GeoEngineers
Fourth & Blanchard Building
2101 4th Avenue, Suite 950
Seattle, Washington 98121
206.728.2674

December 18, 2020

Washington State Department of Ecology
Toxics Cleanup Program
3190 160th Avenue SE
Bellevue, Washington 98008

Attention: Jing Liu

Subject: Request for Reduced Compliance Groundwater Monitoring
North Lot Development
Seattle, Washington
Cleanup Site ID 1966
GeoEngineers File No. 19837-007-01

This letter presents the results of the compliance groundwater monitoring conducted to date for the North Lot Development (herein referred to as "Site") and a request to reduce the monitoring effort required for the Site, based on a comprehensive review and evaluation of the groundwater monitoring data. The Site is formally referenced in the Washington State Department of Ecology (Ecology) databases as North Lot Development (Facility ID: 5378137; Cleanup Site ID: 1966) and is comprised of two parcels (East and West Parcels) located north of CenturyLink Field, at the southeast intersection of South King Street and Occidental Avenue South in Seattle, Washington (Figures 1 and 2).

In January 2014, North Lot Development, LLC (NLD) and 255 South King Street LP entered into a Consent Decree (No. 11-2-27892-1) with Ecology (superseding the 2011 Prospective Purchaser Consent Decree [PPCD]) for cleanup of the Site. Pursuant to the Consent Decree, compliance groundwater monitoring is being performed in accordance with the Cleanup Action Plan (CAP; Ecology 2011) and CAP Addendum (Landau 2013) to assess and document the contaminant concentrations in groundwater and groundwater flow direction following cleanup actions at the Site.

Cleanup actions performed at the Site, and the subsequent monitoring activities to document groundwater conditions, are summarized in the following sections. Detailed information regarding the cleanup actions performed at the Site are documented in the West Block and East Block Cleanup Action Reports (Landau 2012 and Rothman 2019a).

BACKGROUND INFORMATION

The Site, which is located in the Pioneer Square area of Seattle, Washington, consists of two rectangular parcels (East and West Parcels) covering approximately 3.87 acres of land. The 2011 remedial investigation (Landau 2011a) indicated that the Site and surrounding area was originally undeveloped tide

flats of Elliott Bay and was later filled and developed in the 1890s and early 1900s. Early Site structures included engine maintenance buildings, sand houses, coal houses, oil houses, material storage areas and several sets of railroad tracks. In the 1970s, King County purchased the Site to facilitate construction of the Kingdome Stadium and parking lot which was later redeveloped into the existing Century Link Field. North Lot Development purchased the approximately 3.87-acre parking lot property from King County in 2011, and subsequently sold the portion now known as the East Parcel to 255 South King Street LP in 2013. Both the East and West Parcels have been redeveloped with mixed-use structures.

Remedial investigations completed at the Site between 2008 and 2014 identified heterogeneous fill to depths up to 20 feet below ground surface (bgs). Chemical analysis of soil samples collected during these investigations identified concentrations of the contaminants of concern (COCs) consisting of petroleum hydrocarbons, benzene, arsenic, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) at concentrations greater than the Ecology Model Toxics Control Act (MTCA) cleanup levels.

Soil and debris with contaminant concentrations greater than the MTCA cleanup levels was removed for appropriate off-site disposal as part of construction excavation for Site redevelopment. Following excavation, engineering controls consisting of protective barriers (i.e., building foundation walls, floors, and paved surfaces) were utilized to isolate the remaining contaminant-containing soil and debris and prevent direct human contact with the residual contaminated media. In addition, the below-grade parking levels of the East Parcel building were constructed with an impermeable seal-slab floor system with a water barrier that was designed to mitigate the potential for chemical vapor intrusion due to residual contamination remaining on the East Parcel. In addition to engineering controls, the cleanup action includes an Environmental Covenant for each parcel to restrict the disturbance of the protective barriers, disturbance of the underlying soil and use of groundwater as drinking water. The covenant for the West Parcel was recorded in 2020.

COMPLIANCE GROUNDWATER MONITORING

Groundwater compliance monitoring is being conducted at the Site to evaluate groundwater conditions within and/or down gradient of areas where the COCs were detected in soil at concentrations greater than the Site-specific cleanup levels agreed to with Ecology. Groundwater monitoring activities are documented in the following reports:

- Groundwater Monitoring Report, Third Quarter 2017 (Rothman 2017a)
- Groundwater Monitoring Report, Fourth Quarter 2017 (Rothman 2017b)
- Groundwater Monitoring Report, First Quarter 2018 (Rothman 2018a)
- Groundwater Monitoring Report, Second Quarter 2018 (Rothman 2018b)
- Groundwater Monitoring Report, Third Quarter 2018 (Rothman 2018c)
- Groundwater Monitoring Report, Fourth Quarter 2018 (Rothman 2019b)
- Groundwater Monitoring Report, First Quarter 2019 (Rothman 2019c)
- Groundwater Monitoring Report, Second Quarter 2019 (Rothman 2019d)
- Annual Groundwater and Indoor Vapor Monitoring Report - 2020 (EHSI 2020)

Performance criteria, sampling locations, monitoring procedures and chemical analysis for the groundwater monitoring are summarized in the following sections.

Monitoring Program

In accordance with the CAP, initial sampling and analysis of monitoring wells was planned to be conducted on a quarterly basis for 1-year followed by 4 years of annual monitoring. The CAP requires that the frequency of monitoring be adjusted as needed based on the groundwater analytical results if analytes are detected at concentrations greater than the Site-specific cleanup levels. After 5 years of consecutive quarters with no analytes detected at concentrations greater than the Site-specific cleanup levels, the CAP provides for reductions in both the monitoring frequency and the number of sampling locations, as appropriate, based on Site conditions and upon Ecology approval. This letter includes a proposed reduction in the required monitoring program based on the monitoring data collected to date.

Monitoring Well Network

In accordance with the CAP, the monitoring program consisted of two monitoring wells located adjacent to the north of the East Parcel (MW-16D and MW-18D), two monitoring wells (MW-19 and MW-20) on the West Parcel, and two wells (MW-21 and MW-22) on the East Parcel. The selected locations and rational for the compliance monitoring wells are as follows:

- MW-16D and MW-18D – To monitor groundwater north of the East Parcel downgradient of residual creosote-like material identified at the base of the fill.
- MW-19 – To evaluate groundwater north of the West Parcel near the eastern extent of the former gasoline station area.
- MW-20 – To evaluate groundwater northwest of the West Parcel adjacent to the former gasoline station area.
- MW-21 – To evaluate groundwater northeast of the East Parcel downgradient from off-property areas with elevated arsenic concentrations in groundwater.
- MW-22 – To evaluate groundwater southeast of the East Parcel downgradient from off-property areas with elevated arsenic concentrations in groundwater.

The locations of the monitoring wells are shown relative to the Site and surrounding area on Figure 2.

Groundwater Sampling and Analysis

The compliance groundwater samples are being obtained using low-flow/low-turbidity sampling techniques during each monitoring event to minimize the suspension of sediment in groundwater samples. A water quality meter is used to monitor the following parameters during purging:

- Acidity (pH);
- Conductivity;
- Turbidity;
- Dissolved oxygen (DO);
- Temperature; and
- Oxygen reduction potential (ORP).

Water samples are collected following stabilization of the water quality parameters. The samples are then placed in an iced cooler and kept at temperatures below 4 degrees Celsius until delivery to testing laboratory. Groundwater samples collected for dissolved metals analyses are field-filtered using a 0.45-micron membrane filter. A blind duplicate sample is collected for quality control purposes.

Prior to sampling, each of the groundwater monitoring wells is opened and allowed to equilibrate to atmospheric pressure. The depth to groundwater is then measured at each well using an electronic water level sounder. Water and well depths are measured from a permanent mark on the north side of the top of the casing.

Groundwater Gradient and Flow Direction

Measured depth to groundwater and groundwater elevations for each monitoring event are summarized in Table 1. Figures 2 and 3 display the groundwater elevations measured at the Site for selected dry (August 2017; lowest dry season elevations) and wet (December 2018; highest wet season elevations) season monitoring events, respectively.

The results of the groundwater monitoring conducted to date indicate that groundwater flow across the East Parcel is consistently to the northeast and that groundwater flow across the West Parcel is consistently to the west-southwest. Local groundwater flow direction appears to be affected by the foundation drain system at the Site and the foundation drain system at the King Street Center building (parcel 524780079) located north of the Site as documented in the Remedial Investigation/Feasibility Study (RI/FS). Area groundwater flow is to the west toward Puget Sound.

In general, groundwater at the Site is located between 5 and 10 feet below local ground surface and the groundwater elevations have fluctuated approximately 2 feet since monitoring began in August 2017.

Chemical Analytical Results

In accordance with the CAP and CAP Addendum, groundwater samples collected from the Site are being submitted for laboratory chemical analyses for a combination of the following:

- Gasoline-range total petroleum hydrocarbons by Ecology Method NWTPH-Gx.
- Diesel- and oil-range total petroleum hydrocarbons by Ecology Method NWTPH-Dx.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8021B.
- Metals by EPA Method 6020B.
- cPAHs by EPA Method 8270SIM.

The chemical analytical results for the samples collected to date are summarized in Table 1. Review of the chemical analytical data indicates the following regarding Site groundwater conditions:

- Gasoline-range petroleum hydrocarbons were not detected at a concentration greater than the laboratory reporting limit in any of the samples collected from the monitoring wells.
- Diesel- and oil-range petroleum hydrocarbons have not been consistently detected at concentrations greater than the laboratory reporting limits, and the detected concentrations are

limited and generally less than the Site-specific cleanup level. The exception has been the diesel-range concentrations detected in the samples collected at well MW-22 (upgradient monitoring well) during the first and second quarter 2018 monitoring events.

In these two samples from MW-22, the detected diesel-range petroleum hydrocarbon concentrations were slightly greater than the Site-specific cleanup level. However, as noted in the various monitoring reports, the laboratory analytical reports indicate that the chromatographic pattern for the analysis of most of the samples where diesel- and/or oil-range petroleum hydrocarbons were detected at concentrations greater than the laboratory reporting limits, including the two diesel-range detections greater than the Site-specific cleanup level, did not resemble the fuel standard used for quantitation. These findings by the laboratory during the sample analyses and the noted presence of wood debris at the sample locations where diesel- and oil-range petroleum hydrocarbons have been detected at concentrations greater than the laboratory reporting limits (MW-19, MW-20, MW-22), suggest that the data are biased by interferences from wood biodegradation products.

Ecology, in its July 19, 2018 opinion letter referenced below, noted the potential for bias or interference(s) in the petroleum hydrocarbon analyses. Ecology also recommended silica gel "cleanup" prior to analysis to remove the biogenic organic materials that may be present from biodegradation of wood debris.

The silica gel cleanup was subsequently included as part of the NWTPH-Dx analyses for the samples collected from MW-22 in September 2018, July 2019, and January 2020 (see Table 1). As part of these monitoring events, the NWTPH-Dx analysis was run both with and without the silica gel cleanup to allow for comparison of the results.

In the all cases where the silica gel cleanup was used prior to sample analysis, diesel-range petroleum hydrocarbons were not detected at a concentration greater than the laboratory reporting limit. The results indicate the presence of biogenic organic materials and associated interference and bias in the MW-22 sample data, and that the results do not indicate petroleum hydrocarbon contamination related to Site or area uses.

- Dissolved arsenic either was not detected at a concentration greater than the laboratory reporting limit or was detected at concentrations less than Site-specific cleanup level in all of the samples collected from the monitoring wells.
- The total cPAH toxicity equivalency quotient (TEQ) is greater than the Site-specific cleanup level in the samples collected at MW-19 during the fourth quarter 2017, first quarter 2018 and second quarter 2018 monitoring events. During each of the subsequent monitoring events at MW-19 or at other wells at the Site, cPAHs were not detected at a concentration greater than the laboratory reporting limits in any of the samples collected.

EVIDENCE FOR REDUCED COMPLIANCE GROUNDWATER MONITORING

The July 19, 2018 opinion letter was issued following Ecology review of the reports documenting the first four quarterly groundwater monitoring events. As noted above, the Ecology letter acknowledged that the laboratory analyses and results for the groundwater samples with detected concentrations of diesel-range petroleum hydrocarbons, including the two samples from MW-22 with concentrations greater than the cleanup level, were likely affected by the presence of biogenic organic materials, and recommended that

subsequent groundwater samples be split and run by both NWTPH-Dx and NWTPH-Dx with acid silica gel cleanup. The results of the use of the silica gel cleanup as part of the NWTPH-Dx analysis indicate the presence of biogenic organic materials and associated interference and bias in the MW-22 sample data, and that the results do not indicate petroleum hydrocarbon contamination related to Site or area uses.

In addition, Ecology indicated that quarterly groundwater monitoring should continue at MW-19 to further evaluate the observed cPAH exceedances, and that Ecology would re-evaluate the monitoring frequency once the monitoring results showed four consecutive quarters of compliance. Lastly, Ecology concluded that the frequency of monitoring for locations MW-16D, MW-18D, MW-20 and MW-21 could be reduced to annual events.

In an email dated May 19, 2020, Ecology acknowledged that the groundwater data for all of the monitoring wells at both the West Parcel and East Parcel show compliance with cleanup levels and indicate that the frequency of monitoring could be further reduced.

Review of the groundwater monitoring data collected to date in the context of the Ecology comments supports that a further reduction in the frequency of monitoring and number of analytes being evaluated is warranted. The evidence and rationale for an overall reduction in the compliance groundwater monitoring requirement for the Site is detailed below.

Statistical Evaluation

The groundwater data from the six most recent monitoring events, which are considered representative of current stable Site conditions following the cleanup actions and subsequent compliance monitoring, were evaluated using a confidence interval approach along with Ecology's 3-part rule (Washington Administrative Code [WAC] 173-340-720(9)(d) and (e). Using this approach, groundwater is in compliance with the cleanup standard if:

1. The upper 95 percent confidence limit (95% UCL) is less than the cleanup level;
2. The maximum detected concentration is less than two times the cleanup level; and
3. Less than 10 percent of the samples exceed the cleanup level for each analyte at each location being evaluated.

