

Groundwater Assessment

Gold Nugget Market
1041 Buena Road
Buena, Washington

for

Washington State Department of Ecology

June 26, 2019



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523 East Second Avenue
Spokane, Washington 99202
509.363.3125

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File No. 0504-060-05

June 26, 2019

Prepared for:

Washington State Department of Ecology
Toxics Cleanup Program – Central Region Office
1250 West Alder Street
Union Gap, Washington 98903-0009

Attention: Jeff Newschwander

Prepared by:

GeoEngineers, Inc.
523 East Second Avenue
Spokane, Washington 99202
509.363.3125



Scott H. Lathen, PE
Environmental Engineer



Bruce D. Williams
Principal

SHL:BDW:tjh

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1.0 INTRODUCTION

This report describes groundwater assessment activities conducted at the Gold Nugget Market site located at 1041 Buena Road in Buena, Washington (herein referred to as “site”). The approximate site location is shown in the attached Vicinity Map, Figure 1.

Site environmental activities are managed by the Washington State Department of Ecology (Ecology). This report describes field activities, observations and chemical analytical results associated with soil and groundwater samples collected at the site. The purpose of the assessment activities described herein was to identify remnant groundwater contamination beneath the site associated with former underground storage tank (UST) operation. Ecology will use the assessment results to conduct a Site Hazard Assessment (SHA), if necessary, or close to the site.

2.0 SITE DESCRIPTION AND BACKGROUND

The Gold Nugget Market facility is located in southeast Buena, Washington, as shown in Figure 1. The site is located east of the intersection of Buena Road and Yakima Valley Highway.

The Gold Nugget building currently operates as a market and convenience store. The market operated as a service station from at least 1993 to 1998. Information regarding site use before 1993 is currently unavailable.

Petroleum contamination was identified in 1993 at several properties within the town of Buena, including the Gold Nugget Market, during installation of underground sewer lines by the Yakima County Public Works Department. Ecology subsequently conducted site assessment activities between 1997 and 1999 to assess the limits of the contamination.

In 1998, USTs were reportedly removed from the site by the previous property owner. In 2000, a cleanup action from the former UST basin was subsequently completed by the previous property owner, which included excavation and off-site landfarming of approximately 400 tons of petroleum-contaminated soil (PCS). The remedial excavation was reported to have been backfilled with imported material and previously exported overburden soil. Cleanup action details are presented in a report by NetCompliance Products & Services, Inc. (NetCompliance) titled “Site Cleanup and Environmental Site Assessment at the Gold Nugget Market, Buena Road, Buena, Washington” dated November 23, 2000. The NetCompliance report indicated that petroleum contamination was not present at the limits of the remedial excavation following remedial excavation activities.

GeoEngineers, on behalf of Ecology, conducted site characterization activities at the Gold Nugget Market site between 2010 and 2012, including completing direct-push borings and installing six monitoring wells (MW-16 through MW-21). The location of previous explorations and site monitoring wells are shown in the attached Site Plan and Historical Features, Figure 2. Groundwater sampling events were conducted in November 2012, February and December 2013, quarterly in 2014 and in February and May 2015.

Site characterization activities conducted by GeoEngineers indicated that areas of the site contain soil with gasoline-range petroleum hydrocarbons (GRPH), oil-range petroleum hydrocarbons (ORPH), benzene, toluene, ethylbenzene and xylene (BTEX) and naphthalene at concentrations greater than applicable Model

Toxics Control Act (MTCA) Method A cleanup levels. Groundwater monitoring events conducted between 2010 and 2015 indicated that groundwater was contaminated with GRPH, ORPH, BTEX and/or naphthalene at concentrations greater than applicable MTCA cleanup levels.

In September 2012, GeoEngineers installed air sparge wells AS-1 through AS-4. An additional air sparge well (AS-5) was added in August 2013. In December 2013, Green Earthworks constructed an air sparge system to serve as an interim action to protect human health and the environment until further assessment/analysis was completed and whether a full-scale remediation system was warranted. The intent of the air sparge system was to oxygenate groundwater near identified contaminated areas in order to stimulate biodegradation of petroleum contaminants. The system operated between January 3, 2014 and late March 2014, with occasional temporary shutdowns. However, operation of the air sparge system indicated vapor intrusion impacts were occurring at the Gold Nugget Market building. The system was shut down in late March 2014 pending installation of a vapor capture system to mitigate vapor intrusion into the building.

In August 2014, Green Earthworks constructed a vapor capture system to mitigate vapor intrusion into the building due to the operation of the air sparge system. Installation of the vapor capture system occurred in August 2014. The air sparge system and the vapor capture system were not operating during the August 2014 groundwater sampling event. The system was started in September 2014 and remained in operation through and during the February 2015 sampling event. The system was not on during the May 2015 sampling event. GeoEngineers had not performed groundwater monitoring or further assessment activities since May 2015.

3.0 SCOPE OF SERVICES

Because the site has not been sampled since 2015, Ecology requested a groundwater monitoring event to assess the current groundwater conditions. The scope of services included the following:

1. Prepared a Master Work Plan that included a Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP).
2. Mobilized to/from the site from Spokane, Washington to locate and redevelop the site monitoring wells (MW-16 through MW-21). Monitoring wells were redeveloped per procedures outlined in Appendix A, well redevelopment and groundwater sampling.
3. Mobilized to/from the site from Spokane, Washington to conduct the sampling event.
4. Measured and recorded the depth to groundwater and the depth of the well casing in site monitoring wells.
5. Purged and sampled groundwater from site monitoring wells using low-flow sampling techniques. During well purging activities, water quality parameters were measured and recorded including pH, specific conductivity, dissolved oxygen (DO), temperature, oxidation-reduction potential (ORP) and turbidity. Groundwater samples were collected per procedures outlined in Appendix A, well redevelopment and groundwater sampling.
6. Submitted the groundwater samples for analysis on a standard turnaround time (TAT) for the following potential contaminants:

- a. GRPH using Northwest Method NWTPH-Gx;
 - b. DRPH and ORPH using Northwest Method NWTPH-Dx; and
 - c. BTEX and naphthalene using Environmental Protection Agency (EPA) Method 8260C.
7. Drummed and labelled investigation-derived waste (IDW). Able Cleanup Technologies (ACT) was retained to profile and transport the IDW for disposal at Waste Management's Graham Road landfill. The IDW profiled as non-hazardous.
8. Compared groundwater chemical analytical results to MTCA Method A cleanup levels.
9. Prepared this site assessment report summarizing field and laboratory data, comparison of analytical results to MTCA, and provides recommendations.
10. Entered laboratory analytical data results into Ecology's Environmental Information Management (EIM) database.

4.0 FIELD ACTIVITIES

4.1. Well Redevelopment

GeoEngineers mobilized to the site on April 24, 2019 to assess the condition and redevelop the monitoring wells (MW-16 through MW-21). The monitoring wells were in generally good condition, with the exception for MW-16 which was missing a locking well cap (replaced during initial site visit). Missing bolts were replaced during the groundwater sampling event on May 1, 2019. Redevelopment was completed by surging the monitoring wells using a bailer and then purging water, using a submersible pump, until the water was as free of sediment as practicable. Groundwater purged from wells ranged from 10 to 30 gallons. Field methods for well redevelopment are described in Appendix A.

4.2. Groundwater Sampling

Groundwater samples were collected from existing monitoring wells MW-16 through MW-21 on May 1, 2019. Depth to groundwater, measured from the top of casing, ranged from approximately 1.65 feet (MW-20) to 5.12 feet (MW-19) and the general groundwater flow direction was to the south-southeast as shown in Groundwater Elevation Contours, Figure 3.

A peristaltic pump and dedicated tubing were used to purge and sample each well in accordance with low flow sampling procedures (Appendix A). A duplicate groundwater sample was obtained from MW-16. GeoEngineers measured groundwater quality parameters (DO, temperature, specific conductivity, pH, turbidity and ORP) in the field using a calibrated multi-parameter meter equipped with a flow-through cell prior to sampling.

GeoEngineers measured water quality parameters at approximate 3-minute intervals during well purging and collected samples when each water quality parameter stabilized in conformance with the criteria presented in Appendix A or after 30 minutes of purging time had elapsed. Stabilized groundwater quality parameters for each of the wells as measured at the conclusion of purging are presented in the attached Summary of Field Measured Water Quality Parameters, Appendix A - Table A-2 and below.

TABLE I. SUMMARY OF WATER QUALITY PARAMETERS

Sample Identification	Date Sampled	pH	Specific Conductivity (mS/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	ORP (mV)
MW-16:050119	5/1/2019	7.28	68.80	7.8	0.57	12.40	10.3
MW-17:050119	5/1/2019	7.33	95.20	9.2	0.59	11.40	-97.3
MW-18:050119	5/1/2019	7.27	77.80	7.8	0.73	13.20	63.1
MW-19:050119	5/1/2019	7.23	95.80	4.9	0.60	11.50	-24.7
MW-20:050119	5/1/2019	7.18	88.40	4.2	0.60	13.90	-26.9
MW-21:050119	5/1/2019	7.23	91.20	8.1	0.59	11.70	-58.3

Groundwater samples were submitted to TestAmerica for chemical analysis using the methods described in “Section 3.0” and chemical analytical results are discussed in “Section 5.0.”

Purge water generated during groundwater sampling and water generated during well development was placed into 55-gallon drums and stored to the north of the Gold Nugget Market building, as shown on Figure 2.

5.0 CHEMICAL ANALYTICAL RESULTS

5.1. Groundwater Chemical Analytical Results

Six groundwater samples and one duplicate sample were collected from wells MW-16 through MW-21 and were submitted to TestAmerica for the chemical analyses described in “Section 3.0 Scope of Services.” TestAmerica’s laboratory report is included in Appendix B; chemical analytical results are summarized and compared to MTCA Method A cleanup levels are summarized below.

- GRPH were detected at concentrations greater than laboratory detection limits but less than MTCA Method A cleanup levels in samples collected from MW-17 and MW-21 (230 and 480 micrograms per liter [µg/L], respectively). GRPH was not detected in the remaining samples analyzed.
- DRPH and ORPH were not detected in the groundwater samples analyzed.
- Benzene was detected at a concentration greater than the MTCA Method A Cleanup level (5 µg/L) from MW-17 (55 µg/L). Benzene was not detected in the remaining samples analyzed.
- Toluene, ethylbenzene and total xylenes were not detected in the groundwater samples analyzed.

