

February 18, 2025

Washington State Department of Ecology
PO Box 47600
Olympia, Washington 98503

Attention: Josh Morman

Subject: Groundwater Monitoring Progress Report – October 2024 Monitoring Event
Quiet Cove Site
Anacortes, Washington
Agreed Order No. DE 11346

Introduction

Pursuant to Agreed Order No. DE11346 (Agreed Order) and the Washington Department of Ecology (Ecology) approved Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum No. 2 (GeoEngineers 2024), the Port of Anacortes (Port) is monitoring groundwater conditions at the Quiet Cove Site (Site) situated along the shoreline of Guemes Channel at 202 O Avenue (the intersection of 2nd Street and O Avenue) in Anacortes, Washington (Figure 1). Groundwater monitoring activities are being completed by the Port to further document groundwater conditions following completion of the 2020 Interim Action¹.

In accordance with RI/FS Work Plan Addendum No. 2 groundwater monitoring data (Table 1) are being provided to Ecology following the completion of each quarterly monitoring event. Upon completion of the fourth quarterly monitoring event, the groundwater monitoring activities will be summarized in a final report and submitted to Ecology.

Summary of Groundwater Monitoring Activities

GROUNDWATER MONITORING APPROACH

Groundwater monitoring activities are being completed on a quarterly basis for four quarterly monitoring events to evaluate seasonal variability. Groundwater monitoring will include the following events:

¹ Pursuant to the Washington Administrative Code (WAC) 173-340-430 and in coordination with Ecology, the Port completed an Interim Action between August and November 2020 (2020 Interim Action) to remediate a portion of the Site to facilitate redevelopment of the property for commercial purposes. Specific details regarding the 2020 Interim Action are presented in the Interim Action Completion Report (GeoEngineers 2021a).

- Round 1 Groundwater Monitoring Event – Completed on October 30, 2024
- Round 2 Groundwater Monitoring Event – Anticipated for February 2025
- Round 3 Groundwater Monitoring Event – Anticipated for May 2025
- Round 4 Groundwater Monitoring Event – Anticipated for August 2025

MONITORING WELL NETWORK

The network of groundwater monitoring wells being utilized at the Site is shown in Figure 2. In accordance with the Post-Interim Action Construction Groundwater Monitoring Plan (GMP; GeoEngineers 2021b), monitoring wells are positioned to document the following:

- **Shoreline Area Monitoring Wells** – Monitoring wells MW-1A, MW-2A and MW-13 are positioned to document groundwater conditions along the shoreline of Guemes Channel downgradient of the 2020 Interim Action area.
- **2nd Street Area Monitoring Wells** – Monitoring wells MW-3, MW-4 and MW-15 are positioned to document groundwater conditions downgradient of the residual petroleum-related contamination remaining in-place beneath the 2nd Street Right-of-Way (ROW) north of the 2020 Interim Action area.
- **Southern Property Boundary Area** – Monitoring wells MW-8 and MW-14 are positioned to document groundwater conditions in the southern portion of the Site. MW-8 is positioned to document groundwater conditions south and cross-gradient of the 2020 Interim Action area. Monitoring well MW-14 is positioned downgradient of the residual petroleum-related contamination remaining in-place along the southwest sidewall of the completed 2020 Interim Action excavation to evaluate the potential for recontamination of the imported backfill placed as part of the interim action.

SAMPLING PROCEDURES

Groundwater samples were obtained using low-flow/low-turbidity sampling techniques to minimize the potential for suspension of sediment in groundwater. Samples from the shoreline wells were collected around the day-time low tide during the monitoring event. At each well, groundwater was pumped at 0.5 liter per minute or less using a peristaltic pump through dedicated polyethylene tubing placed within the screened interval. A water quality meter with flow-through cell was used to monitor groundwater parameters during purging. Groundwater samples were obtained after ambient groundwater conditions were achieved at each well location. Groundwater field parameters measured at the time of sampling are presented in Table 1.

Prior to sampling, groundwater levels were measured in each monitoring well using an electric water level indicator (e-tape). Measurements were made to the nearest 0.01 foot relative to the surveyed well-casing rim elevations. Measured groundwater levels are summarized in Table 1.

CHEMICAL ANALYSIS

The collected groundwater samples were submitted to OnSite Environmental, Inc. in Redmond, Washington for analysis of the following chemical and geochemical parameters:

- Gasoline-range petroleum hydrocarbons by Ecology Method NWTPH-G;

- Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx with and without the acid silica gel cleanup preparation method;
- Volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX), n-hexane, methyl tert-butyl ether (MTBE), 1,2-dibromoethane (EDB) and 1,2-dichloroethane (EDC) by United States Environmental Protection Agency (EPA) Method 8260;
- Total and dissolved metals including arsenic, cadmium, chromium, lead, and mercury by EPA Method 200.8/245.1;
- Total alkalinity by Standard Method (SM) 2320;
- Ferrous iron by SM 3500-Fe;
- Nitrate and sulfate by EPA Method 300.0; and
- Dissolved manganese by EPA Method 6020; and
- Dissolved methane by EPA Method RSK-175.

ANALYTICAL RESULTS

Groundwater analytical results for the October 2024 groundwater monitoring event are summarized in Table 1. Based on a review of the chemical analytical data, the following exceedances of the preliminary screening levels were identified:

- **Total and dissolved arsenic** in monitoring well MW-15 were detected at concentrations of 8.8 and 9.3 µg/L, respectively, which exceed the preliminary screening level of 8 µg/L.
- **Diesel-range petroleum hydrocarbons** were detected at concentrations between 900 and 1,200 micrograms per liter (µg/L) in monitoring wells MW-8 and MW-15 which exceed the preliminary screening level of 500 µg/L. However, in the samples prepared using the silica gel cleanup method, diesel-range petroleum hydrocarbons were not detected greater than the reporting limit of 200 µg/L.
- **Heavy oil-range petroleum hydrocarbons** were detected at concentrations between 960 and 1,000 µg/L in monitoring wells MW-8 and MW-15 which exceed the preliminary screening level of 500 µg/L. However, in the samples prepared using the silica gel cleanup method, heavy oil-range petroleum hydrocarbons were not detected greater than the reporting limit of 200 µg/L.
- **Total diesel- and heavy oil-range petroleum hydrocarbons** were detected at concentrations between 590 and 2,600 µg/L in monitoring wells MW-4, MW-8 and MW-15 which exceed the preliminary screening level of 500 µg/L. However, in the samples prepared using the silica gel cleanup method, total diesel- and heavy oil-range petroleum hydrocarbons were not detected greater than 400 µg/L (sum of diesel- and heavy oil-range reporting limits).
- **Benzene** was detected in monitoring well MW-8 at concentrations of 12 and 13 µg/L (parent and duplicate sample) which exceed the preliminary screening level of 2.4 µg/L. The detected concentrations are within the range of previously detected concentrations at this location.

Additionally, the polar organic concentration for total diesel- and heavy oil-range petroleum hydrocarbons analyzed with and without the acid silica gel cleanup preparation method were also calculated for comparison to the newly established screening level of 500 µg/L in accordance with Ecology Implementation Memorandum No. 4 and Guidance for Silica Gel Cleanup in Washington State (Ecology

2004 and 2023). The adjusted total diesel- and heavy oil-range petroleum hydrocarbon concentration in monitoring wells MW-8 and MW-15 both exceed the polar metabolite screening level of 500 µg/L. In monitoring well MW-4, the adjusted total diesel- and heavy oil-range petroleum hydrocarbon concentration was less than the polar metabolite screening level of 500 µg/L.

Analytes exceeding the preliminary screening levels during one or more groundwater monitoring event, including gasoline-petroleum hydrocarbons, total diesel- and heavy oil-range petroleum hydrocarbons, benzene and arsenic are shown in trend plots to document changes in groundwater conditions prior to and following the 2020 Interim Action. Trend plots comparing the relationship between gasoline-range petroleum hydrocarbons and benzene are shown in Figure 3. Trend plots for total diesel- and heavy oil-range petroleum hydrocarbons are shown in Figure 4. Trend plots for total and dissolved arsenic are shown in Figure 5.

DEVIATIONS FROM THE WORK PLAN

Deviations to RI/FS Work Plan Addendum No. 2 included the following:

- Shoreline monitoring well MW-3 was previously damaged during pavement construction activities being completed as part of the Port's 2nd Street/Curtis Wharf Paving Project. In coordination with Ecology, groundwater samples from this monitoring well were not obtained as part of the October 2024 monitoring event. Monitoring well MW-3 will be either repaired or decommissioned and reinstalled prior to the next post-interim action quarterly groundwater monitoring event which is anticipated for February 2025.

Limitations

This progress report has been prepared for the exclusive use of the Port of Anacortes and the Washington State Department of Ecology. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance. Any use of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and written authorization by GeoEngineers, Inc., shall be at the user's sole risk. Any unauthorized use of (or reliance on) this report shall release GeoEngineers from any liability resulting from such use (or reliance). Within the limitations of scope, schedule, and budget, GeoEngineers, Inc.'s respective services have been provided in a manner consistent with that level of care and skill exercised by members of the profession currently practicing in the same locality under similar conditions as this project. No warranty or other conditions, expressed or implied, should be understood. GeoEngineers, Inc. assumes no responsibility for any consequence arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available.

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References

GeoEngineers, Inc. 2021a. Interim Action Construction Completion Report; Quiet Cove Interim Action; Anacortes, Washington; Ecology Agreed Order No. DE 11346. GeoEngineers File No. 5147-024-10. June 22, 2021.

GeoEngineers, Inc. 2021b. Post-Interim Action Construction Groundwater Monitoring Plan; Quiet Cove Site; Anacortes, Washington; Ecology Agreed Order No. DE 11346. GeoEngineers File No. 5147-024-10. August 19, 2021.

