Annual Groundwater Monitoring Report 2019

KCHA Former Park Lake Homes
Maintenance Center Site
9800 8th Avenue SW
Seattle, Washington
VCP No. NW3033

for
King County Housing Authority

January 15, 2020

GeoEngineers
Earth Science + Technology

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2101 4th Avenue, Suite 950
Seattle, Washington 98121
206.728.2674

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File No. 1329-003-26

January 15, 2020

Prepared for:

King County Housing Authority
600 Andover Park West
Seattle, Washington 98188

Attention: John Eliason

Prepared by:

GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, Washington 98121
206.728.2674

Katy Ataktürk, LG
Project Manager

Dana Carlisle, PE
Principal

DANA L. CARLISLE
STATE OF WASHINGTON
29634
REGISTERED
PROFESSIONAL ENGINEER
1-16-20

KRA:DLC:cje

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1.0 INTRODUCTION AND BACKGROUND

This report presents the results of groundwater monitoring completed in 2019 at King County Housing Authority's (KCHA) Former Park Lake Homes Maintenance Center Site (site) located at 9800 8th Avenue SW in Seattle, Washington (Figure 1). The site is entered into Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP), VCP Site No. NW3033. KCHA intends to own and manage the areas within the site for the foreseeable future. The location of the site relative to surrounding physical features is shown in Figure 1. The general layout of the site is shown in Figure 2.

The Maintenance Center was removed in 2004/2005 and an independent Model Toxics Control Act (MTCA) cleanup of contaminated soil was completed by KCHA in 2005 (GeoEngineers 2005). After the 2005 cleanup action, the majority of soil underlying the former Maintenance Center was subsequently removed to depths up to 16 feet below original grade for the temporary CV4 construction stormwater pond (later backfilled, area shown in orange shading in Figure 2) and for the permanent CV3 water quality vault (area shown in yellow shading in Figure 2). The site was substantially redeveloped in 2006 for the purposes of KCHA infrastructure, housing, parking and common areas associated with KCHA's Greenbridge project. No evidence of contaminated soil was reported by KCHA representatives or contractors, or by GeoEngineers during geotechnical construction observation, and during soil removal for the CV4 construction stormwater pond and the CV3 water quality vault.

The site was entered into the VCP in late 2015, with a request for a No Further Action (NFA) opinion on the former Maintenance Center cleanup completed by KCHA. Ecology provided a "Further Action" letter to KCHA dated June 6, 2016, requesting groundwater characterization at the site. A modified scope of work for further action relative to site groundwater characterization was developed and approved by Ecology as documented in the May 30, 2017, email response from the VCP Site Manager, Mike Warfel. KCHA installed two monitoring wells (MW-1 and MW-2) in July 2017 to monitor groundwater conditions downgradient of the completed cleanup at the Maintenance Center. The results of 2017 and 2018 groundwater monitoring were submitted to Ecology (GeoEngineers 2018). In late 2018, KCHA requested Ecology's opinion to eliminate MW-1 from further routine groundwater sampling based on favorable groundwater quality at MW-1 for four consecutive sampling events. Ecology provided an Opinion Letter dated March 19, 2019, concurring that chemical analytical sampling of groundwater at monitoring well MW-1 was no longer required.

This report summarizes 2019 quarterly groundwater elevation data at MW-1 and MW-2, quarterly groundwater sampling results for MW-2, and one event of groundwater sampling at MW-1 completed in February 2019.

2.0 SCOPE OF SERVICES

The scope of services completed for annual groundwater monitoring included the following:

1. Survey the monitoring well casing rim elevations relative to NAVD88 datum. The well survey was completed by a licensed surveyor.
2. Measure groundwater parameters and water levels, and collect groundwater samples from the monitoring wells using low-flow sampling methods.

3. Submit the groundwater samples for chemical analysis of diesel- and heavy oil-range petroleum hydrocarbons by Northwest Method NWTPH-Dx and organochlorine pesticides by U.S. Environmental Protection Agency (EPA) Method 8081. The February 2019 groundwater samples also were analyzed for gasoline-range hydrocarbons, volatile organic compounds (VOCs), metals, and polycyclic aromatic hydrocarbons (PAHs). The March 2019 Ecology Opinion stated that future testing for gasoline-range hydrocarbons, VOCs, metals, and PAHs would not be required.
4. As requested by Ecology in their letter dated March 19, 2019, evaluate petroleum hydrocarbons in MW-2 groundwater in accordance with Ecology Implementation Memo #4 (Ecology 2004) to confirm groundwater petroleum hydrocarbon cleanup levels for the site.
5. Generate a waste disposal profile and oversee the transport and disposal of soil cuttings generated from the 2017 monitoring well drilling activities.

3.0 GROUNDWATER MONITORING

3.1. Groundwater Conditions

Quarterly groundwater monitoring in 2019 occurred on February 19, May 15, August 16 and November 22. The monitoring well casing rim elevations were surveyed by a licensed surveyor on May 19, 2019. Depth to groundwater and groundwater elevations (NAVD88) are summarized in Table 1. The local groundwater flow direction beneath the site is likely to the south; however, groundwater gradient maps have not been prepared because only two groundwater elevation data points are available at this time.

Groundwater samples from the monitoring wells were obtained using low-flow/low-turbidity sampling techniques to minimize the suspension of sediment in groundwater samples. Groundwater field measurements, including pH were obtained during each sampling event. Field procedures are described in Appendix A. Analytical laboratory reports are included in Appendix B.

3.1.1. Groundwater and Wastewater pH

Groundwater parameters obtained during each monitoring event are reported in Table A-1. Elevated pH was noted in MW-2 groundwater; elevated pH is suspected to be due to recycled crushed concrete that had been used nearby to stabilize the base of the CV4 stormwater pond excavation during backfilling several years ago. MW-2 pH in May, August and November 2019 was below 12.5.

Purge water generated from quarterly monitoring events from both wells was drummed and stored on KCHA property nearby. Wastewater pH was measured in August and November 2019 for the purpose of wastewater characterization and handling/disposal (Appendix A, Table A-1). pH in the wastewater was less than the dangerous waste threshold (<12.5 pH).

3.1.2. Groundwater Chemical Analytical Results

Groundwater samples were analyzed by OnSite Environmental, Inc. in Redmond, Washington. Groundwater analytical results are summarized in Table 2.

MW-1 was sampled only once during this reporting period (February 2019) because in March 2019 Ecology provided an opinion concurring with the discontinuation of sampling at MW-1 based on MTCA compliance for at least four successive quarters. Consistent with groundwater results at MW-1 during 2017 and 2018,

gasoline-, diesel- and heavy oil-range petroleum hydrocarbons and VOCs were not detected in the February 2019 groundwater sample from MW-1. Other analytes (metals, organochlorine pesticides and PAHs) either were not detected in MW-1 groundwater or the detected concentrations were less than MTCA cleanup levels.

MW-2 was sampled on a quarterly basis during 2019. Gasoline-range petroleum hydrocarbons, VOCs, metals, polychlorinated biphenyls (PCBs) and PAHs, which were only analyzed in February 2019 because MW-2 groundwater had complied with MTCA criteria for these analytes for at least four quarterly sampling events, were either non-detect or the detected concentrations were less than MTCA cleanup levels. Organochlorine pesticides in MW-2 groundwater were non-detect in February 19, August 16, and November 22, 2019. Organochlorine pesticides were not analyzed in May 2019 due to laboratory error. Diesel- and heavy oil-range hydrocarbons were detected in MW-2 groundwater during all four sampling events; the detected concentrations were greater than the MTCA Method A cleanup level except for in May 2019 when the concentration of diesel-range hydrocarbons was less than the cleanup level. Concentrations of diesel-range hydrocarbons in MW-2 groundwater samples in 2019 ranged from 0.37 to 0.83 milligrams per liter (mg/L). Concentrations of heavy oil-range hydrocarbons in MW-2 groundwater samples in 2019 ranged from 0.89 to 1.9 mg/L.

3.1.3. Petroleum Hydrocarbon Cleanup Levels

Ecology requested that KCHA evaluate the applicable method for comparing diesel- and heavy oil-range hydrocarbons detected in MW-2 groundwater to the MTCA Method A cleanup level, using guidance in Ecology's Implementation Memo #4 (Ecology 2004). According to Implementation Memo #4, when the petroleum product present represents a single petroleum product that extends across the diesel- and heavy oil-petroleum hydrocarbon ranges, then the detected concentrations of diesel- and heavy oil-range petroleum hydrocarbons should be summed and compared to the MTCA Method A cleanup level. However, if an evaluation of the petroleum hydrocarbon chromatogram confirms that two distinct petroleum products are present at the site, then the detected concentration of diesel-range petroleum hydrocarbons should be compared to the MTCA Method A cleanup level for diesel, and the detected concentration of heavy oil-range petroleum hydrocarbons should be compared to the MTCA Method A cleanup level for heavy oil.

GeoEngineers reviewed representative NWTPH-Dx chromatograms for soil and groundwater samples from MW-2, and for soil samples near to and upgradient of MW-2 obtained during the 2005 cleanup action. Based on our interpretation of the petroleum hydrocarbon chromatogram of 2005 soil sidewall sample Ex-2 (Figure 3), a single petroleum product in the diesel range is present in this sample. Based on our interpretation of the petroleum hydrocarbon chromatogram for the 2017 composited sample of soil cuttings from MW-1 and MW-2 drilling, a single petroleum product in the heavy oil range is present in this sample (Figure 3). Comparing these two sample results to the petroleum hydrocarbon chromatogram from the February 2019 MW-2 groundwater sample, two distinct petroleum products are apparent -- one in the diesel range and a second in the heavy-oil range. Given the apparent presence of two distinct petroleum products at MW-2 groundwater, the MTCA Method A cleanup levels for both diesel and heavy oil are used for comparison to the groundwater analytical results according to Ecology Implementation Memo #4.

4.0 DISCUSSION AND CONCLUSIONS

Four quarters of groundwater monitoring were completed in the vicinity of the Former Park Lake Homes Maintenance Center to assess groundwater quality relative to the soil cleanup performed at the site in 2005. Based on four quarterly groundwater sampling events in 2019 at MW-2, residual petroleum hydrocarbon impacts in the diesel- and heavy oil-ranges are present at concentrations greater than the MTCA Method A cleanup levels. The concentrations over time show an overall trend downward and are less than an order of magnitude higher than the MTCA Method A cleanup level. Organochlorine pesticides in the 2019 groundwater samples at MW-2 were not detected.

Based on site historical information, the 2005 cleanup, and the extensive soil removal that occurred at the site in connection with the Greenbridge redevelopment, the most likely source of residual petroleum hydrocarbons at MW-2 is an isolated pocket of residual petroleum-impacted soil that was not discovered during removal of the Maintenance Center and excavation of the CV4 stormwater pond. KCHA is evaluating options that may improve groundwater quality at MW-2.

Routine quarterly groundwater sampling at MW-2 is planned during 2020. MW-2 groundwater samples will be analyzed for diesel- and heavy oil-range petroleum hydrocarbons by Northwest Method NWTPH-Dx and organochlorine pesticides by EPA Method 8081.

5.0 REFERENCES

GeoEngineers, Inc. 2005. Independent Cleanup of Petroleum-Contaminated Soil, KCHA Maintenance Center Former Park Lake Homes, King County, Washington dated September 12, 2005.