TABLE II. SUMMARY OF GROUNDWATER CHEMICAL ANALYTICAL RESULTS

Sample Identification	Date Sampled	GRPH ² (µg/L)	DRPH ⁴ (mg/L)	ORPH ⁴ (mg/L)	BTEX ⁵					
					Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m,p-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)
MW-16:050119	5/1/2019	<150	<0.23	<0.38	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
DUP:050119	5/1/2019	<150	<0.23	<0.39	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
MW-17:050119	5/1/2019	230	<0.23	<0.38	55	<1.0	<1.0	<2.0	<1.0	<3.0
MW-18:050119	5/1/2019	<150	<0.23	<0.38	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
MW-19:050119	5/1/2019	<150	<0.23	<0.38	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
MW-20:050119	5/1/2019	<150	<0.23	<0.38	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
MW-21:050119	5/1/2019	480	<0.23	<0.38	<0.4	<1.0	<1.0	<2.0	<1.0	<3.0
MTCA Method A CUL ¹		800/ 1,000 ³	0.5	0.5	5	1,000	700	NE	NE	1,000

Notes:

¹ MTCA Method A CUL - Washington State Model Toxics Control Act Method A unrestricted land use cleanup level

² GRPH analyzed by Northwest Method NWTPH-Gx.

³ Gasoline-range hydrocarbons when benzene is present / no detectable benzene

⁴ DRPH and ORPH analyzed by NWTPH-Dx.

⁵ BTEX analyzed using EPA Method 8260C.

mg/L = micrograms per liter; µg/L = micrograms per liter

U = analyte was not detected above the laboratory reporting limit; J = estimated result

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Groundwater sampling activities were conducted on May 1, 2019, at the Gold Nugget Market site located at 1041 Buena Road in Buena, Washington.

Six groundwater samples were collected from monitoring wells MW-16 through MW-21 and were submitted for GRPH, DRPH, ORPH and BTEX analysis. Benzene was detected at a concentration (55 µg/L) greater than the MTCA Method A Cleanup level (5 µg/L) from MW-17, as shown in Groundwater Analytical, Figure 4. Contaminants were not detected or were detected at concentrations less than the MTCA Method A cleanup levels from the other wells.

Comparing results from this groundwater assessment to the previous groundwater monitoring events which occurred between 2012 and 2015 (historical data are included in Tables 1 through 3), the following observations were made:

- Benzene at concentrations greater than the MTCA method cleanup level has been consistently detected in samples collected from monitoring well MW-17 with the exception for the February 18, 2015 groundwater monitoring event.

- Specific conductance in wells MW-17 through MW-20 was slightly higher than historical levels which can likely be attributed to a natural change in groundwater chemistry since the last groundwater sampling event (May 2015).
- Turbidity was generally higher in all wells which likely due to the redevelopment efforts.
- The headspace readings from MW-20 dropped significantly from levels observed in past events (2.0 parts per million [ppm] down from 213.5 ppm in February 2015 and 301.1 ppm in May 2015).

Based on the chemical analytical results, it appears that benzene contamination remains in groundwater near MW-17. GeoEngineers recommends assessing the condition of the soil vapor extraction (SVE)/air sparge and vapor capture systems installed by Green Earthworks. The systems should be repaired to operational conditions, if need, and returned to operation. In addition, quarterly groundwater monitoring should resume to assess the effectiveness of the SVE/air sparge system.

ACT picked up, stabilized, transported and disposed the IDW at Waste Management's Graham Road landfill located near Medical Lake, Washington. The accumulated IDW amounted to four, 55-gallon drums.

7.0 LIMITATIONS

We have prepared this report for the exclusive use of Ecology and their authorized agents.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to "Report Limitations and Guidelines for Use," Appendix C, for additional information pertaining to use of this report.

8.0 REFERENCES

GeoEngineers, Inc. 2015. "Groundwater Monitoring Report, Second Quarter 2015, Gold Nugget Market, Buena, Washington." GEI File No. 0504-060-04. September 22.

NetCompliance Products & Services, Inc. 2000. "Site Cleanup and Environmental Site Assessment at the Gold Nugget Market, Buena Road, Buena, Washington." November 23.

U.S. Environmental Protection Agency (EPA), Region 1, 2017. Low stress (low flow) purging and sampling procedure for the collection of ground water samples from monitoring wells. EPA SOP No. GW 001, Revision No. 4. September.

Table 1
Summary of Groundwater Level Measurements
 Gold Nugget Market
 Buena, Washington

Well Number	Date Measured	Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Groundwater Elevation (feet)	Change in Elevation (feet)
MW-16	07/25/10	789.25	3.39	785.86	-
	07/26/10		3.44	785.81	-0.05
	12/17/13		3.44	785.81	0.00
	02/24/14		-	-	-
	05/19/14		3.15	786.10	-
	08/13/14		3.24	786.01	-0.09
	11/18/14		3.43	785.82	-0.19
	02/18/15		3.37	785.88	0.06
	05/13/15		2.55	786.70	0.82
	05/01/19		2.99	786.26	-0.44
MW-17	07/25/10	790.89	5.25	785.64	-
	07/26/10		5.29	785.60	-0.04
	11/05/12		5.39	785.50	-0.10
	02/20/13		5.43	785.46	-0.04
	12/17/13		5.24	785.65	0.19
	02/24/14		5.13	785.76	0.11
	05/19/14		5.00	785.89	0.13
	08/14/14		5.06	785.83	-0.06
	11/18/14		5.25	785.64	-0.19
	02/18/15		5.17	785.72	0.08
	05/13/15		4.45	786.44	0.72
	05/01/19		4.78	786.11	-0.33
MW-18	07/22/10	789.50	4.56	784.94	-
	07/26/10		4.58	784.92	-0.02
	11/05/12		4.62	784.88	-0.04
	02/20/13		4.77	784.73	-0.15
	12/17/13		4.58	784.92	0.19
	02/24/14		4.53	784.97	0.05
	05/19/14		4.25	785.25	0.28
	08/13/14		4.45	785.05	-0.20
	11/18/14		4.59	784.91	-0.14
	02/18/15		4.47	785.03	0.12
	05/13/15		4.13	785.37	0.34
MW-19	05/01/19	790.70	4.02	785.48	0.11
	11/05/12		5.72	784.98	-
	2/20/113		5.80	784.90	-0.08
	12/17/13		5.64	785.06	0.16
	02/24/14		5.46	785.24	0.18
	05/19/14		5.32	785.38	0.14
	08/14/14		5.39	785.31	-0.07
	11/18/14		5.50	785.20	-0.11
	02/18/15		5.50	785.20	0.00
	05/13/15		4.99	785.71	0.51
05/01/19	5.12	785.58	-0.13		

Well Number	Date Measured	Top of Casing Elevation ¹ (feet)	Depth to Groundwater ² (feet)	Groundwater Elevation (feet)	Change in Elevation (feet)
MW-20	11/05/12	787.44	2.18	785.26	-
	02/20/13		2.29	785.15	-0.11
	12/17/13		2.03	785.41	0.26
	02/24/14		1.99	785.45	0.04
	05/19/14		1.86	785.58	0.13
	08/13/14		1.97	785.47	-0.11
	11/18/14		2.11	785.33	-0.14
	02/18/15		2.02	785.42	0.09
	05/13/15		1.40	786.04	0.62
	05/01/19		1.65	785.79	-0.25
MW-21	11/05/12	789.28	3.91	785.37	-
	02/20/13		4.02	785.26	-0.11
	12/17/13		3.79	785.49	0.23
	02/24/14		3.75	785.53	0.04
	05/19/14		3.57	785.71	0.18
	08/14/14		3.65	785.63	-0.08
	11/18/14 ³		4.83	784.45	-1.18
	02/18/15		3.74	785.54	1.09
	05/13/15		2.87	786.41	0.87
	05/01/19		3.37	785.91	-0.50

Notes:

¹ Survey completed by TD&H Engineering on February 28, 2013.

² Depth to groundwater measured using electric water level indicator.

³ Depth to groundwater and resulting groundwater elevation does not correlate to measurements and trends observed in other site monitoring wells, which suggests a measurement error.

"-" = not measured

Table 2
Summary of Chemical Analytical Results - Groundwater¹
 Gold Nugget Market
 Buena, Washington

		Well Number		MW-16							MW-17					
Analyte Group	Analyte	Unit	MTCA A Cleanup Level ²	Sample Name and Date												
				MW-16-121813 12/18/13	MW-16-051914 05/19/14	MW-16-081314 08/13/14	MW-16-111814 11/18/14	MW-16-021815 02/18/15	MW-16-051315 05/13/15	MW-16-050119 05/1/19	MW-17-110512 11/05/12	MW-17-022013 02/20/13	MW-17-121713 12/17/13	MW-17-022414 02/24/14	MW-17-051914 05/19/14	
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	90.0 U	89 J	100 U	100 U	100 U	100 U	100 U	150 U	1,300	287 J	583	1,280	420
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.237 U	0.130 U	0.258	0.232 U	0.270	0.230 U	0.23 U		0.360	0.239 U	0.235 U	0.235 U	0.150
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.395 U	0.250 U	0.389 U	0.387 U	0.390 U	0.390 U	0.38 U		0.478 U	0.382 U	0.392 U	0.392 U	0.250 U
BTEX ⁵	Benzene	µg/L	5	0.200 U	1.0 U	0.200 U	0.200 U	0.200 U	0.20 U	0.4 U		110	30.2 J	52.1	66.3	32
	Ethylbenzene	µg/L	700	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U		47.4	11.3 J	21.2	44.1	13
	Toluene	µg/L	1,000	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U		3.11	0.500 U	0.920	1.82	1.0 U
	m,p-Xylene	µg/L	NE	0.500 U	2.0 U	0.500 U	0.500 U	2.0 U	2.0 U	2.0 U		100	12.6 J	7.20	56.6	2.2
	o-Xylene	µg/L	NE	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U		3.87	0.750 J	0.500 U	6.91	1.0 U
	Xylenes (total)	µg/L	1,000	1.50 U	--	1.50 U	1.50 U	3.0 U	3.0 U	3.0 U		104	13.4 J	7.51	63.5	--
VOC ⁵	Methyl tert-butyl ether	µg/L	20	0.500 U	--	0.500 U	--	--	--	--		--	8.95 J	11.3	--	--
	Naphthalene	µg/L	160	2.00 U	--	--	--	--	--	--		--	2.29 J	3.40	--	--
	1,2-Dichloroethane (EDC)	µg/L	5	0.500 U	--	0.500 U	--	--	--	--		--	0.500 U	0.500 U	--	--
	1,2-Dibromoethane (EDB)	µg/L	0.01	0.0100 U	--	--	--	--	--	--		--	1.00 U	0.0100 U	--	--
Metals ⁶	Arsenic	mg/L	0.005	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0020 U	0.0020	--		0.02 U	--	0.0010 U	0.002	0.0010 U
	Chromium	µg/L	50/100 ¹¹	--	0.40 U	0.40 U	0.40 U	2.0 U	2.0 U	--		--	--	--	0.40 U	0.40 U
	Chromium VI	mg/L	0.050	0.00040 U	--	0.012 U	0.012 U	0.012 U H	0.012 U	--		0.008 U	--	0.00040 U	0.012 U	--
	Dissolved Iron	mg/L	NE	0.0300 U	0.50 U	0.0300 U	1.00 U	1.0 U	0.50 U	--		3.83	3.68	0.192	0.281	0.50 U
	Lead	mg/L	0.015	0.00040 U	--	--	--	--	--	--		--	0.0150 U	0.00040 U	--	--
	Dissolved Manganese	mg/L	NE	0.286	0.21	0.239	0.364	0.4	0.37	--		0.907	--	1.01	0.739	1.0
Anions ⁷	Nitrate	mg/L	NE	1.35	--	1.28	--	1.2	--	--		--	--	0.51	1.0	--
	Sulfate	mg/L	NE	38.4	--	48.0	--	25	--	--		--	--	38.6 J	59	--
CC ⁸	Alkalinity	mg/L	NE	225	--	290	--	240 B	--	--		--	--	310	290	--
	Total Organic Carbon	mg/L	NE	--	--	--	--	5.3	4.6	--		--	--	--	--	--