GeoEngineers, Inc. 2024. Remedial Investigation/Feasibility Study Work Plan Addendum No. 2 for Supplemental Soil and Groundwater Characterization in the Riparian and Southern Boundary Areas of the Quiet Cove Site, Anacortes, Washington; Ecology Agreed Order No. DE 11346. GeoEngineers File No. 5147-024-12. March 8, 2024.

Ecology 2003. Washington State Department of Ecology (Ecology) 2004. Implementation Memorandum #4, Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil. Publication No. 04-09-086. June 2004.

Ecology 2023. Washington State Department of Ecology (Ecology) 2023. Guidance for Silica Gel Cleanup in Washington State. Publication No. 22-09-059. November 2023.

Groundwater monitoring activities will continue to be completed by the Port to evaluate groundwater conditions.

Sincerely,



Senior Environmental Engineer



John M. Herzog, PhD
Senior Principal

DK:BJT:RST:JMH:ch

Attachments:

Table 1. Groundwater Field Parameters and Chemical Analytical Data

Figure 1. Vicinity Map

Figure 2. Groundwater Sampling Locations

Figure 3. Groundwater Summary - Gasoline-Range Hydrocarbons and Benzene

Figure 4. Groundwater Summary - Diesel- and Heavy Oil-Range Hydrocarbons

Figure 5. Groundwater Summary- Total and Dissolved Arsenic

Appendix A: Laboratory Data Report

cc: Brad Tesch (1)
Port of Anacortes

Tim Bishop (1)
Chevron Environmental Management and Real Estate Co. (CEMREC)

Tables

Table 1
Groundwater Field Parameters and Chemical Analytical Data
 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Units	MW-1					MW-1A					Preliminary Screening Level ²		
			MW-1_7.1.14	MW-1_110917	MW-1_031918	MW-1_103118	MW-1_060519	MW-1A_102521	DUP-1_102521	MW-1A_020222	DUP-1_020222	MW-1A_051922		DUP-1_051922	MW-1A_082422
Date Sampled			07/01/14	11/09/17	03/19/18	10/31/18	06/05/19	10/25/21	10/25/21	02/02/22	02/02/22	05/19/22	05/19/22	08/24/22	
Field Measured Parameters															
Top of Casing Elevation ³	Feet		11.91	11.91	11.91	11.91	11.91	12.49	12.49	12.49	12.49	12.49	12.49	12.49	NE
Depth to Groundwater ⁴	Feet		12.02	3.93	4.56	4.35	4.76	4.26	4.26	4.76	4.76	4.99	4.99	5.62	NE
Groundwater Elevation	Feet		4.91	7.98	7.35	7.56	7.15	8.23	8.23	7.73	7.73	7.50	7.50	6.87	NE
pH	n/a		5.54	7.46	5.89	6.33	5.92	6.67	6.67	7.02	7.02	6.42	6.42	6.33	NE
Conductivity	µS/cm		237	195.2	132	162.9	421	550	550	460	460	440	440	460	NE
Turbidity	NTU		10.50	4.0	3.3	10.0	7.3	4.9	4.9	3.5	3.5	2.0	2.0	0.6	NE
Dissolved Oxygen	mg/L		0.17	1.27	1.53	2.99	0.72	0.14	0.14	0.53	0.53	1.31	1.31	0.32	NE
Temperature	°C		15.2	11.5	8.0	13.3	13.6	14.3	14.3	10.4	10.4	11.0	11.0	14.2	NE
Total Dissolved Solids	mg/L		--	171	126.7	136	351	448.5	448.5	408.6	408.6	389.8	389.8	372.6	NE
Oxidation Reduction Potential	mV		-4.7	113.9	39.2	31.4	103.7	-35.1	-35.1	20.9	20.9	19.8	19.8	24.9	NE
Salinity	%		--	0.13	0.09	0.10	0.26	0.34	0.34	0.31	0.31	0.30	0.30	0.28	NE
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175															
Total Alkalinity by SM2320	mg/L		--	--	--	69	124	310	300	280	280	270	280	270	NE
Ferrous Iron by SM3500	mg/L		--	--	--	0.598	1.21	2.38 J	2.48	2.86	3.1	2.56	2.61	2.67	NE
Nitrate	mg/L		--	--	--	0.501	0.100 U	0.025 U	0.025 U	0.549 J	0.1 UJ	0.5 UJ	0.5 UJ	0.1 UJ	NE
Sulfate	mg/L		--	--	--	25.8	4.05	7.14	7.38	16.6	16.9	9.55	9.27	8.28	NE
Methane	µg/L		--	--	--	264	1,000	730	780	800	780	510	540	380	NE
Total Metals by EPA 200.8/245.1															
Arsenic	µg/L		--	2.42 J	0.86	--	--	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	8 ⁵
Cadmium	µg/L		--	0.0420 J	0.100 U	--	--	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	8.8
Chromium	µg/L		--	0.520 J	0.323 J	--	--	11 U	11 U	11 U	11 U	11 U	11 U	11 U	50
Lead	µg/L		--	0.403 J	0.361	--	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.1
Mercury	µg/L		--	0.020 U	0.020 U	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Dissolved Metals by EPA 200.8/245.1															
Arsenic	µg/L		--	1.2	0.614	--	--	3.0 U	3.0 U	3.0 U	3.0 U	3.3 U	3.0 U	3.0 U	8 ⁵
Cadmium	µg/L		--	0.0360 J	0.100 U	--	--	4.0 U	4.0 U	4.0 U	4.0 U	4.4 U	4.0 U	4.0 U	8.8
Chromium	µg/L		--	0.228 J	0.333 J	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50
Lead	µg/L		--	0.100 U	0.209	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.1
Manganese	µg/L		--	--	--	48.1	102	120	120	100	100	78	73	81	NE
Mercury	µg/L		--	0.020 U	0.020 U	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Petroleum Hydrocarbons by NWTPH-G/Dx															
Gasoline-Range	µg/L		100 U	100 U	100 U	--	--	100 U	100 U	100 U	100 U	100 U	100 U	100 U	800 ⁶
Diesel-Range	µg/L		860	665 J	388	1,090	614	650	690	310	390	320	300	360	500
Heavy Oil-Range	µg/L		410 U	200 UJ	200 U	359	249	450	600	260	310	270	260	430	500
Total Diesel/Heavy Oil-Range ⁷	µg/L		1,270	865 J	588	1,449	863	1,100	1,290	570	700	590	560	790	500
Diesel-Range with SGC	µg/L		--	--	--	100 U	--	200 U	210 U	210 U	210 U	200 U	200 U	200 U	500
Heavy Oil-Range with SGC	µg/L		--	--	--	200 U	--	200 U	210 U	210 U	210 U	200 U	200 U	200 U	500
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L		--	--	--	300 U	--	400 U	420 U	420 U	420 U	400 U	400 U	400 U	500
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L		--	--	--	1,149	--	700	870	150	280	190	160	390	500
Volatile Organic Compounds (VOCs) by EPA 8260															
Benzene	µg/L		1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2.4
Ethylbenzene	µg/L		1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	130
Toluene	µg/L		1 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	520
Total Xylenes	µg/L		1 U	0.40 U	0.40 U	--	--	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	310
1,2-Dibromoethane (EDB)	µg/L		--	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.3
1,2-Dichloroethane (EDC)	µg/L		--	0.20 U	0.20 U	--	--	0.35 U	0.35 U	0.20 U	0.20 U	1.0 U	1.0 U	1.0 U	4.20
Methyl t-butyl ether (MTBE)	µg/L		--	0.50 U	0.50 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	610
n-Hexane	µg/L		--	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.8

Notes:

- ¹ Sample locations are shown in Figure 2.
- ² Preliminary screening levels referenced from the Post Interim Action Construction Groundwater Monitoring Plan (GeoEngineers 2021b).
- ³ Casing elevation referenced to surveys completed by Sound Development Group (October 2017) or Pacific Surveying and Engineering, Inc. (March 2022). Vertical Datum is referenced to North American Vertical Datum 1988 (NAVD88; US Survey Feet Units).
- ⁴ Depth measured from top of casing.
- ⁵ The preliminary screening level for arsenic has been updated based on Ecology Publication 14-09-044 for Natural Background Groundwater Arsenic Concentrations in Washington State (Ecology 2022) for the Puget Sound Region.
- ⁶ Preliminary screening level for gasoline-range petroleum hydrocarbons is 800 µg/L when benzene is present and 1,000 µg/L when not present.
- ⁷ Sum of diesel- and heavy oil-range petroleum hydrocarbon result (detect or non-detect).
- ⁸ Adjusted concentration calculated by subtracting the total diesel- and heavy oil-range petroleum hydrocarbon with SGC from the total diesel- and heavy oil-range petroleum hydrocarbon result.

-- = Not Analyzed
 NE = Not Established
 µg/L = microgram per liter
 mg/L = milligram per liter
 µS/cm = microseimens per centimeter
 °C = degrees Celsius
 mV = millivolt
 NTU = Nephelometric Turbidity Unit
 ppt = parts per thousand
 SGC = acid silica gel cleanup preparation method
 U = The analyte was not detected at a concentration greater than the value identified.
 UJ = The analyte was not detected at an estimated concentration greater than the value identified.
 J = The analyte was detected and the detected concentration is considered an estimate.
 Yellow shading indicates that the identified concentration is greater than the preliminary screening level.
 Bold font type indicates the analyte was detected at the reported concentration.