GeoEngineers, Inc. 2015. Post-Cleanup Groundwater Confirmation Sampling Event, KCHA Former Park Lake Homes Maintenance Facility, Seattle, Washington, dated October 27, 2015.

GeoEngineers, Inc. 2016. Letter to Michael Warfel, KCHA Response to Ecology's June 2016 Further Action Letter, Former Park Lake Homes Maintenance Shop Site, VCP #NW3033, dated November 21, 2016.

GeoEngineers, Inc. 2018. Supplemental Groundwater Characterization Report, KCHA Former Park Lake Homes Maintenance Facility, Seattle, Washington, dated December 21, 2018.

Washington State Department of Ecology (Ecology). 2004. Implementation Memorandum #4, "Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil," dated June 22, 2004.

Washington State Department of Ecology (Ecology). 2017. Email response from Warfel, Michael, Site Manager of Voluntary Cleanup Program, "VCP NW3033, Park Lake Homes Maintenance Facility - Follow up", dated May 30, 2017.

Washington State Department of Ecology (Ecology). 2019. Warfel, Michael, Site Manager of Voluntary Cleanup Program, "NW3033 Opinion Letter," dated March 19, 2019.

TABLES

GeoEngineers

Table 1

Monitoring Well Elevation Data

King County Housing Authority - Former Park Lake Homes Maintenance Center

9800 8th Avenue SW, Seattle, Washington

Monitoring Well Identification[1] (TOC elevation in feet NAVD88)[2]	Date measured	Depth to Water (feet bgs)	Groundwater Elevation (feet NAVD88)	Well Screen (feet bgs)	
				Top	Bottom
MW-1 (407.41)	08/28/17	9.64	397.77	5	20
	12/01/17	7.37	400.04		
	04/30/18	8.12	399.29		
	07/18/18	9.81	397.60		
	10/18/18	10.18	397.23		
	02/19/19	7.19	400.22		
	05/15/19	9.33	398.08		
	08/16/19	10.64	396.77		
	11/22/19	10.66	396.75		
MW-2 (408.58)	08/28/17	7.99	400.59	5	20
	12/01/17	6.57	402.01		
	04/30/18	7.27	401.31		
	07/18/18	8.96	399.62		
	10/18/18	9.15	399.43		
	02/19/19	7.00	401.58		
	05/15/19	8.20	400.38		
	08/16/19	9.47	399.11		
	11/22/19	10.09	398.49		

Notes:

[1] Monitoring well locations are shown on Figure 2.

[2] Elevations measured by Goldsmith Land Development Services on May 19, 2019.

bgs = below ground surface

Table 2

Summary of Groundwater Chemical Analytical Data

King County Housing Authority - Former Park Lake Homes Maintenance Center

9800 8th Avenue SW, Seattle, Washington

Sample ID[1]		MW-1-170828	MW-1-171201	MW-1-180430	MW-1-180718	MW-1-181018	MW-1-190219	MW-2-170828	MW-2-171201	MW-2-180430	MW-2-180718	MW-2-181018	MW-2-190219	MW-2-190515	MW-2-190816	MW-2-191122	MTCA Method A or B Cleanup Level
Sample Date	**Units**	**08/28/17**	**12/01/17**	**04/30/18**	**07/18/18**	**10/18/18**	**02/19/19**	**08/28/17**	**12/01/17**	**04/30/18**	**07/18/18**	**10/18/18**	**02/19/19**	**05/15/19**	**08/16/19**	**11/22/19**	
Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx																	
Gasoline-Range	µg/L	<100	<100	<100	<100	<100	-	<100	<100	<100	<100	<100	<100	--	--	--	800[2]
Diesel-Range	mg/L	<0.26	<0.25	<0.26	<0.25	<0.25	<0.26	**0.89**	**0.83**	**0.52**	**0.49**	**0.70**	**0.55**	**0.37**	**0.53**	**0.83**	0.5
Oil-Range	mg/L	<0.42	<0.41	<0.41	<0.41	<0.40	<0.41	**2.5**	**2.2**	**2.0**	**1.4**	**1.7**	**1.8**	**0.89**	**1.1**	**1.9**	0.5
Totals Metals by EPA 6000/7000 Series or EPA 200.8																	
Arsenic	µg/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	--	--	--	5
Chromium	µg/L	<11	<11	30	<11	<11	<11	<11	<11	<11	<11	<11	<11	--	--	--	50
Nickel	µg/L	<22	<22	<22	<22	<22	<22	**23**	<22	<22	<22	<22	<22	--	--	--	320
Other (Cadium, Lead, Zinc)	µg/L	ND	ND	Lead- 2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	Lead - 15
Volatile Organic Compounds (VOCs) by EPA 8260[4]																	
Benzene	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.77**	**0.68**	**0.40**	**0.47**	**0.47**	**0.37**	--	--	--	5
Toluene	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.0**	<1.0	<1.0	<1.0	<1.0	--	--	--	1,000
Ethylbenzene	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.24**	**0.24**	<0.20	**0.23**	**0.23**	**0.28**	--	--	--	700
Total Xylenes[3]	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	**0.75**	**0.74**	**0.22**	**0.68**	**0.24**	**0.86**	--	--	--	1,000
Acetone[4]	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**11**	**6.6**	**10**	**9.6**	**7.0**	**5.2**	--	--	--	720
Carbon Disulfide	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.33**	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	--	800
1,2,4-Trimethylbenzene	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.27**	**0.27**	**0.23**	**0.26**	<0.20	**0.33**	--	--	--	NE
Naphthalene	µg/L	<1.0	<1.3	<1.3	<1.5	<1.5	<1.0	**1.2**	<1.3	<2.3	<1.5	<1.0	<1.0	--	--	--	160[5]
p-Isopropyltoluene	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**4.7**	**5.7**	**6.8**	**7.8**	**7.7**	**11.0**	--	--	--	NE
Polychlorinated Biphenyls (PCBs) by EPA 8082A																	
PCBs	µg/L	ND	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	varies
Organochlorine Pesticides by EPA 8081B[6]																	
Endosulfan I	µg/L	**0.012**	<0.0047	<0.0048	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	--[6]	<0.0051	<0.0047	NE
Heptachlor Epoxide	µg/L	<0.0047	<0.0047	<0.0048	<0.0047	<0.0047	<0.0047	<0.0047	**0.011**	<0.0047	**0.0053**	**0.0050**	<0.0047	--[6]	<0.0031	<0.0028	0.00479

Sample ID[1]		MW-1-170828	MW-1-171201	MW-1-180430	MW-1-180718	MW-1-181018	MW-1-190219	MW-2-170828	MW-2-171201	MW-2-180430	MW-2-180718	MW-2-181018	MW-2-190219	MW-2-190515	MW-2-190816	MW-2-191122	MTCA Method A or B Cleanup Level
Sample Date	**Units**	**08/28/17**	**12/01/17**	**04/30/18**	**07/18/18**	**10/18/18**	**02/19/19**	**08/28/17**	**12/01/17**	**04/30/18**	**07/18/18**	**10/18/18**	**02/19/19**	**05/15/19**	**08/16/19**	**11/22/19**	
Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270D/SIM[7]																	
Naphthalene	µg/L	<0.0094	<0.0047	<0.095	<0.096	<0.095	<0.094	**0.46**	**0.60**	**0.44**	**0.51**	**0.60**	**0.48**	--	--	--	
1-Methylnaphthalene	µg/L	<0.094	<0.0047	<0.095	<0.096	<0.095	<0.094	**0.30**	**0.37**	**0.30**	**0.35**	**0.39**	**0.35**	--	--	--	160[5]
2-Methylnaphthalene	µg/L	<0.094	<0.0047	<0.095	<0.096	<0.095	<0.094	**0.30**	**0.42**	**0.27**	**0.37**	**0.40**	**0.32**	--	--	--	
Benzo[a]anthracene (cPAH)	µg/L	<0.0094	<0.0047	<0.0095	**0.0100**	<0.0095	<0.0094	<0.094	<0.0094	**0.012**	<0.0096	<0.047	<0.0094	--	--	--	
Benzo[a]pyrene (cPAH)	µg/L	<0.0094	<0.0047	<0.0095	**0.0110**	<0.0095	<0.0094	<0.0094	<0.0094	<0.0097	<0.0096	<0.0094	<0.0094	--	--	--	
Benzo[b]fluoranthene (cPAH)	µg/L	<0.0094	<0.0047	**0.0098**	**0.0130**	<0.0095	**0.0095**	<0.0094	<0.0094	**0.0100**	<0.0096	<0.0094	**0.014**	--	--	--	
Benzo(k)fluoranthene (cPAH)	µg/L	<0.0094	<0.0047	<0.0095	<0.0096	<0.0095	<0.0094	<0.0094	<0.0094	<0.0097	<0.0096	<0.0094	**0.015**	--	--	--	see cPAHs (TEQ)
Chrysene (cPAH)	µg/L	<0.0094	<0.0047	**0.0110**	<0.0096	<0.0095	**0.012**	<0.094	<0.0094	<0.0097	<0.0096	<0.047	<0.0094	--	--	--	
Dibenz[a,h]anthracene (cPAH)	µg/L	<0.0094	<0.0047	<0.0095	<0.0096	<0.0095	<0.0094	<0.0094	<0.0094	<0.0097	<0.0096	<0.0094	<0.0094	--	--	--	
Indeno(1,2,3-c,d)pyrene (cPAH)	µg/L	<0.0094	<0.0047	<0.0095	<0.0096	<0.0095	<0.0094	<0.0094	<0.0094	<0.0097	<0.0096	<0.0094	<0.0094	--	--	--	
Total cPAHs (TEQ)[8]	µg/L	ND	ND	**0.007**	**0.015**	ND	**0.008**	ND	ND	**0.008**	ND	ND	**0.009**	--	--	--	0.1

Notes:

[1] Monitoring well locations are shown on Figure 2.

[2] When benzene is present the gasoline range cleanup level is 800 µg/L. When benzene is not present the range cleanup level is 1000 µg/L.

[3] Total xylenes is of the sum of m,p- and o- xylene. The higher detection limit is shown when xylenes were not detected.

[4] Acetone is a common laboratory solvent.

[5] Cleanup level for naphthalenes is the sum of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene.

[6] Laboratory error on hold time for pesticide analyses; data not produced.

[7] Only analytes detected in one or more samples were listed. See Laboratory reports in Appendix B for complete list of method analytes and detection limits.

[8] Total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) calculated using the toxicity equivalency (TEQ) methodology defined in WAC 173-340-708 (e)(iii)(A)(II). Where analytes were not detected, one half the detected limit was used for the calculation, except when all analytes were non-detect.

EPA = U.S. Environmental Protection Agency
mg/L = milligrams per liter
µg/L = micrograms per liter
ND = Not Detected
"--" = Not tested
NA = Not Applicable
Bold indicates analyte was detected.
Shading indicates analyte was detected at a concentration greater than the MTCA Cleanup Level.