Well Number				MW-17					MW-18						
Analyte Group	Analyte	Unit	MTCA A Cleanup Level ²	Sample Name and Date											
				MW-17-081414 08/14/14	MW-17-111814 11/18/14	MW-17-021815 02/18/15	MW-17-051315 05/13/15	MW-17-050119 05/1/19	MW-18-110612 11/06/12	MW-18-022013 02/20/13	MW-18-121813 12/18/13	MW-18-022414 02/24/14	MW-18-051914 05/19/14	MW-18-081314 08/13/14	MW-18-111814 11/18/14
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	353	240	240	320	230	90.0 U	90.0 U	90.0 U	90.0 U	50 U	100 U	100 U
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.380	0.233 U	0.26	0.230 U	0.23 U	0.237 U	0.239 U	0.236 U J	0.235 U	0.120 U	0.233 U	0.232 U
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.395 U	0.389 U	0.390 U	0.390 U	0.38 U	0.473 U	0.382 U	0.394 U	0.391 U	0.250 U	0.389 U	0.387 U
BTEX ⁵	Benzene	µg/L	5	61.6	20.5	1.3	5.7	55	0.200 U	0.200 U	0.200 U	0.200 U	1.0 U	0.200 U	0.200 U
	Ethylbenzene	µg/L	700	20.4	10.5	1.0 U	1.9	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U
	Toluene	µg/L	1,000	0.760	0.500 U	1.0 U	1.0 U	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U
	m,p-Xylene	µg/L	NE	2.85	1.09	2.0 U	2.0 U	2.0 U	0.500 U	0.500 U	0.500 U	0.500 U	2.0 U	0.500 U	0.500 U
	o-Xylene	µg/L	NE	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U
	Xylenes (total)	µg/L	1,000	2.85	1.50 U	3.0 U	3.0 U	3.0 U	1.50 U	1.50 U	1.50 U	1.50 U	--	1.50 U	1.50 U
VOC ⁵	Methyl tert-butyl ether	µg/L	20	12.3	--	--	--	--	--	0.500 U	0.500 U	--	--	0.500 U	--
	Naphthalene	µg/L	160	--	--	--	--	--	--	2.00 U	2.00 U	--	--	--	--
	1,2-Dichloroethane (EDC)	µg/L	5	0.500 U	--	--	--	--	--	0.500 U	0.500 U	--	--	0.500 U	--
	1,2-Dibromoethane (EDB)	µg/L	0.01	--	--	--	--	--	--	1.00 U	0.0100 U	--	--	--	--
Metals ⁶	Arsenic	mg/L	0.005	0.0015	0.0011	0.0025	0.0020 U	--	0.0200 U	--	0.0010 U	0.001 U	0.0014	0.0011	0.0010 U
	Chromium	µg/L	50/100 ¹¹	0.40 U	0.40 U	2.0 U	2.0 U	--	--	--	--	0.40 U	0.40 U	0.40 U	0.40 U
	Chromium VI	mg/L	0.050	0.00800 U J	0.012 U	0.012 U H	0.012 U	--	0.00800 U	--	0.00040 U	0.012 U	--	0.012 U	0.012 U
	Dissolved Iron	mg/L	NE	0.305	1.00 U	1.0 U	0.50 U	--	0.0360 U	0.0300 U	0.0300 U	0.0300 U	0.50 U	0.0300 U	1.00 U
	Lead	mg/L	0.015	--	--	--	--	--	--	0.0150 U	0.00040 U	--	--	--	--
	Dissolved Manganese	mg/L	NE	1.04	1.03	0.95	1.2	--	0.579	--	0.210	0.0830	0.065	0.431	0.221
Anions ⁷	Nitrate	mg/L	NE	0.35	--	0.22	--	--	--	--	2.20	4.0	--	2.29	--
	Sulfate	mg/L	NE	43.1	--	110	--	--	--	--	32.0	28	--	31.3	--
CC ⁸	Alkalinity	mg/L	NE	330	--	290 B	--	--	--	--	210	200	--	245	--
	Total Organic Carbon	mg/L	NE	--	--	8.6	5.3	--	--	--	--	--	--	--	--

		Well Number		MW-18			MW-19								
Analyte Group	Analyte	Unit	MTCA A Cleanup Level ²	Sample Name and Date											
				MW-18-021815 02/18/15	MW-18-051315 05/13/15	MW-18-050119 05/1/19	MW-19-110512 11/05/12	MW-19-022013 02/20/13	MW-19-121713 12/17/13	MW-19-022414 02/24/14	MW-19-051914 05/19/14	MW-19-081414 08/14/14	MW-19-111814 11/18/14	MW-19-021815 02/18/15	MW-19-051315 05/13/15
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	100 U	100 U	150 U	90.0 U	90.0 U	90.0 U	90.0 U	50 U	100 U	100 U	100 U	100 U
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.230 U	0.23	0.23 U	0.239 U	0.237 U	0.234 U	0.237 U	0.120 U	0.239 U	0.233 U	0.230 U	0.230 U
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.390 U	0.390 U	0.38 U	0.477 U	0.379 U	0.391 U	0.395 U	0.250 U	0.399 U	0.388 U	0.390 U	0.390 U
BTEX ⁵	Benzene	µg/L	5	0.20 U	0.20 U	0.4 U	0.200 U	0.200 U	0.200 U	0.200 U	1.0 U	0.200 U	0.200 U	0.20 U	0.20 U
	Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U
	Toluene	µg/L	1,000	1.0 U	1.0 U	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U
	m,p-Xylene	µg/L	NE	2.0 U	2.0 U	2.0 U	0.500 U	0.500 U	0.500 U	0.500 U	2.0 U	0.500 U	0.500 U	2.0 U	2.0 U
	o-Xylene	µg/L	NE	1.0 U	1.0 U	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U
	Xylenes (total)	µg/L	1,000	3.0 U	3.0 U	3.0 U	1.50 U	1.50 U	1.50 U	1.50 U	--	1.50 U	1.50 U	3.0 U	3.0 U
VOC ⁵	Methyl tert-butyl ether	µg/L	20	--	--	--	--	0.560	0.500 U	--	--	1.01	--	--	--
	Naphthalene	µg/L	160	--	--	--	--	2.00 U	2.00 U	--	--	--	--	--	--
	1,2-Dichloroethane (EDC)	µg/L	5	--	--	--	--	0.500 U	0.500 U	--	--	0.500 U	--	--	--
	1,2-Dibromoethane (EDB)	µg/L	0.01	--	--	--	--	1.00 U	0.0100 U	--	--	--	--	--	--
Metals ⁶	Arsenic	mg/L	0.005	0.0020 U	0.0090	--	0.0200 U	--	0.0010 U	0.001 U	0.0010 U	0.0010 U	0.0010 U	0.0020 U	0.0020 U
	Chromium	µg/L	50/100 ¹¹	2.0 U	5.0	--	--	--	--	3.7	0.40 U	0.00040 U	0.40 U	2.0 U	3.2
	Chromium VI	mg/L	0.050	0.012 U H	0.012 U H	--	0.00800 U	--	0.00040 U	0.012 U	--	0.00800 U	0.012 U	0.012 U H	0.012 U
	Dissolved Iron	mg/L	NE	1.0 U	0.61	--	2.24	2.59	0.158	0.128	0.50 U	0.0717	1.00 U	1.0 U	0.50 U
	Lead	mg/L	0.015	--	--	--	--	0.0150 U	0.00040 U	--	--	--	--	--	--
	Dissolved Manganese	mg/L	NE	0.17	0.022	--	0.314	--	0.220	0.269	0.19	0.186	0.161	0.24	0.18
Anions ⁷	Nitrate	mg/L	NE	3.5	--	--	--	--	0.200 U	0.90 U	--	0.200 U	--	0.20 U	--
	Sulfate	mg/L	NE	31	--	--	--	--	43.8 J	32	--	49.9	--	64	--
CC ⁸	Alkalinity	mg/L	NE	240 B	--	--	--	--	315	320	--	315	--	310 B	--
	Total Organic Carbon	mg/L	NE	1.5	12	--	--	--	--	--	--	--	--	2.7	2.1

		Well Number		MW-19	MW-20				MW-20					
Analyte Group	Analyte	Unit	MTCA A Cleanup Level ²	Sample Name and Date										
				MW-19-050119 05/1/19	MW-20-110512 11/05/12	MW-20-022013 02/20/13	MW-20-121813 12/18/13	MW-20-022414 02/24/14	MW-20-051914 05/19/14	MW-20-081314 08/13/14	MW-20-111814 11/18/14	MW-20-021815 02/18/15	MW-20-051315 05/13/15	MW-20-050119 05/1/19
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	150 U	118	153	240	436	50 U	100 U	100 U	110	120	150 U
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.23 U	0.238 U	0.239 U	0.239 U J	0.235 U	0.120 U	0.237 U	0.234 U	0.230 U	0.230 U	0.23 U
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.38 U	0.475 U	0.382 U	0.398 U	0.392 U	0.240 U	0.395 U	0.390 U	0.390 U	0.390 U	0.38 U
BTEX ⁵	Benzene	µg/L	5	0.4 U	0.200 U	0.200 U	0.200 U	0.200 U	1.0 U	0.200 U	0.200 U	0.20 U	0.20 U	0.4 U
	Ethylbenzene	µg/L	700	1.0 U	0.500 U	0.500 U	0.500 U	4.03	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U
	Toluene	µg/L	1,000	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U
	m,p-Xylene	µg/L	NE	2.0 U	0.500 U	0.500 U	0.500 U	2.53	2.0 U	0.500 U	0.500 U	2.0 U	2.0 U	2.0 U
	o-Xylene	µg/L	NE	1.0 U	0.500 U	0.500 U	0.500 U	0.500 U	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U
	Xylenes (total)	µg/L	1,000	3.0 U	1.50 U	1.50 U	1.50 U	2.99	--	1.50 U	1.50 U	3.0 U	3.0 U	3.0 U
VOC ⁵	Methyl tert-butyl ether	µg/L	20	--	-	0.500 U	0.500 U	--	--	0.500 U	--	--	--	--
	Naphthalene	µg/L	160	--	-	2.00 U	2.00 U	--	--	--	--	--	--	--
	1,2-Dichloroethane (EDC)	µg/L	5	--	-	0.500 U	0.500 U	--	--	0.500 U	--	--	--	--
	1,2-Dibromoethane (EDB)	µg/L	0.01	--	-	1.00 U	0.0100 U	--	--	--	--	--	--	--
Metals ⁶	Arsenic	mg/L	0.005	--	0.0200 U	--	0.0010 U	0.001 U	0.0010 U	0.0014	0.0010 U	0.0020 U	0.0020 U	--
	Chromium	µg/L	50/100 ¹¹	--	--	--	--	0.40 U	0.40 U	0.40 U	0.40 U	2.0 U	2.0 U	--
	Chromium VI	mg/L	0.050	--	0.00800 U	--	0.00040 U	0.012 U	--	0.012 U	0.012 U	0.012 U H	0.012 U	--
	Dissolved Iron	mg/L	NE	--	3.59	4.22	0.137	0.237	0.50 U	0.0801	1.00 U	1.0 U	0.50 U	--
	Lead	mg/L	0.015	--	-	0.0150 U	0.00040 U	--	--	--	--	--	--	--
	Dissolved Manganese	mg/L	NE	--	1.10	--	0.634	0.718	0.63	0.548	0.460	0.57	0.70	--
Anions ⁷	Nitrate	mg/L	NE	--	--	--	0.200	0.90 U	--	0.200 U	--	0.20 U	--	--
	Sulfate	mg/L	NE	--	--	--	47.7	62	--	47.6	--	70	--	--
CC ⁸	Alkalinity	mg/L	NE	--	--	--	295	250	--	265	--	270 B	--	--
	Total Organic Carbon	mg/L	NE	--	--	--	--	--	--	--	--	2.4	2.8	--

