

TECHNICAL MEMORANDUM

DATE: June 2, 2015
TO: Christopher Maurer
FROM: David Dinkuhn
SUBJECT: Former Chevron Property Long Term Groundwater Monitoring Event 4 (August 2014)
CC: Thomas Knuckey, P.E.
PROJECT NUMBER: 233-1896-107
PROJECT NAME: Former Chevron Property Remediation

FORMER CHEVRON PROPERTY LONG TERM GROUNDWATER MONITORING EVENT 4

This technical memorandum presents a summary of the results of the fourth long-term groundwater monitoring event at the Former Chevron Property (site) located in Bremerton, Washington. Long-term monitoring is being performed under the site's Agreed Order Number DE-12TCPHQ-9509. Sampling was conducted in accordance with the site's Long Term Groundwater Monitoring Plan (LTGMP; Parametrix 2013). Data from this long-term monitoring event is intended to be used to evaluate groundwater quality trends at the site and confirm the continued occurrence of natural attenuation.

EVENT 4 MONITORING RESULTS

Groundwater samples were collected on August 6 and 7, 2014, using a peristaltic pump and low flow sampling techniques. Samples were collected from eleven designated long-term monitoring wells including: MW-4R, -9R, -10R, -11, -13R, -20R, -21R, -22R, -25, -26R, and -27. A figure showing well locations (Figure 1) is attached.

Prior to sampling, all wells were purged until measured water quality parameters stabilized according to criteria specified in the LTGMP. Upon stabilization, groundwater samples were collected in appropriate containers. The final set of water quality parameter measurements is provided in Table 1. Wells MW-9 and MW-13R produced very little water and general chemistry and metals samples were not collected. Field sampling forms related to the sample collection are attached.

Groundwater samples were submitted to OnSite Environmental of Redmond, Washington, for chemical analysis of gasoline, diesel, and lube oil along with benzene, toluene, ethylbenzene, xylenes, total and dissolved lead, and general chemistry parameters. A summary of analytical results is presented in Table 1. An analytical data review memorandum and laboratory report are also attached.

The depth to groundwater was inadvertently not measured in the wells and inferred groundwater surface elevations were not developed for this sampling event.

DISCUSSION

Concentration trends versus time for benzene and gasoline are presented graphically in Figures 2 and 3. Wells MW-4R, MW-9R, and MW-21R contain benzene concentrations exceeding the Model Toxics Control Act (MTCA) cleanup level. The measured concentrations are higher than those measured during Event 3. This trend appears to be seasonal and corresponds with the level of groundwater in the wells, which are typically much lower during the August sampling events as compared to the January sampling events. Gasoline concentrations in these wells also exceed the MTCA cleanup level and are higher than the Event 3 results. Overall concentration trends from historical sampling events through Event 5 appear to be leveling out from an initial downward trend observed during Events 1 through 3.

Evidence that anaerobic respiration is continuing to occur in the impacted aquifer is demonstrated by elevated alkalinity and dissolved methane concentrations with associated highly negative oxidation reduction potential values as compared to concentrations in up-gradient well MW-11.

Diesel concentrations are slightly above the MTCA A cleanup level in wells MW-4R and MW-25.

The lube oil concentration in well MW-10R is slightly above the MTCA A cleanup level.

Well MW-09R continues to produce very little water and total and dissolved lead samples were not collected.

REFERENCES

Parametrix. 2013. Former Chevron Property Long-Term Groundwater Monitoring Plan. Prepared for Washington State Department of Ecology on behalf of the City of Bremerton. July 8.

ATTACHMENTS

- Figures:
 - Figure 1 – Long Term Groundwater Monitoring Event 4 Sampling Results – August 2014.
 - Figure 2 – Event 4 Benzene Results.
 - Figure 3 – Event 4 Gasoline Results.
- Table 1 – Groundwater Results Summary, Long Term Groundwater Monitoring Event 4.
- Monitoring Well Logs.
- Field Sampling Forms.
- Data Validation Technical Memorandum.
- Laboratory Report.

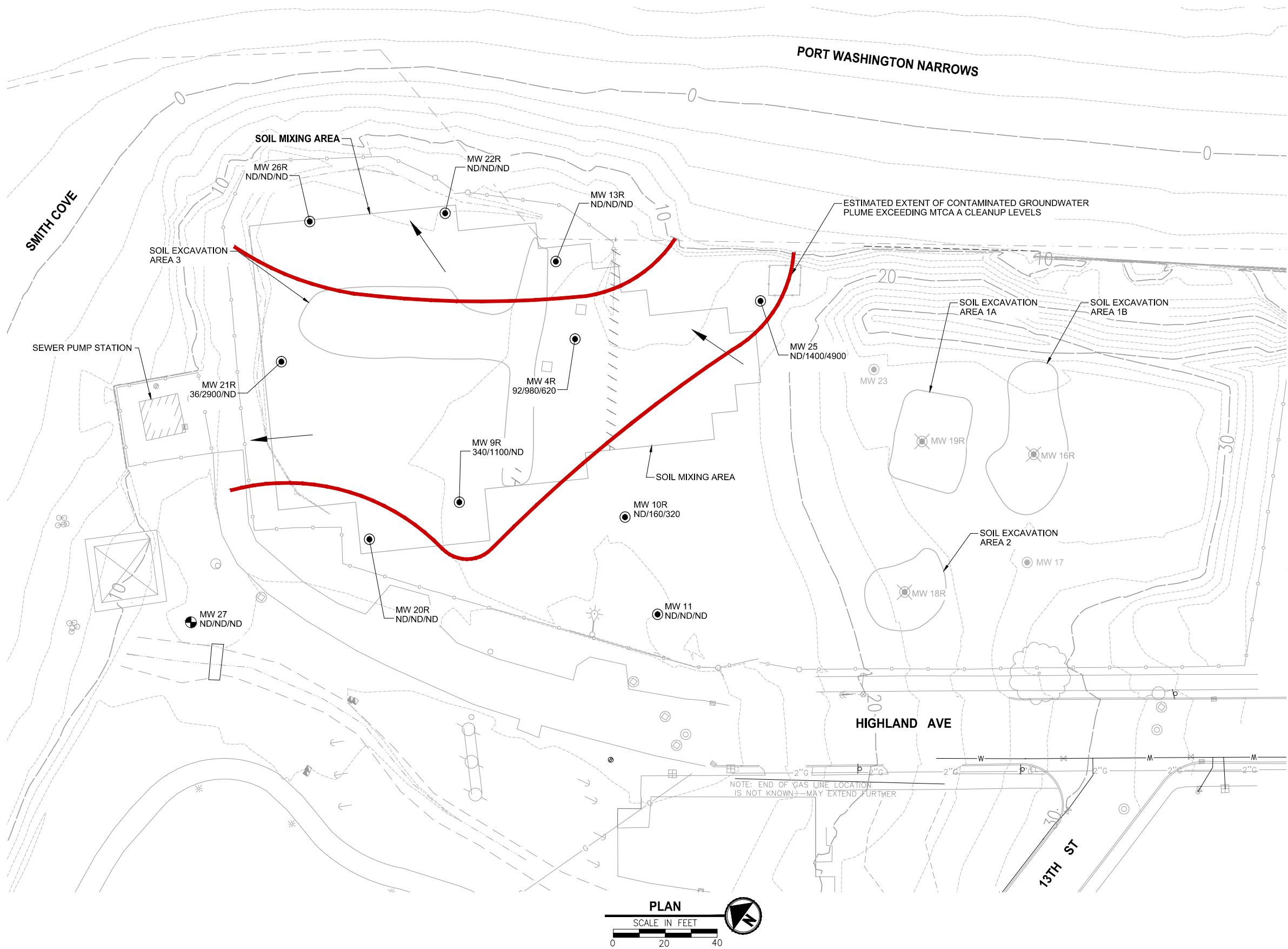
Figures

Figure 1 – Long Term Groundwater Monitoring
Event 4 Sampling Results – August 2014

Figure 2 – Event 4 Benzene Results

Figure 3 – Event 4 Gasoline Results

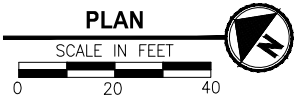
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PLOTTED BY: ceruljps



- LEGEND**
- EXISTING CHAIN LINK FENCE
 - EXISTING MONITORING WELL
 - SOIL EXCAVATION AREA
 - MW 14 WELL REMOVED DURING INTERIM ACTION
 - MW 19R LONG TERM MONITORING WELL
 - R INDICATES REPLACEMENT WELL
 - ESTIMATED CONTAMINATED GROUNDWATER PLUME EXCEEDING MTCA A CLEANUP LEVELS
 - GROUNDWATER FLOW DIRECTION
 - 19/1,500/ND GW RESULTS FOR BENZENE GASOLINE/DIESEL RESULTS IN ug/L
 - ND NOT DETECTED

GENERAL NOTES:
1. CONTOUR DATUM NAVD 88

CLEANUP LEVELS	
MTCA A	ug/L
BENZENE	5
GASOLINE	800
DIESEL	500



REVISIONS			
NO.	DESCRIPTION	DATE	BY

0	1"	2"
TWO INCHES AT FULL SCALE IF NOT SCALE ACCORDINGLY		
SCALE		
HORIZ. 1"=20'	VERT. N/A	

CITY OF BREMERTON DEPARTMENT OF PUBLIC WORKS & UTILITIES ENGINEERING DIVISION			
FIELD BOOK	DRAWING NO.	DESIGN BY: DLD WASH. P.E. # DATE 4/15	CHECKED BY: WASH. P.E. # DATE

FORMER CHEVRON PROPERTY LONG-TERM GROUNDWATER MONITORING EVENT 4 SAMPLING RESULTS - AUGUST 2014			FIG. NO. 1	SHEET 1 OF 1