Table 1
Groundwater Field Parameters and Chemical Analytical Data
 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Date Sampled	Units	MW-1A		MW-2				MW-2A				MW_3	Preliminary Screening Level ²	
				DUP-1-082422	MW-1A-103024	QC-MW-2-7.1.14	MW-2-110917	MW-2-032018	MW-2-103118	MW-2-060419	MW-2A-020722	MW-2A-051722	MW-2A-082322	MW-2A-103024		QC-MW-3-7.1.14
				08/24/22	10/30/24	07/01/14	11/09/17	03/20/18	10/31/18	06/04/19	02/07/22	05/17/22	08/23/22	10/30/24	07/01/14	
Field Measured Parameters																
Top of Casing Elevation ³	Feet			12.49	12.49	12.01	12.01	12.01	12.01	12.01	12.20	12.20	12.20	12.20	12.42	NE
Depth to Groundwater ⁴	Feet			5.62	4.68	5.65	5.12	5.48	5.70	4.60	4.93	4.98	5.42	4.67	6.11	NE
Groundwater Elevation	Feet			6.87	7.81	6.36	6.89	6.53	6.31	7.41	7.27	7.22	6.78	7.53	6.31	NE
pH	n/a			6.33	6.99	6.09	7.41	6.21	6.55	6.63	6.88	6.71	6.14	6.89	6.21	NE
Conductivity	µS/cm			460	399.3	390	493	362	452.7	1,300	470	530	510	470	886	NE
Turbidity	NTU			0.6	9.3	3.1	3.8	4.8	7.6	9.9	17.1	108	13.5	5.8	10.5	NE
Dissolved Oxygen	mg/L			0.32	0.08	0.39	0.28	2.02	1.07	1.05	3.35	1.43	0.44	0.46	0.13	NE
Temperature	°C			14.2	14.2	15.0	13.5	9.8	14.1	14.0	9.3	11.2	15.4	14.9	14.8	NE
Total Dissolved Solids	mg/L			372.6	326.5	--	411.5	332.8	367	980	438.3	468.9	409.5	500.5	--	NE
Oxidation Reduction Potential	mV			24.9	-43.7	-16.2	93.2	70.1	-22.4	-29.8	16.2	-8.8	48.6	-31.1	-13.3	NE
Salinity	%			0.28	0.24	--	0.31	0.24	0.27	0.77	0.33	0.35	0.31	0.29	--	NE
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175																
Total Alkalinity by SM2320	mg/L			270	220	--	--	--	253	326	310	320	300	230	--	NE
Ferrous Iron by SM3500	mg/L			3.99 J	0.404	--	--	--	4.21	--	1.01	1.96	5.44	0.150 U	--	NE
Nitrate	mg/L			0.135 J	0.40 U	--	--	--	1.73	0.119	0.584 J	1.12	1.0 UJ	0.456	--	NE
Sulfate	mg/L			8.25	15.7	--	--	--	20.7	6.11	54.5	43.6	23.3 J	37.8	--	NE
Methane	µg/L			400	39	--	--	--	2,830	2,660	220	180	300	23	--	NE
Total Metals by EPA 200.8/245.1																
Arsenic	µg/L			3.3 U	4.9	--	7.69	5.69	--	--	4.6	5.3	5.2	4.4	4.9	8 ⁵
Cadmium	µg/L			4.4 U	4.4 U	--	0.0410 J	0.0350 J	--	--	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	8.8
Chromium	µg/L			11 U	11 U	--	2.23	1.28	--	--	11 U	11 U	11 U	11 U	11	50
Lead	µg/L			1.1 U	1.1 U	--	0.261	0.204	--	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.1
Mercury	µg/L			0.025 U	0.025 U	--	0.020 U	0.020 U	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.5 U	0.025
Dissolved Metals by EPA 200.8/245.1																
Arsenic	µg/L			3.0 U	5.1	--	7.57	4.66	--	--	3.8	4.5	5.1	3.8	4.5	8 ⁵
Cadmium	µg/L			4.0 U	4.0 U	--	0.100 U	0.100 U	--	--	4.0 U	4.0 U	4.0 U	4.0 U	4 U	8.8
Chromium	µg/L			10 U	10 U	--	1.58	0.99	--	--	10 U	10 U	10 U	10 U	10 U	50
Lead	µg/L			1.0 U	1.0 U	--	0.100 U	0.0860 J	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1 U	2.1
Manganese	µg/L			79	70	--	--	--	156	238	160	130	180	58	--	NE
Mercury	µg/L			0.025 U	0.025 U	--	0.020 U	0.020 U	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.5 U	0.025
Petroleum Hydrocarbons by NWTPH-G/Dx																
Gasoline-Range	µg/L			100 U	100 U	110	100 U	100 U	--	--	100 U	100 U	100 U	100 U	480	800 ⁶
Diesel-Range	µg/L			370	200 U	2,100	3,530	1,600	1,210	2,600	210 U	200 U	370	210 U	2,600 J	500
Heavy Oil-Range	µg/L			490	280	980	1,080	700	616	1,210	210 U	200 U	440	210 U	700	500
Total Diesel/Heavy Oil-Range ⁷	µg/L			860	480	3,080	4,610	2,300	1,826	3,810	420 U	400 U	810	420 U	3,300 J	500
Diesel-Range with SGC	µg/L			200 U	200 U	--	--	--	100 U	--	210 U	200 U	200 U	210 U	--	500
Heavy Oil-Range with SGC	µg/L			200 U	200 U	--	--	--	200 U	--	210 U	200 U	200 U	210 U	--	500
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L			400 U	400 U	--	--	--	300 U	--	420 U	400 U	400 U	420 U	--	500
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L			460	80	--	--	--	1,526	--	0 U	0 U	410	0 U	--	500
Volatile Organic Compounds (VOCs) by EPA 8260																
Benzene	µg/L			0.20 U	0.20 U	1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	2.4
Ethylbenzene	µg/L			0.20 U	0.20 U	1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	1 U	130
Toluene	µg/L			1.0 U	1.0 U	1 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	0.49	520
Total Xylenes	µg/L			0.40 U	0.40 U	1 U	0.40 U	0.40 U	--	--	0.40 U	0.40 U	0.40 U	0.40 U	1.56	310
1,2-Dibromoethane (EDB)	µg/L			0.20 U	0.20 U	--	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	0.3
1,2-Dichloroethane (EDC)	µg/L			1.0 U	0.20 U	--	0.20 U	0.20 U	--	--	0.20 U	1.0 U	1.0 U	1.0 U	0.2 U	4.20
Methyl t-butyl ether (MTBE)	µg/L			0.20 U	0.20 U	--	0.50 U	0.50 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	610
n-Hexane	µg/L			1.0 U	1.0 U	--	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	--	7.8

Notes:

- ¹ Sample locations are shown in Figure 2.
- ² Preliminary screening levels referenced from the Post Interim Action Construction Groundwater Monitoring Plan (GeoEngineers 2021b).
- ³ Casing elevation referenced to surveys completed by Sound Development Group (October 2017) or Pacific Surveying and Engineering, Inc. (March 2022). Vertical Datum is referenced to North American Vertical Datum 1988 (NAVD88; US Survey Feet Units).
- ⁴ Depth measured from top of casing.
- ⁵ The preliminary screening level for arsenic has been updated based on Ecology Publication 14-09-044 for Natural Background Groundwater Arsenic Concentrations in Washington State (Ecology 2022) for the Puget Sound Region.
- ⁶ Preliminary screening level for gasoline-range petroleum hydrocarbons is 800 µg/L when benzene is present and 1,000 µg/L when not present.
- ⁷ Sum of diesel- and heavy oil-range petroleum hydrocarbon result (detect or non-detect).
- ⁸ Adjusted concentration calculated by subtracting the total diesel- and heavy oil-range petroleum hydrocarbon with SGC from the total diesel- and heavy oil-range petroleum hydrocarbon result.

-- = Not Analyzed
 NE = Not Established
 µg/L = microgram per liter
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 °C = degrees Celsius
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 NTU = Nephelometric Turbidity Unit
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 U = The analyte was not detected at a concentration greater than the value identified.
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 J = The analyte was detected and the detected concentration is considered an estimate.
 Yellow shading indicates that the identified concentration is greater than the preliminary screening level.
 Bold font type indicates the analyte was detected at the reported concentration.

