Troil	500	2/1	417.3.6	0930
w	ATER QUALITY METER(S) USED; CALIBRATION DATE / TIME	= <u>Aqua</u>	11011			13 13	20
•	AMPLING METHOD: EPA LOW	Flow	· · · · · · · · · · · · · · · · · · ·		SAMPLE		
	MPLING PERSONNEL:MRH		·		DUPLICA		<u></u>

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. WELL CASING VOLUMES

Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.65 1-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

WELL NO: WEATHER:			PLENO: MW (101d	1-9-22:0	21423 ECOLO W 403		BNV 40	g .DUP	E: 2/14 LICATE NO: _ MSD? Yes	emplotecoparisona
				,S/	AMPLING	DATA		•	<u> </u>	
TIME STAR	Ted;	1335 H	0,0	•	_ppm	• •	pl Thickness Pl Thickness	-	fi.	• •
TOTAL DEF DTW BELOV WATER COU CASING DIA GALLONS IN	LUMN IN WEL	BELOWMP: _ 12.1 L:1 1.90	25.1 2.49 2. 0.16		ft. ft. ft. în. 	Nům		SAMPLE COI Size	Type .	Pres.
	-	· · · · ·		FIEI I	D PARAM	ETERS		· · ·	<u> </u>	•
GALLONS REMOVED Initial 0.5 0.75 1.25 1.7 2.0 2.26	TEMP. (C) 13.29. 13.29. 13.31 13.39 13.39 13.39 13.35	-17.4 -17.4 -17.4 -17.1 -15.7 -15.7 -14.7 -14.5	pH 7:37 7.86 7.85 7.83 7.83 7.82 7.82 7.82 7.82	COND (fumhos / cm) 483.80 486.46 408.21 491.30 491.30 492.06 492.98	0:00.	TURBIDITY (NTU) 5,21. 12.61 12.60 8.59 7.91 .8,09 	SALINITY (%) PN 0,23 0,24 0,24 0,24 0,24 0,24 0,24 0,24	TDS (g1) D,31 D,32 D.32 D.32 D.32 D.32 D.32 D.32	COLOR CLEAV CLEAV CLEAV CLEAV CLEAV CLEAV CLEAV	TIME 1343 1347 1350 1354 1354 1354 1403 1403
After Sampling EVACUATION PUMP INTAKE PURGE WATEF WATER QUALIT WATER QUALIT SAMPLING MET SAMPLING PER PEMARKS (e.g.,	DEPTH (if app CONTRONTION (e.g., sheen YMETER(S) HOD: SONNEL:	N (e.g., drum# , odor): USED; CALIBI	#):Y RATION DATE	E/TIME:	on si dor	t. t. or st	~egir DO ;	2 14 2 SAMPLE DUPLICA	3	29 <u>20</u> 10

. WELL CASING VOLUMES

Gal/ft 1-1/4"=0.077 2"=0.16 3"=0.37 4"=0.651-1/2"=0.10 2-1/2"=0.24 3-1/2"=0.50 6"=1.46

TIME COMPLETED: 1420

Attachment 2

Contents:

Laboratory Report and Chain-of-Custody Form (18 Sheets)



February 27, 2023

Joseph Sawdey Shannon & Wilson, Inc. 400 N 34th Street, Suite 100 Seattle, WA 98103

Re: Analytical Data for Project 21-1-22242-112 Laboratory Reference No. 2302-196

Dear Joseph:

Enclosed are the analytical results and associated quality control data for samples submitted on February 15, 2023.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

L

David Baumeister Project Manager

Enclosures



Date of Report: February 27, 2023 Samples Submitted: February 15, 2023 Laboratory Reference: 2302-196 Project: 21-1-22242-112

Case Narrative

Samples were collected on February 14, 2023 and received by the laboratory on February 15, 2023. They were maintained at the laboratory at a temperature of 2° C to 6° C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