Figure 2. Event 4 Benzene Results - Former Chevron Property

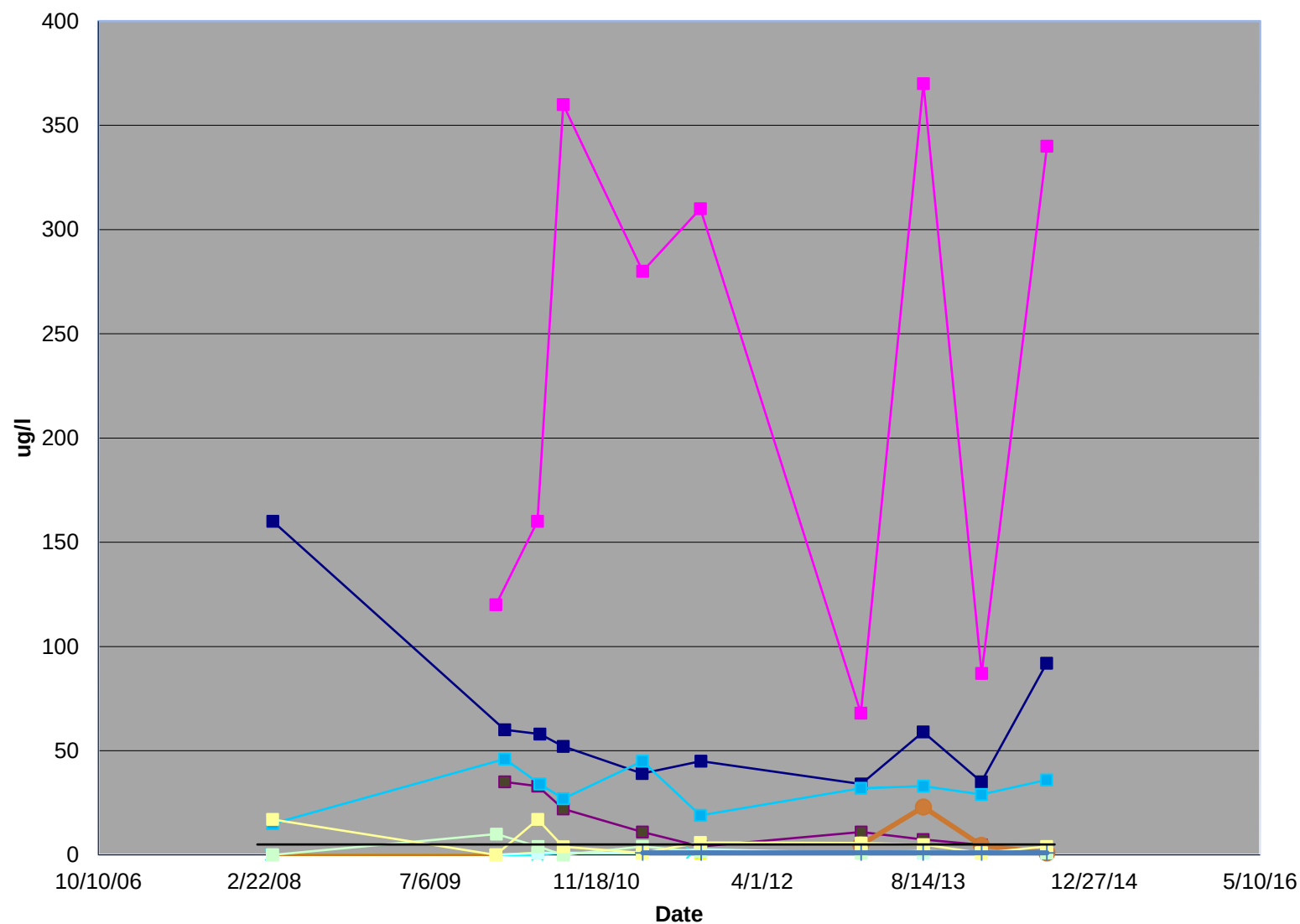


Figure 3. Event 4 Gasoline Results - Former Chevron Property

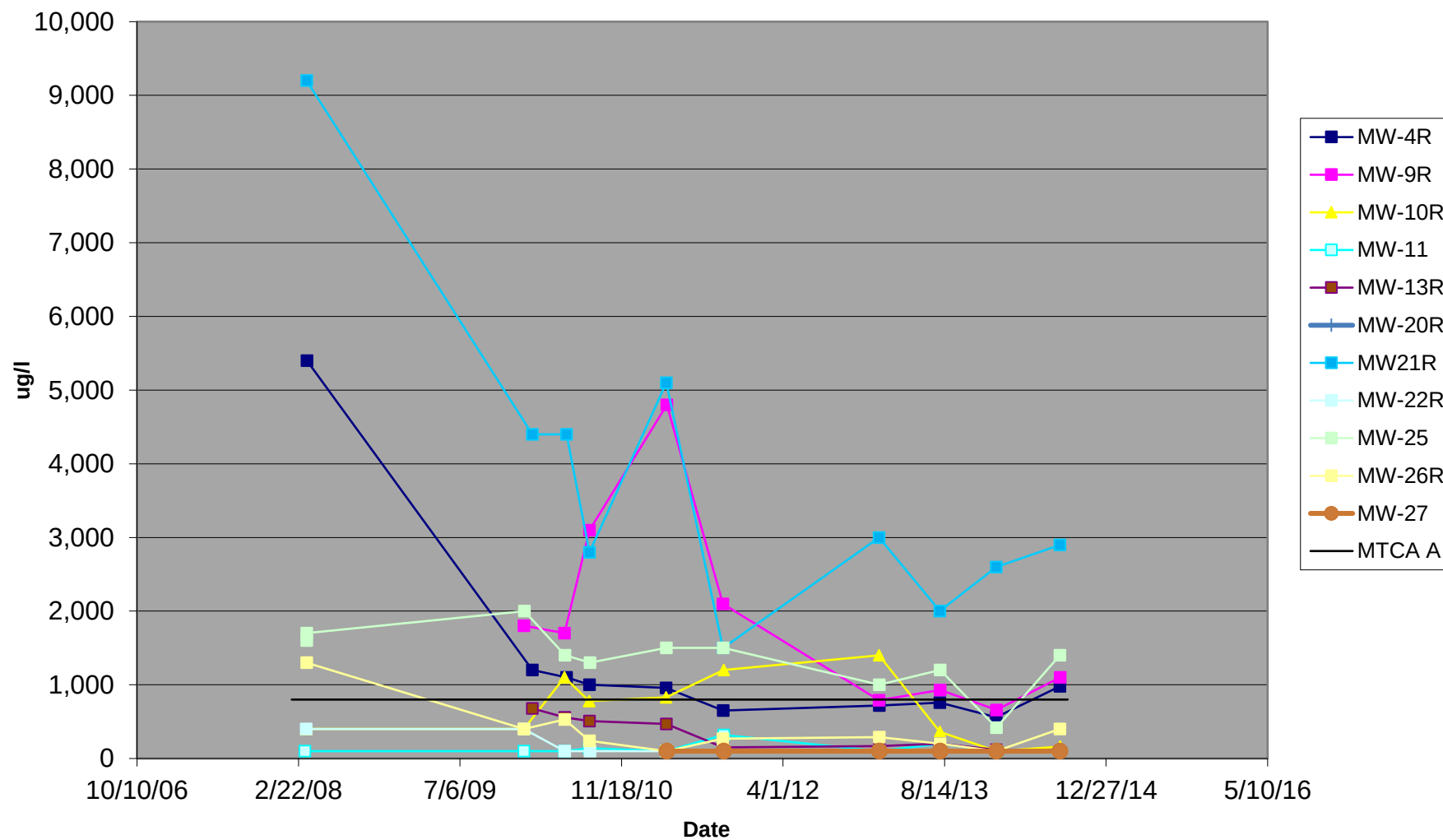


Table 1 – Groundwater Results Summary,
Long Term Groundwater Monitoring Event 4

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014)

Monitoring Well No.			MW-04R													MW-09R									
PARAMETERS	Units	Sample Date	3/19/08 ¹	1/21/10	6/1/10	6/1/10*	8/11/10	8/11/10*	4/5/11	4/5/11*	9/29/11	1/24/13	7/30/13	1/21/14	8/6/14	1/20/10	5/25/10	5/25/10*	8/11/10	4/7/11	9/28/11	1/23/13	7/31/13	1/22/14	
MTCA A																									
VOLATILE ORGANICS (BTEX)																									
Benzene	ug/L	5	160	60 J	58	--	52	--	39	--	45	34	59	35	92	120 J	160	170	360	280	310	68	370	87	
Toluene	ug/L	1,000	10 U	2.0 J	1.0 U	--	1.0 U	--	4.0 U	--	1.0 U	2.1 U	4.0 U	1.8 U	4.0 U	4 U	3.2	3.6	11	11	13	4	7.4	3.4	
Ethylbenzene	ug/L	700	45	31 J	45	--	40	--	17	--	20	7.9	5.9	3.1	9.0	89 J	89	97	230	220	150	20	25	13	
m,p-Xylene	ug/L	1,000	86	15 J	7.6	--	4.7	--	9.4	--	2.1	4.1	9.4	2.5	5.5	170 J	120	140	400	300	190	12	6.9	6.4	
o-Xylene	ug/L	1,000	12	1.8 J	1.0 U	--	1.0 U	--	4.0	--	1.0 U	1.5	4.0 U	1.3 U	4.0 U	4 U	3.5	3.9	8.1	11	10	4	2.5	2.4	
TOTAL PETROLEUM HYDROCARBONS																									
Gasoline	ug/L	800	5,400	1,200 J	1,100	--	1,000	--	960	--	650	720	760	560	980	1,800 J	1,500	1,700	3,100	4,800	2,100	790	930	660	
Diesel	mg/L	0.5	27	0.64 M	0.34 U	--	0.62 M	--	0.46	--	0.34 U	0.31 U	0.31 U	0.36 U	0.62	0.31 U	0.29 U	0.69	0.45 M	0.82	0.33 U	0.26 U	0.54 U	0.30 U	
Lube Oil	mg/L	0.5	2.3	0.45 U	0.42 U	--	0.41 U	--	0.42 U	--	0.42 U	0.41 U	0.41 U	0.41 U	1.20	0.49 U	0.47 U	0.66	0.42 U	0.43 U	0.42 U	0.41 U	0.54	0.54 U	
METALS																									
Total Lead	ug/L	15	--	8.2	--	--	--	--	--	--	--	--	--	--	--	80	36 J	74 J	21 J	170	--	1.00 U	3.90	--	
Dissolved Lead	ug/L	15	--	1.0 U	--	--	--	--	--	--	--	--	--	--	--	13	12	14	17	3.0	--	1.00 U	1.10 U	--	
Dissolved Iron	ug/L		--	4,200	--	--	--	--	--	--	--	--	--	--	--	34,000	--	--	--	--	--	--	--	--	
Total Ferrous Iron	mg/L		--	--	7.36	--	9.75	--	5.4	--	--	7.35	9.70	9.64	11.50	--	46.2	42.1	29.2	49.4	--	34.20	36.20	--	
Dissolved Manganese	ug/L		--	3,000	4,600	--	4,400	--	3,400	--	--	4,500	6,500	5,500	5,800	5,000	3,600	3,900	4,200	4,500	--	4,000	4,500	--	
PAHs																									
Naphthalene	ug/L		--	1.4	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	6.4	--	--	--	--	--	--	--	--	
2-Methylnaphthalene	ug/L		--	0.20	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	2.8	--	--	--	--	--	--	--	--	
1-Methylnappthalene	ug/L		--	3.2	--	--	--	--	4.7	4.9	--	--	--	--	--	2.2	--	--	--	--	--	--	--	--	
Acenaphthylene	ug/L		--	0.23	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	0.11 U	--	--	--	--	--	--	--	--	
Acenaphthene	ug/L		--	1.9	--	--	--	--	3.3	3.4	--	--	--	--	--	0.18	--	--	--	--	--	--	--	--	
Flourene	ug/L		--	1.8	--	--	--	--	2.3	2.3	--	--	--	--	--	0.14	--	--	--	--	--	--	--	--	
Phenanthrene	ug/L		--	0.15	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	0.17	--	--	--	--	--	--	--	--	
Anthracene	ug/L		--	0.44	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	0.11 U	--	--	--	--	--	--	--	--	
Fluoranthene	ug/L		--	0.39	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	0.11 U	--	--	--	--	--	--	--	--	
Pyrene	ug/L		--	0.26	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	0.11 U	--	--	--	--	--	--	--	--	
Benzo(a)anthracene	ug/L		--	0.047	0.032	0.03	0.050 U	0.042	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Chrysene	ug/L		--	0.033	0.010 U	0.010 U	0.050 U	0.023	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Benzo(b)fluoranthene	ug/L		--	0.013	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Benzo(k)fluoranthene	ug/L		--	0.028	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Benzo(a)pyrene	ug/L	0.1	--	0.020	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Indeno(1,2,3-cd)pyrene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Dibenz(a,h)anthracene	ug/L		--	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
Benzo[g,h,i]perylene	ug/L		--	0.010 U	--	--	--	--	0.10 U	0.10 U	--	--	--	--	--	0.011 U	--	--	--	--	--	--	--	--	
GENERAL CHEMISTRY																									
Alkalinity	mg/L		--	190	1,900	--	2,100	--	2,300	--	--	7100	3300	3300	3300	700	720	730	800	730	--	450	85	740	
Nitrate (as Nitrogen)	mg/L		--	0.050 U	0.050 U	--	0.050 U	--	0.050 U	--	--	0.05 U	0.05 U	0.04 U	0.05 U	0.050 U	0.050 U	0.050 U	0.14	0.050 U	--	0.076	0.05 U	0.05 U	
Sulfate	mg/L		--	250	150	--	120	--	110	--	--	5 U	5 U	10 U	5 U	30	7.5	7.4	5.0 U	5.0 U	--	25.00 U	5.00 U	5.00 U	
Chloride	mg/L		--	290	250	--	250	--	230	--	--	240	520	260	270	77	120	120	78	91	--	32	35	31	
Dissolved Methane	ug/L		--	710	590	--	670	--	740	--	--	690	540	600	776	2,100	8,600	7,800	6,600	9,900	--	11000	7100	11000	
BOD5	mg/L		--	8.97	8.1	--	8.6	--	--	--	--	--	--	--	--	5.46	3.0	4.3	12.3	--	--	--	--	--	
FIELD PARAMETERS																									
Turbidity	Neth. Turbidity Units		--	333	5.3	5.3	106	106	9.0	9.0	116.0	NM	0.6	1.1	6.6	146	57.9	57.9	>1000	>1000	106.0	NM	60.0	5.1	
pH	--		--	6.63	6.90	6.90	7.01	7.01	7.09	7.09	7.11	7.07	7.24	6.96	6.56	6.36	6.77	6.77	6.94	6.78	7.05	6.87	7.18	6.57	
Specific Conductance	Millisiemens/cm		--	3.50	3.42	3.42	32.6	32.6	35.1	35.1	5.48	5.41	5.43	5.73	5.68	1.52	1.42	1.42	2.65	1.81	1.91	1.47	1.77	1.41	
Dissolved Oxygen	mg/L		--	4.91	4.55	4.55	0.0	0.0	4.02	4.02	0.06	0.00	1.01	0.43	3.56	9.65	0.96	0.96	0.0	0.40	6.68	3.92	0.97	0.60	
Oxdat. Red. Potential	Millivolts		--	-136	-115	-115	-161	-161	-149	-149	-163	-247	-123	-140	-69.5	-124	-136.8	-136.8	-169	-134	-152	-211	-139	-83	