Table 1
Groundwater Field Parameters and Chemical Analytical Data
 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Units	MW_3								MW-4			Preliminary Screening Level ²	
			QC-MW-3-DUP-7.1.14	MW-3-101817	MW-3-032018	MW-3_103018	MW-3_060419	MW-3_102521	MW-3_020722	MW-3_051722	MW-3_082322	QC-MW-4-7.1.14	MW-4-101817		MW-4-031918
Date Sampled			07/01/14	10/18/17	03/20/18	10/30/18	06/04/19	10/25/21	02/07/22	05/17/22	08/23/22	07/01/14	10/18/17	03/19/18	
Field Measured Parameters															
Top of Casing Elevation ³	Feet		12.42	12.42	12.42	12.42	12.42	12.33	12.33	12.33	12.33	12.43	12.43	12.43	NE
Depth to Groundwater ⁴	Feet		6.11	6.32	5.82	6.21	6.00	4.91	5.78	5.91	6.12	5.23	5.68	5.62	NE
Groundwater Elevation	Feet		6.31	6.10	6.60	6.21	6.42	7.42	6.55	6.42	6.21	7.20	6.75	6.81	NE
pH	n/a		6.21	6.36	6.21	6.61	6.22	6.51	5.90	5.98	5.68	5.82	6.15	6.05	NE
Conductivity	µS/cm		886	740	520	1,457	17,900	1,380	260	350	630	670	860	367	NE
Turbidity	NTU		10.5	9.3	6.8	8.5	21.7	12.1	14.2	104	986	4.0	5.0	8.5	NE
Dissolved Oxygen	mg/L		0.13	0.40	0.11	0.76	0.39	0.11	1.65	0.71	0.78	0.10	0.06	0.16	NE
Temperature	°C		14.8	15.0	10.9	15.3	13.2	15.4	10.8	11.5	15.4	14.2	15.4	11.1	NE
Total Dissolved Solids	mg/L		--	591.5	468	1,170	14,760	1,150	231.4	320	485	--	682.5	324.6	NE
Oxidation Reduction Potential	mV		-13.3	75.6	64.9	-78.7	58.6	-8.5	49.8	98.1	121.3	-22.7	66.5	76.9	NE
Salinity	%		--	0.45	0.35	0.92	1.39	0.91	0.17	0.23	0.33	--	0.52	0.24	NE
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175															
Total Alkalinity by SM2320	mg/L		--	--	--	406	234	190	130	150	180	--	--	--	NE
Ferrous Iron by SM3500	mg/L		--	--	--	3.05	--	0.936	0.595	0.978	0.578 J	--	--	--	NE
Nitrate	mg/L		--	--	--	0.100 U	0.100 U	0.234	1.3 J	0.57 J	1.91 J	--	--	--	NE
Sulfate	mg/L		--	--	--	24.2	635	91	33.5	38.1	40.3 J	--	--	--	NE
Methane	µg/L		--	--	--	9,880	6,000	710	140	94	220	--	--	--	NE
Total Metals by EPA 200.8/245.1															
Arsenic	µg/L		--	--	1.84	2.51	--	3.7	3.3 U	3.3 U	3.3 U	--	1.5	1.97	8 ⁵
Cadmium	µg/L		--	--	0.0710 J	0.0470 J	--	4.4 U	4.4 U	4.4 U	4.4 U	--	0.500 U	0.118	8.8
Chromium	µg/L		--	--	7.32	4.9	--	11 U	11 U	11 U	11 U	--	3.29	0.394 J	50
Lead	µg/L		--	--	0.227	0.276	--	1.1 U	1.1 U	1.1 U	1.1 U	--	3.75	0.0850 J	2.1
Mercury	µg/L		--	--	0.020 U	0.020 U	--	0.025 U	0.025 U	0.025 U	0.025 U	--	0.020 U	0.020 U	0.025
Dissolved Metals by EPA 200.8/245.1															
Arsenic	µg/L		--	1.13	1.42	--	--	3.2	3.0 U	3.0 U	3.0 U	--	1.13	1.42	8 ⁵
Cadmium	µg/L		--	0.100 U	0.100 U	--	--	4.0 U	4.0 U	4.0 U	4.0 U	--	0.100 U	0.100 U	8.8
Chromium	µg/L		--	6.28	4.55	--	--	10 U	10 U	10 U	10 U	--	6.28	4.55	50
Lead	µg/L		--	0.0950 J	0.113	--	--	1.0 U	1.0 U	1.0 U	1.0 U	--	0.0950 J	0.113	2.1
Manganese	µg/L		--	--	--	292	--	59	24	26	35	--	--	--	NE
Mercury	µg/L		--	0.020 U	0.020 U	--	--	0.025 U	0.025 U	0.025 U	0.025 U	--	0.020 U	0.020 U	0.025
Petroleum Hydrocarbons by NWTPH-G/Dx															
Gasoline-Range	µg/L		530	234	100 U	--	--	100 U	100 U	100 U	100 U	510	447	100 U	800 ⁶
Diesel-Range	µg/L		2,400 J	1,940	1,270	1,420	1,080	600	580	420	400	1,300 J	1,460	293	500
Heavy Oil-Range	µg/L		640	461	279	200 U	202	460	270 J	230	530	410 U	285	200 U	500
Total Diesel/Heavy Oil-Range ⁷	µg/L		3,040 J	2,401	1,549	1,620	1,282	1,060	850 J	650	930	1,710 J	1,745	493	500
Diesel-Range with SGC	µg/L		--	--	--	100 U	--	220 U	220 U	200 U	200 U	--	--	--	500
Heavy Oil-Range with SGC	µg/L		--	--	--	200 U	--	220 U	220 U	200 U	200 U	--	--	--	500
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L		--	--	--	300 U	--	440 U	440 U	400 U	400 U	--	--	--	500
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L		--	--	--	1,320	--	620	410 J	250	530	--	--	--	500
Volatile Organic Compounds (VOCs) by EPA 8260															
Benzene	µg/L		1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	1 U	0.11 J	0.20 U	2.4
Ethylbenzene	µg/L		1 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	1 U	0.20 U	0.20 U	130
Toluene	µg/L		1 U	0.04 J	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1 U	0.09 J	0.20 U	520
Total Xylenes	µg/L		1.8	0.25	0.40 U	--	--	0.40 U	0.40 U	0.40 U	0.40 U	1 U	0.21	0.40 U	310
1,2-Dibromoethane (EDB)	µg/L		--	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.3
1,2-Dichloroethane (EDC)	µg/L		--	0.20 U	0.20 U	--	--	0.20 U	0.20 U	1.0 U	1.0 U	--	0.20 U	0.20 U	4.20
Methyl t-butyl ether (MTBE)	µg/L		--	0.50 U	0.50 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	--	0.50 U	0.50 U	610
n-Hexane	µg/L		--	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	--	0.20 U	0.20 U	7.8

Notes:

- ¹ Sample locations are shown in Figure 2.
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- ⁶ Preliminary screening level for gasoline-range petroleum hydrocarbons is 800 µg/L when benzene is present and 1,000 µg/L when not present.
- ⁷ Sum of diesel- and heavy oil-range petroleum hydrocarbon result (detect or non-detect).
- ⁸ Adjusted concentration calculated by subtracting the total diesel- and heavy oil-range petroleum hydrocarbon with SGC from the total diesel- and heavy oil-range petroleum hydrocarbon result.

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Table 1
Groundwater Field Parameters and Chemical Analytical Data
 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Date Sampled	Units	MW-4						MW-8					Preliminary Screening Level ²
				MW-4_102918	MW-4_060519	MW-4_102521	MW-4_020322	MW-4_051722	MW-4_082322	MW-4_103024	MW-8_110917	MW-8_031918	MW-8_102918	MW-8_060519	
Field Measured Parameters															
Top of Casing Elevation ³	Feet	12.43	12.43	12.34	12.34	12.34	12.34	12.34	13.13	13.13	13.13	13.13	13.58	NE	
Depth to Groundwater ⁴	Feet	5.71	5.57	4.54	6.30	6.01	5.42	4.96	4.60	4.89	5.97	4.78	4.06	NE	
Groundwater Elevation	Feet	6.72	6.86	7.80	6.04	6.33	6.92	7.38	8.53	8.24	7.16	8.35	9.52	NE	
pH	n/a	6.04	6.08	6.49	8.32	6.27	5.95	6.69	7.26	6.49	6.78	6.46	6.91	NE	
Conductivity	µS/cm	528	2,950	630	160	740	980	758	567	283	324.6	690	370	NE	
Turbidity	NTU	10.5	9.4	5.4	14.2	3.0	0.02	2.9	5.7	2.7	121	7.7	15.1	NE	
Dissolved Oxygen	mg/L	0.90	1.47	0.55	5.01	0.84	0.28	0.13	0.28	0.22	0.87	0.61	0.16	NE	
Temperature	°C	15.2	14.8	15.5	7.8	11.9	15.1	15.3	15.0	10.3	16.0	14.5	15.8	NE	
Total Dissolved Solids	mg/L	423	2,379	231.4	156.6	643	786.5	608	294.5	260	259	559.8	295.1	NE	
Oxidation Reduction Potential	mV	-82.6	55.80	70.1	35.1	30.8	-60.1	-60.3	30.8	19.4	-65.0	-10.1	-40.1	NE	
Salinity	%	0.32	1.94	0.38	0.11	0.49	0.61	0.45	0.22	0.19	0.19	0.43	0.22	NE	
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175															
Total Alkalinity by SM2320	mg/L	168	192	200	190	240	340	280	--	--	185	238	210	NE	
Ferrous Iron by SM3500	mg/L	16.7	12.7	0.152	3.38	10.9	58.8	14.8	--	--	5.61	17.7	15	NE	
Nitrate	mg/L	0.454	0.100 U	1.28	0.5 U	0.5 UJ	1.05 J	0.40 U	--	--	0.242	0.100 U	0.098	NE	
Sulfate	mg/L	72.2	51.8	42.6	6.82	5.33	2.42 J	20.4	--	--	10.5	4.23	4.69	NE	
Methane	µg/L	7,560	2,920	420	1,700	2,300 J	7,200	3,100	--	--	1,000	1,920	430	NE	
Total Metals by EPA 200.8/245.1															
Arsenic	µg/L	--	--	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	5.96	6.75	--	--	6.9	8 ⁵	
Cadmium	µg/L	--	--	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	0.100 U	0.100 U	--	--	4.4 U	8.8	
Chromium	µg/L	--	--	11 U	11 U	11 U	11 U	11 U	1.92	1.09	--	--	11 U	50	
Lead	µg/L	--	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.164	0.143	--	--	1.1 U	2.1	
Mercury	µg/L	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.020 U	0.020 U	--	--	0.025 U	0.025	
Dissolved Metals by EPA 200.8/245.1															
Arsenic	µg/L	--	--	3.0 U	3.0 U	3.0 U	3.3 U	3.0 U	6.29	3.91	--	--	5.6	8 ⁵	
Cadmium	µg/L	--	--	4.0 U	4.0 U	4.0 U	4.4 U	4.0 U	0.100 U	0.100 U	--	--	4.0 U	8.8	
Chromium	µg/L	--	--	10 U	10 U	10 U	11 U	10 U	1.41	1.13	--	--	10 U	50	
Lead	µg/L	--	--	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U	0.100 U	0.100 U	--	--	1.0 U	2.1	
Manganese	µg/L	2,570	1,800	66	1,600	1,400	5,200	1,400	--	--	1,130	2,450	2,000	NE	
Mercury	µg/L	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.020 U	0.020 U	--	--	0.025 U	0.025	
Petroleum Hydrocarbons by NWTPH-G/Dx															
Gasoline-Range	µg/L	--	--	100 U	100 U	100 U	100 U	100 U	251	109	117	970	150	800 ⁶	
Diesel-Range	µg/L	584	391	210	210 U	260	440	340	828	455	415	881	530	500	
Heavy Oil-Range	µg/L	200 U	200 U	230	210 U	200 U	350	250	342	200 U	200 U	264	400	500	
Total Diesel/Heavy Oil-Range ⁷	µg/L	784	591	440	420 U	460	790	590	1,170	655	415	1,145	930	500	
Diesel-Range with SGC	µg/L	100 U	--	200 U	210 U	200 U	220 U	200 U	--	--	100 U	--	200 U	500	
Heavy Oil-Range with SGC	µg/L	200 U	--	200 U	210 U	200 U	220 U	200 U	--	--	200 U	--	200 U	500	
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L	300 U	--	400 U	420 U	400 U	440 U	400 U	--	--	300 U	--	400 U	500	
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L	484	--	40	0 U	60	350	190	--	--	115	--	530	500	
Volatile Organic Compounds (VOCs) by EPA 8260															
Benzene	µg/L	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	5.83	3.03	2.19	13.9	7.4	2.4	
Ethylbenzene	µg/L	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.24	0.20 U	0.06 J	1.51	0.20 U	130	
Toluene	µg/L	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.54	0.12 J	0.16 J	3.35	1.0 U	520	
Total Xylenes	µg/L	--	--	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.64	0.11	0.19	1.56	0.40 U	310	
1,2-Dibromoethane (EDB)	µg/L	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.20 U	0.3	
1,2-Dichloroethane (EDC)	µg/L	--	--	0.35 U	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.15 J	--	--	0.35 U	4.20	
Methyl t-butyl ether (MTBE)	µg/L	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.50 U	0.50 U	--	--	0.20 U	610	
n-Hexane	µg/L	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.4	1.32	--	--	1.3	7.8	