GASOLINE RANGE ORGANICS NWTPH-Gx

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	MW-2-19:021423					
Laboratory ID:	02-196-01					
Gasoline	ND	100	NWTPH-Gx	2-23-23	2-23-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	94	65-122				
Client ID:	MW-7-22:021423					
Laboratory ID:	02-196-02					
Gasoline	ND	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	98	65-122				
Client ID:	MW-6-22:021423					
Laboratory ID:	02-196-03					
Gasoline	ND	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	96	65-122				
Client ID:	MW-8-22:021423					
Laboratory ID:	02-196-04					
Gasoline	ND	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	99	65-122				
Client ID:	MW-9-22:021423					
Laboratory ID:	02-196-05					
Gasoline	ND	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	96	65-122				
Client ID:	MW-3-19:021423					
Laboratory ID:	02-196-06					
Gasoline	7300	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery					
Fluorobenzene	110	65-122				
Client ID:	MW-100:021423					
Laboratory ID:	02-196-07					
Gasoline	ND	100	NWTPH-Gx	2-23-23	2-23-23	
Surrogate:	Percent Recovery	Control Limits		<i>L</i> - <i>L</i> 0- <i>L</i> 0	L-20-20	
Fluorobenzene	91	65-122				
I IGOLODELIZELIE	31	00-122				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

GASOLINE RANGE ORGANICS NWTPH-Gx

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	Trip Blanks					
Laboratory ID:	02-196-08					
Gasoline	ND	100	NWTPH-Gx	2-22-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	97	65-122				



4

GASOLINE RANGE ORGANICS NWTPH-Gx QUALITY CONTROL

Matrix: Water Units: ug/L (ppb)

						Date	Date			
Analyte		Result	PQL	Me	ethod	Prepared	Analyz	ed	Flags	
METHOD BLANK										
Laboratory ID:		MB0222W1								
Gasoline		ND	100	NW	ГРН-Gx	2-22-23	2-22-2	23		
Surrogate:	Pe	rcent Recovery	Control Lim	its						
Fluorobenzene		102	65-122							
Laboratory ID:		MB0223W1								
Gasoline		ND	100	NW	ГРН-Gx	2-23-23	2-23-2	23		
Surrogate:	Pe	rcent Recovery	Control Lim	its						
Fluorobenzene		97	65-122							
				Source	Percent	Recovery		RPD		
Analyte	Re	sult	Spike Level	Result	Recovery		RPD	Limit	Flags	
DUPLICATE										
Laboratory ID:	02-17	71-01								
	ORIG	DUP								
Gasoline	ND	ND	NA NA		NA	NA	NA	30		
Surrogate:										

Fluorobenzene

106 100 65-122



VOLATILE ORGANICS EPA 8260D

Matrix: Water Units: ug/L

0				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	MW-2-19:021423					
Laboratory ID:	02-196-01					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	104	75-127				
Toluene-d8	98	80-127				
4-Bromofluorobenzene	98	78-125				

Client ID:	MW-7-22:021423					
Laboratory ID:	02-196-02					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	101	75-127				
Toluene-d8	98	80-127				
4-Bromofluorobenzene	98	78-125				

Client ID:	MW-6-22:021423					
Laboratory ID:	02-196-03					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	105	75-127				
Toluene-d8	103	80-127				
4-Bromofluorobenzene	102	78-125				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

VOLATILE ORGANICS EPA 8260D

Matrix: Water Units: ug/L

Ŭ				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	MW-8-22:021423					
Laboratory ID:	02-196-04					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	104	75-127				
Toluene-d8	99	80-127				
4-Bromofluorobenzene	98	78-125				

Client ID:	MW-9-22:021423					
Laboratory ID:	02-196-05					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	102	75-127				
Toluene-d8	103	80-127				
4-Bromofluorobenzene	97	78-125				