The results of this evaluation, which are summarized in Table 2, indicate that groundwater is in compliance with the cleanup standard at each of the monitoring well locations for each of the contaminants being evaluated, except for the limited detections of cPAHs at MW-19. As noted above, since the second quarter 2018 monitoring event, cPAHs have not been detected at a concentration greater than the laboratory reporting limits in any of the samples collected at the Site.

As discussed above, and as noted on Table 2, the chromatograph pattern for the NWTPH-Dx analysis of the samples collected at MW-22 did not resemble the laboratory fuel standard used for quantitation, and the absence of detected concentrations in the analysis using the silica gel cleanup indicates that the detected petroleum hydrocarbon concentrations are the result of interference from degrading wood debris in the subsurface. Therefore, the UCL was calculated using the results of the NWTHP-DX analysis that included the use of silica gel cleanup to address the interference and bias due to biogenic organic materials, and that are considered the analytical results most representative of Site conditions.

Trend Analysis

Plots of the trends in the groundwater data collected at the Site to date are presented on Figures 4 through 12. The trend plots indicate that groundwater conditions at the Site have stabilized with contaminant concentrations at or below Site-specific cleanup levels.

Engineering and Institutional Controls

Engineering and institutional controls consisting of protective barriers and the Environmental Covenant are in place at the Site to protect human health and the environment. Protective barriers prevent direct exposure to the residual contamination and the Environmental Covenant restricts ground disturbance activities and the use of groundwater as drinking water further reducing potential exposure to the residual contamination.

Proposed Future Monitoring

The groundwater compliance monitoring data collected to date confirm compliance with the Site-specific cleanup standards, including meeting the cleanup levels at the point of compliance, stable groundwater conditions, and there is no evidence that the Site poses a threat to human health or the environment. Based on the data collected to date and summarized above, the following is proposed for future groundwater compliance monitoring at the Site:

- **MW-16D, MW-18D, MW-20 and MW-21** – The statistical evaluation of the groundwater monitoring results indicate compliance with the cleanup standards, and the trend analysis of the data indicate stable groundwater conditions. In addition, engineering and institutional controls are in place to protect human health and the environment. Based on these rational, additional groundwater monitoring for well locations MW-16D, MW-18D, MW-20 and MW-21 is no longer warranted and the existing groundwater data can be used to support Ecology's 5-year Periodic Review for the Site. However, if there are changes to the current Site use, removal of a protective barrier or soil disturbance activity that could destabilize subsurface conditions, Ecology will be consulted to determine whether additional groundwater monitoring is required to verify groundwater compliance.
- **MW-19** – The statistical evaluation of the groundwater monitoring results indicate compliance with the cleanup standards and the trend analysis of the data indicate stable groundwater conditions for petroleum related contamination associated with the former gasoline station located upgradient of this location (primary purpose of this monitoring well). Although the statistical evaluation of the groundwater monitoring results for cPAHs did not meet compliance with the cleanup level, the trend analysis of the data indicates that cPAH concentrations in groundwater have remained stable and cPAHs have not been detected at a concentration greater than the laboratory reporting limit since the September 2018 monitoring event. The engineering and institutional controls are in place to protect human health and restrict the use of groundwater as drinking water (basis for the groundwater cleanup level). Based on these rational, additional groundwater monitoring is no longer warranted at MW-19 and the existing data can be used to support Ecology's 5-year Periodic Review for the Site. However, if there are changes to the current Site use, removal of a protective barrier or soil disturbance activity that could destabilize subsurface conditions, Ecology will be consulted to determine whether additional groundwater monitoring is required to verify groundwater compliance.
- **MW-22** – The statistical evaluation of the groundwater monitoring results discussed above indicates compliance with the cleanup standards and the trend analysis of the data indicate stable

groundwater conditions, including for arsenic in groundwater from upgradient sources (the primary purpose for the location of MW-22). As also discussed above, the results of the use of the silica gel cleanup as part of the NWTPH-Dx analysis indicate the presence of biogenic organic materials and associated interference and bias in the MW-22 sample data, and that the results do not indicate petroleum hydrocarbon contamination related to Site or area uses.

Based on these rational, additional groundwater monitoring is no longer warranted at MW-22 and the existing data can be used to support Ecology's 5-year Periodic Review for the Site. However, if there are changes to the current Site use, removal of a protective barrier or soil disturbance activity that could destabilize subsurface conditions, Ecology will be consulted to determine whether additional groundwater monitoring is required to verify groundwater compliance.

As noted above, the Site groundwater compliance monitoring data document compliance with the Site-specific cleanup standards, stable groundwater conditions, and that there is no threat to human health or the environment, and that the proposed reduction in the monitoring program is warranted.

Thank you for your consideration of our request to reduce the groundwater compliance monitoring requirements for the North Lot Development Site on behalf of North Lot Development LLC. Please contact us if you have any questions regarding this request.

Sincerely,
GeoEngineers, Inc.

Robert S. Trahan, LG
Senior Environmental Scientist

Tim L. Syverson, LHG
Associate

RST:TLS:ch:leh

Attachments:
Table 1. Groundwater Elevation and Chemical Analytical Data
Table 2. Groundwater Cleanup Level Compliance Evaluation
Figure 1. Vicinity Map
Figure 2. Representative Dry Season Groundwater Elevation – August 2017 Monitoring Event
Figure 3. Representative Wet Season Groundwater Elevation – December 2018 Monitoring Even
Figures 4 through 12. Summary of Chemical Results

LIMITATIONS

This report has been prepared for the exclusive use of North Lot Development, their authorized agents, and regulatory agencies in their evaluation of the North Lot Development Site in Seattle, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

REFERENCES

EHS-International, Inc. (EHSI) 2020, "Annual Groundwater and Indoor Vapor monitoring – 2020, North Lot, 201 and 255 South King Street, Seattle, Washington 98134, Ecology Site ID 5378137," prepared for American Life, Inc., March 27, 2020.

Landau Associates (Landau) 2013, "Cleanup Action Plan Addendum, North Lot Property, Seattle, Washington," prepared for North Lot Development, LLC and 255 S. King Street LP, September 18, 2013.

Rothman and Associates (Rothman) 2017a, "Groundwater Monitoring Report, Third Quarter 2017," prepared for 255 S King Street LP, August 30, 2017.

Rothman and Associates (Rothman) 2017b, "Groundwater Monitoring Report, Fourth Quarter 2017," prepared for 255 S King Street LP, December 11, 2017.

Rothman and Associates (Rothman) 2018a, "Groundwater Monitoring Report, First Quarter 2018," prepared for 255 S King Street LP, February 28, 2018.

Rothman and Associates (Rothman) 2018b, "Groundwater Monitoring Report, Second Quarter 2018," prepared for 255 S King Street LP, June 2, 2018.

Rothman and Associates (Rothman) 2018c, "Groundwater Monitoring Report, Third Quarter 2018," prepared for 255 S King Street LP, October 28, 2018.

Rothman and Associates (Rothman) 2019b, "Groundwater Monitoring Report, Fourth Quarter 2018," prepared for 255 S King Street LP, January 14, 2019.

Rothman and Associates (Rothman) 2019c, "Groundwater Monitoring Report, First Quarter 2019," prepared for 255 S King Street LP, April 28, 2019.

Rothman and Associates (Rothman) 2019d, "Groundwater Monitoring Report, Second Quarter 2019," prepared for 255 S King Street LP, August 8, 2019.

Rothman and Associates (Rothman) 2019d, "Groundwater Monitoring Report, First Quarter 2019," prepared for 255 S King Street LP, April 28, 2019.

Rothman and Associates (Rothman) 2019a, "Cleanup Action Report," prepared for 255 S King Street LP, January 10, 2019.

Washington State Department of Ecology (Ecology) 2011, "Final Cleanup Action Plan, North Lot Development Site, Cleanup ID# 1966," Toxics Cleanup Program, Northwest Regional Office, July 2011.

Table 1

Groundwater Elevation and Chemical Analytical Data

North Lot Development
Seattle, Washington

Monitoring Well Identification[1]	Date Sampled	Top of Casing Elevation (feet MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet MSL)	Petroleum Hydrocarbons[2]					Volatile Organic Compounds[3] (VOCs)				Total cPAHs TEQ[5,6]	Dissolved Arsenic[7]
					Gasoline-Range	Diesel-Range	Oil-Range	Diesel-Range[4]	Oil-Range[4]	Benzene	Toluene	Ethylbenzene	Total Xylenes		
MW-16D	08/04/17	17.6	10.39	7.21	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	1 U
	11/08/17		10.12	7.48	100 U	60 U	300 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	02/08/18		9.5	8.1	100 U	30 U	150 U	--	--	0.8 U	**1.0**	1 U	3 U	0.007 U	1 U
	05/10/18		10.15	7.45	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	09/28/18		10.07	7.53	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	12/19/18		9.83	7.77	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	03/20/19		10.11	7.49	--	--	--	--	--	--	--	--	--	--	--
	06/20/19		10.15	7.45	--	--	--	--	--	--	--	--	--	--	--
	01/21/20		9.81	7.79	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.06**
MW-18D	08/02/17	17.17	11.09	6.08	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	**7.01**
	11/08/17		10.71	6.46	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.87**
	02/08/18		10.64	6.53	100 U	30 U	150 U	--	--	0.8 U	**1.1**	1 U	3 U	0.007 U	**1.25**
	05/10/18		10.75	6.42	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.44**
	09/28/18		10.66	6.51	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	12/19/18		10.44	6.73	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.83**
	03/20/19		10.79	6.38	--	--	--	--	--	--	--	--	--	--	--
	06/20/19		No Access	--	--	--	--	--	--	--	--	--	--	--	--
	01/21/20		No Access	--	--	--	--	--	--	--	--	--	--	--	--
MW-19	08/02/17	17.49	6.32	11.17	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	**2.61**
	11/08/17		6.18	11.31	100 U	65 U	320 U	--	--	0.8 U	1 U	1 U	3 U	**0.014**	**2.14**
	02/08/18		7.65	9.84	100 U	**36**[8]	**150**	--	--	0.8 U	**1.2**	1 U	3 U	**0.028**	**2.42**
	05/10/18		6.01	11.48	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	**0.021**	**2.10**
	09/28/18		5.99	11.5	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.10**
	12/19/18		5.83	11.66	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.10**
	03/20/19		5.8	11.69	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.02**
	06/20/19		5.84	11.65	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.01**
	01/21/20		5.64	11.85	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.05**
Site-Specific Groundwater Cleanup Level (µg/L)					800	500	500	500	500	0.8	80	275	1,600	0.012	5/21.3[9]

Monitoring Well Identification[1]	Date Sampled	Top of Casing Elevation (feet MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet MSL)	Petroleum Hycrocarbons[2]					Volatile Organic Compounds[3] (VOCs)				Total cPAHs TEQ[5,6]	Dissolved Arsenic[7]
					Gasoline-Range	Diesel-Range	Oil-Range	Diesel-Range[4]	Oil-Range[4]	Benzene	Toluene	Ethylbenzene	Total Xylenes		
MW-20	08/02/17	17.51	7.58	9.93	100 U	**62**[8]	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	1 U
	11/08/17		7.59	9.92	100 U	75 U	380 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	02/08/18		9.45	8.06	100 U	**42**[8]	150 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	05/10/18		7.33	10.18	100 U	**92**[8]	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	09/28/18		7.49	10.02	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	12/19/18		6.69	10.82	100 U	**53**[8]	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
	03/20/19		3.72	13.79	--	--	--	--	--	--	--	--	--	--	--
	06/20/19		6.9	10.61	--	--	--	--	--	--	--	--	--	--	--
	01/21/20		6.68	10.83	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	1 U
MW-21	08/02/17	17.17	9.73	7.44	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	**6.23**
	11/08/17		9.45	7.72	100 U	60 U	300 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**4.34**
	02/08/18		9.34	7.83	100 U	30 U	150 U	--	--	0.8 U	**1.0**	1 U	3 U	0.007 U	**1.74**
	05/10/18		9.53	7.64	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.06**
	09/28/18		9.43	7.74	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**5.42**
	12/20/18		9.16	8.01	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.64**
	03/20/19		9.46	7.71	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.67**
	06/20/19		9.49	7.68	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**2.96**
	01/21/20		9.15	8.02	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.47**
MW-22	08/02/17	17.14	6.51	10.63	100 U	**180**[8]	250 U	--	--	0.8 U	1 U	1 U	3 U	0.034 U	**7.21**
	11/08/17		6.1	11.04	100 U	**330**	300 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**5.97**
	02/08/18		5.27	11.87	100 U	**640**	**310**[8]	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.72**
	05/10/18		5.97	11.17	100 U	**520**[8]	**480**[8]	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.34**
	09/28/18		6.43	10.71	100 U	**470**[8]	250 U	50 U	250 U	0.8 U	1 U	1 U	3 U	0.007 U	**4.58**
	12/20/18		4.76	12.38	100 U	**180**[8]	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.53**
	03/20/19		5.65	11.49	100 U	50 U	250 U	--	--	0.8 U	1 U	1 U	3 U	0.007 U	**1.67**
	07/14/19		6.18	10.96	100 U	**170**[8]	250 U	50 U	250 U	0.8 U	1 U	1 U	3 U	0.007 U	**2.07**
	01/21/20		5.13	12.01	100 U	**100**[8]	250 U	50 U	250 U	0.8 U	1 U	1 U	3 U	0.007 U	**1.27**
Site-Specific Groundwater Cleanup Level (µg/L)					800	500	500	500	500	0.8	80	275	1,600	0.012	5/21.3[9]

Notes:

[1] Monitoring well locations shown on Figure 2.

[2] Analyzed by NWTPH-G or NWTPH-Dx

[3] Analyzed by Environmental Protection Agency (EPA) Method 8021B.

[4] Analyzed by NWTPH-Dx with silica gel cleanup.