Notes:

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 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Date Sampled	Units	MW-8					MW-13					MW-14		Preliminary Screening Level ²
				MW-8_020122	MW-8_051822	MW-8_082422	MW-8_103024	DUP-103024	MW-13_102521	MW-13_020222	MW-13_051822	MW-13_082422	MW-13_103024	MW-14_102521	MW-14_020222	
Field Measured Parameters																
Top of Casing Elevation ³	Feet	02/01/22		13.58	13.58	13.58	13.58	13.58	11.94	11.94	11.94	11.94	11.94	12.14	12.14	NE
Depth to Groundwater ⁴	Feet	02/01/22		4.50	5.11	5.48	4.68	4.68	3.91	4.56	4.84	5.31	4.63	1.70	4.76	NE
Groundwater Elevation	Feet	02/01/22		9.08	8.47	8.10	8.90	8.90	8.03	7.38	7.10	6.63	7.31	10.44	7.38	NE
pH	n/a	02/01/22		6.41	6.38	6.33	4.76	4.76	7.12	7.15	6.57	6.33	7.03	7.96	6.67	NE
Conductivity	µS/cm	02/01/22		360	370	310	460	460	520	370	360	400	370.6	511	930	NE
Turbidity	NTU	02/01/22		9.1	10.2	4.1	4.8	4.8	3.9	4.3	6.4	9.1	5.0	14.3	12.8	NE
Dissolved Oxygen	mg/L	02/01/22		1.09	0.82	0.50	0.59	0.59	0.16	0.68	0.75	0.58	0.21	1.91	1.48	NE
Temperature	°C	02/01/22		10.6	12.2	16.9	15.5	15.5	14.1	9.3	10.8	14.4	13.6	13.8	10.8	NE
Total Dissolved Solids	mg/L	02/01/22		331.4	206.9	240.9	205.5	205.5	429	342.6	317.9	326.3	306.8	423	832	NE
Oxidation Reduction Potential	mV	02/01/22		62.9	-29.5	28.7	-40.1	-40.1	-42.3	29.8	-11.8	38.2	-68.4	137.4	126.8	NE
Salinity	%	02/01/22		0.25	0.21	0.15	0.27	0.27	0.32	0.26	0.24	0.24	0.22	0.32	0.64	NE
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175																
Total Alkalinity by SM2320	mg/L	02/01/22		260	240	180	240	250	270	220	110	240	230	120	100	NE
Ferrous Iron by SM3500	mg/L	02/01/22		24.3	24.5	10.5	17.4 J	1.21 J	1.66	2.92 J	0.768	3.41	3.4	0.1 U	0.29	NE
Nitrate	mg/L	02/01/22		1.14	0.5 U	0.122 J	2.23 J	0.4 UJ	0.053	0.1 U	1.21	0.150 J	0.40 U	1.55	0.979	NE
Sulfate	mg/L	02/01/22		9.08	3.34	4.68	4.06	3.7	56.6	40.2	28.1	19.6	9.09	176	19	NE
Methane	µg/L	02/01/22		1,000	1,400	910	710	850	440	490	300	920	360	3.9	28	NE
Total Metals by EPA 200.8/245.1																
Arsenic	µg/L	02/01/22		6.6	6.8	4.4	5.5	4.3	3.6	3.3 U	6.8	3.3 U	3.3 U	3.3 U	6.2	8 ⁵
Cadmium	µg/L	02/01/22		4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	8.8
Chromium	µg/L	02/01/22		11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	50
Lead	µg/L	02/01/22		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.1
Mercury	µg/L	02/01/22		0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Dissolved Metals by EPA 200.8/245.1																
Arsenic	µg/L	02/01/22		3.5	5.3	4.1	4.1	3.5	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	4.7	8 ⁵
Cadmium	µg/L	02/01/22		4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	8.8
Chromium	µg/L	02/01/22		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50
Lead	µg/L	02/01/22		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.1
Manganese	µg/L	02/01/22		2,500	2,300	1,400	2,300	2,300	190	150	88	110	130	320	55	NE
Mercury	µg/L	02/01/22		0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Petroleum Hydrocarbons by NWTPH-G/Dx																
Gasoline-Range	µg/L	02/01/22		120	320 J	290	170	190	100 U	100 U	100 U	100 U	100 U	100 U	100 U	800 ⁶
Diesel-Range	µg/L	02/01/22		650	700	570	900	990	470	210	200 U	350	200 U	210 U	210 U	500
Heavy Oil-Range	µg/L	02/01/22		730	380	570	1,000	960	560	230	300	630	200 U	210 U	210 U	500
Total Diesel/Heavy Oil-Range ⁷	µg/L	02/01/22		1,380	1,080	1,140	1,900	1,950	1,030	440	500	630	400 U	420 U	420 U	500
Diesel-Range with SGC	µg/L	02/01/22		200 U	200 U	200 U	210 U	200 U	200 U	210 U	200 U	200 U	200 U	210 U	210 U	500
Heavy Oil-Range with SGC	µg/L	02/01/22		200 U	200 U	200 U	210 U	200 U	200 U	210 U	200 U	200 U	200 U	210 U	210 U	500
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L	02/01/22		400 U	400 U	400 U	420 U	400 U	400 U	420 U	400 U	400 U	400 U	420 U	420 U	500
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L	02/01/22		980	680	740	1,480	1,550	630	20	100	230	0 U	0 U	0 U	500
Volatile Organic Compounds (VOCs) by EPA 8260																
Benzene	µg/L	02/01/22		6.3	19	10	12	13	4.0	2.7	3.3	3.0	2.2	0.20 U	0.20 U	2.4
Ethylbenzene	µg/L	02/01/22		0.20 U	0.61	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	130
Toluene	µg/L	02/01/22		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	520
Total Xylenes	µg/L	02/01/22		0.40 U	0.78	0.45	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	310
1,2-Dibromoethane (EDB)	µg/L	02/01/22		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.3
1,2-Dichloroethane (EDC)	µg/L	02/01/22		0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.44	0.32	1.0 U	1.0 U	1.0 U	0.35 U	0.20 U	4.20
Methyl t-butyl ether (MTBE)	µg/L	02/01/22		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	610
n-Hexane	µg/L	02/01/22		1.0 U	8.4	4.3	1.1	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.8

Notes:

- ¹ Sample locations are shown in Figure 2.
- ² Preliminary screening levels referenced from the Post Interim Action Construction Groundwater Monitoring Plan (GeoEngineers 2021b).
- ³ Casing elevation referenced to surveys completed by Sound Development Group (October 2017) or Pacific Surveying and Engineering, Inc. (March 2022). Vertical Datum is referenced to North American Vertical Datum 1988 (NAVD88; US Survey Feet Units).
- ⁴ Depth measured from top of casing.
- ⁵ The preliminary screening level for arsenic has been updated based on Ecology Publication 14-09-044 for Natural Background Groundwater Arsenic Concentrations in Washington State (Ecology 2022) for the Puget Sound Region.
- ⁶ Preliminary screening level for gasoline-range petroleum hydrocarbons is 800 µg/L when benzene is present and 1,000 µg/L when not present.
- ⁷ Sum of diesel- and heavy oil-range petroleum hydrocarbon result (detect or non-detect).
- ⁸ Adjusted concentration calculated by subtracting the total diesel- and heavy oil-range petroleum hydrocarbon with SGC from the total diesel- and heavy oil-range petroleum hydrocarbon result.

- = Not Analyzed

NE = Not Established

µg/L = microgram per liter

mg/L = milligram per liter

µS/cm = microseimens per centimeter

°C = degrees Celsius

mV = millivolt

NTU = Nephelometric Turbidity Unit

ppt = parts per thousand

SGC = acid silica gel cleanup preparation method

U = The analyte was not detected at a concentration greater than the value identified.

UJ = The analyte was not detected at an estimated concentration greater than the value identified.

J = The analyte was detected and the detected concentration is considered an estimate.

Yellow shading indicates that the identified concentration is greater than the preliminary screening level.

Bold font type indicates the analyte was detected at the reported concentration.