Client ID:	MW-3-19:021423					
Laboratory ID:	02-196-06					
Benzene	140	1.0	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	5.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	72	1.0	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	94	2.0	EPA 8260D	2-17-23	2-17-23	
o-Xylene	2.3	1.0	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	101	75-127				
Toluene-d8	104	80-127				
4-Bromofluorobenzene	99	78-125				



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VOLATILE ORGANICS EPA 8260D

Matrix: Water Units: ug/L

Ū				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	MW-100:021423					
Laboratory ID:	02-196-07					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	104	75-127				
Toluene-d8	105	80-127				
4-Bromofluorobenzene	97	78-125				

Client ID:	Trip Blanks					
Laboratory ID:	02-196-08					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	104	75-127				
Toluene-d8	102	80-127				
4-Bromofluorobenzene	100	78-125				



VOLATILE ORGANICS EPA 8260D QUALITY CONTROL

Matrix: Water Units: ug/L

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0217W1					
Benzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Toluene	ND	1.0	EPA 8260D	2-17-23	2-17-23	
Ethylbenzene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
m,p-Xylene	ND	0.40	EPA 8260D	2-17-23	2-17-23	
o-Xylene	ND	0.20	EPA 8260D	2-17-23	2-17-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	101	75-127				
Toluene-d8	102	80-127				
4-Bromofluorobenzene	97	78-125				

					Per	cent	Recovery		RPD	
Analyte	Result		Spike Level		Rec	Recovery		RPD	Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB02	17W1								
	SB	SBD	SB	SBD	SB	SBD				
Benzene	10.4	10.3	10.0	10.0	104	103	80-121	1	16	
Toluene	9.98	10.1	10.0	10.0	100	101	80-120	1	18	
Ethylbenzene	10.3	10.3	10.0	10.0	103	103	80-125	0	18	
m,p-Xylene	20.1	20.5	20.0	20.0	101	103	80-127	2	18	
o-Xylene	10.1	10.2	10.0	10.0	101	102	80-126	1	18	
Surrogate:										
Dibromofluoromethane					101	99	75-127			
Toluene-d8					104	102	80-127			
4-Bromofluorobenzene					101	100	78-125			



DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Water Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	MW-2-19:021423			-		
Laboratory ID:	02-196-01					
Diesel Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-21-23	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	89	50-150				
Client ID:	MW-7-22:021423					
Laboratory ID:	02-196-02					
Diesel Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-21-23	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	105	50-150				
Client ID:	MW-6-22:021423					
Laboratory ID:	02-196-03					
Diesel Range Organics	ND	0.21	NWTPH-Dx	2-21-23	2-21-23	
Lube Oil Range Organics	ND	0.21	NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits	-	-	-	
o-Terphenyl	99	50-150				
Client ID:	MW-8-22:021423					
Laboratory ID:	02-196-04					
Diesel Range Organics	ND	0.21	NWTPH-Dx	2-21-23	2-21-23	
Lube Oil Range Organics	ND	0.21	NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits		2 2 1 20	2 2 1 20	
o-Terphenyl	92	50-150				
Client ID:	MW-9-22:021423					
Laboratory ID:	02-196-05					
Diesel Range Organics	ND	0.21	NWTPH-Dx	2-21-23	2-21-23	
_ube Oil Range Organics	ND	0.21	NWTPH-DX NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits		2-21-20	2-21-20	
o-Terphenyl	105	50-150				
Client ID:	MW-3-19:021423					
_aboratory ID:	02-196-06					
Diesel Range Organics	2.1	0.21	NWTPH-Dx	2-21-23	2-22-23	М
Lube Oil Range Organics	0.32	0.21	NWTPH-Dx	2-21-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits 50-150				
o-Terphenyl	92					



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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Water Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	MW-100:021423					
Laboratory ID:	02-196-07					
Diesel Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-22-23	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	2-21-23	2-22-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	86	50-150				