Notes:

- 1 Sample collected from replaced well.
- * Duplicate sample.
- J = Reported concentration is an estimate.
- mg/L= Milligrams per liter.
- NM = Not measured due to equipment malfunction.
- µg/L = Micrograms per liter.
- U = Analyte not detected above practical quantitation limit given.
- U1 = The practical quantitation limit is elevated due to interferences present in the sample.
- Exceeds MTCA A cleanup level.

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014) – Continued

Monitoring Well No.			MW-09R	MW-10R										MW-11											
PARAMETERS	Units	Sample Date	8/7/14	3/17/08 ¹	1/20/10	5/25/10	8/10/10	4/5/11	9/30/11	1/23/13	7/30/13	1/22/14	8/7/14	3/13/08	1/20/10	5/25/10	8/10/10	8/10/10*	4/5/11	4/5/11*	9/30/11	1/23/13	1/23/2013*	7/30/13	
MTCA A																									
VOLATILE ORGANICS (BTEX)																									
Benzene	ug/L	5	340	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4 U	
Toluene	ug/L	1,000	7	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.7	1.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4 U	
Ethylbenzene	ug/L	700	19	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4 U	
m,p-Xylene	ug/L	1,000	8	6.8	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4 U	
o-Xylene	ug/L	1,000	4 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4 U	
TOTAL PETROLEUM HYDROCARBONS																									
Gasoline	ug/L	800	1,100	400 U	400 U	1,100	780	830	1200	1400	360	100 U	160	100 U	100 U	100 U	140	130	100 U	100 U	320	100 U	100 U	400 U	
Diesel	mg/L	0.5	0.26 U	160	0.27 U	0.61 U	0.42 U	0.45 U	0.81 U	0.76 U	--	0.26 U	0.32	0.27	0.17 U	0.26 U	0.25 U	0.25 U	0.26 U	0.26 U	0.37	0.26 U	0.26 U	0.27 U	
Lube Oil	mg/L	0.5	0.41 U	8.8 U	0.44 U	0.42 U	0.45 U	0.43 U	0.43 U	0.41 U	--	0.41 U	0.58	0.40 U	0.27 U	0.42 U	0.41 U	0.41 U	0.42 U	0.42 U	0.42 U	0.41 U	0.41 U	0.44 U	
METALS																									
Total Lead	ug/L	15	--	--	3.8	--	--	--	--	--	--	--	--	--	4.7	--	--	--	--	--	--	--	--	--	
Dissolved Lead	ug/L	15	--	--	2.2	--	--	--	--	--	--	--	--	--	1.4	--	--	--	--	--	--	--	--	--	
Dissolved Iron	ug/L		--	--	6,400	--	--	--	--	--	--	--	--	--	270	--	--	--	--	--	--	--	--	--	
Total Ferrous Iron	mg/L		--	--	--	25.2	34.4	12.4	--	40.80	--	2.14	30.4	--	--	19.0	30.4	30.0	2.66	2.74	--	0.67	0.88	35.90	
Dissolved Manganese	ug/L		--	--	1,100	1,400	2,000	1,500	--	3,700	--	2000	3400	--	300	1,400	2,600	2,600	400	400	--	370	350	3800	
PAHs																									
Naphthalene	ug/L		--	--	0.14	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
2-Methylnaphthalene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
1-Methylnapthalene	ug/L		--	--	21	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Acenaphthylene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Acenaphthene	ug/L		--	--	0.23	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Flourene	ug/L		--	--	0.32	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Phenanthrene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Anthracene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Fluoranthene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Pyrene	ug/L		--	--	0.12 U	--	--	--	--	--	--	--	--	--	0.13 U	--	--	--	--	--	--	--	--	--	
Benzo(a)anthracene	ug/L		--	--	0.014	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Chrysene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Benzo(b)fluoranthene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Benzo(k)fluoranthene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Benzo(a)pyrene	ug/L	0.1	--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Indeno(1,2,3-cd)pyrene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Dibenz(a,h)anthracene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
Benzo[g,h,i]perylene	ug/L		--	--	0.012 U	--	--	--	--	--	--	--	--	--	0.013 U	--	--	--	--	--	--	--	--	--	
GENERAL CHEMISTRY																									
Alkalinity	mg/L		--	220	190	200	210	230	--	250	--	280	290	170	52	210	120	110	70	66	--	130	180	160	
Nitrate (as Nitrogen)	mg/L		--	0.050 U	0.77	0.094	0.050 U	0.050 U	--	0.05 U	--	0.58	0.50 U	0.050 U	0.050 U	0.070	0.086	0.1	0.050 U	0.050 U	--	2.40	1.60	0.05 U	
Sulfate	mg/L		--	5.0 U	10	10 U	5.0 U	5.0 U	--	25.00 U	--	43	5.00 U	5.0 U	8.8	10 U	25 U	25 U	5.0 U	5.0 U	--	56	47	5 U	
Chloride	mg/L		--	2.5	10	10	14	6.8	--	14.00	--	16	7.8	5.2	3.1	7.9	8.8	9.4	6.0	5.5	--	2.7	3.6	9.7	
Dissolved Methane	ug/L		--	--	170	510	260	590	--	2900	--	37	279	--	15	1,200	870	730	310	340	--	53	68	390	
BOD5	mg/L		--	--	3.06	2.0	12 U	--	--	--	--	--	--	--	3.36	3.1	12 U	12 U	--	--	--	--	--	--	
FIELD PARAMETERS																									
Turbidity	Neth. Turbidity Units		--	208	54.7	3.0	235	2.7	6.5	NM	NM	0.1	3.8	12.6	165	1.5	32.9	32.9	3.4	3.4	21.1	NM	--	5.80	
pH	--		--	6.38	6.00	6.32	6.05	6.50	6.52	6.58	NM	6.4	6.3	6.20	5.27	6.20	6.27	6.27	6.17	6.17	6.41	6.19	--	6.72	
Specific Conductance	Millisiemens/cm		--	53.4	35.9	51.2	90	90	81.2	0.8	NM	0.68	0.605	63.5	10.3	32.0	90	90	64.3	64.3	89.0	0.4	--	0.61	
Dissolved Oxygen	mg/L		--	0.0	5.38	6.31	2.38	2.20	6.16	0.20	NM	0.72	1.9	0.0	5.87	0.90	0.0	0.0	2.67	2.67	0.00	0.91	--	0.59	
Oxdat. Red. Potential	Millivolts		--	-35	-64	-19.0	-79	-110	-96	-194	NM	-58.2	-32.6	62	169	-49.3	-110	-110	-31	-31	-106	-221	--	-98	

Notes:

- 1 Sample collected from replaced well.
- * Duplicate sample.
- J = Reported concentration is an estimate.
- mg/L= Milligrams per liter.
- NM = Not measured due to equipment malfunction.
- µg/L = Micrograms per liter.
- U = Analyte not detected above practical quantitation limit given.
- U1 = The practical quantitation limit is elevated due to interferences present in the sample.
- Exceeds MTCA A cleanup level.