FIGURES

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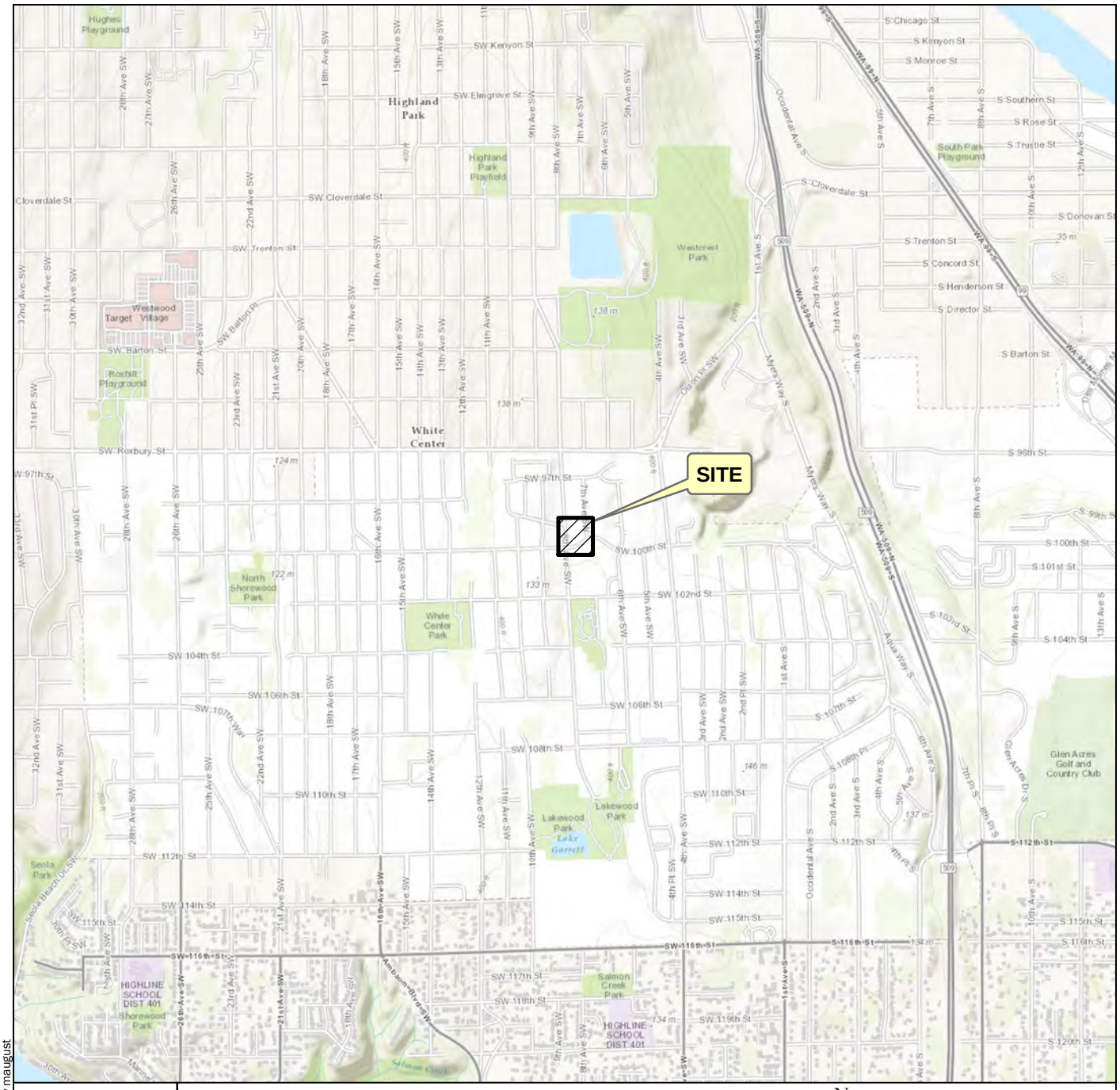

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Feet

Notes:

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

Data Source: Mapbox Open Street Map, 2015

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Former Park Lake Homes Maintenance Center
Seattle, Washington

GeoEngineers

Figure 1

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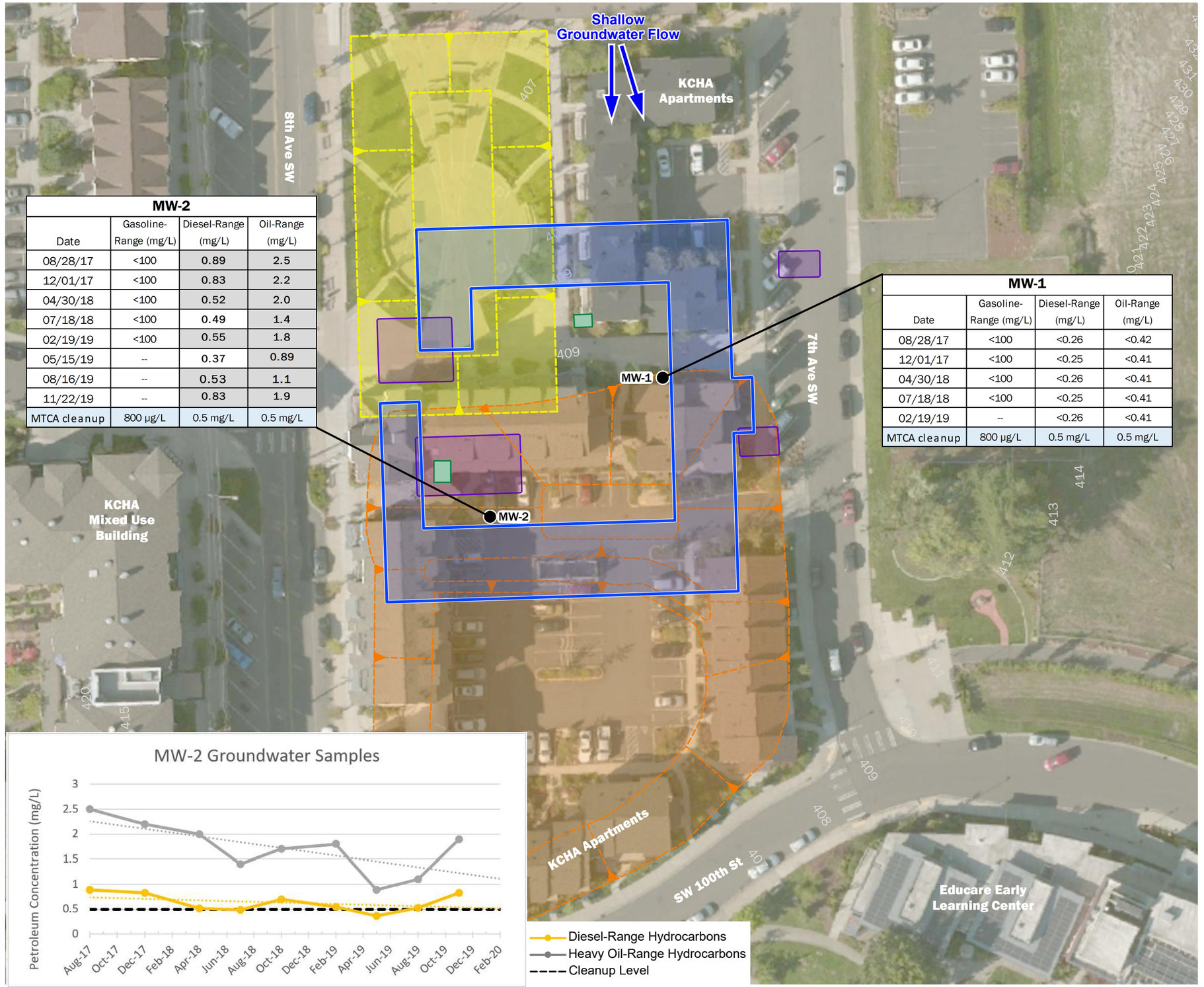

MW-2

Date	Gasoline-Range (mg/L)	Diesel-Range (mg/L)	Oil-Range (mg/L)
08/28/17	<100	0.89	2.5
12/01/17	<100	0.83	2.2
04/30/18	<100	0.52	2.0
07/18/18	<100	0.49	1.4
02/19/19	<100	0.55	1.8
05/15/19	--	0.37	0.89
08/16/19	--	0.53	1.1
11/22/19	--	0.83	1.9
MTCA cleanup	800 µg/L	0.5 mg/L	0.5 mg/L

MW-1

Date	Gasoline-Range (mg/L)	Diesel-Range (mg/L)	Oil-Range (mg/L)
08/28/17	<100	<0.26	<0.42
12/01/17	<100	<0.25	<0.41
04/30/18	<100	<0.26	<0.41
07/18/18	<100	<0.25	<0.41
02/19/19	--	<0.26	<0.41
MTCA cleanup	800 µg/L	0.5 mg/L	0.5 mg/L

Legend

- MW-1 ● Monitoring Well
- Approximate Footprint of Former Park Lake Homes Maintenance Center Building
- Approximate Location of Removed UST
- Approximate Location of 2005 Remedial Excavations - MTCA Cleanup at Maintenance Center
- Approximate Boundary of Backfilled CV4 Stormwater Pond Excavation
- Excavation for existing Water Quality Vault

Groundwater Chemical Analytical Results

2.0 Shading indicates analyte was detected at a concentration greater than the MTCA Cleanup Level for Unrestricted Land Use.

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FEET

Notes:

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

Data Source:

- Aerial from Microsoft Bing dated September 2013
- Stormwater Vault and Excavation from "Lake Garrett Sub-Basin Water Quality Vault Plan and Section", Sheet DF-3 by Goldsmith & Associates dated 10/25/2004
- Location of 2005 Remedial Excavations from "Final Cleanup Report, KCHA Maintenance Facility, Former Park Lake Homes, 9900 8th Avenue SW, Seattle, Washington," dated September 7, 2005 for King County Housing Authority, GEI File 1329-003-04
- CV4 Stormwater Pond Excavation Boundary and 2003/2004 Borings from "Geotechnical Engineering Services Greenbridge Hope VI Redevelopment Update Report" by GeoEngineers dated 1/12/2007
- Waterline Connection Location from "BDR Greenbridge Park Water Plan and Profile", Sheet WA-02 by ESM Consulting Engineers dated 4/26/2016

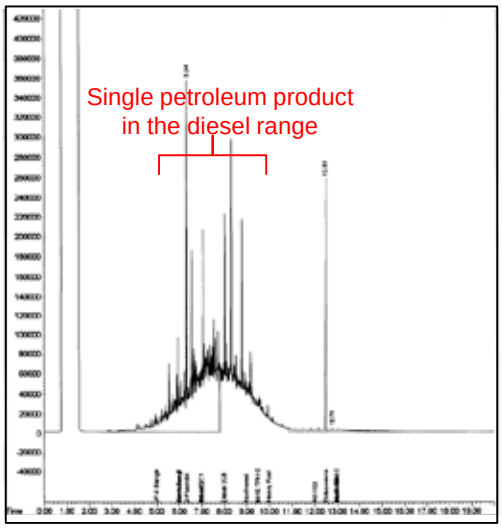
Site Plan with Groundwater Chemical Analytical Data