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

[6] Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. In accordance with Ecology guidance document: Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs; Implementation Memorandum #10, April 20, 2015), non-detect values were assigned a value of one half of the reporting limit for these calculations except for dibenz[a,h]anthracene which was assigned a value of zero because this compound was never detected at the Site.

[7] Analyzed by EPA Method 200.8.

[8] The sample chromatograph pattern does not resemble the fuel standard used for quantitation. The presence of wood debris at the sample location suggests that the data is biased by interferences from wood biodegradation products. The analysis did not include the use of silica gel cleanup.

[9] A cleanup level of 5 µg/L was agreed upon by Ecology for the western portion of the site (MW-19 and MW-20). A background concentration of 21.3 µg/L was agreed upon by Ecology for the eastern portion of the site (MW-16D, MW-18D, MW-21, and MW-22).

-- = not measured/analyzed

U = Not detected greater than the laboratory reporting limit

MSL = Mean Sea Level

TEQ = Toxicity Equivalency Quotient

µg/L = micrograms per liter

Bold indicates analyte was detected.

Grey shading indicates a non-detect result exceeding the Property-specific cleanup level.

Yellow shading indicates analyte was detected at a concentration greater than the Property-specific cleanup level.

Table 2

Groundwater Cleanup Level Compliance Evaluation

North Lot Development
Seattle, Washington

Analyte	Monitoring Well Identification[1]	Number of Data Points[2]	Property-Specific Cleanup Level (µg/L)	Compliance Monitoring Critera[3]			Groundwater Compliance Standard Met (Y/N)
				95% UCL Concentration[4] (µg/L)	Maximum Concentration[5] (µg/L)	Sample Portion Greater Than Cleanup Level[6] (%)	
Gasoline-Range Hydrocarbons	MW-16D	6	800	100 U	100 U	0	Y
	MW-18D			100 U	100 U	0	Y
	MW-19			100 U	100 U	0	Y
	MW-20			100 U	100 U	0	Y
	MW-21			100 U	100 U	0	Y
	MW-22			100 U	100 U	0	Y
Diesel-Range Hydrocarbons	MW-16D	6	500	60 U	60 U	0	Y
	MW-18D			50 U	50 U	0	Y
	MW-19			50 U	50 U	0	Y
	MW-20			**76.6**	**92**	0	Y
	MW-21			50 U	50 U	0	Y
	MW-22			50 U[f]	50 U	0	Y
Oil-Range Hydrocarbons	MW-16D	6	500	300 U	300 U	0	Y
	MW-18D			250 U	250 U	0	Y
	MW-19			250 U	250 U	0	Y
	MW-20			380 U	380 U	0	Y
	MW-21			250 U	250 U	0	Y
	MW-22			**480**	**480**	0	Y
Benzene	MW-16D	6	0.8	0.8 U	0.8 U	0	Y
	MW-18D			0.8 U	0.8 U	0	Y
	MW-19			0.8 U	0.8 U	0	Y
	MW-20			0.8 U	0.8 U	0	Y
	MW-21			0.8 U	0.8 U	0	Y
	MW-22			0.8 U	0.8 U	0	Y
Toluene	MW-16D	6	80	**1**	**1**	0	Y
	MW-18D			**1.1**	**1.1**	0	Y
	MW-19			**1.2**	**1.2**	0	Y
	MW-20			1 U	1 U	0	Y
	MW-21			**1**	**1**	0	Y
	MW-22			1 U	1 U	0	Y
Ethylbenzene	MW-16D	6	275	1 U	1 U	0	Y
	MW-18D			1 U	1 U	0	Y
	MW-19			1 U	1 U	0	Y
	MW-20			1 U	1 U	0	Y
	MW-21			1 U	1 U	0	Y
	MW-22			1 U	1 U	0	Y
Total Xylenes	MW-16D	6	1,600	3 U	3 U	0	Y
	MW-18D			3 U	3 U	0	Y
	MW-19			3 U	3 U	0	Y
	MW-20			3 U	3 U	0	Y
	MW-21			3 U	3 U	0	Y
	MW-22			3 U	3 U	0	Y

Analyte	Monitoring Well Identification[1]	Number of Data Points[2]	Property-Specific Cleanup Level (µg/L)	Compliance Monitoring Critera[3]			Groundwater Compliance Standard Met (Y/N)
				95% UCL Concentration[4] (µg/L)	Maximum Concentration[5] (µg/L)	Sample Portion Greater Than Cleanup Level (%)	
Total cPAH TEQ	MW-16D	6	0.012	0.007 U	0.007 U	0	Y
	MW-18D			0.007 U	0.007 U	0	Y
	MW-19			**0.021**	**0.021**	**17**	**N**
	MW-20			0.007 U	0.007 U	0	Y
	MW-21			0.007 U	0.007 U	0	Y
	MW-22			0.007 U	0.007 U	0	Y
Dissolved Arsenic	MW-16D	6	21.3	**1.06**	**1.06**	0	Y
	MW-18D			**7.4**	**7.01**	0	Y
	MW-19		5	**2.1**	**2.1**	0	Y
	MW-20		5	1 U	1 U	0	Y
	MW-21		21.3	**4.7**	**5.42**	0	Y
	MW-22			**3.6**	**4.58**	0	Y

Notes:

[1] Monitoring well locations shown on Figure 2.

[2] Six most recent data points used for groundwater compliance evaluation.

[3] Groundwater data evaluated using confidence interval approach along with the 3-part rule (WAC 173-340-720(9)(d) and (e).

[4] The upper 95% confidence limit (UCL) on the true mean groundwater concentration shall be less than the groundwater cleanup level. Data is assumed to be lognormally or normally distributed. When fifty percent or more of the data is not detected, the largest value in the data set shall be used in place of an upper confidence limit on the true mean groundwater calculation.

[5] No single sample concentration shall be greater than two times the groundwater cleanup level.

[6] Less than ten percent of the sample concentrations shall exceed the groundwater cleanup level.

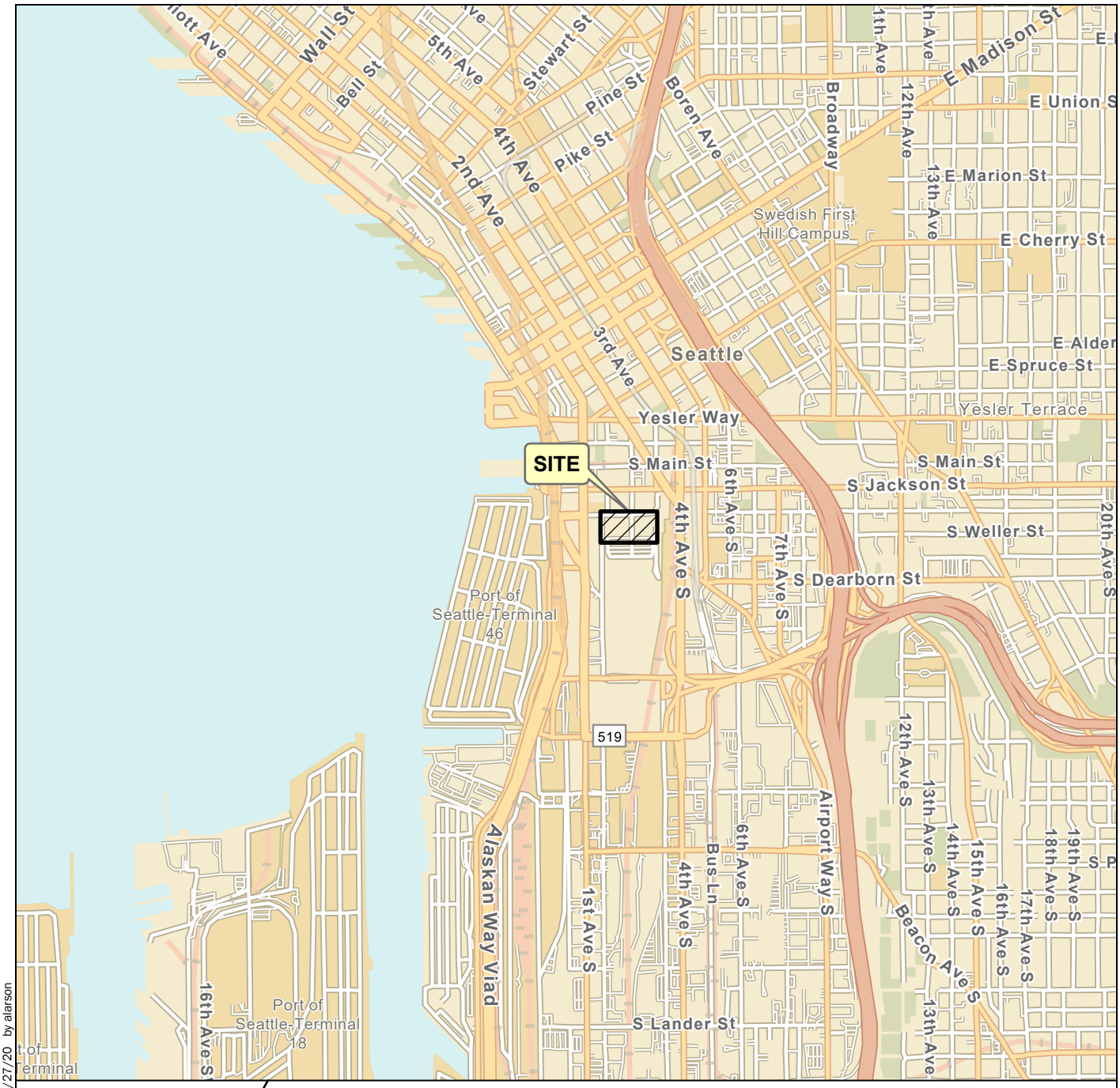
[f] The chromatograph pattern for the analysis of the samples collected at MW-22 (upgradient well) did not resemble the laboratory fuel standard used for quantitation, and the absence of detected concentrations in the analysis using the silica gel cleanup indicates that the detected petroleum hydrocarbon concentrations are the result of interference from degrading wood debris in the subsurface. Therefore, the UCL was calculated using the results of the NWTHP-DX analysis that included the use of silica gel cleanup to address the interference and bias due to biogenic organic materials, and that are considered the analytical results most representative of Site conditions.

U = Not detected greater than the laboratory reporting limit

TEQ = Toxicity Equivalency Quotient

Bold indicates analyte was detected.

Yellow shading indicates compliance monitoring criteria was not met.



N
W E
S

2,000 0 2,000

Feet

Vicinity Map

North Lot Development
Seattle, Washington

GeoEngineers

Figure 1

Notes:

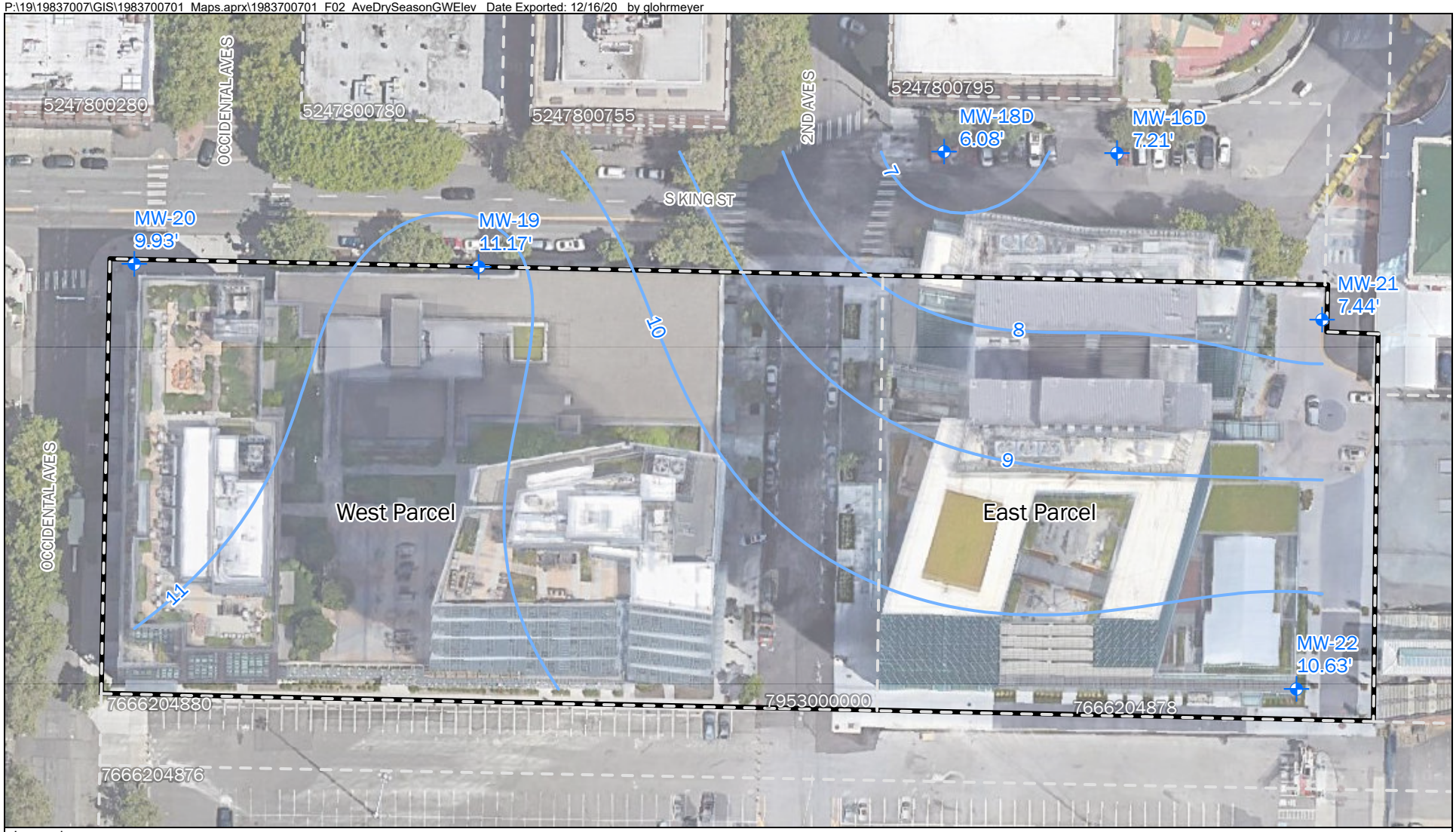
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers,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