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014) – Continued

Monitoring Well No.			MW-11		MW-13R										MW-20R					MW-21R				
PARAMETERS	Units	Sample Date	1/22/14	8/7/14	2/15/10	5/26/10	8/11/10	4/6/11	9/29/11	1/24/13	7/30/13	7/30/13	1/21/14	8/6/14	1/23/13	7/31/13	1/21/14*	1/21/14	8/7/14	3/18/08 ¹	2/15/10	6/1/10	8/11/10	8/11/10*
MTCA A																								
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	1 U	1 U	35 J	33	22	11	4	11	11	7.4	4.8	1 U	4.8	23	4.3	4.5	1.0 U	15	46 J	34	27	--
Toluene	ug/L	1,000	1 U	1 U	4.0 U	1.3	1.0 U	1.0 U	1.0 U	1 U	1 U	4 U	1 U	1 U	1 U	4 U	1 U	1 U	1 U	91	5.0 J	2.9	1.7	--
Ethylbenzene	ug/L	700	1 U	1 U	13 J	15	10	2.6	1.0 U	2	2	8.8	1	1	3	40	4.9	5	1 U	620	230 J	240	120	--
m,p-Xylene	ug/L	1,000	1 U	1 U	4.0 U	1.4	1.7	1.0 U	1.0 U	1 U	1 U	4 U	1 U	1 U	1 U	4 U	1 U	1 U	1 U	910	190 J	210	100	--
o-Xylene	ug/L	1,000	1 U	1 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	4 U	1 U	1 U	1 U	4 U	1 U	1 U	1 U	110	8.9 J	2.3	1.9	--
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	100 U	100 U	680 J	560	510	420	150	170	170	400 U	120 U	100 U	260	790	280	290	100 U	9,200	4,400 J	4,400	2,800	--
Diesel	mg/L	0.5	0.26 U	0.26 U	0.49 U1	0.43	0.39 U	0.41	0.26 U	0.26 U	0.26 U	0.35	0.27 U	0.27 U	0.26 U	0.27 U	0.26 U	0.26 U	0.26 U	1.7	0.89 U1	0.79 U	0.87	--
Lube Oil	mg/L	0.5	0.41 U	0.41 U	0.70 J	0.45 U	0.43 U	0.42 U	0.42 U	0.42 U	0.42 U	0.64	0.43 U	0.43 U	0.42 U	0.43 U	0.41 U	0.41 U	0.41 U	0.40 U	0.46 U	0.42 U	0.41 U	--
METALS																								
Total Lead	ug/L	15	--	--	5.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	15	2.8 J	10 J	5.5 J
Dissolved Lead	ug/L	15	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9	2.3	1.4	1.4	1.0
Dissolved Iron	ug/L		--	--	3,600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18,000	--	--	--
Total Ferrous Iron	mg/L		6.88	36.80	--	15.2	9.31	7.94	--	4.51	4.51	--	0.286	--	26.20	29.20	0.088	0.078	33.20	--	--	16.2	17.9	--
Dissolved Manganese	ug/L		1100	3700	1,500	1,300	2,000	1,800	--	1,700	1,700	--	--	--	1,900	2,600	390	390	2,500	--	4,100	4,500	3,500	--
PAHs																								
Naphthalene	ug/L		--	--	15	--	--	0.35	--	--	--	--	--	--	--	--	--	--	--	18	18	--	--	--
2-Methylnaphthalene	ug/L		--	--	1.1	--	--	0.10 U	--	--	--	--	--	--	--	--	--	--	--	32	7.3	--	--	--
1-Methylnappthalene	ug/L		--	--	4.7	--	--	0.38	--	--	--	--	--	--	--	--	--	--	--	20	18	--	--	--
Acenaphthylene	ug/L		--	--	1.1	--	--	0.40	--	--	--	--	--	--	--	--	--	--	--	0.099	1.1 U	--	--	--
Acenaphthene	ug/L		--	--	48	--	--	22	--	--	--	--	--	--	--	--	--	--	--	1.1	1.3	--	--	--
Flourene	ug/L		--	--	21	--	--	7.6	--	--	--	--	--	--	--	--	--	--	--	0.96	0.61	--	--	--
Phenanthrene	ug/L		--	--	3.2	--	--	0.70	--	--	--	--	--	--	--	--	--	--	--	0.65	0.44	--	--	--
Anthracene	ug/L		--	--	1.9	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--	0.095 U	0.26	--	--	--
Fluoranthene	ug/L		--	--	1.5	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--	0.11	0.12	--	--	--
Pyrene	ug/L		--	--	0.91	--	--	0.58	--	--	--	--	--	--	--	--	--	--	--	0.095 U	0.11 U	--	--	--
Benzo(a)anthracene	ug/L		--	--	0.15	0.057	0.061	0.058	--	--	--	--	--	--	--	--	--	--	--	0.012	0.011 U	--	--	--
Chrysene	ug/L		--	--	0.15	0.040	0.050 U	0.044	--	--	--	--	--	--	--	--	--	--	--	0.011	0.011 U	--	--	--
Benzo(b)fluoranthene	ug/L		--	--	0.093	0.010 U	0.010 U	0.018	--	--	--	--	--	--	--	--	--	--	--	0.010	0.011 U	--	--	--
Benzo(k)fluoranthene	ug/L		--	--	0.083	0.010 U	0.010 U	0.014	--	--	--	--	--	--	--	--	--	--	--	0.011	0.011 U	--	--	--
Benzo(a)pyrene	ug/L	0.1	--	--	0.092	0.010 U	0.010 U	0.017	--	--	--	--	--	--	--	--	--	--	--	0.012	0.011 U	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	--	0.041	0.010 U	0.010 U	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.0099	0.011 U	--	--	--
Dibenz(a,h)anthracene	ug/L		--	--	0.013	0.010 U	0.010 U	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.0095 U	0.011 U	--	--	--
Benzo[g,h,i]perylene	ug/L		--	--	0.053	--	--	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.013	0.011 U	--	--	--
GENERAL CHEMISTRY																								
Alkalinity	mg/L		190	280	1,300	1,400	1,600	1,500	--	1900	1900	--	--	--	220	270	250	270	300	150	140	1,400	1,500	--
Nitrate (as Nitrogen)	mg/L		30.00	0.05	0.050 U	0.050 U	0.050 U	0.050 U	--	0.05 U	0.05 U	--	--	--	0.05 U	0.05 U	6.40	6.30	0.05 U	0.050 U	0.050 U	0.050 U	0.057	--
Sulfate	mg/L		45	5 U	460	460	560	280	--	160.00	160.00	--	--	--	25 U	10 U	43	38	19	5.0 U	230	170	120	--
Chloride	mg/L		25.0	10.0	710	670	750	420	--	400.00	400.00	--	--	--	24	28	43	42	25	28	140	120	110	--
Dissolved Methane	ug/L		190	805	280	580	680	290	--	10.00	10.00	--	220.00	--	540	2000	930	840	1650	--	5,700	4,200	4,800	--
BOD5	mg/L		--	--	4.47	2.2	5.1	--	--	--	--	--	--	--	--	--	--	--	--	--	17	8.4	16.2	--
FIELD PARAMETERS																								
Turbidity	Neth. Turbidity Units		13.20	14.40	366	275.3	106	>1000	170.0	NM	NM	11.2	10.4	--	NM	0	--	0.1	6	168	303	8.9	384	384
pH	--		6.15	6.07	6.96	6.81	6.89	6.99	7.42	7.20	7.20	7.31	7.01	--	6.67	6.62	--	5.98	6.11	6.39	6.56	6.83	7.00	7.00
Specific Conductance	Millisiemens/cm		0.78	0.645	57.3	4.53	55.2	438	5.99	4.85	4.85	5.82	5.24	--	0.64	0.70	--	0.724	0.72	44.4	33.3	2.50	4.47	4.47
Dissolved Oxygen	mg/L		0.71	0.27	7.56	3.07	0.0	4.82	7.70	7.68	7.68	5.34	3.29	--	0.00	3.79	--	0.56	0.25	0.0	0.00	4.92	0.0	0.0
Oxdat. Red. Potential	Millivolts		36.4	-27	-13	-96.3	-146	-103	-133	151	151	151	80	--	-243	-79	--	166	-30.1	15	-107	-140.0	-162	-162

Notes:
1 Sample collected from replaced well.
* Duplicate sample.
J = Reported concentration is an estimate.
mg/L= Milligrams per liter.
NM = Not measured due to equipment malfunction.
µg/L = Micrograms per liter.
U = Analyte not detected above practical quantitation limit given.
U1 = The practical quantitation limit is elevated due to interferences present in the sample.
Exceeds MTCA A cleanup level.

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014) – Continued

Monitoring Well No.			MW-21R									MW-22R									MW-25			
PARAMETERS	Units	Sample Date	4/6/11	4/6/11*	9/28/11	1/23/13	7/31/13	7/31/13*	1/21/14	8/6/14	8/6/2014*	3/17/08 ¹	1/20/10	5/26/10	8/12/10	4/6/11	9/29/11	1/24/13	7/31/13	1/21/14	8/6/14	3/18/08	3/18/08	1/21/10
MTCA A																								
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	45	--	19	32	39	33	29	33	36	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	2.7	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	10 J
Toluene	ug/L	1,000	6.7	--	1.0 U	4.5	7.3	6.7	9.1	11.0	11.0	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	7.2 J
Ethylbenzene	ug/L	700	340	--	34	160	98	82	95	58	58	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	56	56	74 J
m,p-Xylene	ug/L	1,000	290	--	21	85	59	48	80	51	50	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	4.1	140 J
o-Xylene	ug/L	1,000	4.0 U	--	1.0 U	2.3	4.0 U	4.0 U	4.1	5.2	5.2	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0	200 U1
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	5,100	--	1500	3000	2300	2000	2600	2700	2900	400 U	400 U	100 U	100 U	100 U	120	100 U	100 U	100 U	100 U	1,600	1,700	2,000 U
Diesel	mg/L	0.5	0.68 U	--	0.42 U	0.47 U	0.59 U	0.65 U	0.77 U	0.67 U	0.76 U	0.26 U	0.26 U	0.27 U	0.25 U	0.27 U	0.26 U	0.26 U	0.27 U	0.26 U	0.26 U	1.2	1	0.49
Lube Oil	mg/L	0.5	0.42 U	--	0.42 U	0.41 U	0.43 U	0.42 U	0.41 U	0.43 U	0.42 U	0.41 U	0.41 U	0.43 U	0.41 U	0.41 U	0.41 U	0.41 U	0.44 U	0.41 U	0.42 U	0.48 U	0.46 U	0.42 U
METALS																								
Total Lead	ug/L	15	1.1	1.1 U	--	--	--	--	--	--	--	1.1 U	1.3	--	--	--	--	--	--	--	--	1.2	1.3	1.1 U
Dissolved Lead	ug/L	15	1.0 U	1.0 U	--	--	--	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U
Dissolved Iron	ug/L		--	--	--	--	--	--	--	--	--	--	220	--	--	--	--	--	--	--	--	--	--	2,000
Total Ferrous Iron	mg/L		10.1	--	--	6.45	7.10	--	7.42	8.18	7.62	--	--	0.295	1.29	0.043	--	0.06	0.04 U	0.04 U	0.04 U	--	--	--
Dissolved Manganese	ug/L		4,200	--	--	2,800	3,400	--	3300	3700	3700	--	1,400	890	3,200	840	--	700	770	400	510	--	--	120
PAHs																								
Naphthalene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	1.2	1.4	0.27
2-Methylnaphthalene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.11 U	0.11 U	0.10 U
1-Methylnappthalene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	22	25	0.67
Acenaphthylene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.17	0.17	0.10 U
Acenaphthene	ug/L		--	--	--	--	--	--	--	--	--	0.52	0.10 U	--	--	--	--	--	--	--	--	0.98	0.96	0.15
Flourene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	1.6	1.7	0.18
Phenanthrene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.11 U	0.11 U	0.10 U
Anthracene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.11 U	0.11 U	0.10 U
Fluoranthene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.11 U	0.11 U	0.10 U
Pyrene	ug/L		--	--	--	--	--	--	--	--	--	0.098 U	0.10 U	--	--	--	--	--	--	--	--	0.11 U	0.11 U	0.10 U
Benzo(a)anthracene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Chrysene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Benzo(b)fluoranthene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Benzo(k)fluoranthene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Benzo(a)pyrene	ug/L	0.1	--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Indeno(1,2,3-cd)pyrene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Dibenz(a,h)anthracene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.011 U	0.010 U
Benzo[g,h,i]perylene	ug/L		--	--	--	--	--	--	--	--	--	0.0098 U	0.010 U	--	--	--	--	--	--	--	--	0.011 U	0.11 U	0.010 U
GENERAL CHEMISTRY																								
Alkalinity	mg/L		2,000	2000	--	1700	1800	--	2000	1800	1900	340	160	320	240	310	--	250	200	280	280	420	410	140
Nitrate (as Nitrogen)	mg/L		0.27	--	--	0.05 U	0.05 U	--	0.062	0.05 U	0.05 U	0.050 U	0.50	0.050 U	0.17	0.41	--	0.31 U	0.22	0.50	0.50	0.052	0.050 U	3.4
Sulfate	mg/L		110	--	--	5.00 U	5.00 U	--	5.00 U	5.00 U	5.00 U	22	1,200	75	200	39	--	34	510	240	120	36	36	13
Chloride	mg/L		100	--	--	74	120	--	100	150	140	370	9,100	390	1,600	97	--	90	4100	1300	560	980	910	38
Dissolved Methane	ug/L		3,200	--	--	1300	2200	--	4200	5130	6190	--	6.3	21	10	6.8	--	1.90	3.30	5.40	0.70 U	--	--	220
BOD5	mg/L		--	--	--	--	--	--	--	--	--	--	2.00 U	1.0 U	1.2 U	--	--	--	--	--	--	--	--	2.00 U
FIELD PARAMETERS																								
Turbidity	Neth. Turbidity Units		52.2	52.2	646.0	NM	NM	5.6	5.7	6.3	--	212	56.3	4.1	132	0.8	112.0	NM	0.0	0.2	0.5	120	120	164
pH	--		7.06	7.06	7.06	7.08	7.08	7.20	6.84	6.83	--	6.62	6.32	6.82	6.69	7.03	7.65	7.08	6.97	6.98	6.33	6.31	6.31	5.81
Specific Conductance	Millisiemens/cm		430	430	3.33	3.22	3.22	3.09	3.60	3.27	--	19.6	17.9	1.37	NM	128	6.04	0.85	11.00	5.13	2.34	19.8	19.8	31.8
Dissolved Oxygen	mg/L		1.80	1.80	0.00	0.70	0.70	0.71	0.36	4.72	--	0.0	7.55	4.90	0.01	1.75	8.48	8.69	7.10	0.97	4.76	0.0	0.0	4.96
Oxdat. Red. Potential	Millivolts		-160	-160	-195	-244	-244	-117	-32	-16	--	148	54	62.0	-36	32	-139	-161	35	41.3	83	-56	-56	-14

Notes:
1 Sample collected from replaced well.
* Duplicate sample.
J = Reported concentration is an estimate.
mg/L= Milligrams per liter.
NM = Not measured due to equipment malfunction.
µg/L = Micrograms per liter.
U = Analyte not detected above practical quantitation limit given.
U1 = The practical quantitation limit is elevated due to interferences present in the sample.
Exceeds MTCA A cleanup level.