Well Number				MW-21									
Analyte Group	Analyte	Unit	MTCA A Cleanup Level ²	Sample Name and Date									
				MW-21-110512 11/05/12	MW-21-022013 02/20/13	MW-21-121813 12/18/13	MW-21-022414 02/24/14	MW-21-051914 05/19/14	MW-21-081414 08/14/14	MW-21-111814 11/18/14	MW-21-021815 02/18/15	MW-21-051315 05/13/15	MW-21-050119 05/1/19
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	4,070	2,030	1,210 J	1,350	690	702	1,170	1,100	1,400	480
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.875	0.461	0.248 U J	0.318	0.220	0.233 U	0.381 J	0.410	0.360	0.23 U
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.477 U	0.380 U	0.413 U	0.393 U	0.240 U	0.389 U	0.385 U	0.390 U	0.390 U	0.38 U
BTEX ⁵	Benzene	µg/L	5	0.200 U	0.200 U	0.200 U	0.460	1.0 U	0.200 U	0.200 U	0.20 U	0.20 U	0.4 U
	Ethylbenzene	µg/L	700	87.0	55.5	8.37 J	17.4	7.4	2.84	11.9	1.8	5.8	1.0 U
	Toluene	µg/L	1,000	1.07	0.520	0.500 U	0.820	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U
	m,p-Xylene	µg/L	NE	218 (E), 217 (H2) ¹⁰	84.7	9.99 J	26.2	13	2.54	128	5.6	5.6	2.0 U
	o-Xylene	µg/L	NE	35.2	11.6	1.20 J	4.32	3.4	0.500 U	34.0	2.5	1.3	1.0 U
	Xylenes (total)	µg/L	1,000	254	96.3	11.2	30.6	--	2.90	162	8.1	7.0	3.0 U
VOC ⁵	Methyl tert-butyl ether	µg/L	20	--	0.500 U	0.500 U	NT	--	0.500 U	--	--	--	--
	Naphthalene	µg/L	160	--	11.2	3.08	NT	--	--	--	--	--	--
	1,2-Dichloroethane (EDC)	µg/L	5	--	0.500 U	0.500 U	NT	--	0.500 U	--	--	--	--
	1,2-Dibromoethane (EDB)	µg/L	0.01	--	1.00 U	0.0100 U	NT	--	--	--	--	--	--
Metals ⁶	Arsenic	mg/L	0.005	0.0200 U	--	0.0010 U	0.001 U	0.0010 U	0.0010 U	0.0010 U	0.0020 U	0.0032	--
	Chromium	µg/L	50/100 ¹¹	--	--	--	0.40 U	0.40 U	0.40 U	0.40 U	2.0 U	2.0 U	--
	Chromium VI	mg/L	0.050	0.00800 U	--	0.00040 U	0.012 U J	--	0.00800 U	0.012 U	0.012 U H	0.012 U	--
	Dissolved Iron	mg/L	NE	0.968	0.899	0.131 J	0.141	0.50 U	0.102	1.00 U	1.0 U	1.6	--
	Lead	mg/L	0.015	--	0.0150 U	0.00040 U	--	--	--	--	--	--	--
	Dissolved Manganese	mg/L	NE	0.826	--	0.962	0.692	1.1	0.996	1.24	7.2	9.8	--
Anions ⁷	Nitrate	mg/L	NE	--	--	0.330	0.90 U	--	0.550 J	--	0.70	--	--
	Sulfate	mg/L	NE	--	--	38.5	54	--	36.6	--	300	--	--
CC ⁸	Alkalinity	mg/L	NE	--	--	280	250	--	340	--	220 B	--	--
	Total Organic Carbon	mg/L	NE	--	--	--	--	--	--	--	3.6	5.3	--

Analyte Group	Analyte	Unit	Well Number	Duplicates					Duplicates					
			MTCA A Cleanup Level ²	Sample Name and Date										
			Duplicate-1-022013 02/20/13	Duplicate-1-121813 12/18/13	Duplicate-1-022414 02/24/14	DUP-1-051914 05/19/14	DUP-1-081414 08/14/14	MW-DUP-111814 11/18/14	MW-DUP-021815 02/18/15	MW-DUP-051315 05/13/15	DUP:050119 (MW-16) 05/01/19			
TPH	Gasoline-range hydrocarbons ³	µg/L	1,000/800 ⁹	506 J	1,640 J	1,710	690	696	1,190	1,200	1,400	150 U		
	Diesel-range hydrocarbons ⁴	mg/L	0.5	0.238 U	0.234 U	0.417	0.24	0.233 U	0.333 J	0.4	0.39	0.23 U		
	Heavy oil-Range Hydrocarbons ⁴	mg/L	0.5	0.381 U	0.391 U	0.391 U	0.240 U	0.388 U	0.386 U	0.380 U	0.390 U	0.39 U		
BTEX ⁵	Benzene	µg/L	5	58.0 J	0.200 U	0.620	1.0 U	0.200 U	0.200 U	0.20 U	0.20 U	0.4 U		
	Ethylbenzene	µg/L	700	23.6 J	15.8 J	23.8	8.0	2.93	11.3	1.7	4.6	1.0 U		
	Toluene	µg/L	1,000	0.700 J	0.500 U	1.16	1.0 U	0.500 U	0.500 U	1.0 U	1.0 U	1.0 U		
	m,p-Xylene	µg/L	NE	27.7 J	19.3 J	35.8	14	2.72	96.6	5.6	5.1	2.0 U		
	o-Xylene	µg/L	NE	1.85 J	2.38 J	5.95	3.8	0.500 U	25.4	2.5	1.6	1.0 U		
	Xylenes (total)	µg/L	1,000	29.6 J	21.7	41.8	-	3.02	122	8.1	6.7	3.0 U		
VOC ⁵	Methyl tert-butyl ether	µg/L	20	13.5 J	0.500 U	-	-	0.500 U	-	-	-	-		
	Naphthalene	µg/L	160	5.62 J	4.69	-	-	-	-	-	-	-		
	1,2-Dichloroethane (EDC)	µg/L	5	0.500 U	0.500 U	-	-	0.500 U	-	-	-	-		
	1,2-Dibromoethane (EDB)	µg/L	0.01	1.00 U	0.0100 U	-	-	-	-	-	-	-		
Metals ⁶	Arsenic	mg/L	0.005	-	0.0010 U	0.001 U	0.0010 U	0.0010 U	0.0010 U	0.0020 U	0.0032	-		
	Chromium	µg/L	50/100 ¹¹	-	-	0.40 U	0.40 U	0.40 U	0.40 U	2.0 U	2.0 U	-		
	Chromium VI	mg/L	0.050	-	0.00040 U	0.012 U	-	0.00800 U	0.012 U	0.012 U H	0.012 U	-		
	Dissolved Iron	mg/L	NE	3.46 J	0.199 J	0.154	0.50 U	0.110	1.00 U	1.0	1.4	-		
	Lead	mg/L	0.015	0.0150 U	0.00040 U	-	-	-	-	-	-	-		
	Dissolved Manganese	mg/L	NE	-	0.951	0.690	1.0	1.00	1.19	7.8	10	-		
Anions ⁷	Nitrate	mg/L	NE	-	0.340	0.90 U	-	0.200 J	-	0.52	-	-		
	Sulfate	mg/L	NE	-	38.4	55	-	35.1	-	320	-	-		
CC ⁸	Alkalinity	mg/L	NE	-	340	240	-	335	-	220 B	-	-		
	Total Organic Carbon	mg/L	NE	-	-	-	-	-	-	3.5	6.0	-		

Notes:

¹Chemical analyses conducted by TestAmerica Laboratories in Spokane, Washington. Chromium analysis conducted by TestAmerica Laboratories in Spokane, Washington and Richland, Washington.

²MTCA = Washington State Model Toxics Control Act Method A cleanup levels.

³Gasoline-range petroleum hydrocarbons were analyzed using Method NWTPH-Gx.

⁴Diesel- and heavy-oil-range petroleum hydrocarbons were analyzed using Method NWTPH-Dx.

⁵Benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tert-butyl ether, naphthalene, 1,2-dichloroethane (EDC) and 1,2-dibromoethane (EDB) were analyzed using EPA Method 8260B and/or 8260C.

⁶Metals were analyzed using EPA 6000/7000 Series Methods.

⁷Anions analyzed using EPA Method 300.

⁸Conventional Chemistry analyzed by APHA/EPA Methods.

⁹Gasoline-range petroleum hydrocarbon cleanup level is 1,000 µg/L if benzene is not present; 800 µg/L if benzene is present.

¹⁰E = concentration based on EPA Method 8260C exceeded the calibration range and therefore the result is a semi-quantitative value; H2 = the sample was diluted and re-analyzed using EPA Method 8260C. However, the sample was re-analyzed past the holding time.

¹¹MTCA Method A cleanup level for total chromium is 100 µg/L if only chromium III is present. Otherwise, cleanup level is 50 µg/L based on MTCA equation 720-1 for total chromium.

J = Results qualified as estimated. Refer to data validation report in appropriate groundwater monitoring report for details; U = analyte not detected at a concentration greater than the listed reporting limits;

H = Sample was prepped or analyzed beyond the specific holding time. Refer to data validation report in appropriate groundwater monitoring report for details; B = Compound was found in blank and sample.

Bold = detection is greater than reporting limit.

Blue highlight indicates non-detected value was greater than MTCA Method A cleanup level.