Former Park Lake Homes Maintenance Center
9800 8th Ave SW. Seattle, Washington

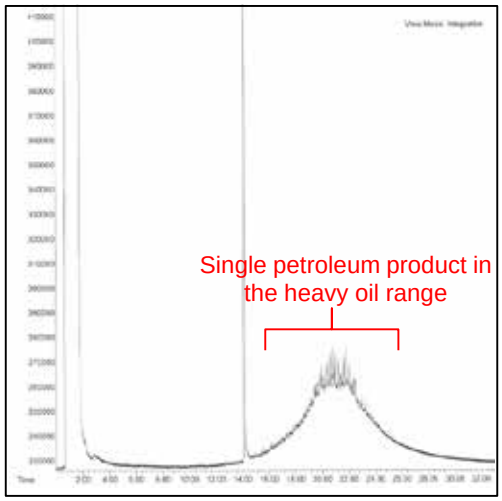
GeoEngineers

Figure 2

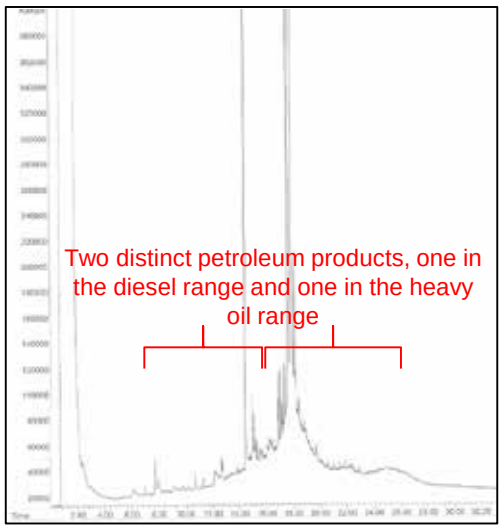
\\geoengineers.com\WAN\Projects\1\1329003\CAD\26\GW Assessment SAP\132900326_F02_Site Plan with Groundwater Chemical Analytical Data.dwg TAB:F02 Site Plan Date Exported: 12/20/19 15:20 by mwoods



Ex-2-6-10 Soil
NWTPH-Dx Chromatogram
Sample Date: 6/23/2005
(GeoEngineers, 2005)



MW-1 and MW-2 Drill Cuttings (Soil)
NWTPH-Dx Chromatogram
Sample Date: 8/28/2017
(GeoEngineers, 2018)



MW-2 Groundwater
NWTPH-Dx Chromatogram
Sample Date: 2/19/2019

Notes:

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

Site Samples NWTPH-Dx Chromatograms

Former Park Lake Homes Maintenance Center Site
Seattle, Washington

GeoEngineers

Figure 3

APPENDICES

GeoEngineers

APPENDIX A
Field Procedures

APPENDIX A
FIELD PROCEDURES

Groundwater Sample Collection and Handling

Groundwater samples were collected using a peristaltic pump with dedicated Teflon tubing at low-flow sampling rates. The groundwater was pumped at approximately 0.5 liter per minute until the water purged clear, after which the samples were collected at a flow rate of approximately 0.5 liter per minute (low-flow). A YSI water quality meter with flow-through-cell was used to monitor the following parameters during purging:

- Acidity (pH)
- Electrical conductivity (EC)
- Turbidity
- Dissolved oxygen (DO)
- Temperature
- Total dissolved solids (TDS)
- Oxygen reduction potential (ORP)
- Salinity

Collection of water samples began once these parameters were observed to vary by less than 10 percent on three consecutive measurements. Purge water generated during these activities was transferred the onsite dedicated purge water drum labeled with the date and origin of contents. Incidental waste generated during sampling activities such as gloves, plastic sheeting, paper towels and similar expended and discarded field supplies were disposed of in the local trash receptacle.

The groundwater samples were transferred directly from the tubing outlet to laboratory-prepared sample containers. New nitrile gloves were worn when collecting the groundwater samples. The sample containers were filled completely and placed in a cooler with ice pending transport to the analytical laboratory. Sample labels were completed for each sample. Chain-of-custody procedures were followed in transporting the samples to the laboratory.

Investigative Waste Disposal for Groundwater and Soil

No groundwater disposal events took place following the 2019 Opinion letter received from Ecology. Groundwater purged during quarterly monitoring events was stored in 55-gallon steel drums. The drums were temporarily stored on KCHA property nearby. pH measurements of investigation wastewater are tabulated in Table A-1; wastewater pH was below 12.5.

Drummed soil cuttings from the 2017 monitoring well drilling were transported to and disposed at Waste Management's Columbia Ridge Landfill (Subtitle D landfill) on July 19, 2019. The waste manifest and disposal certificate are presented in Appendix C.

Table A-1

Groundwater Field Parameter Data

King County Housing Authority - Former Park Lake Homes Maintenance Center

9800 8th Avenue SW, Seattle, Washington

Sample ID[1]		MW-1-170828	MW-1-171201	MW-1-180430	MW-1-180718	MW-1-181018	MW-1-190219	MW-2-170828	MW-2-171201	MW-2-180430	MW-2-180718	MW-2-181018	MW-2-190219	MW-2-190515	MW-2-190816	MW-2-191122
Monitoring Quarter		Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Sample Date	**Units**	08/28/17	12/01/17	04/30/18	07/18/18	10/18/18	02/19/19	08/28/17	12/01/17	04/30/18	07/18/18	10/18/18	02/19/19	05/15/19	08/16/19	11/22/19
Groundwater Field Parameters																
pH	pH	6.76	7.91	8.18	7.77	7.68	7.82	12.59	12.72	12.88	12.84	12.64	12.95	12.31	11.70	12.12
Specific Conductivity	µS/cm	310.9	257.5	234.9	239.2	238.7	283.2	2,463	2,106	1,839	2,081	2,121	1,742	1,795	1,986	1,872
Dissolved Oxygen	µg/L	2.56	4.41	4.64	3.26	4.14	6.04	0.06	0.07	0.17	0.08	0.07	0.09	0.13	0.08	0.08
Redox Potential	mV	198.2	188.2	186.7	146.5	159.6	245.7	-324.9	-202.5	-91.3	-213.6	-311.8	-212.3	-220.2	-235.9	-254.3
Turbidity	NTU	4.0	4.1	4.30	4.60	3.20	3.50	3.1	3.7	3.1	4.7	4.1	3.6	3.3	3.2	4.2
Purge Water Field Parameters																
Drummed Wastewater[2]	pH	--	--	--	--	--	--	--	--	--	--	--	--	--	11.76	11.79

Notes:

[1] Monitoring well locations are shown on Figure 2.

[2] Bulk pH measured from drum water grab sample.

µg/L = micrograms per liter

µS/cm = microSiemens per centimeter

mV = millivolts

NTU = nephelometric turbidity units;

NA = Not Applicable

APPENDIX B
Chemical Analytical Data

APPENDIX B
CHEMICAL ANALYTICAL DATA

Analytical Methods

Chain-of-custody procedures were followed during the transport of the soil and groundwater samples to the analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. The analytical results, analytical methods reference and laboratory quality control (QC) records are included in this appendix. The analytical results are also summarized in the text and tables of this report.

Analytical Data Review

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the validity of the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report. Data quality exceptions documented by the accredited laboratory were reviewed by GeoEngineers. Based on our data quality review, it is our opinion that the laboratory data qualifiers listed are not significant with regard to the use of the data for characterization purposes. The samples/results were considered of acceptable quality for their intended use in this report.

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

February 25, 2019

Katy Atakturk
GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, WA 98121

Re: Analytical Data for Project 1329-003-25
Laboratory Reference No. 1902-101

Dear Katy:

Enclosed are the analytical results and associated quality control data for samples submitted on February 19, 2019.

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,

David Baumeister
Project Manager

Enclosures

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

Case Narrative

Samples were collected on February 19, 2019 and received by the laboratory on February 19, 2019. 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.

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
MW-1-190219	02-101-01	Water	2-19-19	2-19-19	
MW-2-190219	02-101-02	Water	2-19-19	2-19-19	

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

GASOLINE RANGE ORGANICS
NWTPH-Gx

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
Gasoline	**ND**	100	NWTPH-Gx	2-19-19	2-19-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*66-117*				
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
Gasoline	**ND**	100	NWTPH-Gx	2-19-19	2-19-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*86*	*66-117*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

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-1-190219**					
Laboratory ID:	02-101-01					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	2-20-19	2-21-19	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	2-20-19	2-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*86*	*50-150*				
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
Diesel Range Organics	**0.55**	0.25	NWTPH-Dx	2-20-19	2-20-19	N
Lube Oil Range Organics	**1.8**	0.40	NWTPH-Dx	2-20-19	2-20-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*92*	*50-150*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
Dichlorodifluoromethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloromethane	ND	1.5	EPA 8260C	2-20-19	2-20-19	
Vinyl Chloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromomethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloroethane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Trichlorofluoromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Acetone	ND	5.0	EPA 8260C	2-20-19	2-20-19	
Iodomethane	ND	1.6	EPA 8260C	2-20-19	2-20-19	
Carbon Disulfide	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methylene Chloride	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl t-Butyl Ether	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Vinyl Acetate	ND	1.0	EPA 8260C	2-20-19	2-20-19	
2,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Butanone	ND	5.0	EPA 8260C	2-20-19	2-20-19	
Bromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chloroform	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Carbon Tetrachloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Benzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Trichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Dibromomethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromodichloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl Isobutyl Ketone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Toluene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
1,1,2-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Tetrachloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Hexanone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Dibromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromoethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Ethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
m,p-Xylene	ND	0.40	EPA 8260C	2-20-19	2-20-19	
o-Xylene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Styrene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromoform	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Isopropylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Propylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
4-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3,5-Trimethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
tert-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trimethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
sec-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
p-Isopropyltoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,4-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Hexachlorobutadiene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Naphthalene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*102*	*75-127*				
Toluene-d8	*105*	*80-127*				
4-Bromofluorobenzene	*108*	*78-125*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
Dichlorodifluoromethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloromethane	ND	1.5	EPA 8260C	2-20-19	2-20-19	
Vinyl Chloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromomethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloroethane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Trichlorofluoromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Acetone	5.2	5.0	EPA 8260C	2-20-19	2-20-19	
Iodomethane	ND	1.6	EPA 8260C	2-20-19	2-20-19	
Carbon Disulfide	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methylene Chloride	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl t-Butyl Ether	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Vinyl Acetate	ND	1.0	EPA 8260C	2-20-19	2-20-19	
2,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Butanone	ND	5.0	EPA 8260C	2-20-19	2-20-19	
Bromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chloroform	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Carbon Tetrachloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Benzene	0.37	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Trichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Dibromomethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromodichloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl Isobutyl Ketone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Toluene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
1,1,2-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Tetrachloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Hexanone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Dibromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromoethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Ethylbenzene	0.28	0.20	EPA 8260C	2-20-19	2-20-19	
m,p-Xylene	0.52	0.40	EPA 8260C	2-20-19	2-20-19	
o-Xylene	0.34	0.20	EPA 8260C	2-20-19	2-20-19	
Styrene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromoform	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Isopropylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Propylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
4-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3,5-Trimethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
tert-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trimethylbenzene	0.33	0.20	EPA 8260C	2-20-19	2-20-19	
sec-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
p-Isopropyltoluene	11	0.20	EPA 8260C	2-20-19	2-20-19	
1,4-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Hexachlorobutadiene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Naphthalene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*106*	*75-127*				
Toluene-d8	*109*	*80-127*				
4-Bromofluorobenzene	*114*	*78-125*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
alpha-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
gamma-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
beta-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
delta-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Heptachlor	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Aldrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Heptachlor Epoxide	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
gamma-Chlordane	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
alpha-Chlordane	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDE	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endosulfan I	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Dieldrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDD	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endosulfan II	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDT	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin Aldehyde	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Methoxychlor	**ND**	0.0093	EPA 8081B	2-21-19	2-21-19	
Endosulfan Sulfate	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin Ketone	**ND**	0.019	EPA 8081B	2-21-19	2-21-19	
Toxaphene	**ND**	0.047	EPA 8081B	2-21-19	2-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*88*	*28-110*				
DCB	*101*	*37-142*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
alpha-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
gamma-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
beta-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
delta-BHC	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Heptachlor	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Aldrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Heptachlor Epoxide	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
gamma-Chlordane	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
alpha-Chlordane	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDE	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endosulfan I	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Dieldrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDD	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endosulfan II	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
4,4'-DDT	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin Aldehyde	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Methoxychlor	**ND**	0.0094	EPA 8081B	2-21-19	2-21-19	
Endosulfan Sulfate	**ND**	0.0047	EPA 8081B	2-21-19	2-21-19	
Endrin Ketone	**ND**	0.019	EPA 8081B	2-21-19	2-21-19	
Toxaphene	**ND**	0.047	EPA 8081B	2-21-19	2-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*68*	*28-110*				
DCB	*68*	*37-142*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