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014) – Continued

Monitoring Well No.			MW-25								MW-26R										MW-27			
PARAMETERS	Units	Sample Date	5/27/10	8/12/10	4/6/11	9/29/11	1/24/13	7/30/13	1/22/14	8/7/14	3/18/08 ¹	1/20/10	5/26/10	8/11/10	4/6/11	9/28/11	1/24/13	7/31/13	1/21/14	8/6/14	4/7/11	9/30/11	1/24/13	7/30/13
MTCA A																								
VOLATILE ORGANICS (BTEX)																								
Benzene	ug/L	5	4.0 U	1.3	4.0 U	1.4	1.0	4.0 U	1.0 U	1.0 U	17	4.0 U	17	3.9	1.0 U	6.0	5.7	5.0	1.0 U	4.2 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1,000	4.0 U	2.1	4.0 U	2.5	1.2	4.0 U	1.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	4.0 U	6.1	5.3	11	2	5	1.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	4.0 U	5.0 U	8.4	1.2	3.4	9.0	1.0	1.0	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.1	4.0	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	ug/L	1,000	4.0 U	1.0 U	4.0 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS																								
Gasoline	ug/L	800	1,400	1,300	1,500	1500	1000	1200	420	1400	1,300	400 U	530	240	100 U	270	290	400 U	100 U	400 U	100 U	100 U	100 U	100 U
Diesel	mg/L	0.5	0.92	2	7.0	1.3	0.7 U	2.0	0.7	4.9	1.3	0.27 U	0.26 U	0.31 U	0.27 U	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U
Lube Oil	mg/L	0.5	0.42 U	0.41 U	0.42 U	0.41 U	0.44 U	0.48	0.41	0.41 U	0.40 U	0.43 U	0.41 U	0.40 U	0.43 U	0.41 U	0.41 U	0.41 U	0.40 U	0.41 U	0.41 U	0.42 U	0.42 U	0.43 U
METALS																								
Total Lead	ug/L	15	--	--	--	--	--	--	--	--	3.3	1.1 U	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Lead	ug/L	15	--	--	--	--	--	--	--	--	1.0 U	1.0 U	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Iron	ug/L		--	--	--	--	--	--	--	--	--	56 U	--	--	--	--	--	--	--	--	--	--	--	--
Total Ferrous Iron	mg/L		0.352	3.78	1.39	--	5.71	108.00	0.088	13.10	--	--	0.758	0.8	0.059	--	0.395	0.706	0.196	0.385	27.6	--	34.9	42.6
Dissolved Manganese	ug/L		220	130	170	--	670	2700	250	96	--	11 U	66	560	10 U	--	4,000	260	77	150	3,900	--	4,300	6,500
PAHs																								
Naphthalene	ug/L		--	--	--	--	--	--	--	--	0.80	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/L		--	--	--	--	--	--	--	--	0.10 U	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylnapthalene	ug/L		--	--	--	--	--	--	--	--	69	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	ug/L		--	--	--	--	--	--	--	--	0.45	0.15 U	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	ug/L		--	--	--	--	--	--	--	--	23	0.17 U	--	--	--	--	--	--	--	--	--	--	--	--
Flourene	ug/L		--	--	--	--	--	--	--	--	4.8	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	ug/L		--	--	--	--	--	--	--	--	10	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	ug/L		--	--	--	--	--	--	--	--	2.4	0.17 U	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	ug/L		--	--	--	--	--	--	--	--	0.88	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	ug/L		--	--	--	--	--	--	--	--	1.2	0.10 U	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/L		--	--	--	--	--	--	--	--	0.10	0.016 U	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	ug/L		--	--	--	--	--	--	--	--	0.098	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L		--	--	--	--	--	--	--	--	0.022	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L		--	--	--	--	--	--	--	--	0.027	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.1	--	--	--	--	--	--	--	--	0.051	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	--	--	--	--	--	--	--	0.017	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L		--	--	--	--	--	--	--	--	0.010 U	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[g,h,i]perylene	ug/L		--	--	--	--	--	--	--	--	0.020	0.010 U	--	--	--	--	--	--	--	--	--	--	--	--
GENERAL CHEMISTRY																								
Alkalinity	mg/L		190	260	200	--	400	130	150	340	190	180	270	210	300	--	330	200	160	320	310	--	270	310
Nitrate (as Nitrogen)	mg/L		0.73	0.050 U	1.4	--	0.05 U	0.05 U	7.60	0.07	0.050 U	1.0	0.16	0.050 U	0.050 U	--	0.05 U	0.05 U	0.41	0.05 U	0.050 U	--	0.05 U	0.05 U
Sulfate	mg/L		8.0	26	5.0 U	--	18	1100	140	40	1,400	1,200	1,400	2,200	1,300	--	1100	1100	2400	1600	25 U	--	25 U	10 U
Chloride	mg/L		31	610	24	--	120	8000	1300	530	9,400	9,100	10,000	20,000	8,400	--	7200	14000	11000	9400	9.8	--	10	20
Dissolved Methane	ug/L		190	330	190	--	110	57	3.2	63	--	3.0	68	5.0	29	--	270	16	1.0	12.1	8,600	--	6900	5200
BOD5	mg/L		1.9	4.3	--	--	--	--	--	--	--	2.00 U	1.7	1.5	--	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS																								
Turbidity	Neth. Turbidity Units		4.8	32.6	65.5	60.0	NM	49.0	8.1	6.7	85.7	70.2	3.8	38.0	0.1	82.3	NM	0.0	4.9	16.0	49.2	>1000	NM	NM
pH	--		6.28	6.96	6.20	6.21	6.54	6.30	5.80	6.35	6.24	6.19	6.31	6.53	6.88	6.52	6.72	6.68	6.51	6.52	6.58	6.53	6.61	6.60
Specific Conductance	Millisiemens/cm		28.9	5.13	90	51.6	1.1	23.4	4.8	2.4	3.25	16.6	22.42	--	--	--	5.70	38.00	38.30	25.82	92	1.18	5.76	0.82
Dissolved Oxygen	mg/L		1.10	0.0	0.57	0.00	0.07	0.50	0.80	0.32	0.0	6.75	5.52	0.01	0.36	0.00	0.21	2.11	2.60	4.95	0.27	0.00	0.10	5.20
Oxdat. Red. Potential	Millivolts		85.6	-120	-30	-99	-287	-32	179	-76.6	48	58	-64.5	-98	-84	-275	-321	-88	-156.5	-192	-88	-111	-210	-99

Notes:

- 1 Sample collected from replaced well.
- * Duplicate sample.
- J = Reported concentration is an estimate.
- mg/L= Milligrams per liter.
- NM = Not measured due to equipment malfunction.
- µg/L = Micrograms per liter.
- U = Analyte not detected above practical quantitation limit given.
- U1 = The practical quantitation limit is elevated due to interferences present in the sample.
- Exceeds MTCA A cleanup level.

Table 1. Groundwater Results Summary, Long Term Groundwater Monitoring Event 4 (August 2014) – Continued

PARAMETERS	Monitoring Well No.		MW-27	
	Units	Sample Date	1/22/14	8/7/14
MTCA A				
VOLATILE ORGANICS (BTEX)				
Benzene	ug/L	5	1.0 U	1.0 U
Toluene	ug/L	1,000	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.0 U	1.0 U
m,p-Xylene	ug/L	1,000	1.0 U	1.0 U
o-Xylene	ug/L	1,000	1.0 U	1.0 U
TOTAL PETROLEUM HYDROCARBONS				
Gasoline	ug/L	800	100 U	100 U
Diesel	mg/L	0.5	0.26 U	0.26 U
Lube Oil	mg/L	0.5	0.41 U	0.41 U
METALS				
Total Lead	ug/L	15	--	--
Dissolved Lead	ug/L	15	--	--
Dissolved Iron	ug/L		--	--
Total Ferrous Iron	mg/L		32.4	49.4
Dissolved Manganese	ug/L		5,400	6,800
PAHs				
Naphthalene	ug/L		--	--
2-Methylnaphthalene	ug/L		--	--
1-Methylnapthalene	ug/L		--	--
Acenaphthylene	ug/L		--	--
Acenaphthene	ug/L		--	--
Flourene	ug/L		--	--
Phenanthrene	ug/L		--	--
Anthracene	ug/L		--	--
Fluoranthene	ug/L		--	--
Pyrene	ug/L		--	--
Benzo(a)anthracene	ug/L		--	--
Chrysene	ug/L		--	--
Benzo(b)fluoranthene	ug/L		--	--
Benzo(k)fluoranthene	ug/L		--	--
Benzo(a)pyrene	ug/L	0.1	--	--
Indeno(1,2,3-cd)pyrene	ug/L		--	--
Dibenz(a,h)anthracene	ug/L		--	--
Benzo[g,h,i]perylene	ug/L		--	--
GENERAL CHEMISTRY				
Alkalinity	mg/L		360	370
Nitrate (as Nitrogen)	mg/L		0.05 U	0.05 U
Sulfate	mg/L		25 U	5 U
Chloride	mg/L		34	12
Dissolved Methane	ug/L		5900	10900
BOD5	mg/L		--	--
FIELD PARAMETERS				
Turbidity	Neth. Turbidity Units		9.2	36
pH	--		6.50	5.97
Specific Conductance	Millisiemens/cm		0.77	0.80
Dissolved Oxygen	mg/L		0.53	0.22
Oxdat. Red. Potential	Millivolts		-60.3	-38.8

Notes:

- 1 Sample collected from replaced well.
- * Duplicate sample.
- J = Reported concentration is an estimate.
- mg/L= Milligrams per liter.
- NM = Not measured due to equipment malfunction.
- µg/L = Micrograms per liter.
- U = Analyte not detected above practical quantitation limit given.
- U1 = The practical quantitation limit is elevated due to interferences present in the sample.
- Exceeds MTCA A cleanup level.