Red outline indicates value was greater than MTCA Method A cleanup level.

mg/L = milligrams per liter; µg/L = micrograms per liter; "-" = not tested; NE = not established; TPH = total petroleum hydrocarbons; VOC = volatile organic compound

Table 3
Summary of Field-Measured Parameters¹
Gold Nugget Market
Buena, Washington

Exploration / Well Number	Date Sampled	pH	Specific Conductivity (mS/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	ORP (mV)	Well Headspace PID (ppm)	Ferrous Iron ² Fe ²⁺ (mg/L)
MW-16	12/18/13	6.95	43.48	0.7365	0.08	13.39	-25	0.0	0.25
	05/19/14	7.05	63.20	<1	0.15	14.77	65	0.0	<0.2
	08/13/14	6.99	63.27	2.768	0.08	21.02	-226	0.7	<0.2
	11/18/14	6.96	51.90	2.227	0.03	16.96	-1	0.1	0.25
	02/18/15	7.11	35.35	1.004	0.00	11.77	76	0.0	<0.2
	05/13/15	7.33	42.01	1.012	0.08	14.80	80	0.0	<0.2
	05/01/19	7.28	68.80	7.8	0.57	12.40	10.3	0.4	-
MW-17	11/05/12	6.87	62.92	0.0000	0.00	20.11	-117	<1	-
	02/20/13	8.25	50.32	0.0000	0.01	10.85	-106	0.0	-
	12/17/13	6.99	56.85	0.0986	0.05	14.92	-115	0.0	3
	02/25/14	7.23	75.30	0.0000	2.61	9.95	-99	43.2	2
	05/19/14	7.08	72.50	<1	0.17	15.25	-201	6.7	2.5
	08/14/14	6.86	74.06	4.240	0.13	22.56	-100	2.4	2.4
	11/18/14	6.94	67.76	0.3892	0.11	19.04	-120	0.2	1
	02/18/15	7.25	62.55	1.004	1.17	11.78	187	0.2	1
	05/13/15	7.32	56.42	2.162	0.07	14.67	171	0.8	1.25
05/01/19	7.33	95.20	9.2	0.59	11.40	-97.3	0.0	-	
MW-18	11/06/12	7.00	45.54	0.2290	0.05	16.71	129	0.0	-
	02/20/13	8.21	36.79	0.0000	0.08	10.74	-67	0.0	-
	12/18/13	7.07	36.81	0.0000	0.13	11.13	4	0.0	<0.2
	02/25/14	7.03	53.30	<1	0.48	8.42	133	0.2	<0.2
	05/19/14	7.07	52.80	<1	0.25	15.32	117	0.0	<0.2
	08/13/14	7.05	47.63	8.855	0.16	22.93	-240	70.8	<0.2
	11/18/14	7.06	40.62	1.064	0.08	15.91	54	0.0	<0.2
	02/18/15	7.11	34.42	0.0808	0.08	10.56	194	0.0	<0.2
	05/13/15	7.01	33.94	4.913	5.19	17.91	365	0.0	0.0
05/01/19	7.27	77.80	7.8	0.73	13.20	63.1	0.0	-	

Exploration / Well Number	Date Sampled	pH	Specific Conductivity (mS/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	ORP (mV)	Well Headspace PID (ppm)	Ferrous Iron ² Fe ²⁺ (mg/L)
MW-19	11/05/12	7.03	57.51	5.848	0.00	16.91	-84	0.0	-
	02/20/13	10.56	52.89	2.134	0.00	12.55	-196	0.0	-
	12/17/13	6.94	54.05	5.180	0.06	14.19	-81	0.0	1.6
	02/25/14	7.07	72.90	16.99	0.35	11.96	-126	1.9	2
	05/19/14	7.06	71.40	<1	0.19	14.14	-193	0.0	2
	08/14/14	7.02	59.30	0.5320	0.11	17.30	-84	0.1	1.6
	11/18/14	7.01	59.08	1.774	0.08	16.23	-95	0.0	2
	02/18/15	7.06	52.61	0.4319	0.00	12.87	108	0.0	2
	05/13/15	7.32	49.02	0.1782	1.09	13.63	278	0.0	1.5
05/01/19	7.23	95.80	4.9	0.60	11.50	-24.7	0.3	-	
MW-20	11/05/12	7.07	54.21	3.840	0.00	16.66	-109	85.9	-
	02/20/13	8.37	42.53	0.0000	0.00	7.62	-86	0.0	-
	12/18/13	7.16	45.22	0.0000	0.21	9.43	-176	2.3	3
	02/25/14	7.08	71.90	0.0000	0.36	7.08	-127	1.5	3
	05/19/14	7.12	64.50	<1	0.12	16.17	-193	2.3	2.5
	08/13/14	6.95	60.82	1.978	0.14	24.58	-99	6.1	2
	11/18/14	7.12	46.12	0.1710	0.08	13.60	-101	0.6	1
	02/18/15	7.11	44.61	2.013	0.10	9.49	128	0.3	1.25
	05/13/15	7.19	56.89	3.107	0.07	15.33	165	0.7	1
05/01/19	7.18	88.40	4.2	0.60	13.90	-26.9	0.7	-	
MW-21	11/05/12	7.07	57.06	1.064	0.00	17.49	-116	385.7	-
	02/20/13	8.35	43.87	0.9141	0.00	8.71	-85	24.0	-
	12/18/13	7.11	48.97	0.0588	0.03	11.69	-134	3.9	1.4
	02/25/14	7.13	72.30	<1	0.37	8.13	-120	68.8	0.5
	05/19/14	7.15	72.50	<1	0.13	14.99	-236	66.4	1.5
	08/14/14	7.06	64.39	0.0000	0.06	22.66	-235	32.1	1.5
	11/18/14	7.12	59.68	4.222	0.00	16.60	-145	892.3	1
	02/18/15	7.10	70.19	1.976	0.05	9.60	305	213.5	1
	05/13/15	7.21	82.26	1.603	0.22	14.70	309	301.1	1.25
05/01/19	7.23	91.20	8.1	0.59	11.70	-58.3	2.0	-	

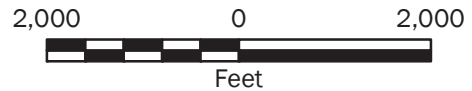
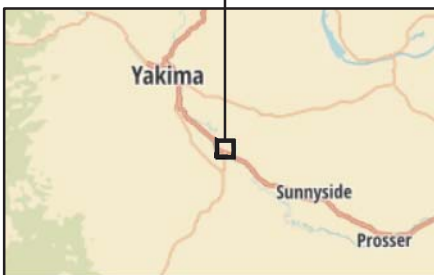
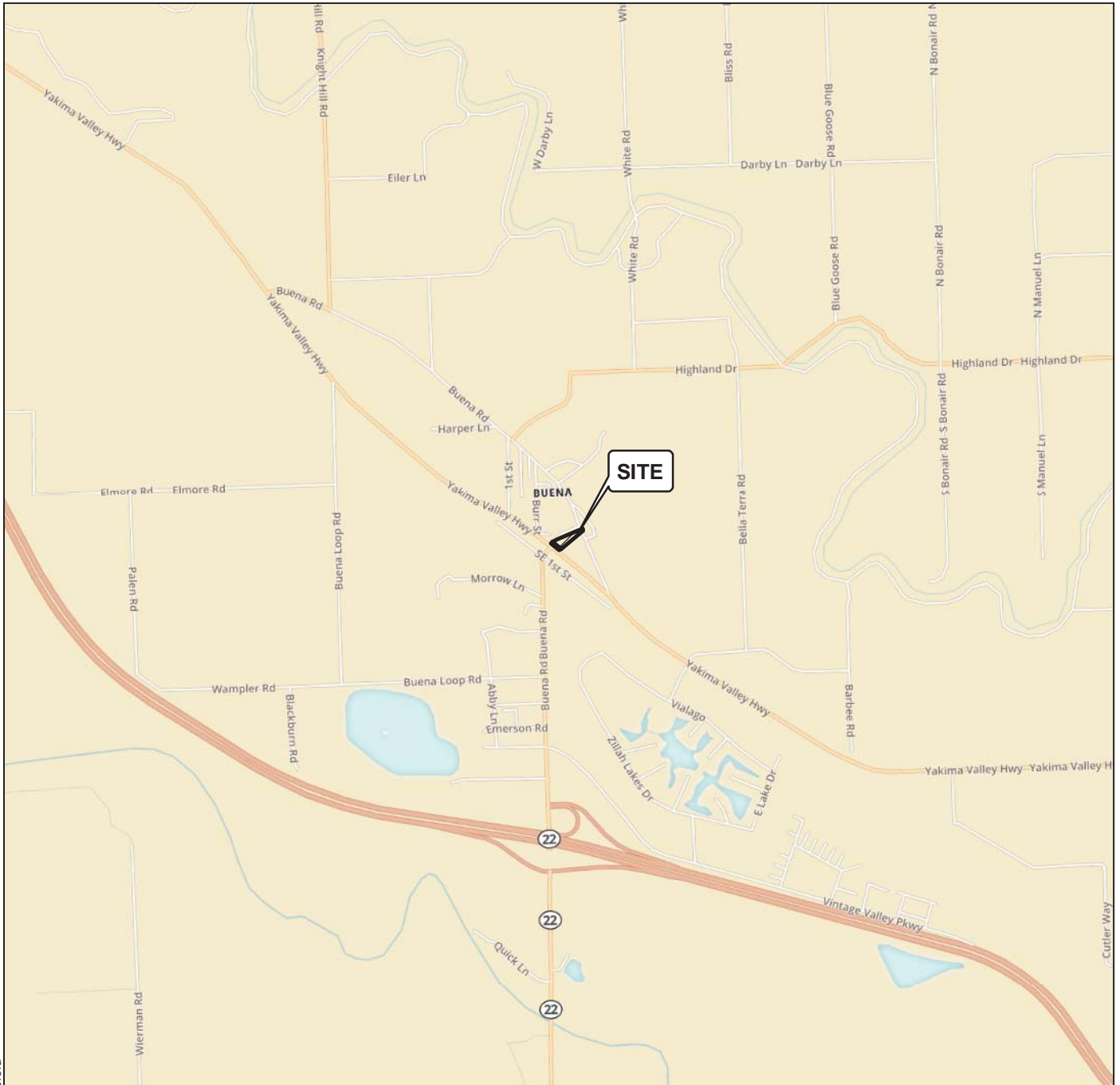
Notes:

¹Reported water quality parameters reflect conditions at the conclusion of well purging during low-flow sampling.

²Ferrous iron measurements are approximate and based on visual assessment of a Hach Ferrous Iron IR-I8C test.