PAHs EPA 8270D/SIM

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
Naphthalene	**ND**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
2-Methylnaphthalene	**ND**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
1-Methylnaphthalene	**ND**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]anthracene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Chrysene	**0.012**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[b]fluoranthene	**0.0095**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo(j,k)fluoranthene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]pyrene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Dibenz[a,h]anthracene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*65*	*21 - 110*				
Pyrene-d10	*81*	*19 - 111*				
Terphenyl-d14	*93*	*32 - 137*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

PAHs EPA 8270D/SIM

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
Naphthalene	**0.48**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
2-Methylnaphthalene	**0.35**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
1-Methylnaphthalene	**0.32**	0.094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]anthracene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Chrysene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[b]fluoranthene	**0.014**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo(j,k)fluoranthene	**0.015**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]pyrene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Dibenz[a,h]anthracene	**ND**	0.0094	EPA 8270D/SIM	2-22-19	2-22-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*96*	*21 - 110*				
Pyrene-d10	*83*	*19 - 111*				
Terphenyl-d14	*96*	*32 - 137*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
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TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-1-190219**					
Laboratory ID:	02-101-01					
Arsenic	**ND**	3.3	EPA 200.8	2-20-19	2-20-19	
Cadmium	**ND**	4.4	EPA 200.8	2-20-19	2-20-19	
Chromium	**ND**	11	EPA 200.8	2-20-19	2-20-19	
Lead	**ND**	1.1	EPA 200.8	2-20-19	2-20-19	
Nickel	**ND**	22	EPA 200.8	2-20-19	2-20-19	
Zinc	**ND**	28	EPA 200.8	2-20-19	2-20-19	
Client ID:	**MW-2-190219**					
Laboratory ID:	02-101-02					
Arsenic	**ND**	3.3	EPA 200.8	2-20-19	2-20-19	
Cadmium	**ND**	4.4	EPA 200.8	2-20-19	2-20-19	
Chromium	**ND**	11	EPA 200.8	2-20-19	2-20-19	
Lead	**ND**	1.1	EPA 200.8	2-20-19	2-20-19	
Nickel	**ND**	22	EPA 200.8	2-20-19	2-20-19	
Zinc	**ND**	28	EPA 200.8	2-20-19	2-20-19	

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

GASOLINE RANGE ORGANICS
NWTPH-Gx
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0219W1					
Gasoline	**ND**	100	NWTPH-Gx	2-19-19	2-19-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*87*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-101-01										
	ORIG	DUP									
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*86*	*85*	*66-117*			

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0220W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	2-20-19	2-20-19	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	2-20-19	2-20-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*93*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	02-101-01									
	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						*86* *93*	*50-150*			

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
METHOD BLANK QUALITY CONTROL
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Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0220W1					
Dichlorodifluoromethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloromethane	ND	1.5	EPA 8260C	2-20-19	2-20-19	
Vinyl Chloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromomethane	ND	0.36	EPA 8260C	2-20-19	2-20-19	
Chloroethane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Trichlorofluoromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Acetone	ND	5.0	EPA 8260C	2-20-19	2-20-19	
Iodomethane	ND	1.6	EPA 8260C	2-20-19	2-20-19	
Carbon Disulfide	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methylene Chloride	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl t-Butyl Ether	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Vinyl Acetate	ND	1.0	EPA 8260C	2-20-19	2-20-19	
2,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Butanone	ND	5.0	EPA 8260C	2-20-19	2-20-19	
Bromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chloroform	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Carbon Tetrachloride	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Benzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Trichloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Dibromomethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromodichloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chloroethyl Vinyl Ether	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Methyl Isobutyl Ketone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Toluene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260C	2-20-19	2-20-19	

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VOLATILE ORGANICS EPA 8260C
METHOD BLANK QUALITY CONTROL
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Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0220W1					
1,1,2-Trichloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Tetrachloroethene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Hexanone	ND	2.0	EPA 8260C	2-20-19	2-20-19	
Dibromochloromethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromoethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Chlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Ethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
m,p-Xylene	ND	0.40	EPA 8260C	2-20-19	2-20-19	
o-Xylene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Styrene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromoform	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Isopropylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Bromobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichloropropane	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Propylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
2-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
4-Chlorotoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3,5-Trimethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
tert-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trimethylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
sec-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,3-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
p-Isopropyltoluene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,4-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
n-Butylbenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Hexachlorobutadiene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
Naphthalene	ND	1.0	EPA 8260C	2-20-19	2-20-19	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260C	2-20-19	2-20-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*99*	*75-127*				
Toluene-d8	*101*	*80-127*				
4-Bromofluorobenzene	*102*	*78-125*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

VOLATILE ORGANICS EPA 8260C
SB/SBD QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result	Spike Level	Percent Recovery	Recovery Limits	Flags
SPIKE BLANK					
Laboratory ID:	SB0220W1				
1,1-Dichloroethene	**9.09**	10.0	91	62-129	
Benzene	**8.73**	10.0	87	77-127	
Trichloroethene	**9.28**	10.0	93	70-120	
Toluene	**9.49**	10.0	95	82-123	
Chlorobenzene	**9.32**	10.0	93	79-120	
Surrogate:					
Dibromofluoromethane			*99*	*75-127*	
Toluene-d8			*101*	*80-127*	
4-Bromofluorobenzene			*110*	*78-125*	

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

ORGANOCHLORINE PESTICIDES EPA 8081B METHOD BLANK QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0221W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
gamma-BHC	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
beta-BHC	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
delta-BHC	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Heptachlor	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Aldrin	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Heptachlor Epoxide	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
4,4'-DDE	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Endosulfan I	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Dieldrin	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Endrin	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
4,4'-DDD	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Endosulfan II	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
4,4'-DDT	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Methoxychlor	**ND**	0.010	EPA 8081B	2-21-19	2-21-19	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	2-21-19	2-21-19	
Endrin Ketone	**ND**	0.020	EPA 8081B	2-21-19	2-21-19	
Toxaphene	**ND**	0.050	EPA 8081B	2-21-19	2-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*83*	*28-110*				
DCB	*110*	*37-142*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

ORGANOCHLORINE PESTICIDES EPA 8081B SB/SBD QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB0221W1										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0847**	**0.0877**	0.100	0.100	N/A	**85**	**88**	59-107	3	15	
gamma-BHC	**0.0891**	**0.0908**	0.100	0.100	N/A	**89**	**91**	61-109	2	15	
beta-BHC	**0.0843**	**0.0883**	0.100	0.100	N/A	**84**	**88**	61-122	5	15	
delta-BHC	**0.0703**	**0.0732**	0.100	0.100	N/A	**70**	**73**	30-130	4	15	
Heptachlor	**0.0958**	**0.0963**	0.100	0.100	N/A	**96**	**96**	51-126	1	15	
Aldrin	**0.0949**	**0.0940**	0.100	0.100	N/A	**95**	**94**	46-125	1	15	
Heptachlor Epoxide	**0.0893**	**0.0909**	0.100	0.100	N/A	**89**	**91**	52-132	2	15	
gamma-Chlordane	**0.0969**	**0.0970**	0.100	0.100	N/A	**97**	**97**	52-129	0	15	
alpha-Chlordane	**0.0971**	**0.0993**	0.100	0.100	N/A	**97**	**99**	53-129	2	15	
4,4'-DDE	**0.0930**	**0.0940**	0.100	0.100	N/A	**93**	**94**	66-126	1	15	
Endosulfan I	**0.0957**	**0.0946**	0.100	0.100	N/A	**96**	**95**	56-143	1	15	
Dieldrin	**0.0996**	**0.100**	0.100	0.100	N/A	**100**	**100**	60-125	0	15	
Endrin	**0.102**	**0.105**	0.100	0.100	N/A	**102**	**105**	59-134	3	15	
4,4'-DDD	**0.0989**	**0.102**	0.100	0.100	N/A	**99**	**102**	69-137	3	15	
Endosulfan II	**0.0944**	**0.0964**	0.100	0.100	N/A	**94**	**96**	58-128	2	15	
4,4'-DDT	**0.107**	**0.110**	0.100	0.100	N/A	**107**	**110**	60-132	3	15	
Endrin Aldehyde	**0.0927**	**0.0944**	0.100	0.100	N/A	**93**	**94**	58-121	2	15	
Methoxychlor	**0.109**	**0.108**	0.100	0.100	N/A	**109**	**108**	67-137	1	15	
Endosulfan Sulfate	**0.0920**	**0.0939**	0.100	0.100	N/A	**92**	**94**	61-116	2	15	
Endrin Ketone	**0.0945**	**0.0942**	0.100	0.100	N/A	**94**	**94**	58-120	0	15	
Surrogate:											
TCMX						*88*	*79*	*28-110*			
DCB						*106*	*101*	*37-142*			

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

PAHs EPA 8270D/SIM
METHOD BLANK QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB0222W2					
Naphthalene	**ND**	0.10	EPA 8270D/SIM	2-22-19	2-22-19	
2-Methylnaphthalene	**ND**	0.10	EPA 8270D/SIM	2-22-19	2-22-19	
1-Methylnaphthalene	**ND**	0.10	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]anthracene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Chrysene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Benzo[a]pyrene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Indeno(1,2,3-c,d)pyrene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270D/SIM	2-22-19	2-22-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*89*	*21 - 110*				
Pyrene-d10	*90*	*19 - 111*				
Terphenyl-d14	*110*	*32 - 137*				