Data Source: ESRI

Projection: NAD 1983 UTM Zone 10N

P:\19\19837007\GIS\19837007_Maps.aprx\VicinityMap Date Exported: 08/27/20 by alarson

P:\19\19837007\GIS\1983700701_Maps.aprx\1983700701_F02_AveDrySeasonGWElev Date Exported: 12/16/20 by glohrmeyer



Legend

- Monitoring Well Location (Approximate)
- Groundwater Elevation Contour
- Site Boundary
- Parcel Boundary

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.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

N W E S

80 0 80

Feet

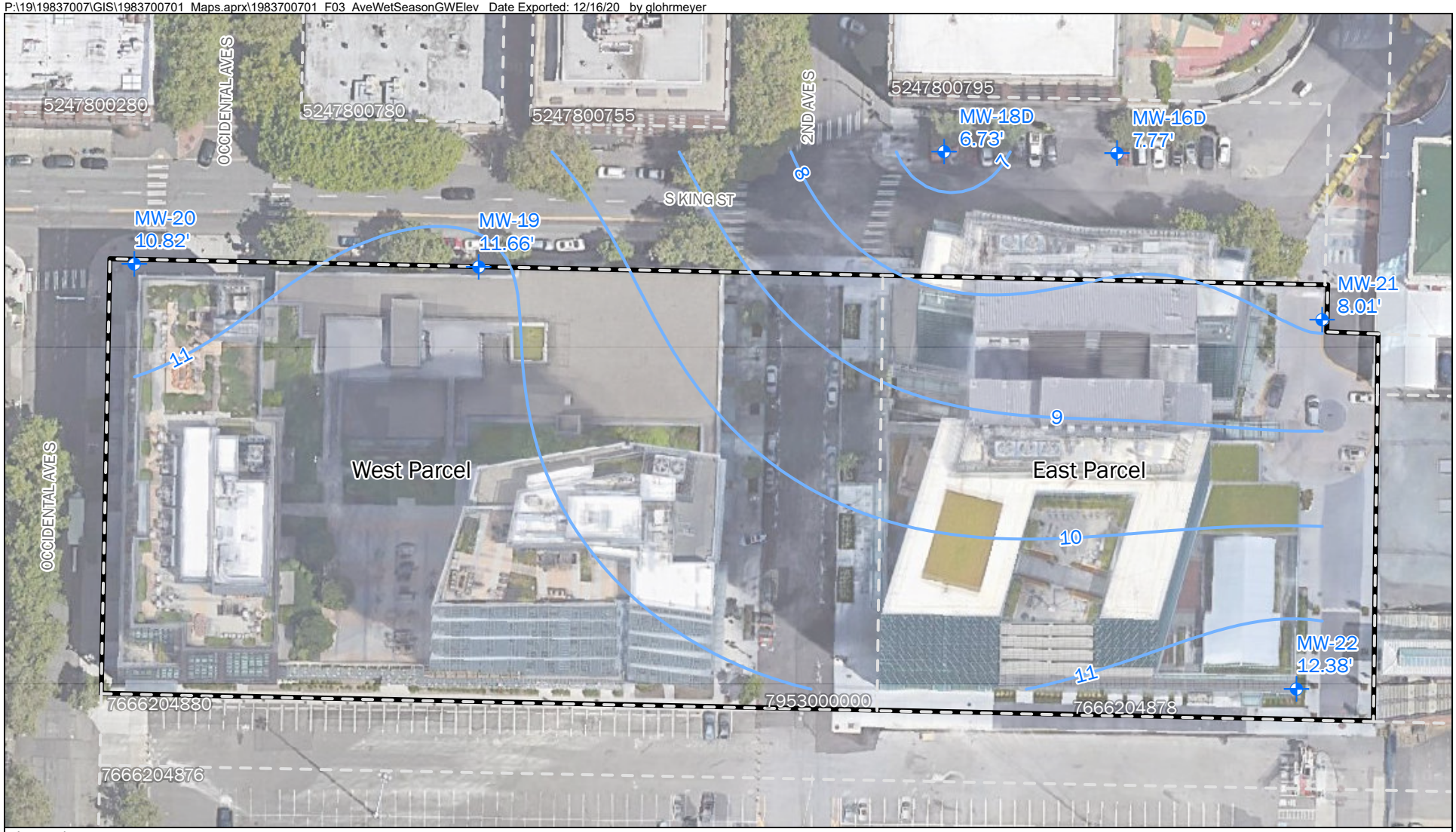
Representative Dry Season Groundwater Elevation
August 2017 Monitoring Event

North Lot Development
Seattle, Washington

GeoEngineers

Figure 2

P:\19\19837007\GIS\1983700701_Maps.aprx\1983700701_F03_AveWetSeasonGWElev Date Exported: 12/16/20 by glohrmeyer



Legend

- Monitoring Well Location (Approximate)
- Groundwater Elevation Contour
- Site Boundary
- Parcel Boundary

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.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

N W E S

80 0 80

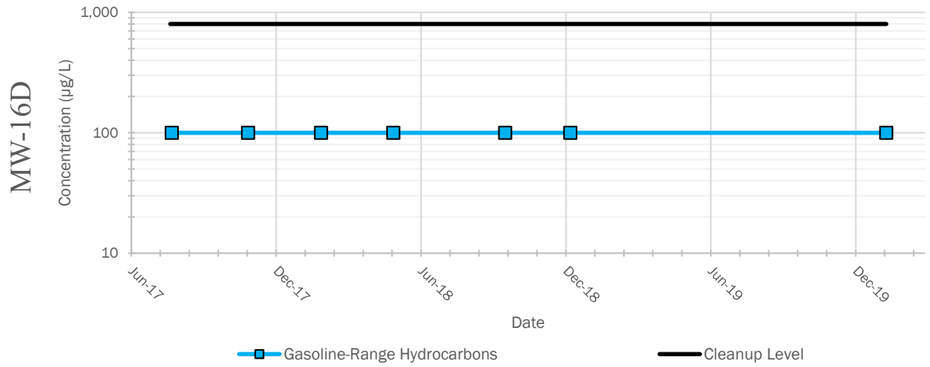
Feet

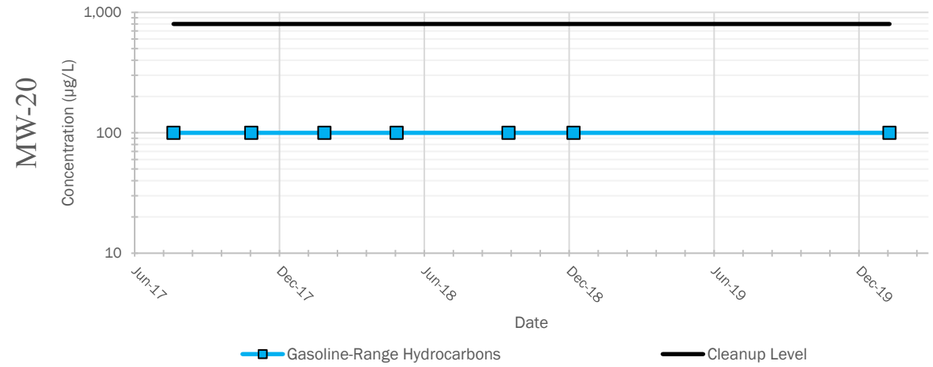
Representative Wet Season Groundwater Elevation
December 2018 Monitoring Event

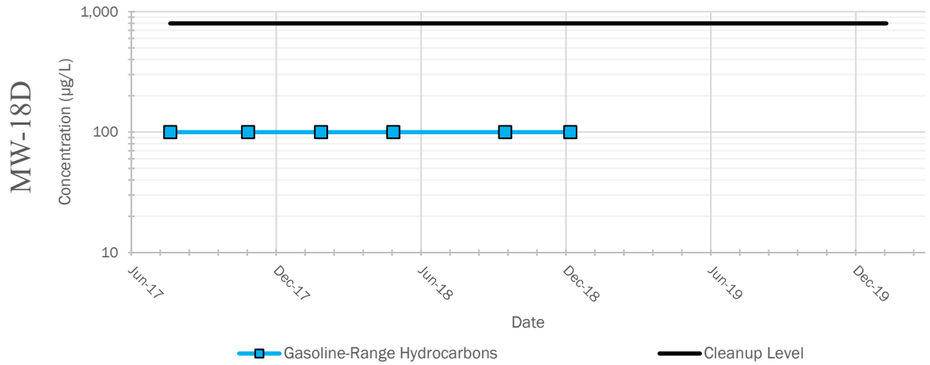
North Lot Development
Seattle, Washington

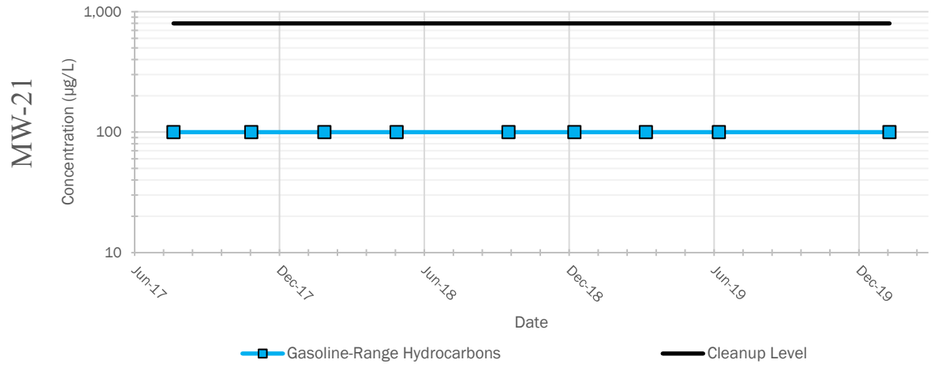
GeoEngineers

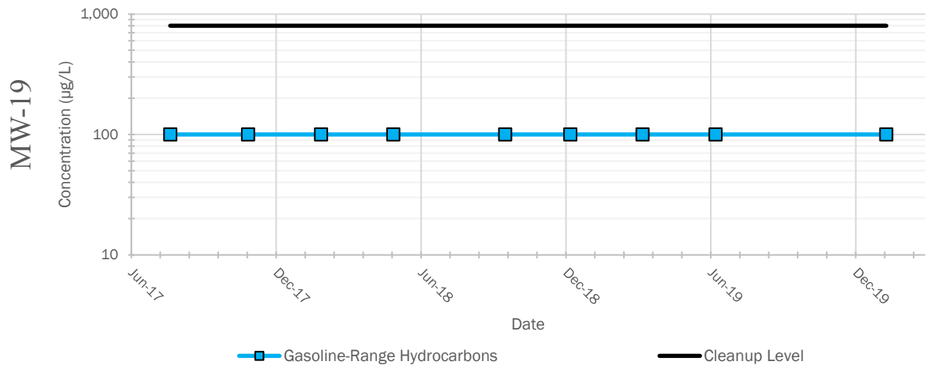
Figure 3

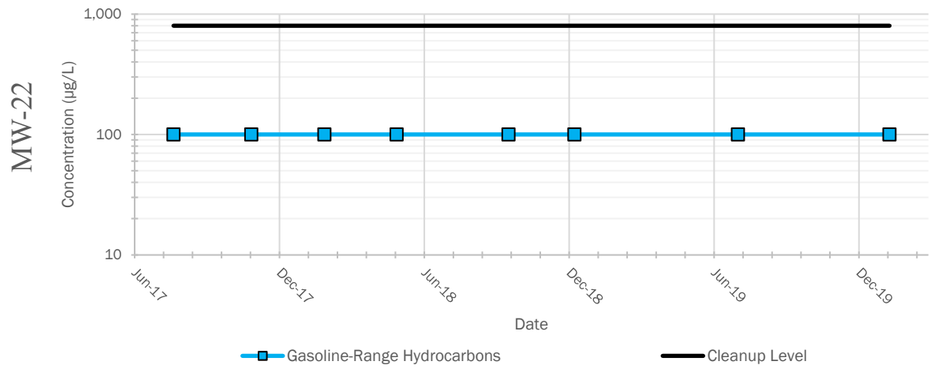












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

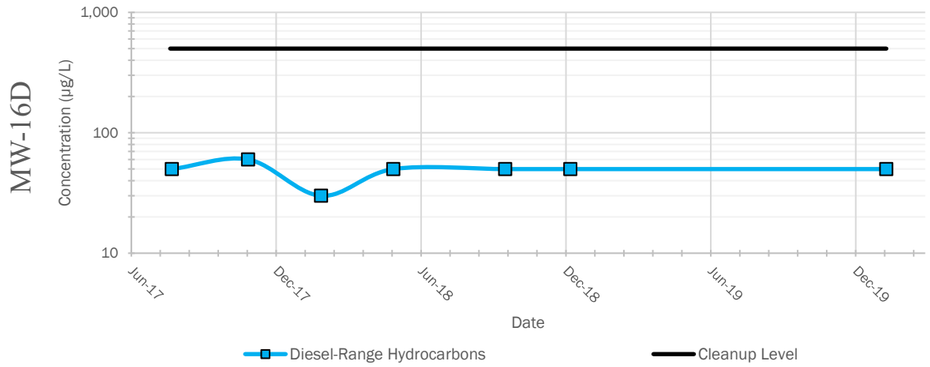
Gasoline-Range Hydrocarbon Results

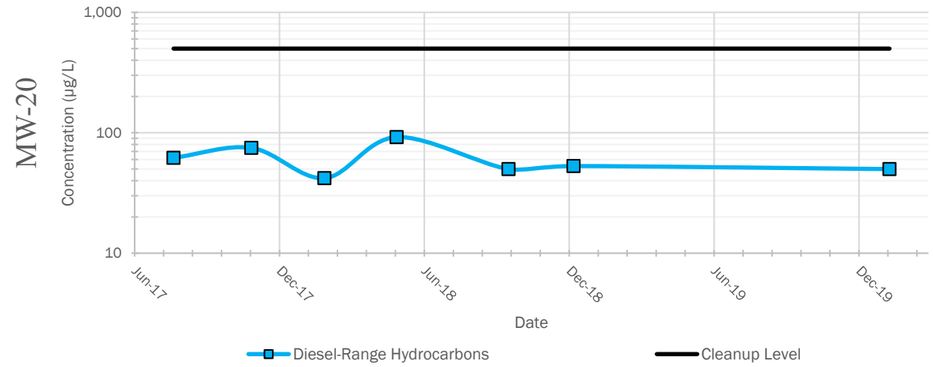
North Lot Development
Seattle, Washington