ORP = reduction-oxidation potential; PID = photoionization detector

mS/m = millisiemens per meter; NTU = nephelometric turbidity unit; mg/L = milligrams per liter; °C = celsius; mV = millivolts; ppm = parts per million; " - " = not measured



Notes:

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

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

**Gold Nugget Market
Buena, Washington**



Figure 1



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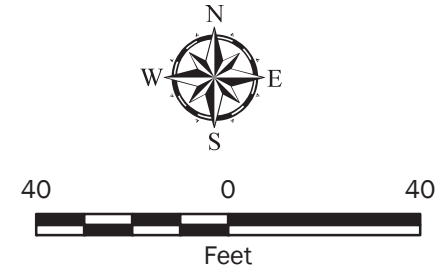
Notes:
 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by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

Data Source: Image from Google Earth, October 2018.
 Site boundary and street data from Yakima County parcel data, January 2019.

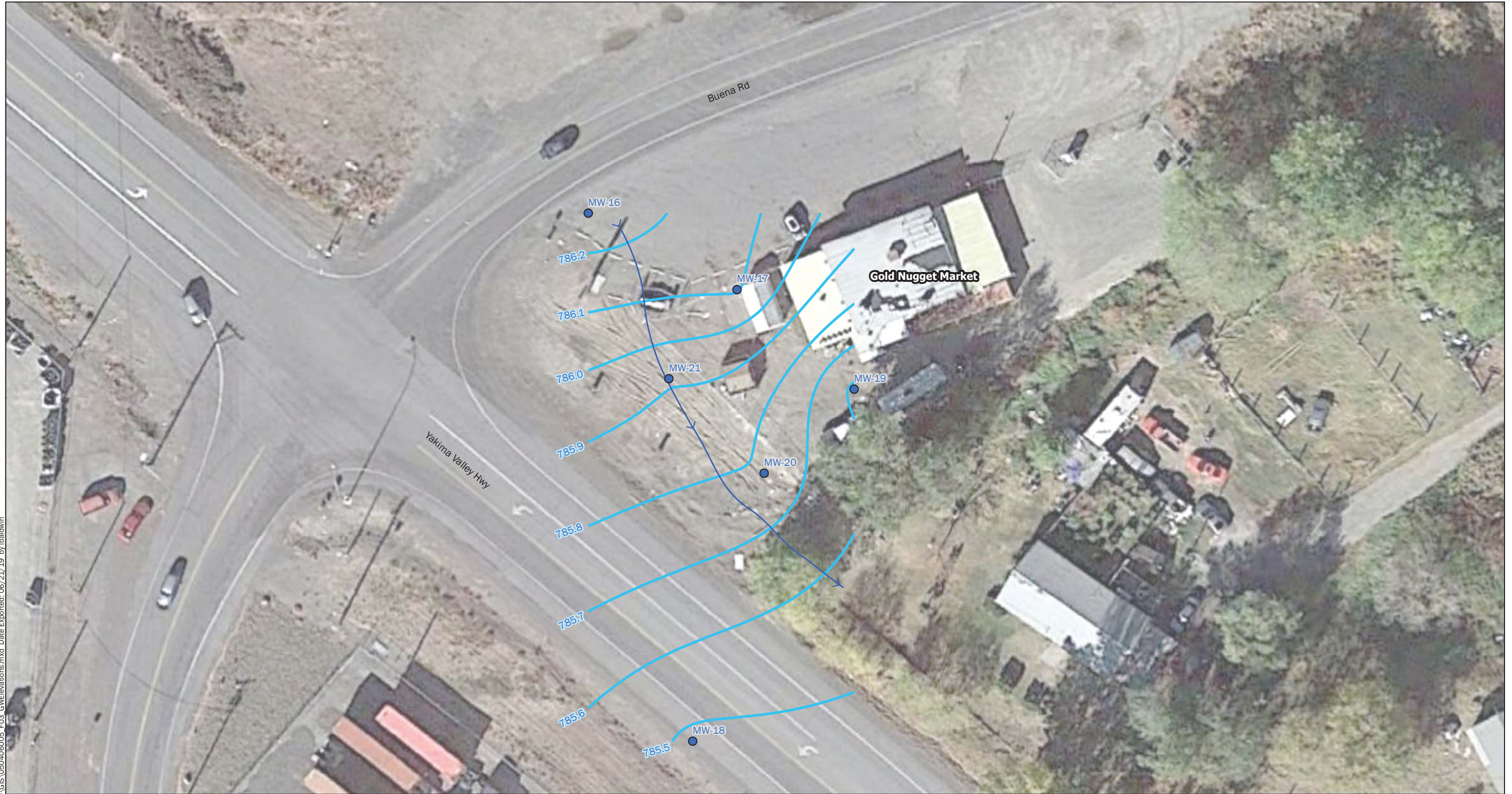
Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

- Monitoring Well Number and Approximate Location (GeoEngineers, 2012)
- ⊕ Air Sparge Number and Approximate Location (GeoEngineers, 2012)
- ⊗ Boring Number and Approximate Location (GeoEngineers, 2012)
- SVE Extraction Trench (Green Earthworks, 2014)
- ⊠ SVE/AS Remediation System Shed (Green Earthworks, 2014)



Site Plan and Historical Features	
Gold Nugget Market Buena, Washington	
	Figure 2



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Notes:

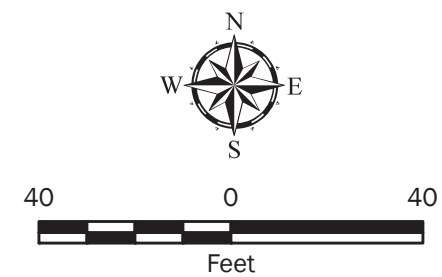
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers,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

Data Source: Image from Google Earth, October 2018.
 Site boundary and street data from Yakima County parcel data, January 2019.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

- Monitoring Well Number and Approximate Location
- Groundwater Elevation Contours
- >>> Flow Direction



Groundwater Elevation Contours - May 2019	
Gold Nugget Market Buena, Washington	
	Figure 3



\\geoengineers.com\WAW\Projects\0_0504060\GIS\050406005_F04_GW.mxd Date Exported: 06/21/19 by lbaldwin

Notes:

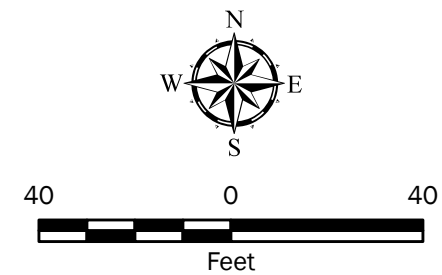
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers,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

Data Source: Image from Google Earth, October 2018.
 Site boundary and street data from Yakima County parcel data, January 2019.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

- Monitoring Well Number and Approximate Location
- Benzene in Groundwater Greater Than MTCA Method A Unrestricted Land Use clean up level (5 µg/L)



Groundwater Analytical Results - May 2019	
Gold Nugget Market Buena, Washington	
	Figure 4

APPENDIX A

Field Procedures

APPENDIX A FIELD PROCEDURES

General

Groundwater conditions at the Golden Nugget Market site were assessed on May 1, 2019, collecting groundwater samples from monitoring wells MW-16 through MW-21, shown on Figure 2. Field methods generally were performed in compliance with the project Work Plan assessment procedures.

Groundwater Sampling

Groundwater samples will be collected from existing monitoring wells (following redevelopment).

Well Redevelopment

Existing groundwater monitoring wells will be redeveloped to remove potential material that has accumulated since the last sampling event, stabilize the filter pack and formation materials surrounding the well screen, and restore the hydraulic connection between the well screen and the surrounding soil. Each well will be redeveloped by surging and bailing with a stainless-steel bailer. Surging will be conducted slowly to reduce disruption to the filter pack and screen.

The depth to water in the groundwater monitoring well will be measured prior to redevelopment. Well development will continue until the water is as free of sediment as practicable with respect to the composition of the subsurface materials within the screened interval. The removal rate, depth to water and volume of groundwater removed will be recorded during well redevelopment procedures. Well redevelopment water will be stored in a 55-gallon drum on the site, pending analysis and disposal.

Bailers used to develop more than one well will be decontaminated by wiping with a detergent such as Simple Green and washing with a Liquinox® solution, followed by a potable water rinse and distilled water rinse. Sampling will proceed in developed wells no sooner than 48 hours following development.

Depth to Groundwater

Depth to groundwater measurements from site monitoring wells will be collected and recorded on the field forms. Depth to groundwater relative to the north side of the top of the well casing will be measured to the nearest 0.01 foot using an electronic water-level indicator and recorded in the field notebook. Product thickness (if any) will be measured with an oil-water interface probe and recorded in the field notebook. Groundwater elevation will be calculated by subtracting the depth-to-water measurement from the surveyed casing rim elevation provided in the available site documentation. The electronic water-level indicator will be decontaminated with Liquinox® solution wash and a distilled water rinse prior to use in each well.

Well Sampling

Following depth-to-groundwater measurement, a groundwater sample will be collected from each well consistent with the EPA's low-flow groundwater sampling procedure, as described in EPA (2017) and Puls and Barcelona (1996). Dedicated tubing and a peristaltic pump will be used for groundwater purging and sampling. During purging activities, water quality parameters, including pH, temperature, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and turbidity, will be measured using a multi-parameter meter equipped with a flow-through cell. Groundwater samples will be collected after (1) water quality parameters stabilize; or (2) a maximum purge time of 30 minutes is reached. During purging and

sampling, drawdown will not be allowed to exceed 0.3 feet, if possible, and the purge rate will not be allowed to exceed 400 milliliters per minute. Water quality parameter stabilization criteria will include the following:

- Turbidity: ± 10 percent for values greater than 5 nephelometric turbidity units;
- Conductivity: ± 3 percent;
- pH: ± 0.1 unit;
- Temperature: ± 3 percent; and
- DO: ± 10 percent for values greater than 0.5 milligrams per liter.

Samples will not be collected from the well if it has measurable (>0.1 inches) free product. Field water quality measurements and depth-to-water measurements will be recorded on a Well Purging-Field Water Quality Measurement Form. Groundwater samples will be transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. Chain-of-custody procedures will be observed from the time of sample collection to delivery to the testing laboratory consistent with the QAPP (Appendix B)

APPENDIX B
Chemical Analytical Laboratory Report
and Data Validation

APPENDIX B CHEMICAL ANALYTICAL LABORATORY REPORT AND DATA VALIDATION

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2A data validation (EPA Document 540-R-08-005; EPA 2009) of analytical data from the analyses of groundwater samples collected as part of the May 2019 sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the Gold Nugget Market site located at 1041 Buena Road in Buena, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the EPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (EPA 2017) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Work Plan (GeoEngineers 2019), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method and Trip Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Field Duplicates

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery group (SDG) listed below in Table B-1.

TABLE B-1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
590-10913-1	MW-16:050119, DUP:050119, MW-17:050119, MW-18:050119, MW-19:050119, MW-20:050119, MW-21:050119, Trip Blank

CHEMICAL ANALYSIS PERFORMED

Eurofins TestAmerica Laboratories, Inc. (TestAmerica), located in Spokane, Washington, performed laboratory analyses on the samples using one or more of the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Petroleum Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx; and
- Volatile Organic Compounds (VOCs) by Method EPA8260C

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

TestAmerica provided the required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and the identified anomalies were discussed in the relevant laboratory case narrative.