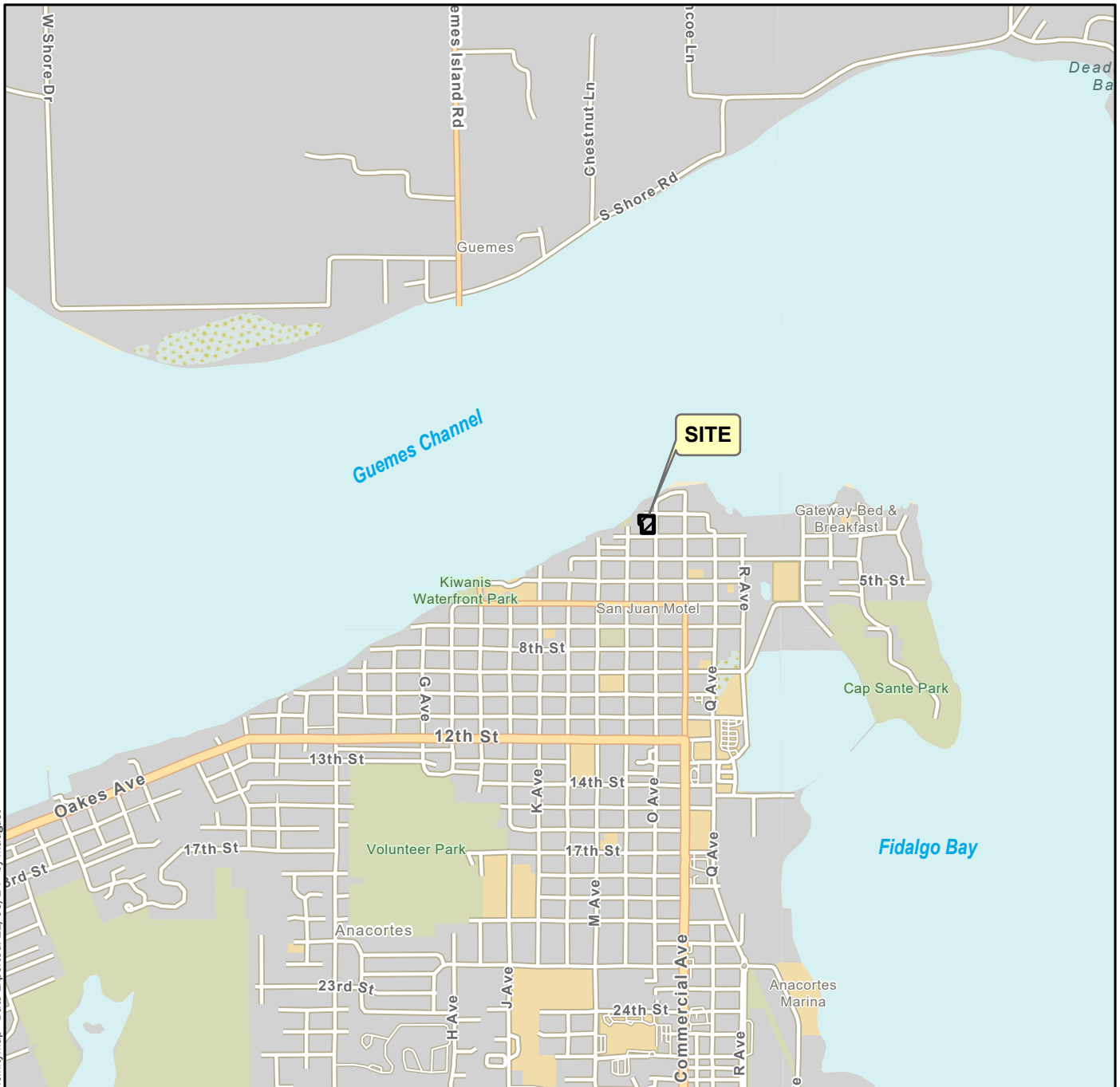
Table 1
Groundwater Field Parameters and Chemical Analytical Data
 Quiet Cove Site
 Anacortes, Washington

Sample Location ¹	Sample Identification	Units	MW-14			MW-15					Preliminary Screening Level ²
			MW-14_051822	MW-14_082422	MW-14_103024	MW-15_102521	MW-15_020322	MW-15_051722	MW-15_082422	MW-15_103024	
Date Sampled			05/18/22	08/24/22	10/30/24	10/25/21	02/03/22	05/17/22	08/24/22	10/30/24	
Field Measured Parameters											
Top of Casing Elevation ³	Feet		12.14	12.14	12.14	12.20	11.20	11.20	11.20	11.20	NE
Depth to Groundwater ⁴	Feet		10.05	3.18	4.61	4.38	4.78	5.41	5.31	4.61	NE
Groundwater Elevation	Feet		2.09	8.96	7.53	7.82	6.42	5.79	5.89	6.59	NE
pH	n/a		7.64	6.96	7.85	6.23	6.63	6.31	5.81	6.45	NE
Conductivity	µS/cm		240	290	248	1,730	1,330	1,510	1,580	2,098	NE
Turbidity	NTU		11.2	4.8	5.5	4.4	10.9	4.4	1.8	2.2	NE
Dissolved Oxygen	mg/L		3.83	0.54	7.84	0.18	0.52	0.89	0.31	0.15	NE
Temperature	°C		11.4	17.3	14.0	14.5	8.6	12.0	17.3	15.0	NE
Total Dissolved Solids	mg/L		204.9	218.1	203.8	1,385	1,259	1,307	1,203	1,604	NE
Oxidation Reduction Potential	mV		57.8	87.3	158.2	-18.0	47.1	-38.2	-6.4	-58.5	NE
Salinity	%		0.15	0.16	0.15	1.12	0.99	1.03	0.94	1.35	NE
Geochemical Parameters by SM 2320/3500-Fe and EPA 300.0/6020/RSK-175											
Total Alkalinity by SM2320	mg/L		110	150	110	570	440	390	450	500	NE
Ferrous Iron by SM3500	mg/L		0.768	1.59	0.150 U	51.2	53.4	52.2	59.2	97.4	NE
Nitrate	mg/L		1.21	1.0 U	1.15	0.025 U	0.415 J	1.0 UJ	1.0 UJ	0.40 U	NE
Sulfate	mg/L		28.1	23	35.9	1.48	4.13	5.53 J	6.0 UJ	2.0 U	NE
Methane	µg/L		300	760	5.3	10,000	14,000	7,900 J	7,700	7,900	NE
Total Metals by EPA 200.8/245.1											
Arsenic	µg/L		5.0	4.0	3.9	6.2	3.3 U	4.4	6.8	8.8	8 ⁵
Cadmium	µg/L		4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	8.8
Chromium	µg/L		11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	50
Lead	µg/L		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.1
Mercury	µg/L		0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Dissolved Metals by EPA 200.8/245.1											
Arsenic	µg/L		3.7	3.2	3.5	5.4	3.0 U	4.3	6.8	9.3	8 ⁵
Cadmium	µg/L		4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	8.8
Chromium	µg/L		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50
Lead	µg/L		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.1
Manganese	µg/L		11	150	11 U	3,900	4,800	5,300	5,000	5,900	NE
Mercury	µg/L		0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025
Petroleum Hydrocarbons by NWTPH-G/Dx											
Gasoline-Range	µg/L		100 U	100 U	100 U	100 U	110 U	240 U	230	150	800 ⁶
Diesel-Range	µg/L		200 U	210 U	200 U	1,600	1,200	1,400	1,600	1,200	500
Heavy Oil-Range	µg/L		200 U	250	200 U	1,100	520	530	1,000	960	500
Total Diesel/Heavy Oil-Range ⁷	µg/L		400 U	460	400 U	2,700	1,720	1,930	2,600	2,160	500
Diesel-Range with SGC	µg/L		200 U	210 U	200 U	210 U	210 U	200 U	200 U	200 U	500
Heavy Oil-Range with SGC	µg/L		200 U	210 U	200 U	210 U	210 U	200 U	200 U	200 U	500
Total Diesel/Heavy Oil-Range with SGC ⁷	µg/L		400 U	420 U	400 U	420 U	420 U	400 U	400 U	400 U	500
Adjusted Total Diesel/Heavy Oil-Range ⁸	µg/L		0 U	40	0 U	2,280	1,300	1,530	2,200	1,760	500
Volatile Organic Compounds (VOCs) by EPA 8260											
Benzene	µg/L		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2.4
Ethylbenzene	µg/L		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	130
Toluene	µg/L		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	520
Total Xylenes	µg/L		0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	310
1,2-Dibromoethane (EDB)	µg/L		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.3
1,2-Dichloroethane (EDC)	µg/L		1.0 U	1.0 U	1.0 U	0.35 U	0.20 U	1.0 U	1.0 U	1.0 U	4.20
Methyl t-butyl ether (MTBE)	µg/L		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	610
n-Hexane	µg/L		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.8

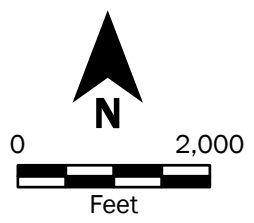
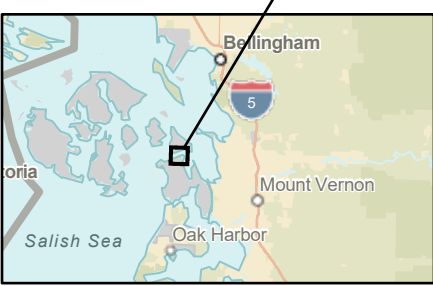
Notes:

- ¹ Sample locations are shown in Figure 2.
 - ² Preliminary screening levels referenced from the Post Interim Action Construction Groundwater Monitoring Plan (GeoEngineers 2021b).
 - ³ Casing elevation referenced to surveys completed by Sound Development Group (October 2017) or Pacific Surveying and Engineering, Inc. (March 2022). Vertical Datum is referenced to North American Vertical Datum 1988 (NAVD88; US Survey Feet Units).
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 - ⁵ The preliminary screening level for arsenic has been updated based on Ecology Publication 14-09-044 for Natural Background Groundwater Arsenic Concentrations in Washington State (Ecology 2022) for the Puget Sound Region.
 - ⁶ Preliminary screening level for gasoline-range petroleum hydrocarbons is 800 µg/L when benzene is present and 1,000 µg/L when not present.
 - ⁷ Sum of diesel- and heavy oil-range petroleum hydrocarbon result (detect or non-detect).
 - ⁸ Adjusted concentration calculated by subtracting the total diesel- and heavy oil-range petroleum hydrocarbon with SGC from the total diesel- and heavy oil-range petroleum hydrocarbon result.
- = Not Analyzed
 NE = Not Established
 µg/L = microgram per liter
 mg/L = milligram per liter
 µS/cm = microseimens per centimeter
 °C = degrees Celsius
 mV = millivolt
 NTU = Nephelometric Turbidity Unit
 ppt = parts per thousand
 SGC = acid silica gel cleanup preparation method
 U = The analyte was not detected at a concentration greater than the value identified.
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 Yellow shading indicates that the identified concentration is greater than the preliminary screening level.
 Bold font type indicates the analyte was detected at the reported concentration.