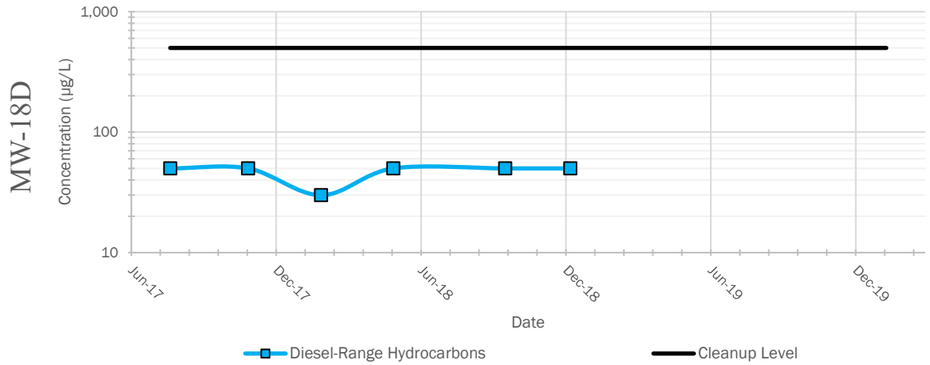
GeoEngineers

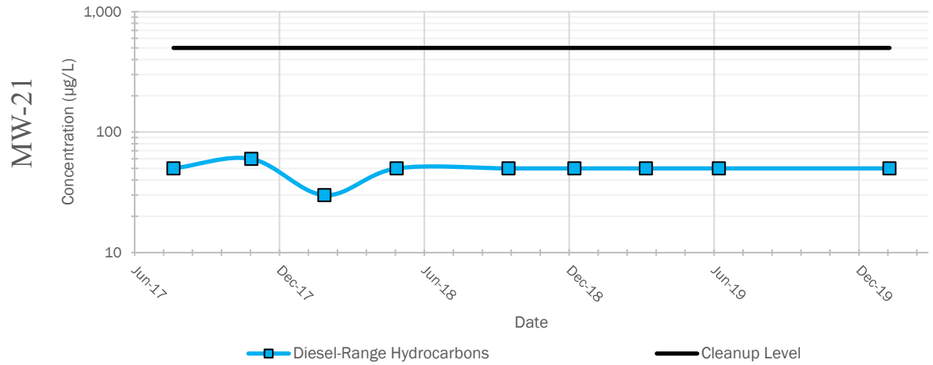
Figure 4

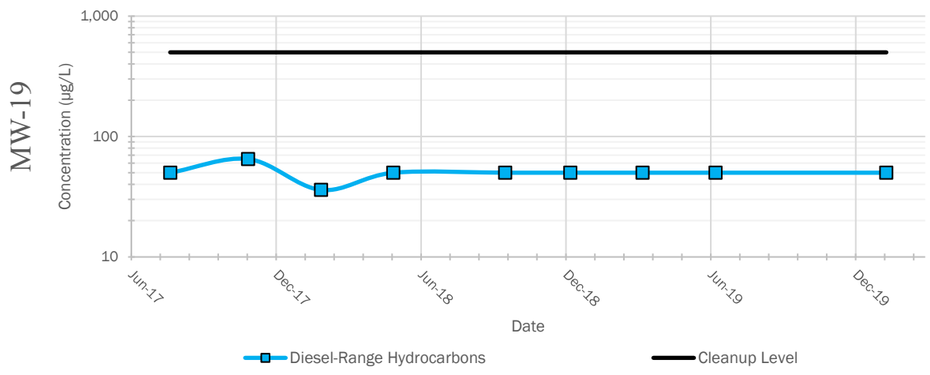
File No. 19837-007-01 Date Exported: 12/18/2020

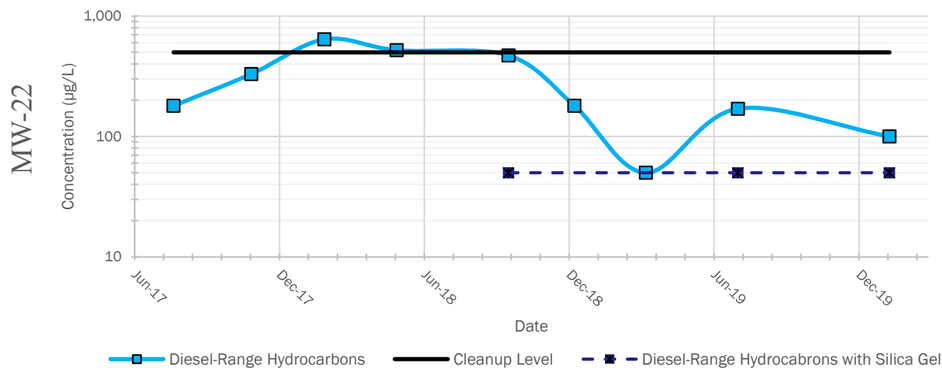












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

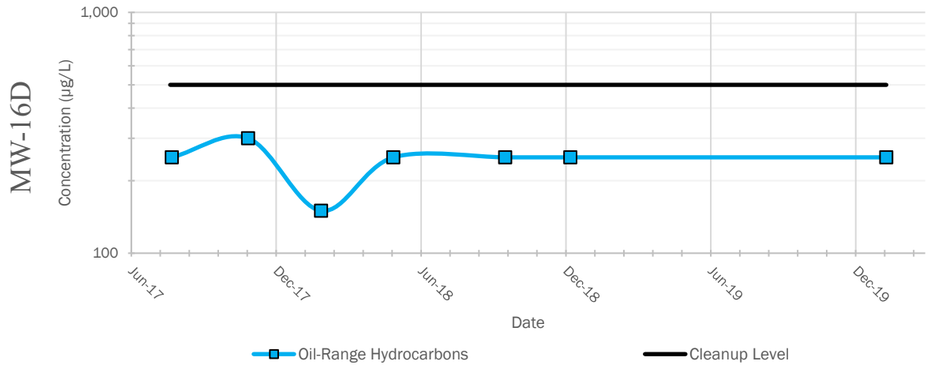
Diesel-Range Hydrocarbon Results

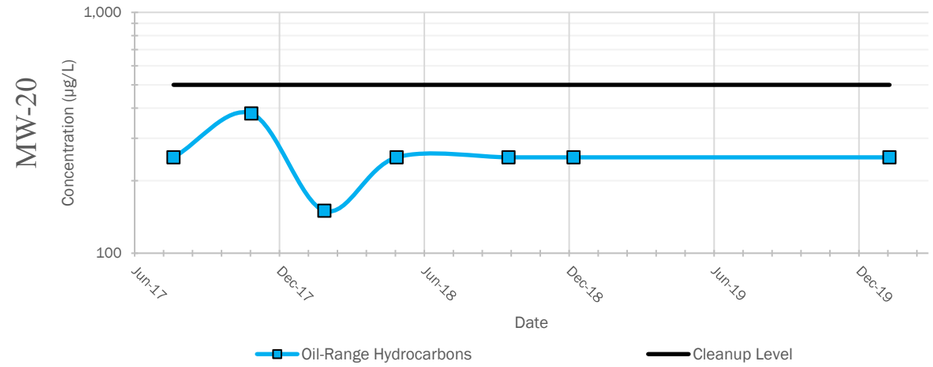
North Lot Development
Seattle, Washington

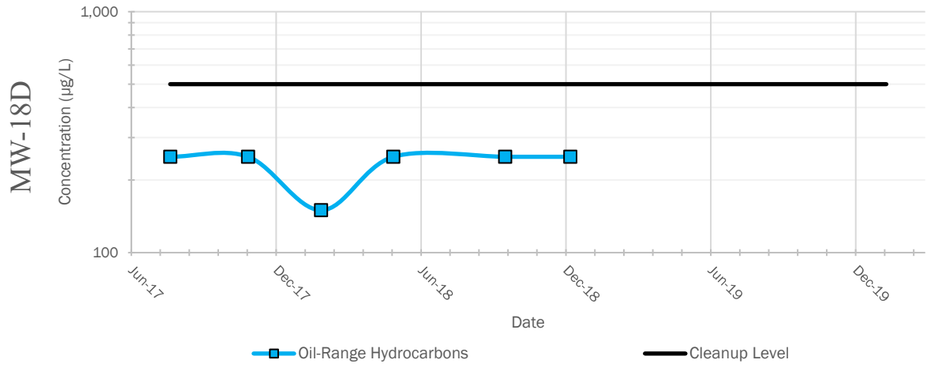
GeoEngineers

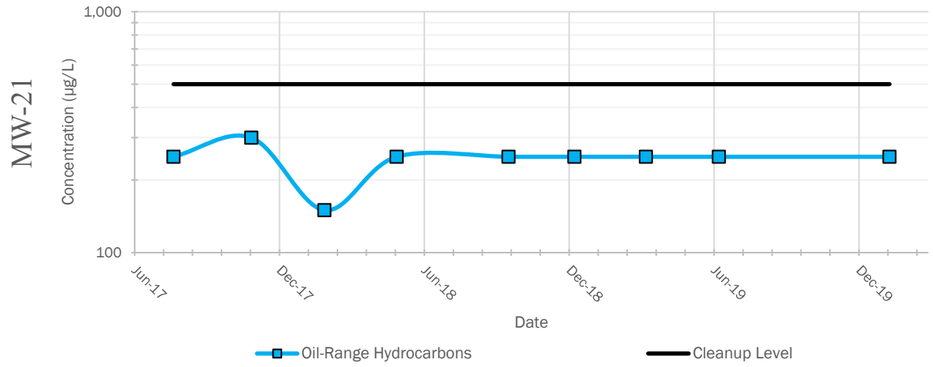
Figure 5

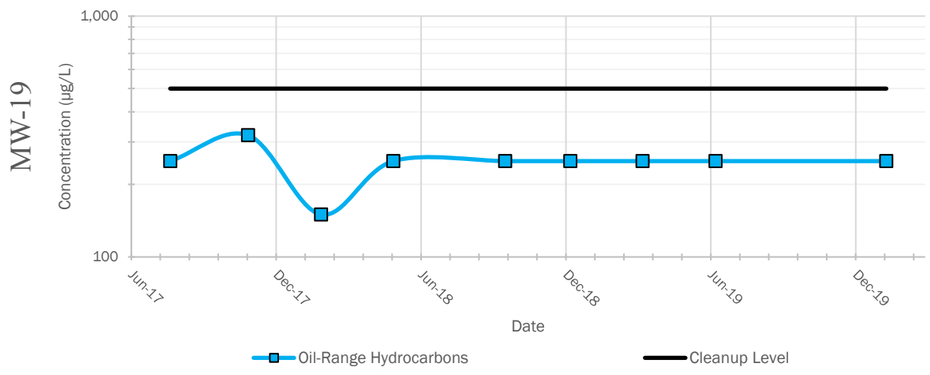
File No. 19837-007-01 Date Exported: 12/18/2020

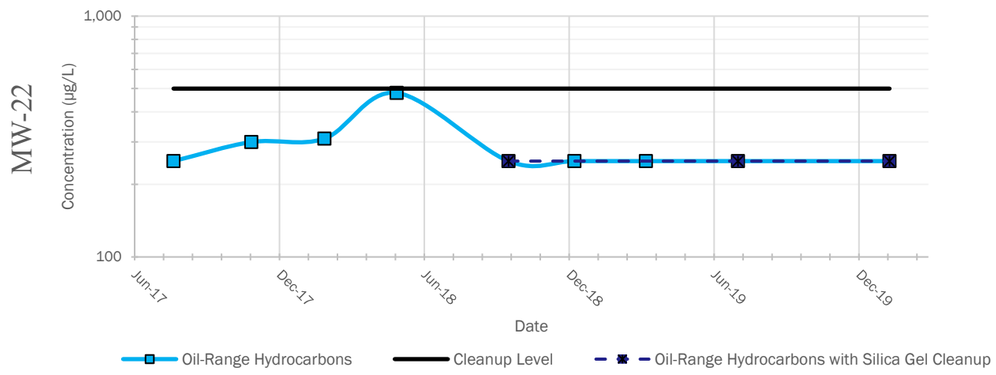












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

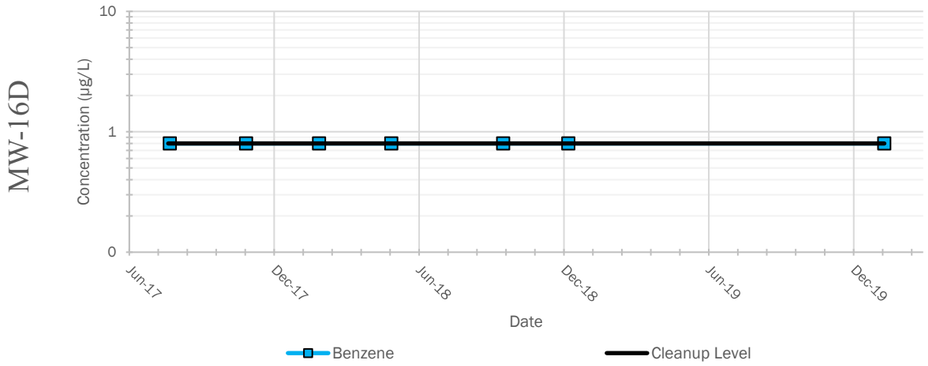
Oil-Range Hydrocarbon Results

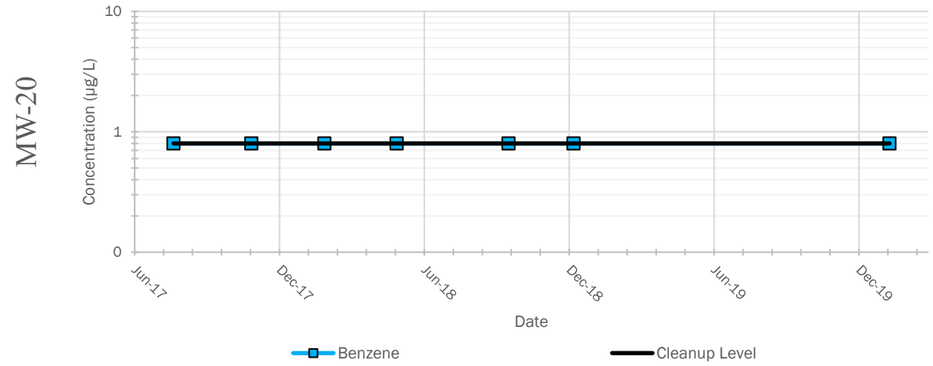
North Lot Development
Seattle, Washington