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

PAHs EPA 8270D/SIM
SB/SBD QUALITY CONTROL

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0222W2									
	SB	SBD	SB	SBD	SB	SBD				
Naphthalene	**0.434**	**0.384**	0.500	0.500	87	77	28 - 109	12	38	
Benzo[a]anthracene	**0.517**	**0.523**	0.500	0.500	103	105	57 - 127	1	15	
Chrysene	**0.485**	**0.503**	0.500	0.500	97	101	51 - 120	4	15	
Benzo[b]fluoranthene	**0.507**	**0.523**	0.500	0.500	101	105	54 - 124	3	17	
Benzo(j,k)fluoranthene	**0.511**	**0.519**	0.500	0.500	102	104	50 - 127	2	18	
Benzo[a]pyrene	**0.513**	**0.515**	0.500	0.500	103	103	50 - 120	0	16	
Indeno(1,2,3-c,d)pyrene	**0.528**	**0.539**	0.500	0.500	106	108	46 - 132	2	20	
Dibenz[a,h]anthracene	**0.526**	**0.533**	0.500	0.500	105	107	49 - 129	1	18	
Surrogate:										
2-Fluorobiphenyl					*90*	*73*	*21 - 110*			
Pyrene-d10					*93*	*94*	*19 - 111*			
Terphenyl-d14					*104*	*98*	*32 - 137*			

Date of Report: February 25, 2019
Samples Submitted: February 19, 2019
Laboratory Reference: 1902-101
Project: 1329-003-25

TOTAL METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0220WM1					
Arsenic	**ND**	3.3	EPA 200.8	2-20-19	2-20-19	
Cadmium	**ND**	4.4	EPA 200.8	2-20-19	2-20-19	
Chromium	**ND**	11	EPA 200.8	2-20-19	2-20-19	
Lead	**ND**	1.1	EPA 200.8	2-20-19	2-20-19	
Nickel	**ND**	22	EPA 200.8	2-20-19	2-20-19	
Zinc	**ND**	28	EPA 200.8	2-20-19	2-20-19	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-097-01										
	ORIG	DUP									
Arsenic	**4.67**	**4.07**	NA	NA		NA		NA	14	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Nickel	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	02-097-01										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**122**	**120**	111	111	4.67	**106**	**104**	75-125	1	20	
Cadmium	**114**	**114**	111	111	ND	**103**	**102**	75-125	0	20	
Chromium	**113**	**111**	111	111	ND	**102**	**100**	75-125	2	20	
Lead	**108**	**107**	111	111	ND	**97**	**96**	75-125	1	20	
Nickel	**110**	**108**	111	111	ND	**99**	**97**	75-125	2	20	
Zinc	**108**	**107**	111	111	ND	**98**	**97**	75-125	1	20	

OnSite Environmental Inc.

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.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, 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.

Z -

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

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEOENGINEERS
Project Number: 1329-003-25
Project Name: KCHA GREENBRIDGE
Project Manager: KATY ATAKTURK
Sampled by: BRIAN ANDERSON

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 02-101

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/~~Gx~~	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	cPAHs 8270 SIM	NAPHTHALENES	TOTAL METALS		% Moisture
1	MW-1-190219	2-19-19	1050	W	12		X		X	X						X							X	X	X		
2	MW-2-190219	2-19-19	0943	W	12		X		X	X						X							X	X	X		

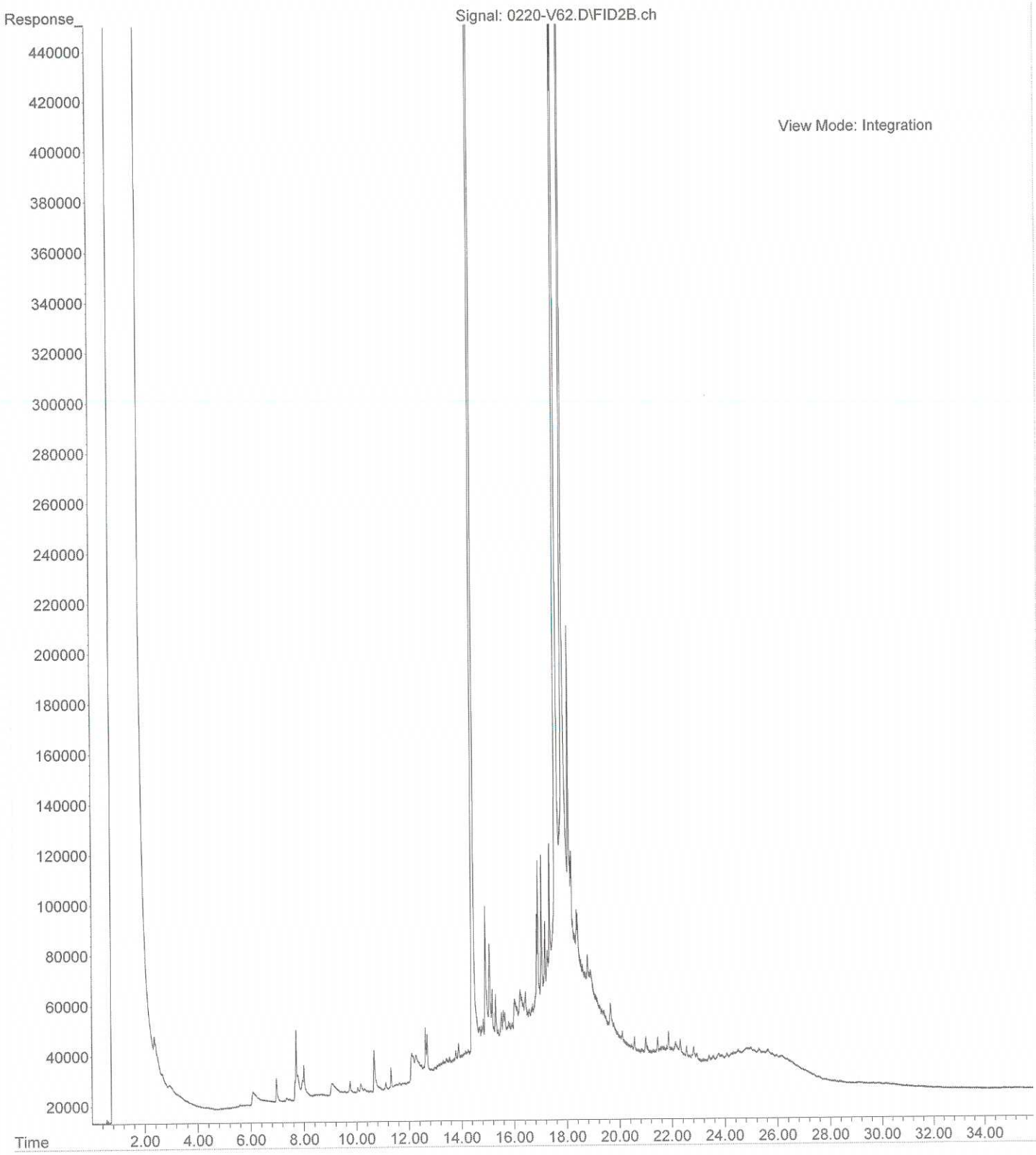
	Signature	Company	Date	Time
Relinquished	Brian Anderson	GEOENGINEERS	2-19-19	1328
Received		ONE	2/19/19	1328
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
METALS:
As, Cd, Cr, Ni, Pb, Zn EPA 200.8

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

File :C:\msdchem\2\data\V190220.SEC\0220-V62.D
Operator : JT
Acquired : 20 Feb 2019 15:31 using AcqMethod V180601F.M
Instrument : Vigo
Sample Name: 02-101-02
Misc Info :
Vial Number: 62



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

May 30, 2019

Katy Atakturk
GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, WA 98121

Re: Analytical Data for Project 1329-003-26
Laboratory Reference No. 1905-214

Dear Katy:

Enclosed are the analytical results and associated quality control data for samples submitted on May 15, 2019.

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,

David Baumeister
Project Manager

Enclosures

Date of Report: May 30, 2019
Samples Submitted: May 15, 2019
Laboratory Reference: 1905-214
Project: 1329-003-26

Case Narrative

Samples were collected on May 15, 2019 and received by the laboratory on May 15, 2019. 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.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: May 30, 2019
Samples Submitted: May 15, 2019
Laboratory Reference: 1905-214
Project: 1329-003-26

ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
MW-2-190515	05-214-01	Water	5-15-19	5-15-19	

Date of Report: May 30, 2019
Samples Submitted: May 15, 2019
Laboratory Reference: 1905-214
Project: 1329-003-26

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-2-190515**					
Laboratory ID:	05-214-01					
Diesel Range Organics	**0.37**	0.26	NWTPH-Dx	5-22-19	5-23-19	
Lube Oil Range Organics	**0.89**	0.42	NWTPH-Dx	5-22-19	5-23-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*82*	*50-150*				

Date of Report: May 30, 2019
Samples Submitted: May 15, 2019
Laboratory Reference: 1905-214
Project: 1329-003-26

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0522W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	5-22-19	5-22-19	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	5-22-19	5-22-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*89*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	SB0522W1										
	ORIG	DUP									
Diesel Fuel #2	**0.901**	**0.765**	NA	NA		NA		NA	16	NA	
Lube Oil Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Surrogate:											
o-Terphenyl						*103*	*98*	*50-150*			

OnSite Environmental Inc.

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 _____.

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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.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, 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.

Z -

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

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Chain of Custody

Laboratory Number: 05-214

Company: GEOENGINEERS
Project Number: 1329-003-26
Project Name: KOHA GREENBRIDGE
Project Manager: KATY ATAKTURK
Sampled by: BRIAN ANDERSON

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ ________ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	~~Organochlorine Pesticides 8081B~~ NO. D3	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A					% Moisture
1	MW-2-190515	5-15-19	0945	W	4				X							~~X~~											

	Signature	Company	Date	Time
Relinquished	Brian Anderson	GEOENGINEERS	5-15-19	1340
Received	[signature]	OSE	5/15/19	1340
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

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

August 26, 2019

Katy Atakturk
GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, WA 98121

Re: Analytical Data for Project 1329-003-26
Laboratory Reference No. 1908-213

Dear Katy:

Enclosed are the analytical results and associated quality control data for samples submitted on August 16, 2019.

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,

David Baumeister
Project Manager

Enclosures

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

Case Narrative

Samples were collected on August 16, 2019 and received by the laboratory on August 16, 2019. 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.