DIESEL AND HEAVY OIL RANGE ORGANICS **NWTPH-Dx** QUALITY CONTROL

Matrix: Water Units: mg/L (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0221W1					
Diesel Range Organics	ND	0.13	NWTPH-Dx	2-21-23	2-21-23	
Lube Oil Range Organics	ND	0.13	NWTPH-Dx	2-21-23	2-21-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	89	50-150				

					Source	Percent	Recovery		RPD	
Analyte	Res	Result S		Spike Level		Recovery	Limits	RPD	Limit	Flags
DUPLICATE										
Laboratory ID:	02-19	96-01								
	ORIG	DUP								
Diesel Range	ND	ND	NA	NA		NA	NA	NA	NA	
Lube Oil Range	ND	ND	NA	NA		NA	NA	NA	NA	
Surrogate:										
o-Terphenyl						89 94	50-150			



TOTAL ARSENIC EPA 200.8

Units: ug/L (ppb)				D. (D (1)	
Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	MW-2-19:021423	FQL	Method	Flepaleu	Analyzeu	Flags
Laboratory ID:	02-196-01					
Arsenic	ND	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-7-22:021423					
Laboratory ID:	02-196-02					
Arsenic	ND	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-6-22:021423					
Laboratory ID:	02-196-03					
Arsenic	ND	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-8-22:021423					
Laboratory ID:	02-196-04					
Arsenic	4.2	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-9-22:021423					
Laboratory ID:	02-196-05					
Arsenic	ND	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-3-19:021423					
Laboratory ID:	02-196-06	2.0		0.47.00	0.47.00	
Arsenic	22	3.3	EPA 200.8	2-17-23	2-17-23	
Client ID:	MW-100:021423					
Laboratory ID:	02-196-07					
Arsenic	4.4	3.3	EPA 200.8	2-17-23	2-17-23	

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TOTAL ARSENIC EPA 200.8 QUALITY CONTROL

Matrix: Water Units: ug/L (ppb)

								Date	Dat	е	
Analyte	Result			PQL	м	ethod		Prepared	Analy	zed	Flags
METHOD BLANK											
Laboratory ID:	Ν	/B0217WN	12								
Arsenic		ND		3.3	EP	A 200.	8	2-17-23	2-17-	23	
						Per	cent	Recovery		RPD	
Analyte	Res	sult	Spike	e Level	Result	Rec	overy	Limits	RPD Limit		Flags
DUPLICATE											
Laboratory ID:	02-06	68-05									
	ORIG	DUP									
Arsenic	ND	ND	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-06	68-05									
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	100	117	111	111	ND	90	105	75-125	16 20		



DISSOLVED ARSENIC EPA 200.8

Units: ug/L (ppb)				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	MW-2-19:021423			•		
Laboratory ID:	02-196-01					
Arsenic	ND	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-7-22:021423					
Laboratory ID:	02-196-02					
Arsenic	ND	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-6-22:021423					
Laboratory ID:	02-196-03					
Arsenic	ND	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-8-22:021423					
Laboratory ID:	02-196-04					
Arsenic	ND	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-9-22:021423					
Laboratory ID:	02-196-05					
Arsenic	3.0	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-3-19:021423					
Laboratory ID:	02-196-06					
Arsenic	13	3.0	EPA 200.8	2-15-23	2-17-23	
Client ID:	MW-100:021423					
Laboratory ID:	02-196-07					
Arsenic	ND	3.0	EPA 200.8	2-15-23	2-17-23	



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DISSOLVED ARSENIC EPA 200.8 QUALITY CONTROL

Matrix: Water Units: ug/L (ppb)

					Date	Dat	e	
Analyte	Result	PQL	Μ	lethod	Prepared	Analy	zed	Flags
METHOD BLANK								
Laboratory ID:	MB0215F1							
Arsenic	ND	3.0	EPA 200.8		2-15-23	2-17-	-23	
			Source	Percent	Recovery		RPD	
Analyte	Result	Spike Level	Result	Recovery	Limits	RPD	Limit	Flags
DUPLICATE								
Laboratory ID:	02-174-08							