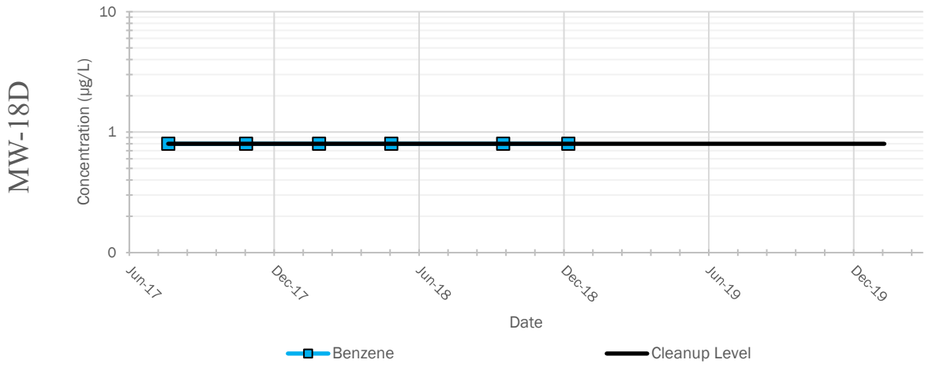
GeoEngineers

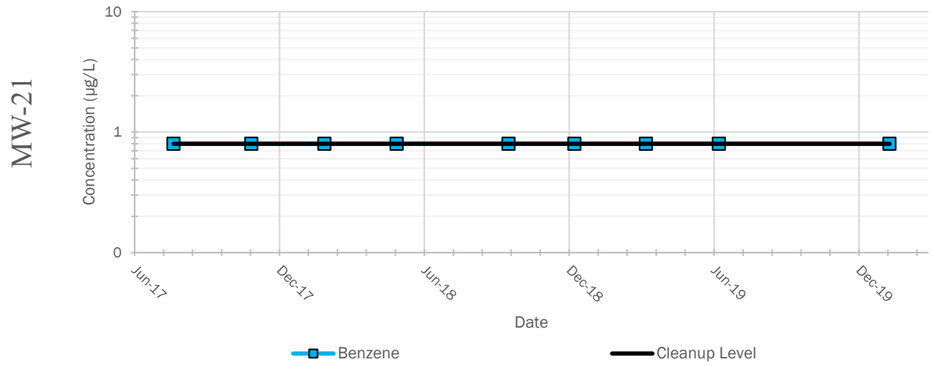
Figure 6

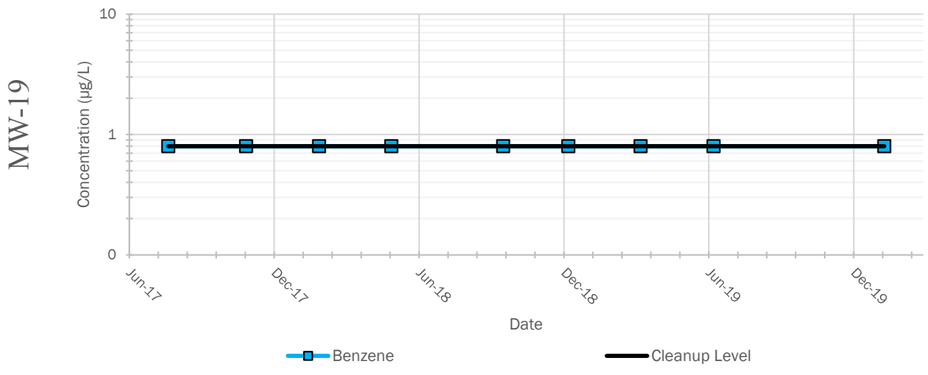
File No. 19837-007-01 Date Exported: 12/18/2020

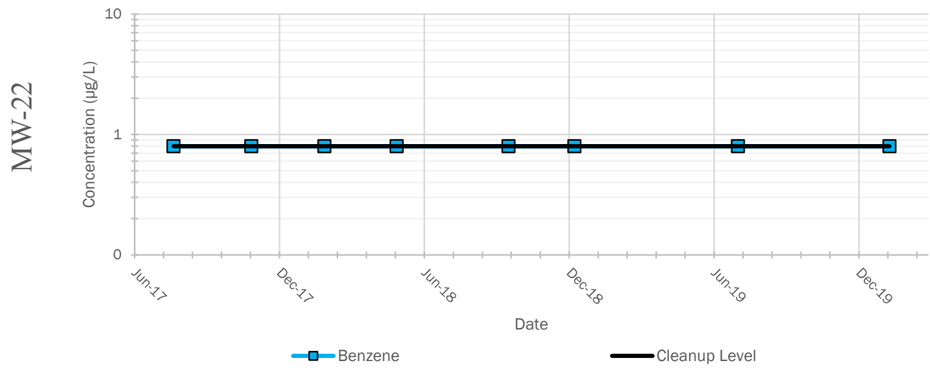












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

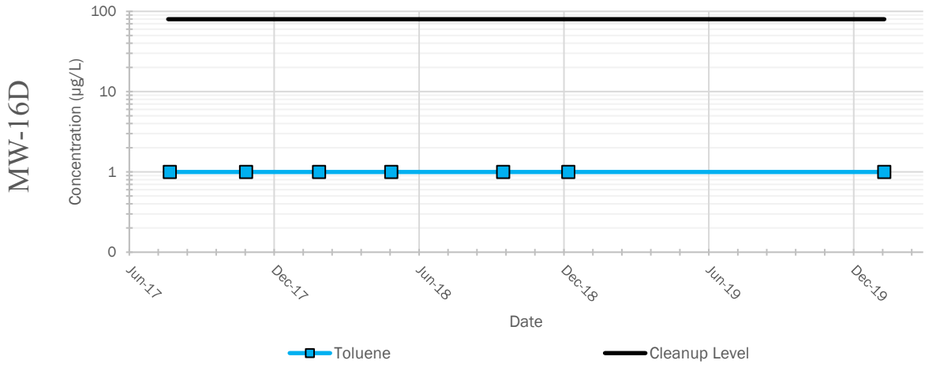
Benzene Results

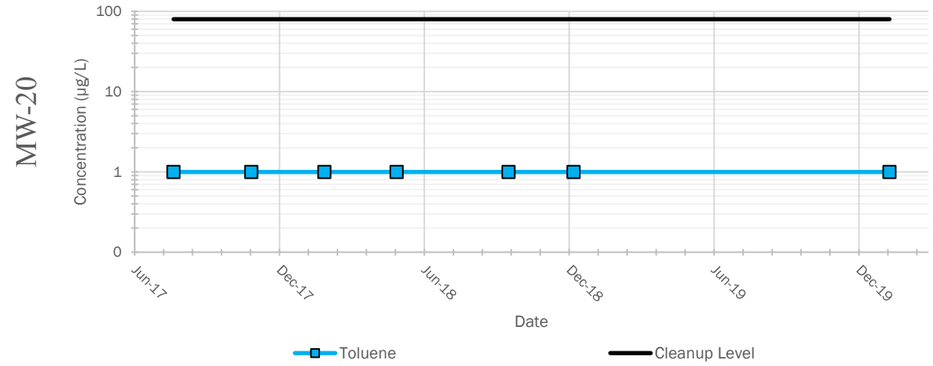
North Lot Development
Seattle, Washington

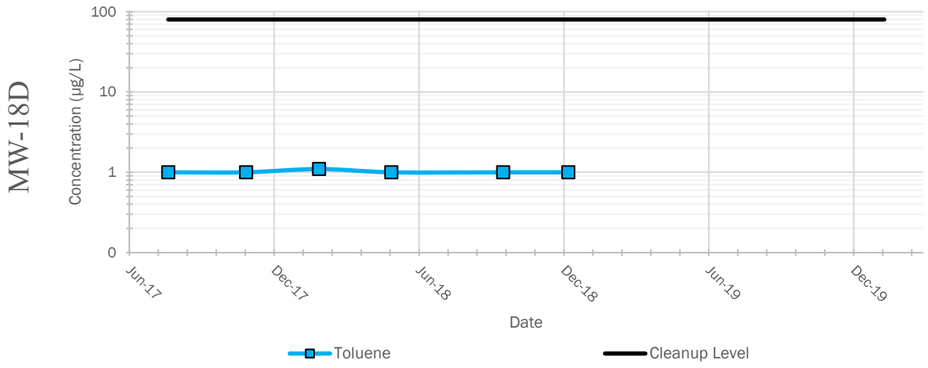
GeoEngineers

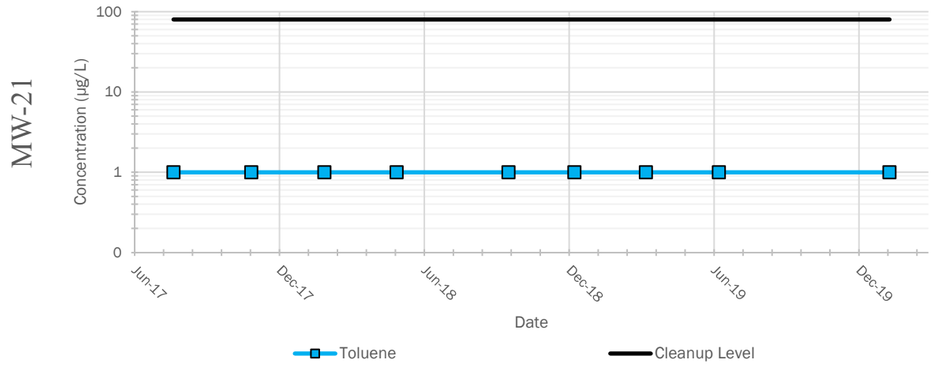
Figure 7

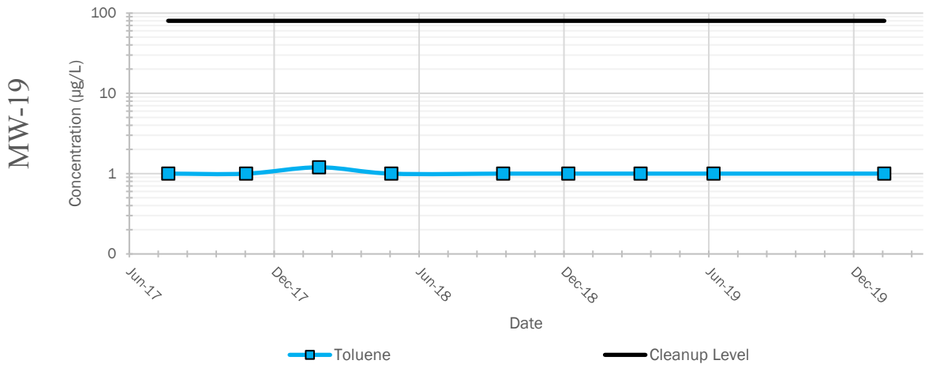
File No. 19837-007-01 Date Exported: 12/18/2020

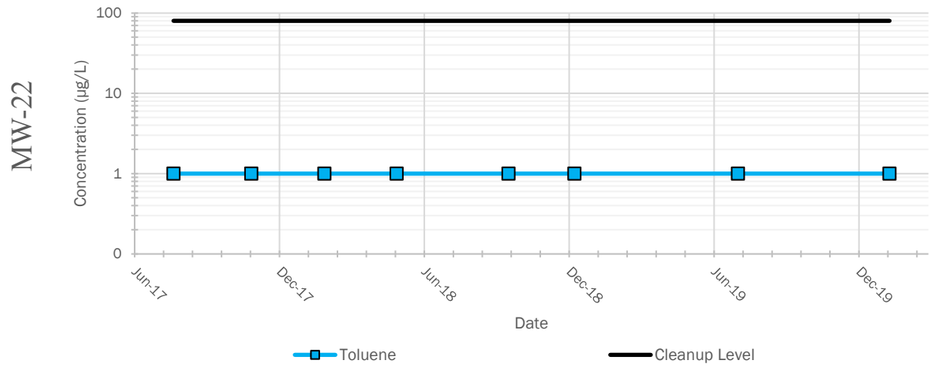












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

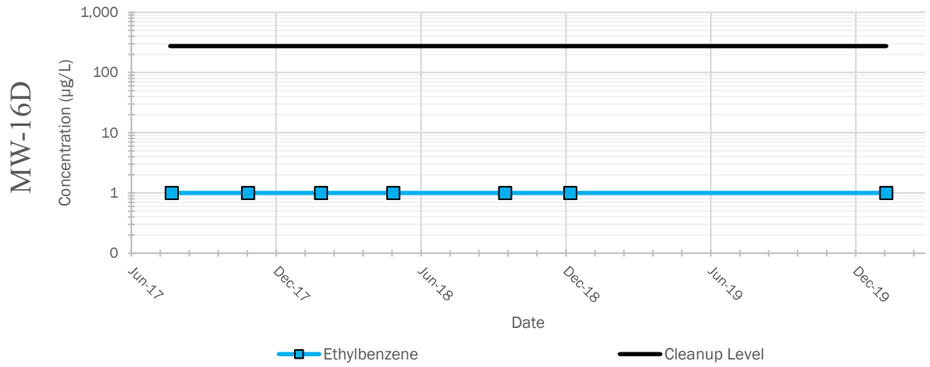
Toluene Results

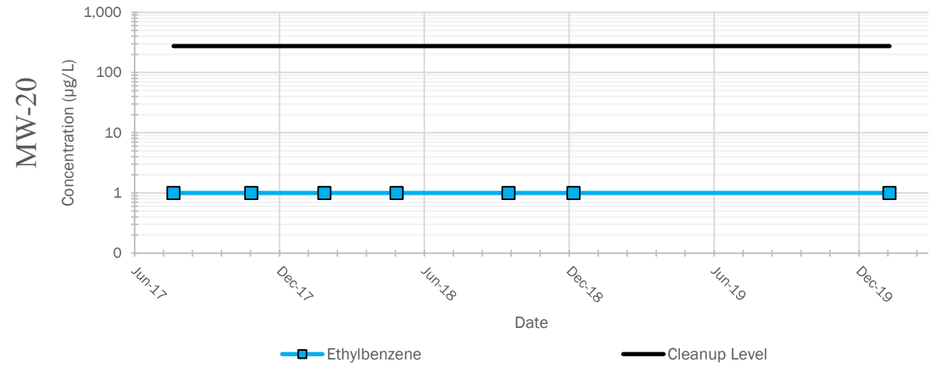
North Lot Development
Seattle, Washington