Organochlorine Pesticides by EPA 8081B Analysis:

The percent recovery values (%R) for alpha-BHC, delta-BHC,and 4,4'-DDE were above their respective quality control limits in the Spike Blank Duplicate. Due to the fact the sample was non-detect for these analytes and all other QC was within quality control limits, no further action was performed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
MW-2-190816	08-213-01	Water	8-16-19	8-16-19	

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

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-2-190816**					
Laboratory ID:	08-213-01					
Diesel Range Organics	**0.53**	0.26	NWTPH-Dx	8-20-19	8-21-19	N
Lube Oil Range Organics	**1.1**	0.41	NWTPH-Dx	8-20-19	8-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*72*	*50-150*				

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-190816**					
Laboratory ID:	08-213-01					
alpha-BHC	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
gamma-BHC	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
beta-BHC	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
delta-BHC	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Heptachlor	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Aldrin	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Heptachlor Epoxide	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
gamma-Chlordane	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
alpha-Chlordane	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
4,4'-DDE	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Endosulfan I	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Dieldrin	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Endrin	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
4,4'-DDD	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Endosulfan II	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
4,4'-DDT	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Endrin Aldehyde	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Methoxychlor	**0.018**	0.010	EPA 8081B	8-16-19	8-16-19	
Endosulfan Sulfate	**ND**	0.0051	EPA 8081B	8-16-19	8-16-19	
Endrin Ketone	**ND**	0.020	EPA 8081B	8-16-19	8-16-19	
Toxaphene	**ND**	0.051	EPA 8081B	8-16-19	8-16-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*54*	*32-103*				
DCB	*77*	*42-132*				

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0820W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	8-20-19	8-21-19	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	8-20-19	8-21-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*65*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	SB0820W1										
	ORIG	DUP									
Diesel Fuel #2	**0.936**	**0.812**	NA	NA		NA		NA	14	NA	
Lube Oil Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Surrogate:											
o-Terphenyl						*77*	*73*	*50-150*			

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B METHOD BLANK QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0816W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
gamma-BHC	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
beta-BHC	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
delta-BHC	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Heptachlor	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Aldrin	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Heptachlor Epoxide	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
4,4'-DDE	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Endosulfan I	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Dieldrin	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Endrin	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
4,4'-DDD	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Endosulfan II	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
4,4'-DDT	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Methoxychlor	**ND**	0.010	EPA 8081B	8-16-19	8-16-19	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	8-16-19	8-16-19	
Endrin Ketone	**ND**	0.020	EPA 8081B	8-16-19	8-16-19	
Toxaphene	**ND**	0.050	EPA 8081B	8-16-19	8-16-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*66*	*32-103*				
DCB	*98*	*42-132*				

Date of Report: August 26, 2019
Samples Submitted: August 16, 2019
Laboratory Reference: 1908-213
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B SB/SBD QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB0816W1										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0859**	**0.0933**	0.100	0.100	N/A	**86**	**93**	47-89	8	15	I
gamma-BHC	**0.0808**	**0.0873**	0.100	0.100	N/A	**81**	**87**	49-91	8	15	
beta-BHC	**0.0860**	**0.0940**	0.100	0.100	N/A	**86**	**94**	55-99	9	15	
delta-BHC	**0.0842**	**0.0909**	0.100	0.100	N/A	**84**	**91**	20-84	8	15	I
Heptachlor	**0.0812**	**0.0867**	0.100	0.100	N/A	**81**	**87**	49-106	7	15	
Aldrin	**0.0799**	**0.0850**	0.100	0.100	N/A	**80**	**85**	41-100	6	15	
Heptachlor Epoxide	**0.0818**	**0.0891**	0.100	0.100	N/A	**82**	**89**	48-112	9	15	
gamma-Chlordane	**0.0802**	**0.0863**	0.100	0.100	N/A	**80**	**86**	55-95	7	15	
alpha-Chlordane	**0.0790**	**0.0843**	0.100	0.100	N/A	**79**	**84**	53-101	6	15	
4,4'-DDE	**0.0972**	**0.104**	0.100	0.100	N/A	**97**	**104**	49-103	7	15	I
Endosulfan I	**0.0853**	**0.0916**	0.100	0.100	N/A	**85**	**92**	57-107	7	15	
Dieldrin	**0.0856**	**0.0921**	0.100	0.100	N/A	**86**	**92**	54-110	7	15	
Endrin	**0.0885**	**0.0955**	0.100	0.100	N/A	**89**	**95**	63-117	8	15	
4,4'-DDD	**0.0924**	**0.100**	0.100	0.100	N/A	**92**	**100**	52-111	8	15	
Endosulfan II	**0.0821**	**0.0885**	0.100	0.100	N/A	**82**	**89**	60-104	8	15	
4,4'-DDT	**0.0882**	**0.0944**	0.100	0.100	N/A	**88**	**94**	52-112	7	15	
Endrin Aldehyde	**0.0732**	**0.0787**	0.100	0.100	N/A	**73**	**79**	52-117	7	15	
Methoxychlor	**0.0889**	**0.0944**	0.100	0.100	N/A	**89**	**94**	60-128	6	15	
Endosulfan Sulfate	**0.0803**	**0.0859**	0.100	0.100	N/A	**80**	**86**	53-105	7	15	
Endrin Ketone	**0.0863**	**0.0898**	0.100	0.100	N/A	**86**	**90**	52-120	4	15	
Surrogate:											
TCMX						*62*	*67*	*32-103*			
DCB						*90*	*94*	*42-132*			

OnSite Environmental Inc.

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.

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.

Z -

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

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEOENGINEERS
Project Number: 1329-003-26
Project Name: KCHA GREENBRIDGE
Project Manager: KATY ATAKTURK
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 08-213

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A					% Moisture
1	MW-2-190816	8/16/19	0942	W	4				2							2											

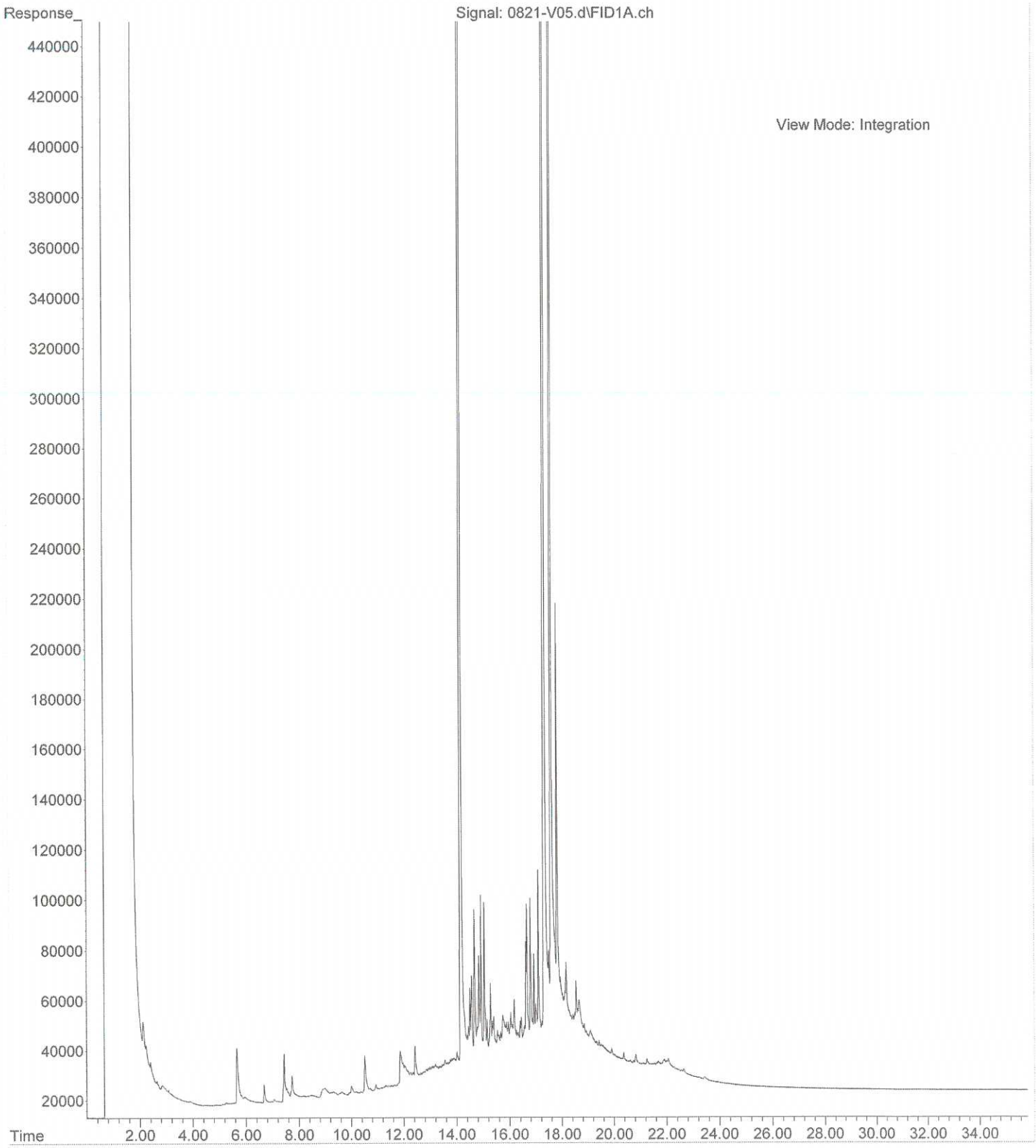
	Signature	Company	Date	Time
Relinquished	Brian Anderson	GEOENGINEERS	8-16-19	1237
Received		ONE	8/16/19	1237
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

File :X:\DIESELS\VIGO\DATA\V190821\0821-V05.d
Operator : JT
Acquired : 21 Aug 2019 8:20 using AcqMethod V180601F.M
Instrument : Vigo
Sample Name: 08-213-01
Misc Info :
Vial Number: 5



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

December 6, 2019

Katy Atakturk
GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, WA 98121

Re: Analytical Data for Project 1329-003-26
Laboratory Reference No. 1911-240

Dear Katy:

Enclosed are the analytical results and associated quality control data for samples submitted on November 22, 2019.

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,

David Baumeister
Project Manager

Enclosures

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

Case Narrative

Samples were collected on November 22, 2019 and received by the laboratory on November 22, 2019. 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.

Organochlorine Pesticides by EPA 8081B Analysis

The percent recovery values (%R) for alpha-BHC, gamma-BHC, and delta-BHC were above their respective quality control limits in the Spike Blank and Spike Blank Duplicate. The percent recoveries for Endrin Aldehyde in the Spike Blank and Spike Blank duplicate were below their respective control limits. Due to the fact the sample was non-detect, all other QC was within quality control limits, and hold time has expired, no further action was performed.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
MW-2-191122	11-240-01	Water	11-22-19	11-22-19	

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

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-2-191122**					
Laboratory ID:	11-240-01					
Diesel Range Organics	**0.83**	0.20	NWTPH-Dx	11-25-19	11-26-19	
Lube Oil Range Organics	**1.9**	0.20	NWTPH-Dx	11-25-19	11-26-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*109*	*50-150*				

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-2-191122**					
Laboratory ID:	11-240-01					
alpha-BHC	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
gamma-BHC	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
beta-BHC	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
delta-BHC	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Heptachlor	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Aldrin	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Heptachlor Epoxide	**ND**	0.0028	EPA 8081B	11-26-19	11-27-19	
gamma-Chlordane	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
alpha-Chlordane	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
4,4'-DDE	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Endosulfan I	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Dieldrin	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Endrin	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
4,4'-DDD	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Endosulfan II	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
4,4'-DDT	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Endrin Aldehyde	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Methoxychlor	**ND**	0.0095	EPA 8081B	11-26-19	11-27-19	
Endosulfan Sulfate	**ND**	0.0047	EPA 8081B	11-26-19	11-27-19	
Endrin Ketone	**ND**	0.019	EPA 8081B	11-26-19	11-27-19	
Toxaphene	**ND**	0.047	EPA 8081B	11-26-19	11-27-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*56*	*32-103*				
DCB	*52*	*42-132*				

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1125W1					
Diesel Range Organics	**ND**	0.20	NWTPH-Dx	11-25-19	11-25-19	
Lube Oil Range Organics	**ND**	0.20	NWTPH-Dx	11-25-19	11-25-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*108*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	SB1125W1										
	ORIG	DUP									
Diesel Fuel #2	**0.506**	**0.503**	NA	NA		NA		NA	1	NA	
Lube Oil Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Surrogate:											
o-Terphenyl						*118*	*119*	*50-150*			