NA NA NA 20	
MS MSD	
ND 105 110 75-125 4 20	





Data Qualifiers and Abbreviations

- A Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
- B The analyte indicated was also found in the blank sample.
- C The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
- E The value reported exceeds the quantitation range and is an estimate.
- F Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
- H The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
- I Compound recovery is outside of the control limits.
- J The value reported was below the practical quantitation limit. The value is an estimate.
- K Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
- L The RPD is outside of the control limits.
- M Hydrocarbons in the gasoline range are impacting the diesel range result.
- M1 Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
- N Hydrocarbons in the lube oil range are impacting the diesel range result.
- N1 Hydrocarbons in diesel range are impacting lube oil range results.
- O Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
- P The RPD of the detected concentrations between the two columns is greater than 40.
- Q Surrogate recovery is outside of the control limits.
- S Surrogate recovery data is not available due to the necessary dilution of the sample.
- T The sample chromatogram is not similar to a typical _____
- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- U1 The practical quantitation limit is elevated due to interferences present in the sample.
- V Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
- W Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
- X Sample extract treated with a mercury cleanup procedure.
- X1 Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
- X2 Sample extract treated with a silica gel cleanup procedure.
- Y The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
- Y1 Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Ζ-

ND - Not Detected at PQL PQL - Practical Quantitation Limit RPD - Relative Percent Difference



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Chain of Custody

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Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052 Phone: (425) 883-3881 • www.onsite-env.com	Tur (i						orat	ory	Nur	nbe	er:	02	-	1	96										
Company: Shannoh & Wilson Project Number: 21-1-22242-112 Project Name: Former Montlake 76 Gas Station Project Manager: Sampled by: MIRWELL HARREN	Sam		1 Day	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX (8021 8260 N	H-Gx	NWTPH-Dx (Acid / SG Clean-up])	Volatiles 8260	FDR EDA 8011 Motors 0200	A OULL (WATERS UNIY)	Semivolatiles 8270/SIM (with low-level PAHs) PAHs 8270/SIM (low-level)	082	Organochlorine Pesticides 8081	Organophosphorus Pesticides 8270/SIM	Chlorinated Acid Herbicides 8151	Total RCRA Metals	Total MTCA Metals	etals	l and grease) 1664	1 & dissolved Arcinic	0			ure
Lab ID Sample Identification	Date Sampled	Time Sampled	Matrix	Numbe	NWTPI	NWTPI	NWTPH-Gx	NWTPH	Volatiles 8260	FDR FL		Semivo (with lo PAHs 8	PCBs 8082	Organo	Organo	Chlorin	Total R(Total M	TCLP Metals	HEM (oil and	10401	B			% Moisture
1 MW-2-19:021423	2/14/23	1630	Water	9		X		×													X				
2 MW-7-22:021423		1200	1	9		X		X													×				
3 MW-6-22:021423		1240		9		X		X													X				
4 MW-8-22:021423		1320		9		X		X													X				
5 MW-9-22:021423		1410		9		X		X													X				
6 MW-3-19:021423		1510		9		×		X													X		+	+	
7 MW-100:021423	V	1300	V	9		X		X			1										X		+		
8 Trip Blanks	2/14/23	0800	Water	5		X		/~			1										N		+		-
																								+	-
								-	-			-				-	-			-	-	7	1	+	
Signature	Co	ompany				Date			Time			Commer	nts/Sp	ecial	Instru	iction	15								
Relinquished		SW. 7/0/04	E			2/1	52	3	030			LAS		朽	F	11+	er								
						2/	15/	23	125																
Relinquished Josh the A			0			2/1	52	3	1:1	-															
Received Relinquished		>	0	80	1	21	115	20	3 /	32	8														
Received											1	Data Pad	kage	: Sta	Indard	d 🗆	Lev	el III		Level	IV []			-
Reviewed/Date							-	Data Package: Standard Level III Level IV Chromatograms with final report Electronic Data Deliverables (EDDs)							-										