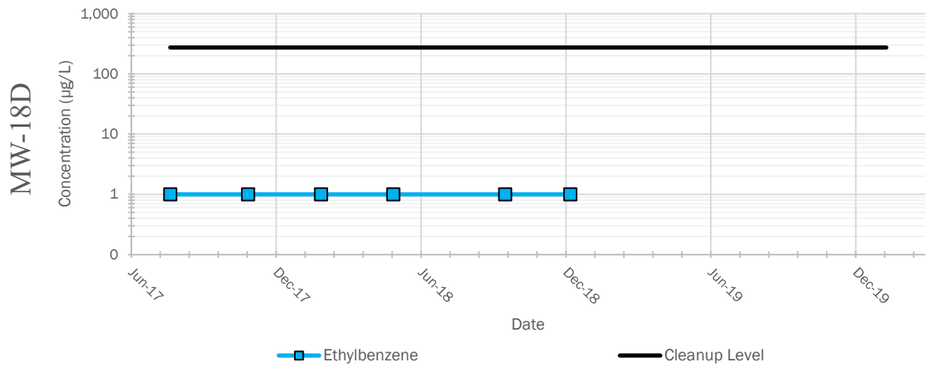
GeoEngineers

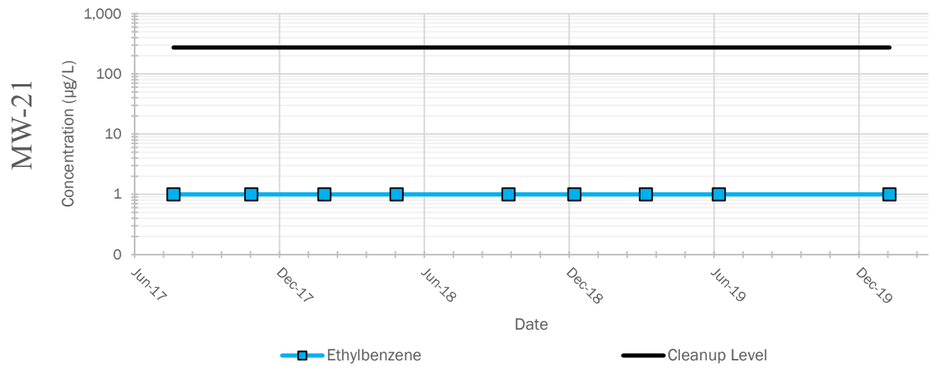
Figure 8

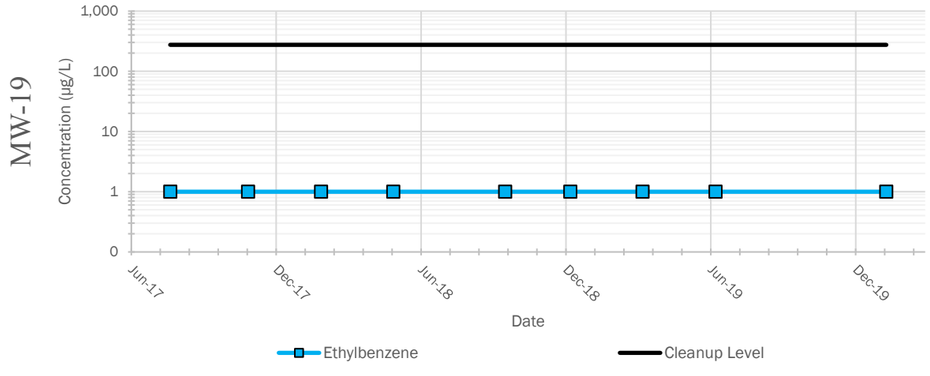
File No. 19837-007-01 Date Exported: 12/18/2020

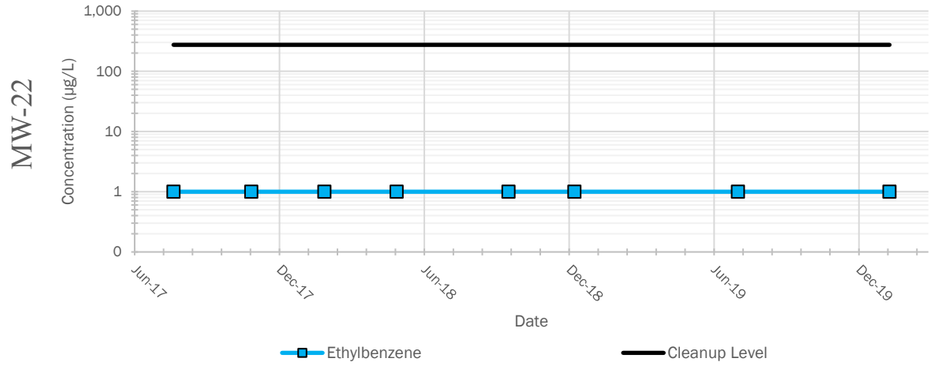












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

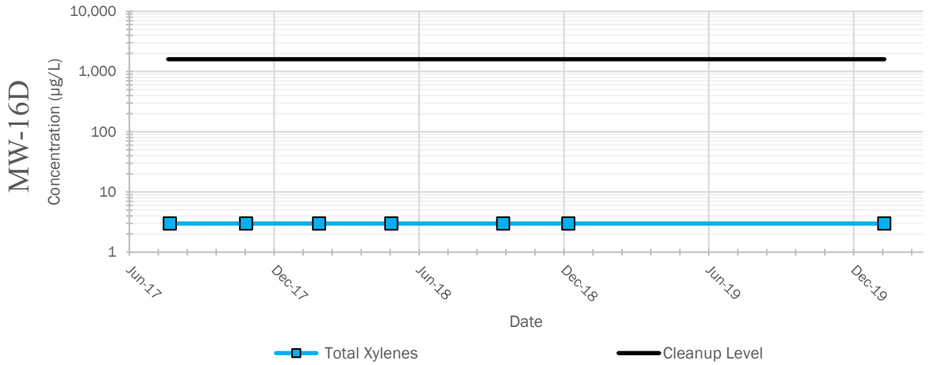
Ethylbenzene Results

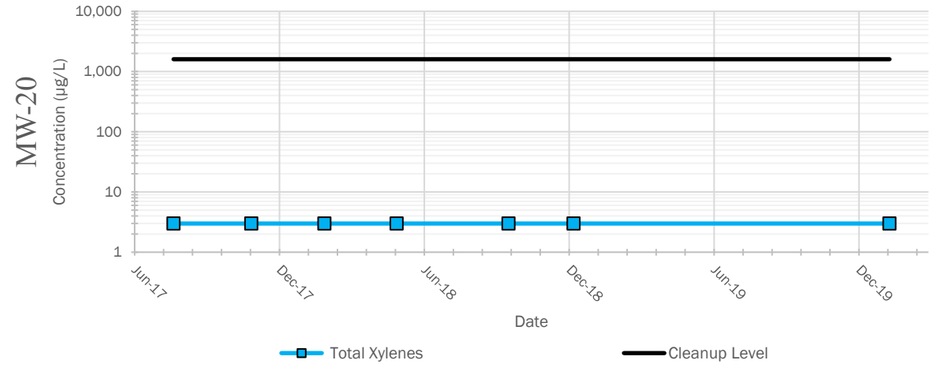
North Lot Development
Seattle, Washington

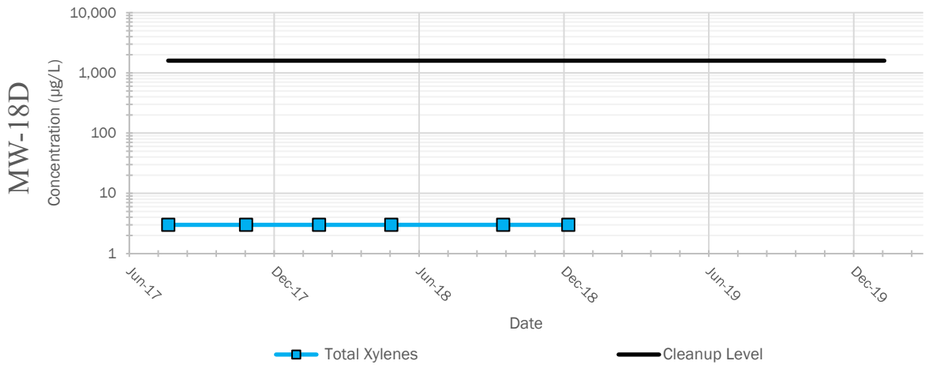
GeoEngineers

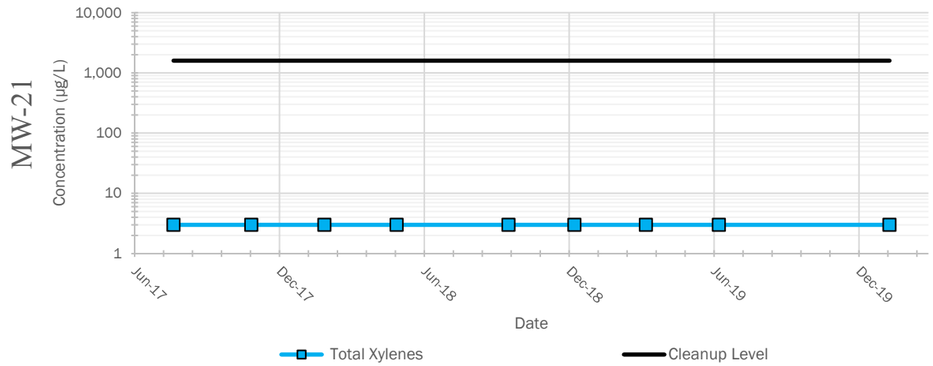
Figure 9

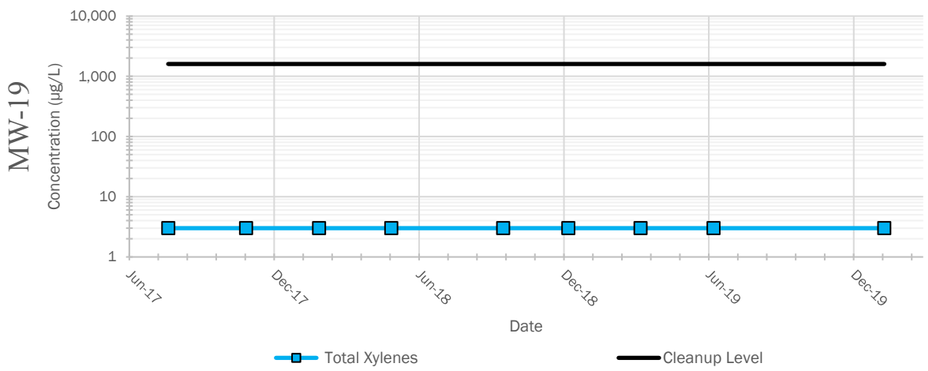
File No. 19837-007-01 Date Exported: 12/18/2020