Monitoring Well Logs

Parametrix

Boring Log

Boring ID: MW-4R Project Name: Chevron Interim Action Project #: 255-1896-063 / 04-1304 Location: Bremerton, WA		Drilling Company: Drilling Method: Direct Push Logged by: Lily Vagelatos Checked by: Ingmar Saul, L.G.		Sheet 1 of 1 Starting Date: 12/14/09 Ending Date: 12/14/09 Boring Depth: 15 ft Depth to Water: 5 ft		
Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface			Ground Water at 5' bgs Bentonite Seal from 0 to 5' - 0.75" Diameter Casing; 0 to 5' Well Screen Sand Pack from 5' to 15' - 0.75" Diameter Prepacked Well Screen; 5' to 15'	0
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		50"		5
5				55"		10
10		Silty sand and gravel, tan brown, saturated, starting at approximately 10 ft bgs.		40"		15
15		Bottom of boring at 15 feet bgs.				20

Parametrix

Boring Log

Boring ID: MW-9R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

Starting Date: 12/15/09

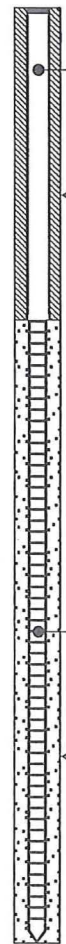
Ending Date: 12/15/09

Boring Depth: 15 ft

Depth to Water: 9 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		TOP SOIL with VEGETATION Silty sand				
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		30"		
5				45"		5
10		Silty sand and gravel, tan brown, saturated, starting at approximately 10 ft bgs.	CHEV-SO-MW9R-0090			10
15		Bottom of boring at 15 feet bgs.		24"		15
20						20

Ground Water at 9' bgs



Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'

Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

Parametrix

Boring Log

Boring ID: MW-10R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

Starting Date: 12/29/09

Ending Date: 12/29/09

Boring Depth: 15 ft

Depth to Water: 7 ft

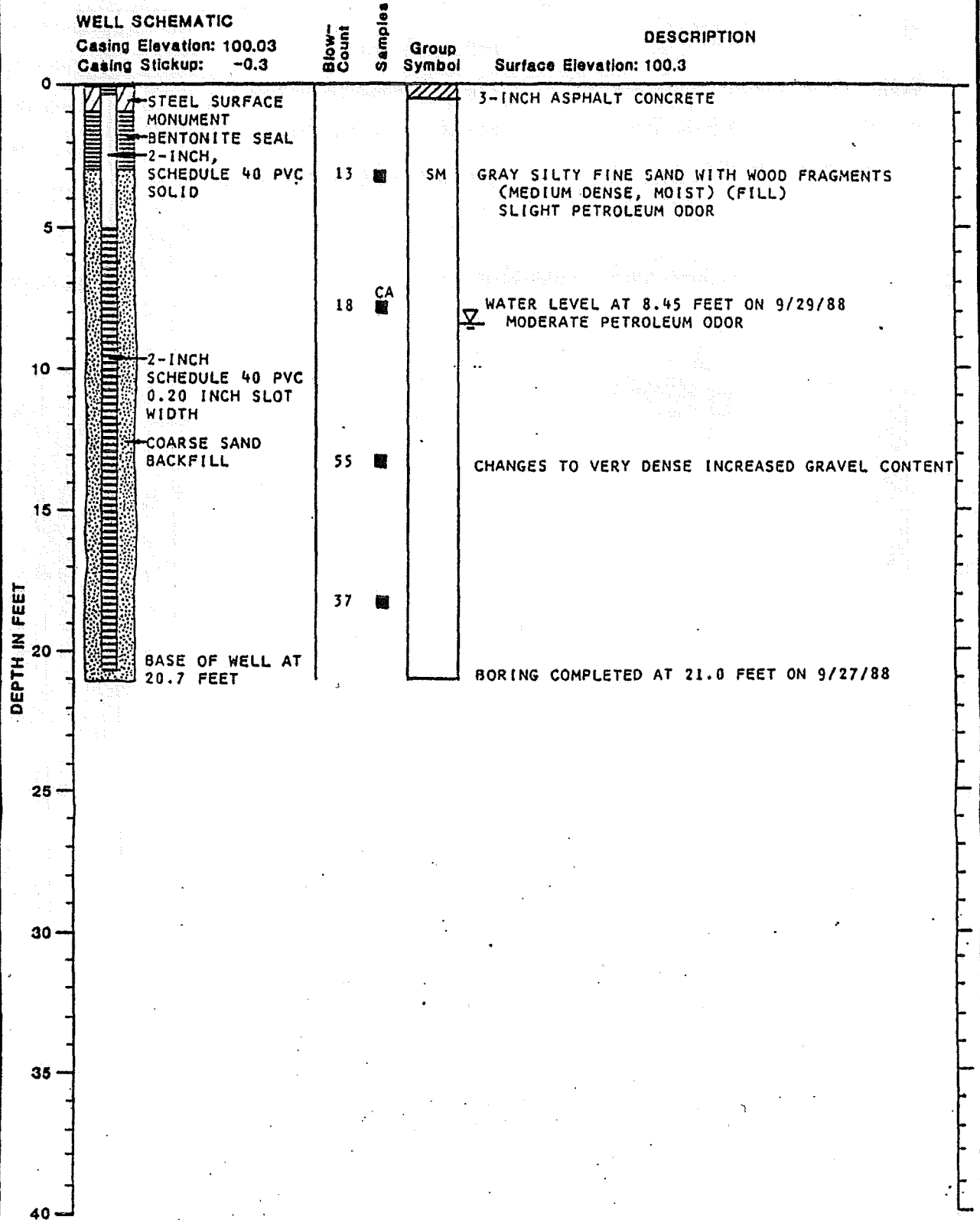
Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		TILL and FILL MATERIAL Silty sand and gravel, brown tan.		12"		
5		Damp, starting at approximately 5 ft bgs.				5
		Saturated starting at approximately 7 ft bgs.	CHEV-SO-MW10R-0070	20"		
10				20"		10
15		Bottom of boring at 15 feet bgs.				15
20						20

Ground Water at 7' bgs

Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'

Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

MONITOR WELL NO. M 11



Note: See Figure A-2 for Explanation of Symbols

Geo  Engineers

LOG OF MONITOR WELL

FIGURE A-13

0372-34-4 KRF:DWA:GD 10/12/88

Parametrix

Boring Log

Boring ID: MW-13R		Drilling Company:		Sheet 1 of 1	
Project Name: Chevron Interim Action		Drilling Method: Direct Push		Starting Date: 12/14/09	
Project #: 255-1896-063 / 04-1304		Logged by: Lily Vagelatos		Ending Date: 12/14/09	
Location: Bremerton, WA		Checked by: Ingmar Saul, L.G.		Boring Depth: 15 ft	
				Depth to Water: 7 ft	

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		45"		
5						5
				50"		
10		Silty sand and gravel, tan brown, saturated, at approximately 10 ft bgs.				10
				30"		
15		Bottom of boring at 15 feet bgs.				15
20						20

Ground Water at 7' bgs

Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'

Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

Parametrix

Boring Log

Boring ID: MW-16R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

Starting Date: 12/29/09

Ending Date: 12/29/09

Boring Depth: 15 ft

Depth to Water: 7 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		SILTY GRAVELLY SAND Gray brown, damp, fill.				
5						5
10						10
15		Bottom of boring at 15 feet bgs.				15
20						20

Ground Water at 7' bgs

Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'

Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

Parametrix

Boring Log

Boring ID: MW-18R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

Starting Date: 12/29/09

Ending Date: 12/29/09

Boring Depth: 15 ft

Depth to Water: 5 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
5		SILTY GRAVELLY SAND Gray brown, damp, fill.			Ground Water at 5' bgs Bentonite Seal from 0 to 5' 0.75" Diameter Casing; 0 to 5' Well Screen Sand Pack from 5' to 15' 0.75" Diameter Prepacked Well Screen; 5' to 15'	
10						10
15		Bottom of boring at 15 feet bgs.				15
20						20

Parametrix

Boring Log

Boring ID: MW-19R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

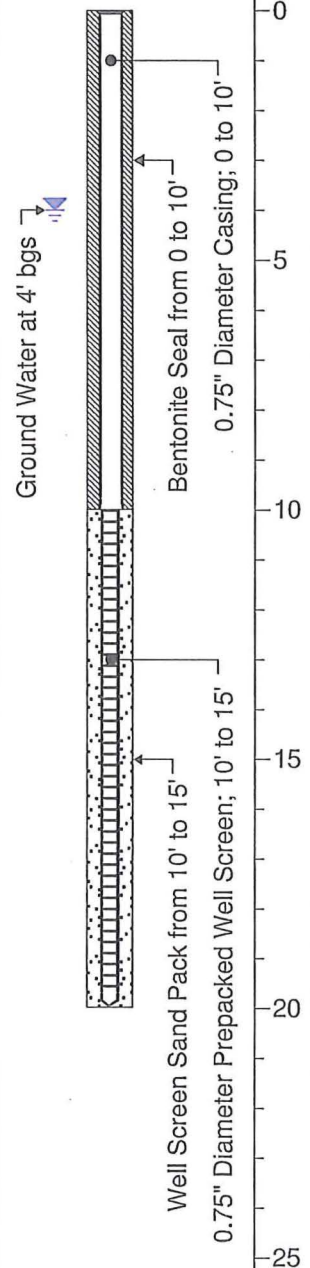
Starting Date: 12/29/09

Ending Date: 12/29/09

Boring Depth: 15 ft

Depth to Water: 4 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		SILTY GRAVELLY SAND Gray brown, damp, fill.				
5						5
10						10
15						15
20		Bottom of boring at 20 feet bgs.				20
25						25



Boring ID: MW-20R

Drilling Method: HSA

Sheet 1 of 1

Project Name: Chevron LTM

Sample Method: Sprit Spoon

Drilling Date: 1/10/13

Project #: 233-1896-107

Logged by: Lara Linde, L.G.

Boring Depth: 15 ft

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Depth to Water: 4.99 ft

Ecology Tag #: BHK 398

Elevation (ft)	Lithologic Symbol	U.S.C.S.	Description/Classification of Materials; Soil: Group name, group symbol, color, plasticity, grain size, moisture, density, misc.	PID (PPM)	Recovery (in)	Well Diagram	Depth (ft)
0.0			Ground Surface				0
	SM		SAND (SM) Brown-gray, nonplastic, medium to fine, moist, loose, trace of fine rounded gravel, no petroleum odor.		36"/60"		
-8.0			Increasing silt content starting at approx. 8 ft bgs.		30"/60"		
-9.0			Strong petroleum odor starting at approx. 9 ft bgs.				
-9.5							
	SP		SAND (SP) Gray, low plasticity, fine to medium grained, wet, loose, some fine rounded gravel, strong petroleum odor.		36"/60"		10
-14.0							
-15.0	ML		SILT (ML) Brown-gray, high plasticity, moist, soft, some fine rounded gravel, slight petroleum odor.				15
			Bottom of boring at 15 feet bgs.				

Parametrix

Boring Log

Boring ID: MW-21R		Drilling Company:		Sheet 1 of 1	
Project Name: Chevron Interim Action		Drilling Method: Direct Push		Starting Date: 12/15/09	
Project #: 255-1896-063 / 04-1304		Logged by: Lily Vagelatos		Ending Date: 12/15/09	
Location: Bremerton, WA		Checked by: Ingmar Saul, L.G.		Boring Depth: 15 ft	
				Depth to Water: 7 ft	

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		50"		
5				50"		5
10		Silty sand and gravel, tan brown, saturated, starting at approximately 10 ft bgs.	CHEV-SO-MW21R-0100	40"		10
15		Bottom of boring at 15 feet bgs.				15
20						20

Ground Water at 7' bgs

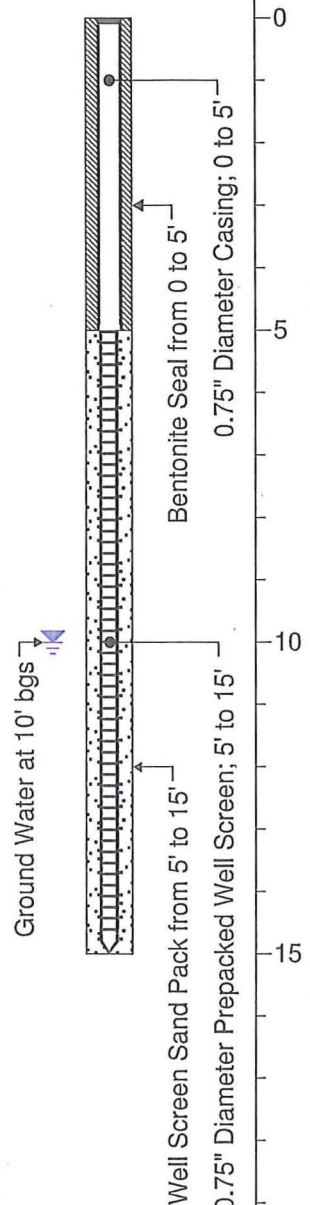
Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'
Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

Parametrix

Boring Log

Boring ID: MW-22R		Drilling Company:		Sheet 1 of 1	
Project Name: Chevron Interim Action		Drilling Method: Direct Push		Starting Date: 12/14/09	
Project #: 255-1896-063 / 04-1304		Logged by: Lily Vagelatos		Ending Date: 12/14/09	
Location: Bremerton, WA		Checked by: Ingmar Saul, L.G.		Boring Depth: 15 ft	
				Depth to Water: 10 ft	

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		50"		
5				55"		5
10		Silty sand and gravel, tan brown, saturated, starting at approximately 10 ft bgs.	CHEV-SO-MW22R-0100	45"		10
15		Bottom of boring at 15 feet bgs.				15
20						20



Boring ID: MW-25

Drilling Company: ESN

Project Name: Chevron Prop RI/FS

Drilling Method: Auger

Project #: 255-1896-063

Logged by: David Dinkuhn, P.E.