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1126W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
gamma-BHC	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
beta-BHC	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
delta-BHC	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Heptachlor	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Aldrin	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-26-19	11-27-19	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Dieldrin	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Endrin	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Methoxychlor	**ND**	0.010	EPA 8081B	11-26-19	11-27-19	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-26-19	11-27-19	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-26-19	11-27-19	
Toxaphene	**ND**	0.050	EPA 8081B	11-26-19	11-27-19	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*43*	*32-103*				
DCB	*48*	*42-132*				

Date of Report: December 6, 2019
Samples Submitted: November 22, 2019
Laboratory Reference: 1911-240
Project: 1329-003-26

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB1126W1										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0952**	**0.0969**	0.100	0.100	N/A	**95**	**97**	47-89	2	15	I,I
gamma-BHC	**0.0924**	**0.0886**	0.100	0.100	N/A	**92**	**89**	49-91	4	15	I
beta-BHC	**0.0931**	**0.0888**	0.100	0.100	N/A	**93**	**89**	55-99	5	15	
delta-BHC	**0.0882**	**0.0776**	0.100	0.100	N/A	**88**	**78**	20-84	13	15	I
Heptachlor	**0.0860**	**0.0756**	0.100	0.100	N/A	**86**	**76**	49-106	13	15	
Aldrin	**0.0771**	**0.0672**	0.100	0.100	N/A	**77**	**67**	41-100	14	15	
Heptachlor Epoxide	**0.0792**	**0.0750**	0.100	0.100	N/A	**79**	**75**	48-112	5	15	
gamma-Chlordane	**0.0753**	**0.0697**	0.100	0.100	N/A	**75**	**70**	55-95	8	15	
alpha-Chlordane	**0.0717**	**0.0671**	0.100	0.100	N/A	**72**	**67**	53-101	7	15	
4,4'-DDE	**0.0851**	**0.0813**	0.100	0.100	N/A	**85**	**81**	49-103	5	15	
Endosulfan I	**0.0739**	**0.0708**	0.100	0.100	N/A	**74**	**71**	57-107	4	15	
Dieldrin	**0.0812**	**0.0770**	0.100	0.100	N/A	**81**	**77**	54-110	5	15	
Endrin	**0.0892**	**0.0832**	0.100	0.100	N/A	**89**	**83**	63-117	7	15	
4,4'-DDD	**0.0979**	**0.0950**	0.100	0.100	N/A	**98**	**95**	52-111	3	15	
Endosulfan II	**0.0768**	**0.0724**	0.100	0.100	N/A	**77**	**72**	60-104	6	15	
4,4'-DDT	**0.0768**	**0.0684**	0.100	0.100	N/A	**77**	**68**	52-112	12	15	
Endrin Aldehyde	**0.0468**	**0.0444**	0.100	0.100	N/A	**47**	**44**	52-117	5	15	I,I
Methoxychlor	**0.0834**	**0.0759**	0.100	0.100	N/A	**83**	**76**	60-128	9	15	
Endosulfan Sulfate	**0.0616**	**0.0603**	0.100	0.100	N/A	**62**	**60**	53-105	2	15	
Endrin Ketone	**0.0737**	**0.0694**	0.100	0.100	N/A	**74**	**69**	52-120	6	15	
Surrogate:											
TCMX						*69*	*59*	*32-103*			
DCB						*81*	*77*	*42-132*			

OnSite Environmental Inc.

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.

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.

Z -

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

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEOENGINEERS
Project Number: 1329-003-26
Project Name: KCHA - GREENBRIDGE
Project Manager: KATY ATAKTURK
Sampled by: BRIAN ANDERSON

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 11-240

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A					% Moisture
1	MW-2-191122	11-22-19	0922	W	4				X							X											

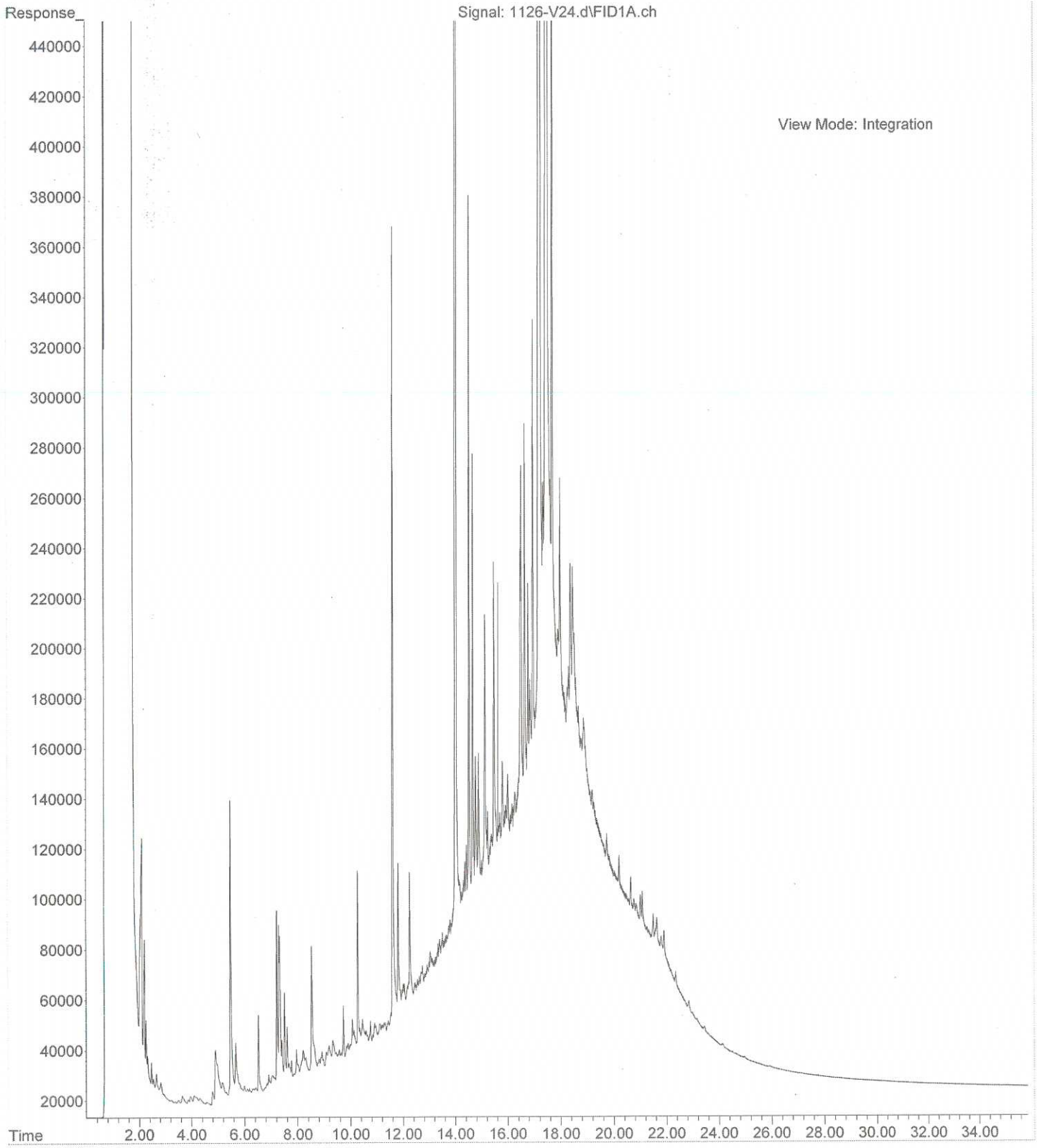
	Signature	Company	Date	Time
Relinquished	Brian Anderson	GEOENGINEERS	11-22-19	1705
Received		CORE	11/22/19	1705
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

File : X:\DIESELS\VIGO\DATA\V191126\1126-V24.d
Operator : JT
Acquired : 26 Nov 2019 23:07 using AcqMethod V180601F.M
Instrument : Vigo
Sample Name: 11-240-01
Misc Info :
Vial Number: 24



APPENDIX C
Waste Manifest for Soil Disposal

CWMI

471843

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	N/A	2	(800)424-9300	KCHA71119-CWM1

5. Generator's Name and Mailing Address
KING COUNTY HOUSING AUTHORITY
9800 8TH AVE SW
SEATTLE WA 98106
Generator's Phone: (206)574-1196

Generator's Site Address (if different than mailing address)
740 SW 96TH CIRCLE
SEATTLE, WA 98106

6. Transporter 1 Company Name: CHEMICAL WASTE MANAGEMENT, INC. — U.S. EPA ID Number: ORD089452353

7. Transporter 2 Company Name: UPRR — U.S. EPA ID Number: NED001792810

8. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
Facility's Phone: (541)454-2643
U.S. EPA ID Number: ORD089452353

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	MATERIAL NOT REGULATED BY D.O.T. OR342342	4	DM	2800	P	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
1. OR342342-LF01-FUEL OIL IMPACTED SOIL/DEBRIS

WMXJ 980571

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: JOSHUA BOWEN — Signature — Month 7 Day 19 Year 19

INT'L
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER
16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: PAT LAVRAT — Signature — Month 7 Day 19 Year 19
Transporter 2 Printed/Typed Name: JR — Signature — Month 7 Day 23 Year 19

DESIGNATED FACILITY
17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) — Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name: Becky Sumner — Signature: Becky Sumner — Month 8 Day 8 Year 19

169-BLC-O 6 10498 (Rev. 9/09)

DESIGNATED FACILITY TO GENERATOR

AMS

CWMI

471843

NON-HAZARDOUS WASTE MANIFEST (Continuation Sheet)

19. Generator ID Number: N/A

20. Page 2 of 2

21. Waste Tracking Number: KCHA71119-CWM1

22. Generator's Name: KING COUNTY HOUSING AUTHORITY

23. Transporter 3 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

24. Transporter ____ Company Name — U.S. EPA ID Number

GENERATOR

	25. Waste Shipping Name and Description	26. Containers No.	26. Containers Type	27. Total Quantity	28. Unit Wt./Vol.	

29. Special Handling Instructions and Additional Information

WMXU 980571

TRANSPORTER

30. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name: Jan L Gaffney — Signature: Jan L Gaffney — Month: 9 Day: 24 Year: 19

31. Transporter ____ Acknowledgment of Receipt of Materials

Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

32. Discrepancy

170-BLC-O 6 10502 (Rev. 8/06)

DESIGNATED FACILITY TO GENERATOR

APPENDIX D
Report Limitations and Guidelines for Use

APPENDIX D
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geosciences practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of King County Housing Authority (KCHA) and their authorized agents and regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment or remedial action study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except KCHA should rely on this report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report Is Based on a Unique Set of Project-Specific Factors

This report applies to the Former Park Lake Homes Maintenance Center Site located at 9800 8th Avenue SW located in Seattle, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

[1] Developed based on material provided by GBA, The GeoProfessional Business Association; www.gba.org.

Reliance Conditions for Third Parties

No third party may rely on the product of our services unless GeoEngineers agrees in advance, and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Environmental Regulations Are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Subsurface Conditions Can Change

This report is based on conditions that existed at the time our site studies were performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes and slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Do Not Redraw the Exploration Logs

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproduction is acceptable but recognize that separating logs from the report can elevate risk.

Geotechnical, Geologic and Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Soil and Groundwater End Use

The cleanup levels referenced in this report are site- and situation-specific. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject site to another location or its reuse on site in instances that we were not aware of or could not control.

Most Environmental Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

GeoEngineers