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the laboratory.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for each analysis. The sample cooler arrived at the laboratory within the appropriate temperatures of between 2 and 6 degrees Celsius.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the laboratory control limits.

Method Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For each sample batch, method blanks for the applicable

methods were analyzed at the required frequency. None of the analytes of interest were detected in the method blanks.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. None of the analytes of interest were detected in the trip blank.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated.

A laboratory control sample/laboratory control sample duplicate (LCS/LCSD) sample set was performed in lieu of a MS/MSD analysis.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits.

FIELD DUPLICATES

In order to assess precision, field duplicate samples were collected and analyzed along with the reviewed sample batches. The duplicate samples were analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for water samples is 35 percent.

SDG 590-10913-1: One field duplicate sample pair, MW-16:050119 and DUP:050119, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate and LCS/LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD and field duplicate RPD values.

No analytical results were qualified. The data are acceptable for the intended use.

REFERENCES

GeoEngineers, Inc. (GeoEngineers). 2019. "Work Plan, Gold Nugget Market," prepared for Washington State Department of Ecology. April 19, 2019.

U.S. Environmental Protection Agency (EPA). 2009. "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (EPA). 2017. "Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review," EPA-540-R-2017-002. January 2017.

ANALYTICAL REPORT

Eurofins TestAmerica, Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

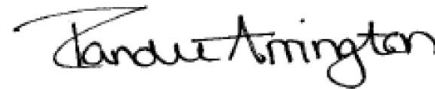
Laboratory Job ID: 590-10913-1

Client Project/Site: Gold Nugget Market/00504-060-00
Sampling Event: Quarterly Groundwater Monitoring

For:

GeoEngineers Inc
523 East Second Ave
Spokane, Washington 99202

Attn: Dave Lauder



Authorized for release by:
5/8/2019 4:37:24 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Job ID: 590-10913-1

Laboratory: Eurofins TestAmerica, Spokane

Narrative

Receipt

The samples were received on 5/3/2019 11:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

GC/MS VOA

Method 8260C: A duplicate for (LCS 590-22053/1003) was not analyzed because the wrong vial was run in its place. Containers were not available for a sample duplicate, matrix spike, or matrix spike duplicate.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-10913-1	MW-16:050119	Water	05/01/19 16:23	05/03/19 11:55
590-10913-2	MW-17:050119	Water	05/01/19 11:28	05/03/19 11:55
590-10913-3	MW-18:050119	Water	05/01/19 13:29	05/03/19 11:55
590-10913-4	MW-19:050119	Water	05/01/19 09:54	05/03/19 11:55
590-10913-5	MW-20:050119	Water	05/01/19 14:17	05/03/19 11:55
590-10913-6	MW-21:050119	Water	05/01/19 15:12	05/03/19 11:55
590-10913-7	DUP:050119	Water	05/01/19 12:00	05/03/19 11:55
590-10913-8	Trip Blank	Water	05/01/19 09:54	05/03/19 11:55

Definitions/Glossary

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-16:050119

Lab Sample ID: 590-10913-1

Date Collected: 05/01/19 16:23

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/06/19 23:32	1
Ethylbenzene	ND		1.0		ug/L			05/06/19 23:32	1
m,p-Xylene	ND		2.0		ug/L			05/06/19 23:32	1
o-Xylene	ND		1.0		ug/L			05/06/19 23:32	1
Toluene	ND		1.0		ug/L			05/06/19 23:32	1
Xylenes, Total	ND		3.0		ug/L			05/06/19 23:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		80 - 120		05/06/19 23:32	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/06/19 23:32	1
Dibromofluoromethane (Surr)	103		80 - 120		05/06/19 23:32	1
Toluene-d8 (Surr)	102		80 - 120		05/06/19 23:32	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/06/19 23:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141		05/06/19 23:32	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 08:10	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 08:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	84		50 - 150	05/03/19 16:36	05/04/19 08:10	1
n-Triacontane-d62	73		50 - 150	05/03/19 16:36	05/04/19 08:10	1

Client Sample ID: MW-17:050119

Lab Sample ID: 590-10913-2

Date Collected: 05/01/19 11:28

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	55		0.40		ug/L			05/06/19 23:54	1
Ethylbenzene	ND		1.0		ug/L			05/06/19 23:54	1
m,p-Xylene	ND		2.0		ug/L			05/06/19 23:54	1
o-Xylene	ND		1.0		ug/L			05/06/19 23:54	1
Toluene	ND		1.0		ug/L			05/06/19 23:54	1
Xylenes, Total	ND		3.0		ug/L			05/06/19 23:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		80 - 120		05/06/19 23:54	1
4-Bromofluorobenzene (Surr)	91		80 - 120		05/06/19 23:54	1
Dibromofluoromethane (Surr)	105		80 - 120		05/06/19 23:54	1
Toluene-d8 (Surr)	103		80 - 120		05/06/19 23:54	1

Client Sample Results

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-17:050119

Lab Sample ID: 590-10913-2

Date Collected: 05/01/19 11:28

Matrix: Water

Date Received: 05/03/19 11:55

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	230		150		ug/L			05/06/19 23:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		68.7 - 141		05/06/19 23:54	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 08:30	1

Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 08:30	1
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Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	90		50 - 150	05/03/19 16:36	05/04/19 08:30	1
n-Triacontane-d62	80		50 - 150	05/03/19 16:36	05/04/19 08:30	1

Client Sample ID: MW-18:050119

Lab Sample ID: 590-10913-3

Date Collected: 05/01/19 13:29

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 00:16	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 00:16	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 00:16	1
o-Xylene	ND		1.0		ug/L			05/07/19 00:16	1
Toluene	ND		1.0		ug/L			05/07/19 00:16	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 00:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		80 - 120		05/07/19 00:16	1
4-Bromofluorobenzene (Surr)	96		80 - 120		05/07/19 00:16	1
Dibromofluoromethane (Surr)	105		80 - 120		05/07/19 00:16	1
Toluene-d8 (Surr)	103		80 - 120		05/07/19 00:16	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/07/19 00:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		68.7 - 141		05/07/19 00:16	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 08:50	1

Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 08:50	1
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Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150	05/03/19 16:36	05/04/19 08:50	1
n-Triacontane-d62	76		50 - 150	05/03/19 16:36	05/04/19 08:50	1

Eurofins TestAmerica, Spokane

Client Sample Results

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-19:050119

Lab Sample ID: 590-10913-4

Date Collected: 05/01/19 09:54

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 00:37	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 00:37	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 00:37	1
o-Xylene	ND		1.0		ug/L			05/07/19 00:37	1
Toluene	ND		1.0		ug/L			05/07/19 00:37	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 00:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		80 - 120		05/07/19 00:37	1
4-Bromofluorobenzene (Surr)	95		80 - 120		05/07/19 00:37	1
Dibromofluoromethane (Surr)	105		80 - 120		05/07/19 00:37	1
Toluene-d8 (Surr)	103		80 - 120		05/07/19 00:37	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/07/19 00:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		68.7 - 141		05/07/19 00:37	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 09:10	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 09:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	73		50 - 150	05/03/19 16:36	05/04/19 09:10	1
n-Triacontane-d62	60		50 - 150	05/03/19 16:36	05/04/19 09:10	1

Client Sample ID: MW-20:050119

Lab Sample ID: 590-10913-5

Date Collected: 05/01/19 14:17

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 00:59	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 00:59	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 00:59	1
o-Xylene	ND		1.0		ug/L			05/07/19 00:59	1
Toluene	ND		1.0		ug/L			05/07/19 00:59	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 00:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		80 - 120		05/07/19 00:59	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/07/19 00:59	1
Dibromofluoromethane (Surr)	109		80 - 120		05/07/19 00:59	1
Toluene-d8 (Surr)	107		80 - 120		05/07/19 00:59	1

Client Sample Results

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-20:050119

Lab Sample ID: 590-10913-5

Date Collected: 05/01/19 14:17

Matrix: Water

Date Received: 05/03/19 11:55

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/07/19 00:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141					05/07/19 00:59	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 09:29	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 09:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	88		50 - 150				05/03/19 16:36	05/04/19 09:29	1
n-Triacontane-d62	72		50 - 150				05/03/19 16:36	05/04/19 09:29	1

Client Sample ID: MW-21:050119

Lab Sample ID: 590-10913-6

Date Collected: 05/01/19 15:12

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 01:21	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 01:21	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 01:21	1
o-Xylene	ND		1.0		ug/L			05/07/19 01:21	1
Toluene	ND		1.0		ug/L			05/07/19 01:21	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 01:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		80 - 120					05/07/19 01:21	1
4-Bromofluorobenzene (Surr)	102		80 - 120					05/07/19 01:21	1
Dibromofluoromethane (Surr)	101		80 - 120					05/07/19 01:21	1
Toluene-d8 (Surr)	99		80 - 120					05/07/19 01:21	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	480		150		ug/L			05/07/19 01:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		68.7 - 141					05/07/19 01:21	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 09:49	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/03/19 16:36	05/04/19 09:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		50 - 150				05/03/19 16:36	05/04/19 09:49	1
n-Triacontane-d62	71		50 - 150				05/03/19 16:36	05/04/19 09:49	1

Eurofins TestAmerica, Spokane

Client Sample Results

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: DUP:050119

Lab Sample ID: 590-10913-7

Date Collected: 05/01/19 12:00

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 01:43	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 01:43	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 01:43	1
o-Xylene	ND		1.0		ug/L			05/07/19 01:43	1
Toluene	ND		1.0		ug/L			05/07/19 01:43	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 01:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		80 - 120		05/07/19 01:43	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/07/19 01:43	1
Dibromofluoromethane (Surr)	107		80 - 120		05/07/19 01:43	1
Toluene-d8 (Surr)	105		80 - 120		05/07/19 01:43	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/07/19 01:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		68.7 - 141		05/07/19 01:43	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/03/19 16:36	05/04/19 10:09	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		05/03/19 16:36	05/04/19 10:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	86		50 - 150	05/03/19 16:36	05/04/19 10:09	1
n-Triacontane-d62	75		50 - 150	05/03/19 16:36	05/04/19 10:09	1

Client Sample ID: Trip Blank

Lab Sample ID: 590-10913-8

Date Collected: 05/01/19 09:54

Matrix: Water

Date Received: 05/03/19 11:55

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 20:24	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 20:24	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 20:24	1
o-Xylene	ND		1.0		ug/L			05/07/19 20:24	1
Toluene	ND		1.0		ug/L			05/07/19 20:24	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 20:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		80 - 120		05/07/19 20:24	1
4-Bromofluorobenzene (Surr)	97		80 - 120		05/07/19 20:24	1
Dibromofluoromethane (Surr)	112		80 - 120		05/07/19 20:24	1
Toluene-d8 (Surr)	98		80 - 120		05/07/19 20:24	1

QC Sample Results

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-22053/5
Matrix: Water
Analysis Batch: 22053