Figures



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Vicinity Map	
Quiet Cove Site Anacortes, Washington	
GEOENGINEERS	Figure 1

Source(s):
 • ESRI

Coordinate System: NAD 1983 UTM Zone 10N

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.



Legend

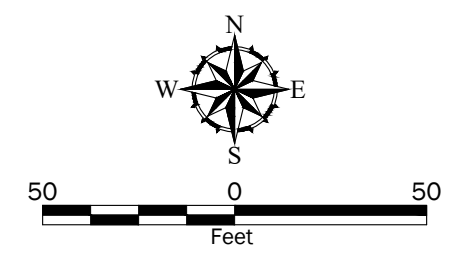
- Port of Anacortes Properties at Quiet Cove Site
- Contour (Feet, NAVD 88)
- Interim Action Remedial Excavation Horizontal Limits
- Final Interim Action Excavation Sidewalls with the Presence of Petroleum Hydrocarbon-Related Contamination Exceeding Site Remediation Objectives
- MW-2 Monitoring Well Decommissioned During Interim Action Construction
- MW-6 Pre-Interim Action Groundwater Monitoring Location
- MW-1A Post Interim Action Groundwater Monitoring Location
- Inferred groundwater flow direction

- Notes:**
1. Interim action excavation limit based on surveys completed by Larry Steele & Associates, Inc. Dated 11/02/2020.
 2. The locations of all features shown are approximate.
 3. 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: Base survey by Sound Development Group on 10/11/2017
 Imagery from Google Earth Pro dated 8/15/2020.

Horizontal Datum: NAD83 Washington State Planes, North Zone, US Foot

Vertical Datum: North American Vertical Datum, 1988, US Foot



Groundwater Sampling Locations

Quiet Cove Site
Anacortes, Washington

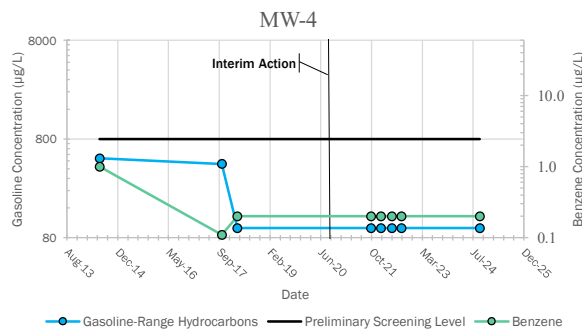
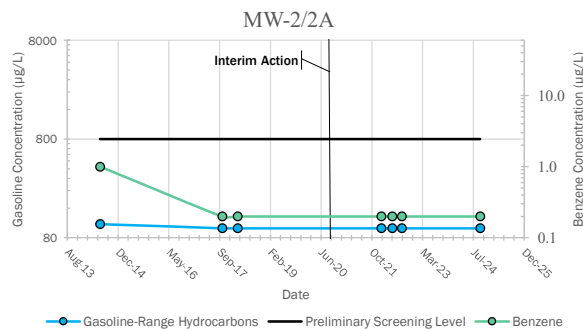
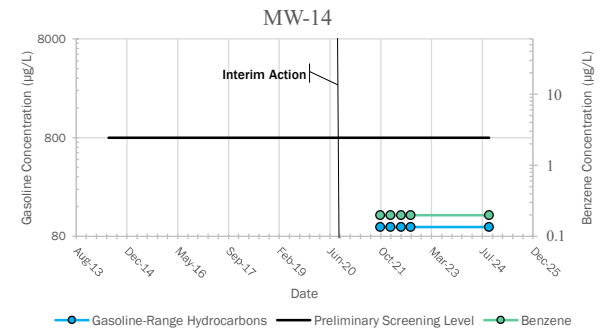
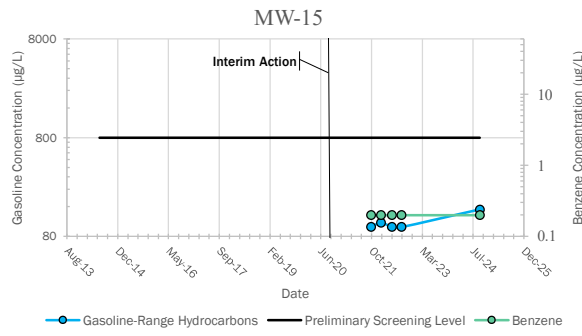
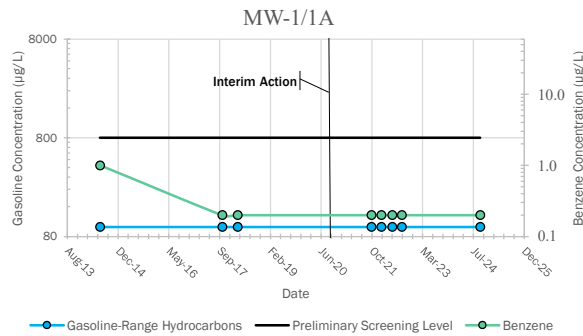
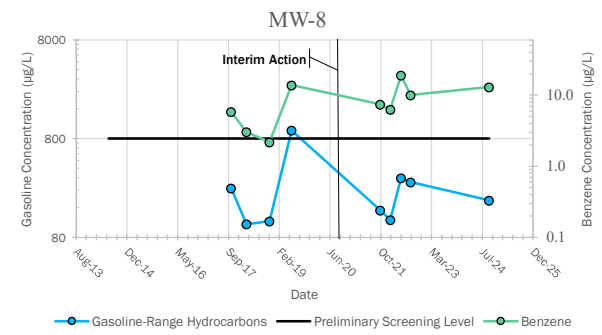
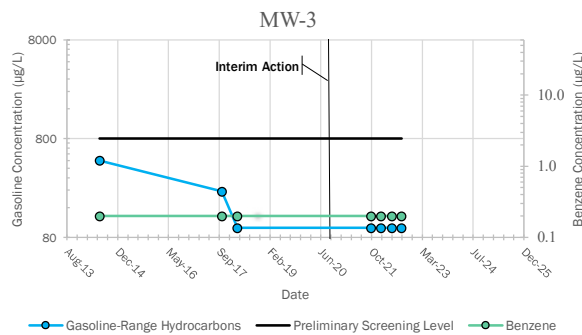
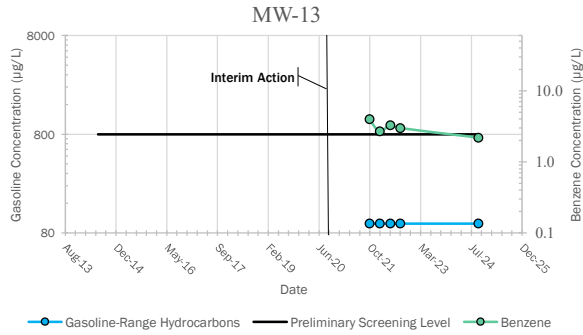
GEOENGINEERS

Figure 2

Shoreline Area Monitoring Wells

2nd Street Area Monitoring Wells

Southern Property Boundary Area Monitoring Wells



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.