Location: SEE MAP

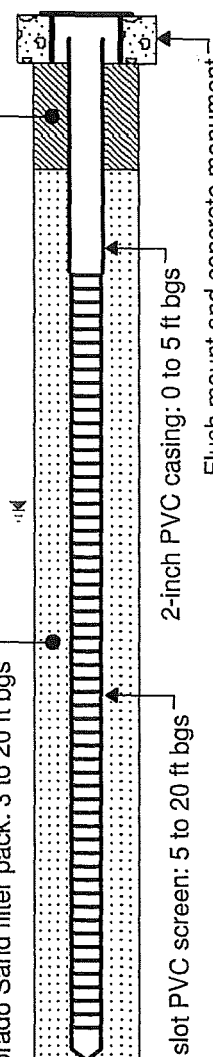
Checked by: David Dinkuhn, P.E.

Sheet 1 of 1

Drilling Date: 3/7/08

Boring Depth: 20 ft

Depth to Water: 9.5 ft

Depth (ft)	Sample Type	Lithologic Symbol	Description/Classification of Materials	Sample			Well Point Diagram	Depth (ft)
				PID Reading	Sample ID	Recovery (ft)		
0			Ground Surface				 Bentonite Anular Seal: 1 to 3 ft bgs 2-inch PVC casing: 0 to 5 ft bgs Flush mount and concrete monument 10/20 Colorado Sand filter pack: 3 to 20 ft bgs 2-inch 0.010 slot PVC screen: 5 to 20 ft bgs	0
			Silty Sandy Gravel Gray brown, damp, No petroleum hydrocarbon odor (FILL)	0		4		
5						3		5
				0		3		
10			Silty Gravelly Sand Gray, wet, moderate petroleum hydrocarbon odor (FILL)	1400	CHEV-SO-MW25-0100	3		10
			Silty Gravelly Sand Wet, No petroleum hydrocarbon odor (OUTWASH)			3		
15				4		3		15
						3		
20						1		20
			Bottom of boring at 20 feet bgs.					

Parametrix

Boring Log

Boring ID: MW-26R

Drilling Company:

Project Name: Chevron Interim Action

Drilling Method: Direct Push

Project #: 255-1896-063 / 04-1304

Logged by: Lily Vagelatos

Location: Bremerton, WA

Checked by: Ingmar Saul, L.G.

Sheet 1 of 1

Starting Date: 12/14/09

Ending Date: 12/14/09

Boring Depth: 15 ft

Depth to Water: 9.5 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample		Boring Diagram	Depth (ft)
			Sample ID	Recovery		
0		Ground Surface				0
		MIXED TREATMENT ZONE Sandy silt with gravel, tan brown, very moist.		50"		
5				45"		5
10		Silty sand and gravel, tan brown, saturated, untreated fill in saturation zone, starting at approximately 10 ft bgs.	CHEV-SO-MW26R-0095	40"		10
15		Bottom of boring at 15 feet bgs.				15
20						20

Ground Water at 9.5' bgs

Bentonite Seal from 0 to 5'
0.75" Diameter Casing; 0 to 5'

Well Screen Sand Pack from 5' to 15'
0.75" Diameter Prepacked Well Screen; 5' to 15'

Boring ID: MW-27

Drilling Method: Probe/HSA Combo

Project Name: Former Chevron Prop. Remediation

Sample Method: Split Spoon

Project #: 233-1896-098 / 01-03

Logged by: Lara Linde

Location: 1310 Highland Drive, Bremerton

Checked by: Ingmar Saul, R.G.

Sheet 1 of 1

Drilling Date: 3/11/11

Boring Depth: 16 ft

Depth to Water: 6 ft

Ecology Tag #: BCN 891

Elevation (ft)	Lithologic Symbol	U.S.C.S.	Description/Classification of Materials; Soil: Group name, group symbol, color, plasticity, grain size, moisture, density, misc.	PID (PPM)	Recovery (in)	Well Diagram	Depth (ft)
12.0			Ground Surface				0
11.5	GW		RIP RAP Coarse gravel to cobbles (beach reinforcement)				
9.0	SP		SAND Brown, fine to medium grained, dry, loose, occassional fine gravel, no odor.	0	36/48		
6.0			Red, moist, iron staining starting at approximately 3 ft bgs.				
3.5			Moist to wet, few fine gravels, no odor, starting at approximately 6 ft bgs.	0	18/48		
	SM		SAND Brown to gray, fine to medium grained, wet, loose, organic odor, no sheen.	0	40/48		
-4.0			Gray, fine grained, wet to saturated, 5% shell fragments, moderate petroleum odor at approximately 16 ft bgs.	0	42/48		
			Bottom of boring at 16 feet bgs.				

Field Sampling Forms

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-4R

Sample #: Chev-GW-MW04R-0140

[illegible]

Well #: MW-9R

Sample #: Chev-GW-MW09R-0130

124 lose flow stopped pump. 1214 start pump. 1215 lose of flow
cannot fill the flow cell taking sample
GAS/BTEX & DSL/HO sample only

Groundwater Sampling Field Data Sheet No. 2

10R

Well #: MW-~~22~~

Sample #: Chev-GW-MW~~09R~~-10R-0130

Project Number:	2331896107	Date:	8-7-14
Project Name:	Former Chevron Property	Location:	CHEVRON
Project Address:	1310 Highland Ave, Bremerton	Sampled By:	WALTER HARVEY
Client Name:	City of Bremeerton	Purged By:	SAME

Casing Diameter:	2" _____ 4" _____ 6" _____ Other X 3/4"
-------------------------	---

Depth to Water (feet):	920	Purge Volume Measurement Method:	STOP WATCH MEASURING CV
Depth of Well (feet):	1656	Date Purged:	8-7-14
Reference Point (surveyor's notch, etc.):	TOC NORTH	Purge Time (from/to):	0942 - 1008
Date/Time Sampled:	8-7-14 / 1020		

Purge Volume Calculation: ($\pi r^2 h$) (7.48 gal/ft³) (# Casing volumes) 200 ml/m

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): _____ Actual Purge Volume (gallons): 1.5 GAL

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	NITR SAT%	REDOX (mv)
0942	10.26	6.37	0.622	0.76	16.09	13.6	49.0
0946	9.60	6.32	0.622	0.69	15.92	13.8	- 47.8
0950	10.24	6.29	0.612	1.29	15.76	8.5	- 40.7
1004	10.40	6.30	0.608	1.78	15.40	4.1	- 24.3
1008	10.20	6.29	0.605	1.89	15.85	3.8	- 32.6

Purge Equipment:	PERISTALTIC Pump ~~YSI 692 HPL Flowcell~~	Sampling Equipment:	PERISTALTIC Pump
Laboratory:	ON-SITE ENVIRONMENTAL	Date Sent to Lab:	8-7-14
Chain-of-Custody (yes/no):	YES	Field QC Sample Number:	
Shipment Method:	COURIER	Split With (names[s]/organization):	NA

Well Integrity:	GOOD
Remarks:	0943 stopped pumping loss of flow 0945 started pump strong su
Signature:	[Signature]

0952 stopped pump loss of flow, started pump 002
1005 stopped pump loss of flow, started pump 1006

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-11

Sample #: Chev-GW-MW11-0120

Project Number: 2331896107		Date: 8-7-14	
Project Name: Former Chevron Property		Location: CHEVRON	
Project Address: 1310 Highland Ave, Bremerton		Sampled By: WALTER HARVEY	
Client Name: City of Bremeerton		Purged By: SAMP	

Casing Diameter: 2" <u>X</u> 4" _____ 6" _____ Other _____			
Depth to Water (feet): 6.80		Purge Volume Measurement Method: STOPWATCH MEASUREMENT	
Depth of Well (feet): 18.96		Date Purged: 8-7-14	
Reference Point (surveyor's notch, etc.): TOC NORTH		Purge Time (from/to): 1112 - 1132	
Date/Time Sampled: 8-7-14 / 1140			

Purge Volume Calculation: $(\pi^2 h)(7.48 \text{ gal/ft}^3)(\# \text{ Casing volumes})$		300 mL / m	
Purge Volume (gallons) for: 2" = $(0.16)(h)(\#Cv)$; 4" = $(0.653)(h)(\#Cv)$; 6" = $(1.48)(h)(\#Cv)$			
Calculated Purge Volume (gallons): _____		Actual Purge Volume (gallons): 2.56 GAL	

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	KPU %AZ %	REDOX (mv)
1112	7.56	6.02	0.569	1.75	16.92	3.4	-41.9
1116	7.87	5.93	0.578	0.37	17.13	98.7	-17.4
1120	8.18	5.95	0.593	0.32	17.04	43.9	-14.3
1124	8.50	5.97	0.617	0.32	17.12	40.6	-10.6
1128	8.82	6.02	0.637	0.27	17.38	14.0	-27.8
1132	9.21	6.07	0.645	0.27	17.07	14.4	-27.1

Purge Equipment: PERISTALTIC Pump	YSI 6920 W/FLOW CELL	Sampling Equipment: PERISTALTIC Pump
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Laboratory: ONSITE ENVIRONMENTAL	Date Sent to Lab: 8-7-14
Chain-of-Custody (yes/no): YES	Field QC Sample Number: _____
Shipment Method: COURIER	Split With (names[s]/organization): NA

Well Integrity: GOOD
Remarks: H2O YELLOW STRONG ODOOR PETROLEUM
Signature: <u>WALTER HARVEY</u>

Well #: MW-13R

Sample #: Chev-GW-MW13R-0140

GAS/BTEX SAMPLE ONLY

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-20R

Sample #: Chev-GW-MW20R-0100

Project Number: 2331896107		Date: 8-7-14	
Project Name: Former Chevron Property		Location: CHEVRON	
Project Address: 1310 Highland Ave, Bremerton		Sampled By: WALTER HARVEY	
Client Name: City of Bremeerton		Purged By: SAME	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐			
Depth to Water (feet): 8.46		Purge Volume Measurement Method: STOPWATCH MEASUREMENT	
Depth of Well (feet): 13.72		Date Purged: 8-7-14	
Reference Point (surveyor's notch, etc.):		Purge Time (from/to): 1414 - 1430	
Date/Time Sampled: 8-7-14 / 1440			

Purge Volume Calculation: $(\pi r^2 h)(7.48 \text{ gal/ft}^3)(\# \text{ Casing volumes})$		300 ml/m
Purge Volume (gallons) for: 2" = $(0.16)(h)(\#Cv)$; 4" = $(0.653)(h)(\#Cv)$; 6" = $(1.48)(h)(\#Cv)$		
Calculated Purge Volume (gallons):	Actual Purge Volume (gallons): 2.56 gal	

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	NTU OR %	REDOX (mv)
1414	8.98	6.33	0.673	0.21	17.31	19.1	-43.7
1418	9.27	6.07	0.715	0.33	16.43	19.5	-31.9
1422	9.34	6.04	0.742	0.32	16.40	18.5	-31.8
1426	9.27	6.06	0.739	0.26	16.45	8.0	-32.9
1430	9.22	6.11	0.724	0.25	16.66	6.1	-30.1

Purge Equipment: PERISTALTIC Pump / YSI 6920	Sampling Equipment: W/ FLOW CELL PERISTALTIC Pump
--	---