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/06/19 17:17	1
Ethylbenzene	ND		1.0		ug/L			05/06/19 17:17	1
m,p-Xylene	ND		2.0		ug/L			05/06/19 17:17	1
o-Xylene	ND		1.0		ug/L			05/06/19 17:17	1
Toluene	ND		1.0		ug/L			05/06/19 17:17	1
Xylenes, Total	ND		3.0		ug/L			05/06/19 17:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		80 - 120		05/06/19 17:17	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/06/19 17:17	1
Dibromofluoromethane (Surr)	103		80 - 120		05/06/19 17:17	1
Toluene-d8 (Surr)	102		80 - 120		05/06/19 17:17	1

Lab Sample ID: LCS 590-22053/1003
Matrix: Water
Analysis Batch: 22053

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.4		ug/L		104	80 - 126
Ethylbenzene	10.0	9.92		ug/L		99	80 - 120
m,p-Xylene	10.0	9.69		ug/L		97	80 - 120
o-Xylene	10.0	9.87		ug/L		99	80 - 120
Toluene	10.0	9.89		ug/L		99	80 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		80 - 120
4-Bromofluorobenzene (Surr)	97		80 - 120
Dibromofluoromethane (Surr)	105		80 - 120
Toluene-d8 (Surr)	95		80 - 120

Lab Sample ID: MB 590-22075/6
Matrix: Water
Analysis Batch: 22075

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/07/19 19:18	1
Ethylbenzene	ND		1.0		ug/L			05/07/19 19:18	1
m,p-Xylene	ND		2.0		ug/L			05/07/19 19:18	1
o-Xylene	ND		1.0		ug/L			05/07/19 19:18	1
Toluene	ND		1.0		ug/L			05/07/19 19:18	1
Xylenes, Total	ND		3.0		ug/L			05/07/19 19:18	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		80 - 120		05/07/19 19:18	1
4-Bromofluorobenzene (Surr)	90		80 - 120		05/07/19 19:18	1
Dibromofluoromethane (Surr)	105		80 - 120		05/07/19 19:18	1
Toluene-d8 (Surr)	104		80 - 120		05/07/19 19:18	1

Eurofins TestAmerica, Spokane

QC Sample Results

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 590-22075/1003
Matrix: Water
Analysis Batch: 22075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.5		ug/L		105	80 - 126
Ethylbenzene	10.0	10.4		ug/L		104	80 - 120
m,p-Xylene	10.0	10.3		ug/L		103	80 - 120
o-Xylene	10.0	9.47		ug/L		95	80 - 120
Toluene	10.0	10.3		ug/L		103	80 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	104		80 - 120
4-Bromofluorobenzene (Surr)	90		80 - 120
Dibromofluoromethane (Surr)	104		80 - 120
Toluene-d8 (Surr)	100		80 - 120

Lab Sample ID: LCSD 590-22075/7
Matrix: Water
Analysis Batch: 22075

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	10.4		ug/L		104	80 - 126	1	25
Ethylbenzene	10.0	10.1		ug/L		101	80 - 120	3	25
m,p-Xylene	10.0	9.85		ug/L		99	80 - 120	4	25
o-Xylene	10.0	9.19		ug/L		92	80 - 120	3	25
Toluene	10.0	10.2		ug/L		102	80 - 123	0	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		80 - 120
4-Bromofluorobenzene (Surr)	99		80 - 120
Dibromofluoromethane (Surr)	101		80 - 120
Toluene-d8 (Surr)	96		80 - 120

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Lab Sample ID: MB 590-22054/5
Matrix: Water
Analysis Batch: 22054

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/06/19 17:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		68.7 - 141		05/06/19 17:17	1

Lab Sample ID: LCS 590-22054/1004
Matrix: Water
Analysis Batch: 22054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	1060		ug/L		106	80 - 120

Eurofins TestAmerica, Spokane

QC Sample Results

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS) (Continued)

Lab Sample ID: LCS 590-22054/1004
Matrix: Water
Analysis Batch: 22054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	99		68.7 - 141

Lab Sample ID: LCSD 590-22054/1014
Matrix: Water
Analysis Batch: 22054

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1000	1100		ug/L		110	80 - 120	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		68.7 - 141

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-22024/1-A
Matrix: Water
Analysis Batch: 22010

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 22024

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		05/03/19 16:36	05/04/19 05:31	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		05/03/19 16:36	05/04/19 05:31	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	94		50 - 150	05/03/19 16:36	05/04/19 05:31	1
n-Triacontane-d62	78		50 - 150	05/03/19 16:36	05/04/19 05:31	1

Lab Sample ID: LCS 590-22024/2-A
Matrix: Water
Analysis Batch: 22010

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 22024

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	1.60	1.29		mg/L		81	50 - 150
Residual Range Organics (RRO) (C25-C36)	1.60	1.61		mg/L		100	50 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	90		50 - 150
n-Triacontane-d62	82		50 - 150

Lab Sample ID: LCSD 590-22024/3-A
Matrix: Water
Analysis Batch: 22010

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 22024

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.38		mg/L		87	50 - 150	7	25

Eurofins TestAmerica, Spokane

QC Sample Results

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 590-22024/3-A
Matrix: Water
Analysis Batch: 22010

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 22024

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Residual Range Organics (RRO) (C25-C36)	1.60	1.74		mg/L		109	50 - 150	8	25
Surrogate							LCS D %Recovery	LCS D Qualifier	Limits
<i>o</i> -Terphenyl							97		50 - 150
<i>n</i> -Triacontane-d62							91		50 - 150

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Lab Chronicle

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-16:050119

Lab Sample ID: 590-10913-1

Date Collected: 05/01/19 16:23

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/06/19 23:32	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/06/19 23:32	MRS	TAL SPK
Total/NA	Prep	3510C			263.2 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 08:10	NMI	TAL SPK

Client Sample ID: MW-17:050119

Lab Sample ID: 590-10913-2

Date Collected: 05/01/19 11:28

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/06/19 23:54	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/06/19 23:54	MRS	TAL SPK
Total/NA	Prep	3510C			264.2 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 08:30	NMI	TAL SPK

Client Sample ID: MW-18:050119

Lab Sample ID: 590-10913-3

Date Collected: 05/01/19 13:29

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/07/19 00:16	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/07/19 00:16	MRS	TAL SPK
Total/NA	Prep	3510C			263.5 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 08:50	NMI	TAL SPK

Client Sample ID: MW-19:050119

Lab Sample ID: 590-10913-4

Date Collected: 05/01/19 09:54

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/07/19 00:37	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/07/19 00:37	MRS	TAL SPK
Total/NA	Prep	3510C			261.7 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 09:10	NMI	TAL SPK

Client Sample ID: MW-20:050119

Lab Sample ID: 590-10913-5

Date Collected: 05/01/19 14:17

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/07/19 00:59	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/07/19 00:59	MRS	TAL SPK
Total/NA	Prep	3510C			261 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 09:29	NMI	TAL SPK

Eurofins TestAmerica, Spokane

Lab Chronicle

Client: GeoEngineers Inc
 Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Client Sample ID: MW-21:050119

Lab Sample ID: 590-10913-6

Date Collected: 05/01/19 15:12

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/07/19 01:21	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/07/19 01:21	MRS	TAL SPK
Total/NA	Prep	3510C			260.8 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 09:49	NMI	TAL SPK

Client Sample ID: DUP:050119

Lab Sample ID: 590-10913-7

Date Collected: 05/01/19 12:00

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22053	05/07/19 01:43	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	22054	05/07/19 01:43	MRS	TAL SPK
Total/NA	Prep	3510C			259.6 mL	2 mL	22024	05/03/19 16:36	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			22010	05/04/19 10:09	NMI	TAL SPK

Client Sample ID: Trip Blank

Lab Sample ID: 590-10913-8

Date Collected: 05/01/19 09:54

Matrix: Water

Date Received: 05/03/19 11:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	43 mL	43 mL	22075	05/07/19 20:24	MRS	TAL SPK

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Laboratory: Eurofins TestAmerica, Spokane

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-025	12-07-19
Oregon	NELAP	10	4137	12-07-19
Washington	State Program	10	C569	01-06-20

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Method Summary

Client: GeoEngineers Inc
Project/Site: Gold Nugget Market/00504-060-00

Job ID: 590-10913-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL SPK
5030C	Purge and Trap	SW846	TAL SPK

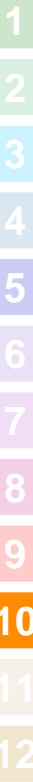
Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200



Eurofins TestAmerica, Spokane

11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



Client Information				Sampler: <u>M. Peterson</u>		Lab PM:		Carrier Tracking No(s):		COC No: 590-4564-1472.1	
Client Contact: Scott Lathen				Phone: <u>425-293-9560</u>		E-Mail:				Page: Page 1 of 1	
Company: GeoEngineers Inc				Due Date Requested: <u>STD</u>		Analysis Requested Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) <u>NWTPH-Gx: GRPH</u> <u>NWTPH-Dx: DRPH+ORPH</u> <u>BTEX-8266C</u>		Total Number of containers 3		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:	
Address: 523 East Second Ave				TAT Requested (days): <u>STD</u>							
City: Spokane				PO #:							
State, Zip: WA, 99202				WO #:							
Phone:				Project #: <u>0504-060-05</u>							
Email: slathen@geoengineers.com				SSOW#:							
Project Name: <u>Gold Nugget</u>											
Site:											
Sample Identification			Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Special Instructions/Note:
MW-16:050119			5-1-19	1623	G	W					
MW-17:050119				1128							
MW-18:050119				1329							
MW-19:050119				0954							
MW-20:050119				1417							
MW-21:050119				1512							
DUP:050119				1200							
Trip Blank											
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements:					
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:			
Relinquished by: <u>Matt Peterson</u>				Date/Time: <u>5/3/19 11:55</u>		Company: <u>G-EI</u>		Received by: <u>Maria Moore</u>		Date/Time: <u>5/3/19 11:55</u>	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: Δ Yes Δ No				Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks: <u>4.9°C</u>			



Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-10913-1

Login Number: 10913

List Number: 1

Creator: O'Toole, Maria C

List Source: Eurofins TestAmerica, Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.



APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C

REPORT LIMITATIONS AND GUIDELINES FOR USE¹

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

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of the Washington State Department of Ecology (Ecology). This report is not intended for use by others, and the information contained herein is not applicable to other sites.

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

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

This report has been prepared for the Gold Nugget Market site located at Gold Nugget Market site located at 1041 Buena Road in Buena, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

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

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

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of Ecology. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm and Ecology with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with Ecology and generally accepted environmental practices in this area at the time this report was prepared.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

Environmental Regulations are Always Evolving

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

Uncertainty May Remain Even After This Phase II ESA is Completed

No ESA can wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely-spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Subsurface Conditions Can Change

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

Most Environmental Findings are Professional Opinions

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

Do Not Redraw the Exploration Logs

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

Read These Provisions Closely

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

Geotechnical, Geologic and Geoenvironmental Reports Should Not be Interchanged

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

Biological Pollutants

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

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