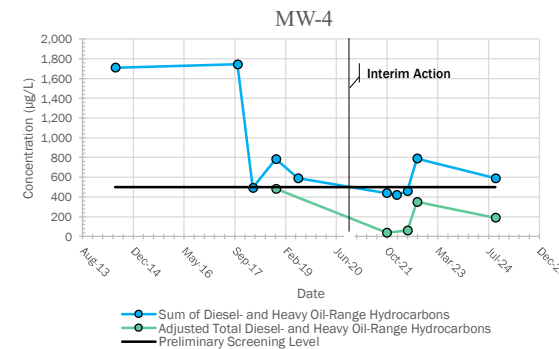
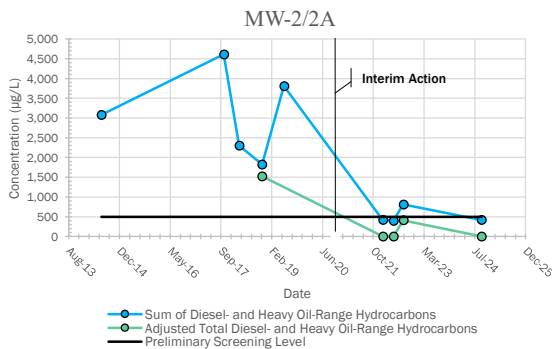
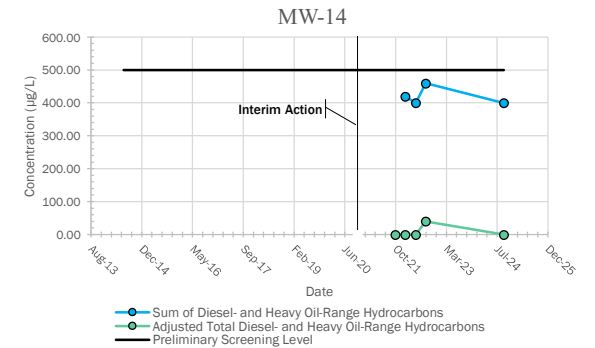
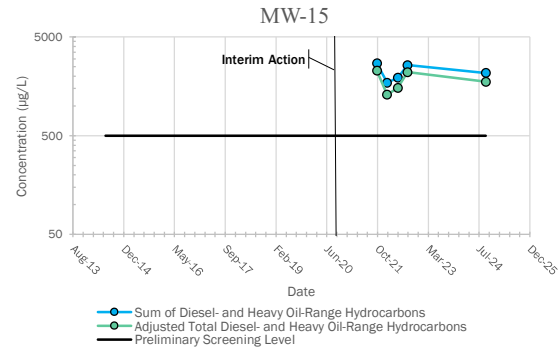
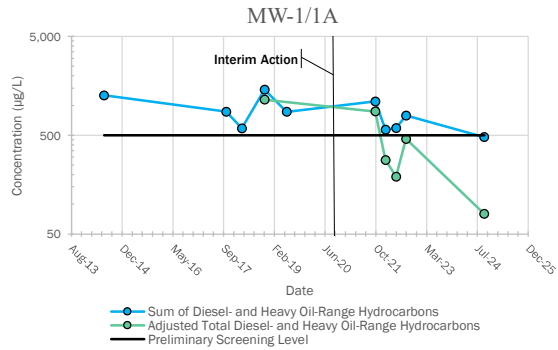
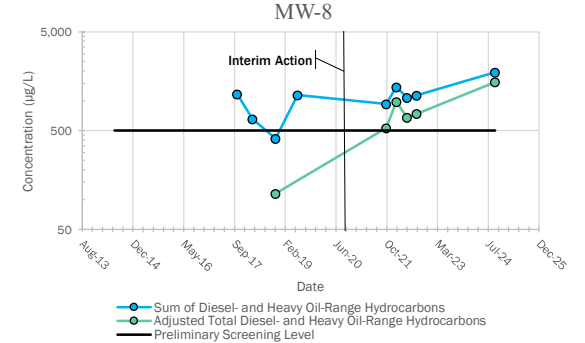
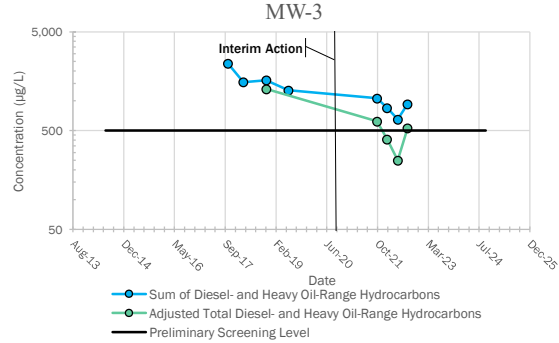
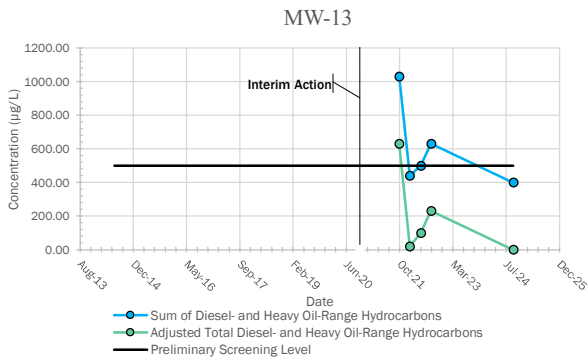
Data Source: Table 1 – Groundwater Field Parameters and Chemical Analytical Data, Quiet Cove Site, Anacortes, WA

Groundwater Summary Gasoline-Range Hydrocarbons and Benzene	
Quiet Cove Site Anacortes, Washington	
	Figure 3

Shoreline Area Monitoring Wells

2nd Street Area Monitoring Wells


Southern Property Boundary Area Monitoring Wells



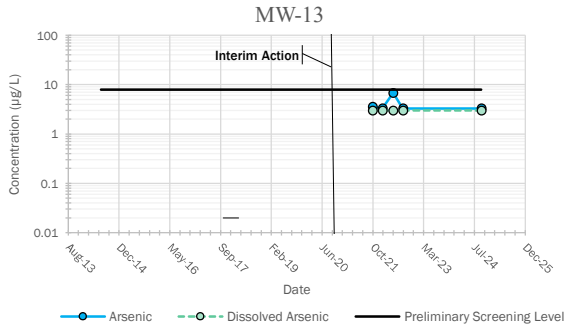
Notes:

1. Results shown are for diesel- and heavy oil-range petroleum hydrocarbons without acid silica gel preparation method.
2. 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.

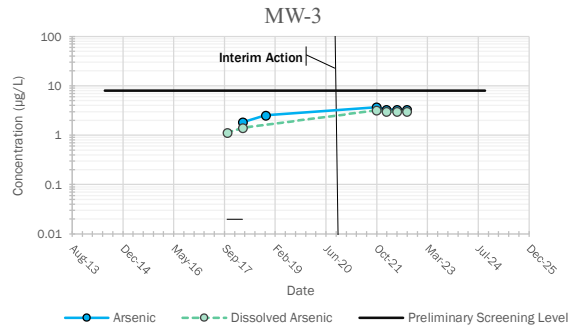
Data Source: Table 1 – Groundwater Field Parameters and Chemical Analytical Data, Quiet Cove Site, Anacortes, WA

Groundwater Summary	
Total Diesel and Heavy Oil-Range Hydrocarbons and Adjusted Total Diesel and Heavy Oil-Range Hydrocarbons	
Quiet Cove Site Anacortes, Washington	
	Figure 4

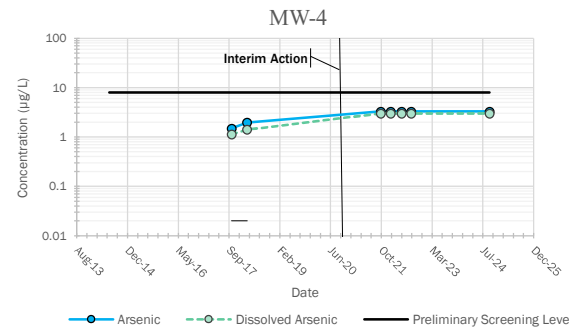
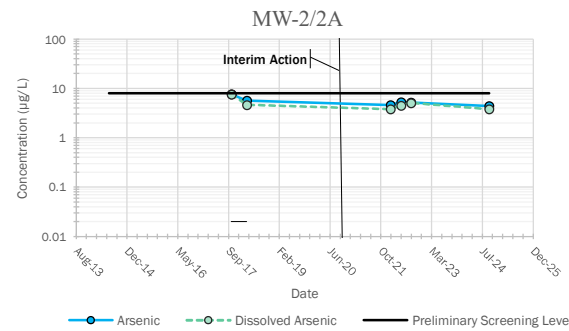
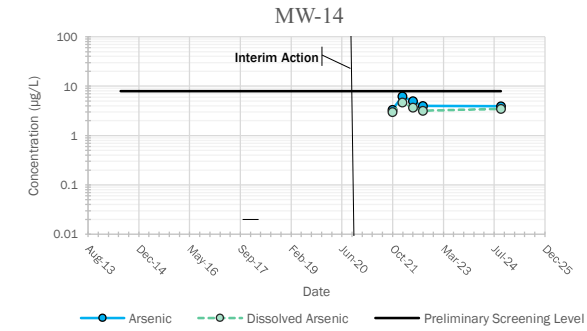
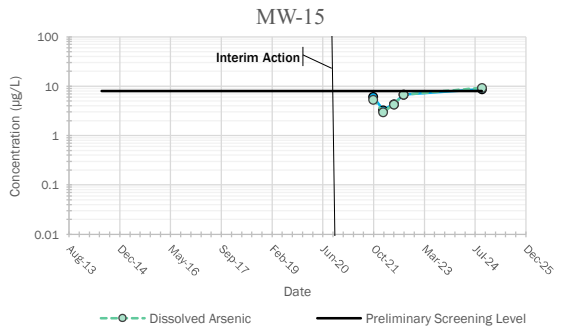
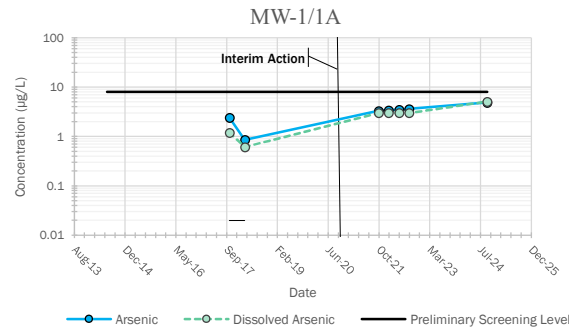
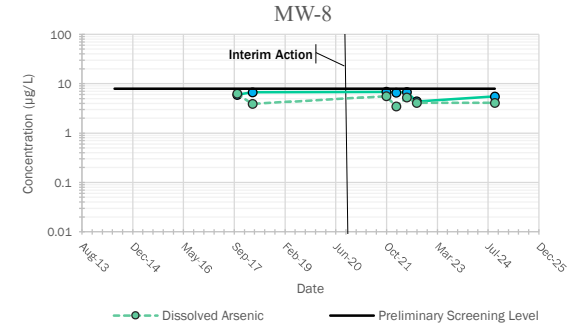
Shoreline Area Monitoring Wells



2nd Street Area Monitoring Wells



Southern Property Boundary Area Monitoring Wells



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: Table 1 – Groundwater Field Parameters and Chemical Analytical Data, Quiet Cove Site, Anacortes, WA

**Groundwater Summary
Total and Dissolved Arsenic**

Quiet Cove Site
Anacortes, Washington



Figure 5

Appendix A
Laboratory Data Report