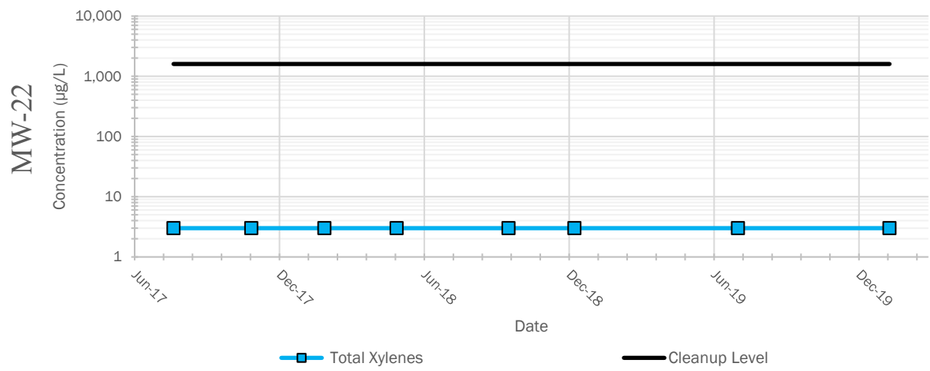












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

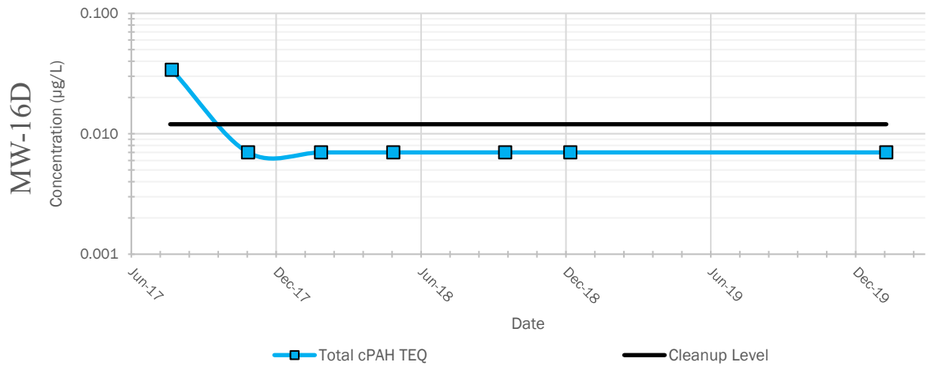
Total Xylene Results

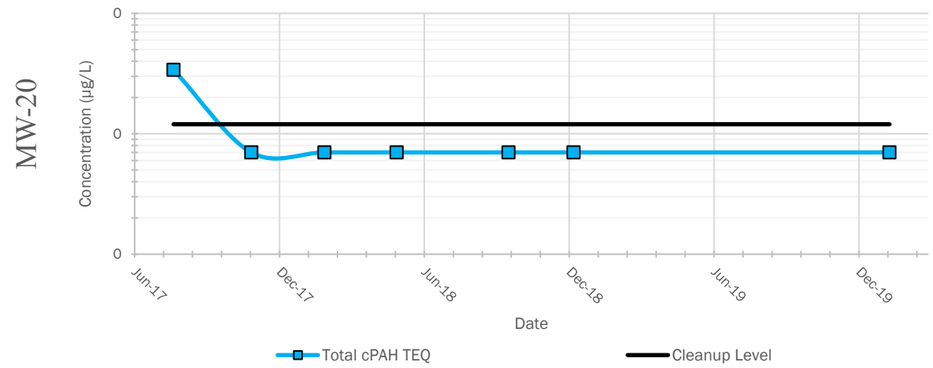
North Lot Development
Seattle, Washington

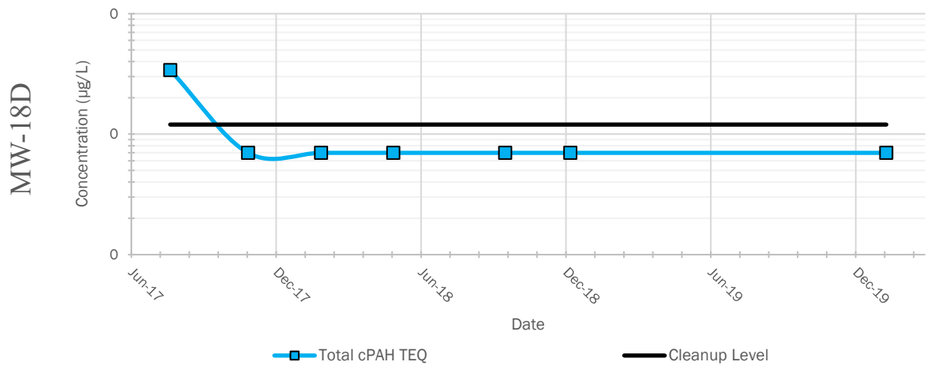
GeoEngineers

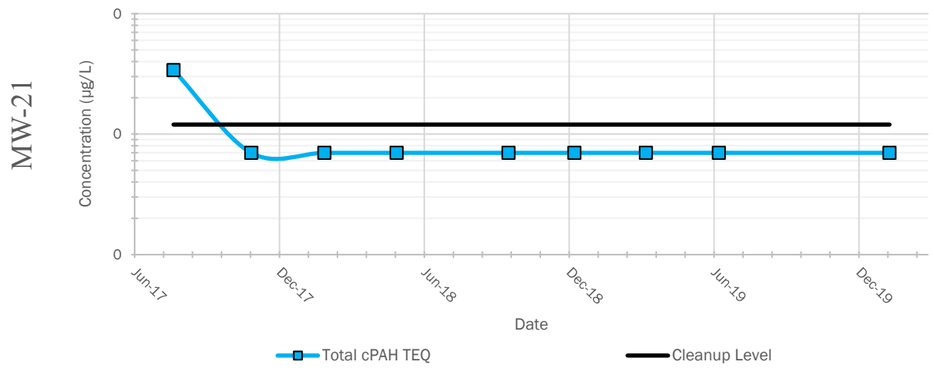
Figure 10

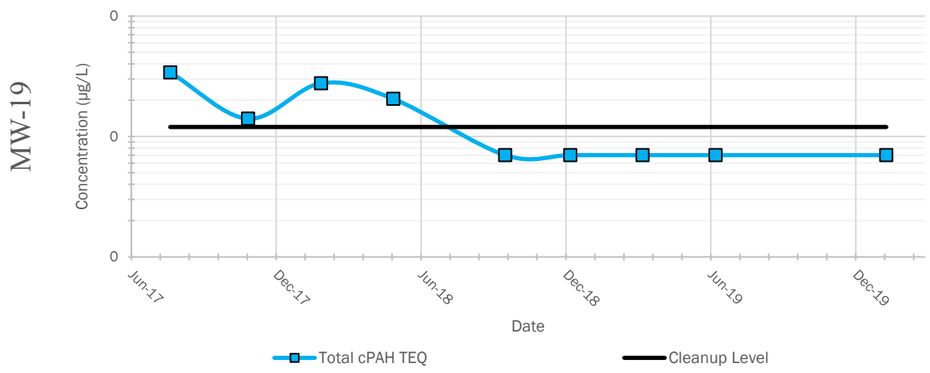
File No. 19837-007-01 Date Exported: 12/18/2020

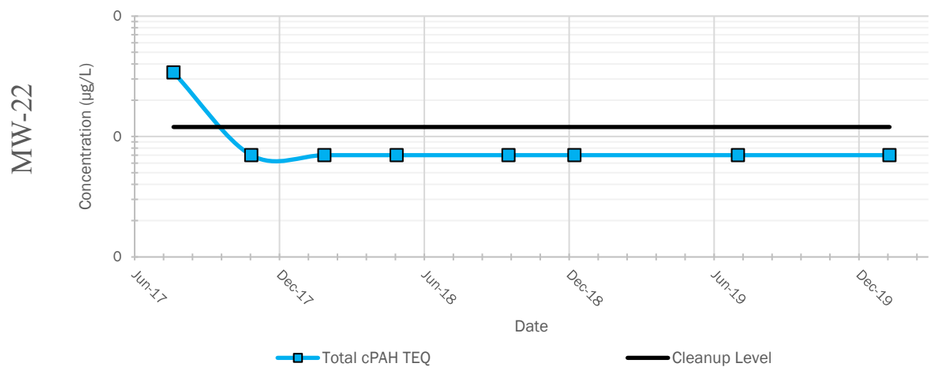












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

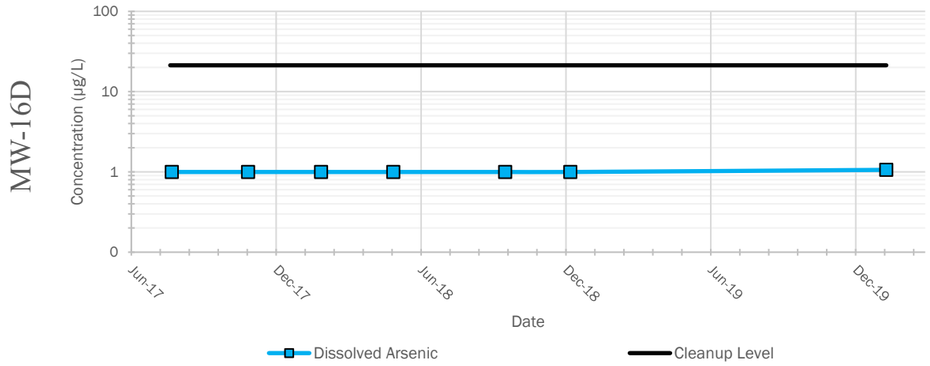
Total cPAH TEQ Results

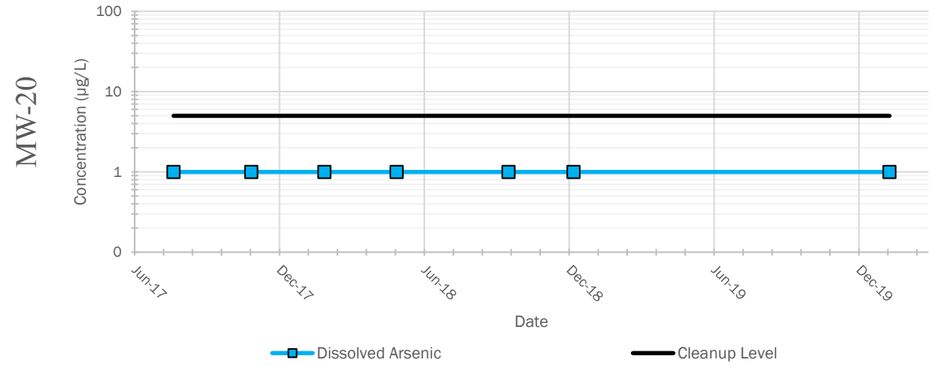
North Lot Development
Seattle, Washington

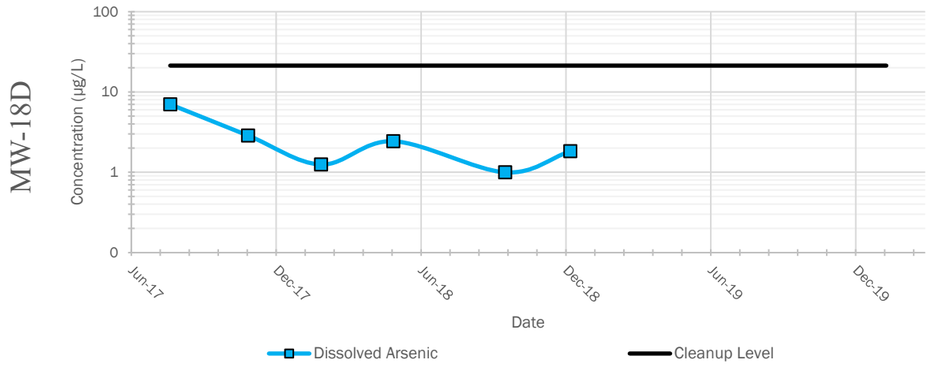
GeoEngineers

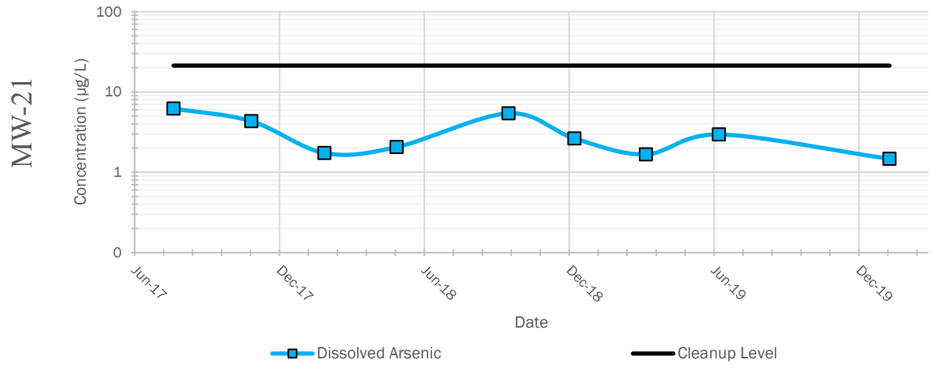
Figure 11

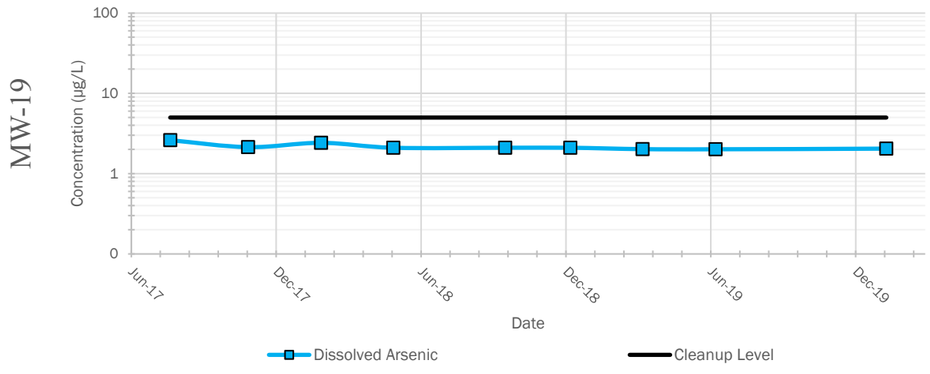
File No. 19837-007-01 Date Exported: 12/18/2020

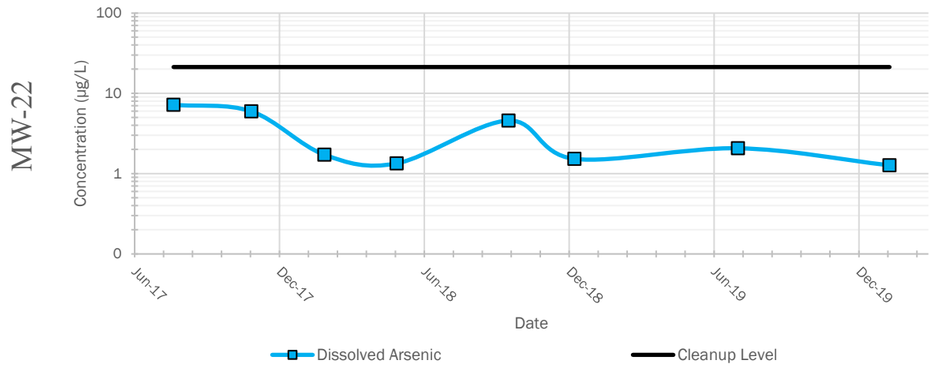












Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record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

Data Source: North Lot Development groundwater monitoring results (see Table 1).

Dissolved Arsenic Results

North Lot Development
Seattle, Washington

GeoEngineers

Figure 12

File No. 19837-007-01 Date Exported: 12/18/2020