Laboratory: ONSITE ENVIRONMENTAL	Date Sent to Lab: 8-7-14
Chain-of-Custody (yes/no): YES	Field QC Sample Number:
Shipment Method: COURIER	Split With (names[s]/organization): NA

Well Integrity: GOOD
Remarks: Water has strong odor and is yellow in color.
Signature: [Signature]

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-21R

Sample #: Chev-GW-MW21R-0100

Project Number: 2331896107	Date: 8-6-14
Project Name: Former Chevron Property	Location: CHEVRON SITE
Project Address: 1310 Highland Ave, Bremerton	Sampled By: W. HARVEY
Client Name: City of Bremerton	Purged By: SAME

Casing Diameter: 2" _____ 4" _____ 6" _____ Other <u>X 3/4"</u>			
Depth to Water (feet): 7.20	Purge Volume Measurement Method: <u>Step Water & Measure cup</u>		
Depth of Well (feet): 12.08	Date Purged: 8-6-14		
Reference Point (surveyor's notch, etc.): <u>NORTH TOC</u>	Purge Time (from/to): 1122-1144		
Date/Time Sampled: 8-6-14 1215 1123G			

Purge Volume Calculation: $(\pi^2 h)(7.48 \text{ gal/ft}^3)(\# \text{ Casing volumes})$		300 mL/m
Purge Volume (gallons) for: 2" = $(0.16)(h)(\#Cv)$; 4" = $(0.653)(h)(\#Cv)$; 6" = $(1.48)(h)(\#Cv)$		
Calculated Purge Volume (gallons): _____	Actual Purge Volume (gallons): <u>3GM</u>	

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	NTU SAL%	REDOX (mv)
1122	7.08	6.73	3.359	0.25	15.43	2.9	0.7
1126	7.08	6.74	3.337	0.41	15.36	1.7	-31.7
1130	7.14	6.78	3.304	2.21	15.33	1.4	-32.7
1134	7.07	6.80	3.299	3.56	15.35	1.5	-21.1
1140	7.06	6.83	3.276	4.62	15.32	2.4	-16.2
1144	7.08	6.83	3.271	4.72	15.35	6.3	-16.0

Purge Equipment: <u>PERISTALTIC PUMP WITH HYDROLAB</u>	Sampling Equipment: <u>YSI 6920 W/ FLOW CELL</u>	<u>PERISTALTIC PUMP</u>
--	--	-------------------------

Laboratory: <u>ONSITE ENVIRONMENTAL</u>	Date Sent to Lab: 8-6-14
Chain-of-Custody (yes/no): <u>YES</u>	Field QC Sample Number: _____
Shipment Method: <u>COURIER</u>	Split With (names[s]/organization): <u>NA</u>

Well Integrity: <u>GOOD</u>
Remarks: <u>Sulfur odor brown tint, some effervescence</u>
Signature: <u>[Signature]</u>

Well #: MW-22R

Project Number:	2331896107	Date:	8-6-14
Project Name:	Former Chevron Property	Location:	CHEVRON
Project Address:	1310 Highland Ave, Bremerton	Sampled By:	WALTER HARVEY
Client Name:	City of Bremeertton	Purged By:	Same

Casing Diameter: 2" _____ 4" _____ 6" _____ Other X 3/4"

Depth to Water (feet): 8.34 **Purge Volume Measurement Method:** STOPWATCH

Depth of Well (feet): 14.96 **Date Purged:** 8-6-14 MEASURING C.V.

Reference Point (surveyor's notch, etc.): TOC NORTH **Purge Time (from/to):** 1442-1458

Date/Time Sampled: 8-6-14 1510

Purge Volume Calculation: ($\pi r^2 h$) (7.48 gal/ft³) (# Casing volumes) 200 mL/m

Purge Volume (gallons) for: 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)

Calculated Purge Volume (gallons): _____ Actual Purge Volume (gallons): 2GA

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	NITR SAT%	REDOX (mv)
<u>1442</u>	<u>8.36</u>	<u>6.99</u>	<u>1.913</u>	<u>8.68</u>	<u>17.96</u>	<u>12.6</u>	<u>118.2</u>
<u>1446</u>	<u>10.00</u>	<u>6.56</u>	<u>2.055</u>	<u>5.06</u>	<u>16.86</u>	<u>3.2</u>	<u>57.3</u>
<u>1450</u>	<u>9.93</u>	<u>6.43</u>	<u>2.186</u>	<u>4.81</u>	<u>16.36</u>	<u>1.5</u>	<u>70.5</u>
<u>1454</u>	<u>9.05</u>	<u>6.34</u>	<u>2.318</u>	<u>4.91</u>	<u>15.84</u>	<u>1.0</u>	<u>79.9</u>
<u>1458</u>	<u>9.05</u>	<u>6.33</u>	<u>2.349</u>	<u>4.76</u>	<u>15.69</u>	<u>0.5</u>	<u>83.1</u>

Purge Equipment: PERISTALTIC PUMP YSI 8920 FLOW CELL **Sampling Equipment:** SAME PERISTALTIC Pump

Laboratory: ONSITE ENVIRONMENTAL	Date Sent to Lab: 8-6-14
Chain-of-Custody (yes/no): YES	Field QC Sample Number:
Shipment Method: COURIER	Split With (names[s])/organization: NA

Well Integrity: GOOD

Remarks: H2O CLEAR SLIGHT SULFURODOR

Signature: [Handwritten Signature]

Groundwater Sampling Field Data Sheet No. 2

Well #: MW-25

Sample #: Chev-GW-MW25-0130

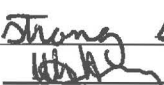
Project Number: 2331896107		Date: 8-7-14	
Project Name: Former Chevron Property		Location: CHEVRON	
Project Address: 1310 Highland Ave, Bremerton		Sampled By: WALTER HARVEY	
Client Name: City of Bremeerton		Purged By: SAME	

Casing Diameter: 2" ☒ 4" ☐ 6" ☐ Other ☐
Depth to Water (feet): 8.85
Depth of Well (feet): 19.20
Reference Point (surveyor's notch, etc.): TOC NORTH
Date/Time Sampled: 8-7-14 0825 0840

Purge Volume Calculation: $(\pi^2 h)(7.48 \text{ gal/ft}^3)(\# \text{ Casing volumes})$	
Purge Volume (gallons) for: 2" = $(0.16)(h)(\#Cv)$; 4" = $(0.653)(h)(\#Cv)$; 6" = $(1.48)(h)(\#Cv)$	
Calculated Purge Volume (gallons):	Actual Purge Volume (gallons): 2.562

TIME (2400 hr)	WATER LEVEL (feet)	pH (units)	COND (mS/cm)	DO (mg/L)	TEMP °C	NTU ~~SEC~~ %	REDOX (mv)
0814	9.22	6.54	2.069	0.59	14.50	23.5	-26.3
0818	9.82	6.29	2.307	0.37	14.31	10.1	-65.7
0822	9.82	6.26	2.286	0.33	14.42	4.7	-62.4
0826	10.60	6.26	2.360	0.31	14.38	7.8	-61.1
0830	10.20	6.35	2.407	0.32	14.12	6.7	-76.6

Purge Equipment: PERISTALTIC Pump / 692 YSI	Sampling Equipment: W/ FLOW CELL
Laboratory: ON SITE ENVIRONMENTAL	Date Sent to Lab: 8-7-14
Chain-of-Custody (yes/no): YES	Field QC Sample Number:
Shipment Method: COURIER	Split With (names[s]/organization): NA

Well Integrity: Good
Remarks: Strong sulfur odor
Signature: 

Well #: MW-26R[illegible]

Well #: MW-27

Sample #: Chev-GW-MW27-0110

Page 1 of 1

Data Validation Technical Memorandum

TECHNICAL MEMORANDUM

DATE: April 27, 2015
TO: David Dinkuhn
FROM: Lisa Gilbert
SUBJECT: Quality Assurance/Quality Control Review for Event 4
CC:
PROJECT NUMBER: 233-1896-107
PROJECT NAME: Former Chevron Property Remediation Performance Monitoring August 2014

Introduction

This technical memorandum summarizes the results of an internal quality assurance/quality control (QA/QC) review of analytical results for groundwater samples collected on August 6 and 7, 2014. Twelve groundwater samples, including one field duplicate (CHEV-GW-MW21R-1000), were submitted to OnSite Environmental, Inc. (Redmond, WA) for analysis. The samples were submitted in two batches, 1408-044 (sampled on August 6) and 1408-060 (sampled on August 6 and 7). The second batch of samples was accompanied by gasoline/BTEX trip blanks (TRIP BLANKS). Ferrous iron analyses and dissolved methane were subcontracted to Analytical Resources, Inc. (YV56, YV78, YV81).

All samples were analyzed for gasoline/BTEX, diesel/lube oil, dissolved manganese, nitrate, sulfate, alkalinity, chloride and dissolved methane, with the following exceptions:

- CHEV-GW-MW09R-0130 was analyzed for gasoline/BTEX, and diesel/lube oil only.
- CHEV-GW-MW13R-0140 was analyzed for gasoline/BTEX only.
- The trip blank (TRIP BLANK) was analyzed for gasoline/BTEX only.

Final laboratory data were submitted to Parametrix via a Tier II-type data report and EIM EDDs (OnSite Laboratory Reference Numbers 1408-044 and 1408-060). All data and analytical QC elements were reviewed against laboratory and method QC criteria, and qualifiers were applied where judged appropriate.

DATA REVIEW SUMMARY

All samples collected were prepared and analyzed using standard methods. All analyses requested on the COC were conducted. No laboratory method or trip blank contamination was reported.

On-Site Environmental, Inc. noted the following:

- Some diesel results were qualified with "U1" (CHEV-GW-MW21R-0100, CHEV-GW-MW21R-1000) indicating an elevated practical quantitation limit due to interferences present in the sample. These results were not qualified based on this data review since all other analytical QC results were in control, indicating acceptable analytical accuracy and precision.

- Diesel range hydrocarbon results for CHEV-GW-MW4R-0140 and CHEV-GW-MW10R-0130 were qualified with “M” indicating that hydrocarbons in the gasoline range are impacting diesel range results.
- All diesel and lube oil range hydrocarbon sample extracts were qualified “X1” indicating the sample extract was treated with sulfuric acid/silica gel cleanup procedure.

ARI, Inc. noted the following:

- Surrogate recoveries of propane for the methane analyses were low for samples CHEV-GW-MW-21R-0100, CHEV-GW-MW-21R-1000 (1408-044, YV81), and CHEV-GW-MW4R-0140 (1408-060, YV78). The recoveries were 66.2, 68.3, and 62.8 percent, respectively, compared to the limit of 72 percent. The samples were reanalyzed and the surrogate recoveries were low again (62.8, 70.0, and 71.1 percent, respectively, compared to the limit of 72 percent). It was concluded that the sample matrices were the cause of the low surrogate recoveries.
- There sample containers for samples CHEV-GW-MW-21R-0100, CHEV-GW-MW-21R-1000 contained headspace.

A comparison of results between the sample and duplicate results were within acceptable ranges of precision.

CONCLUSION

Appropriate standard methods were used. No laboratory method blank contamination was observed. Analytical accuracy and precision were determined to be generally acceptable based on this review.

All data reported should be considered valid as qualified and acceptable for further use.

Laboratory Report



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

August 19, 2014

David Dinkuhn
Parametrix, Inc.
4660 Kitsap Way, Suite A
Bremerton, WA 98312

Re: Analytical Data for Project 2331896107
Laboratory Reference No. 1408-044

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on August 7, 2014.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'DB', with a long horizontal line extending to the right.

David Baumeister
Project Manager

Enclosures

Date of Report: August 19, 2014
Samples Submitted: August 7, 2014
Laboratory Reference: 1408-044
Project: 2331896107

Case Narrative

Samples were collected on August 6, 2014 and received by the laboratory on August 7, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

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

Date of Report: August 19, 2014
 Samples Submitted: August 7, 2014
 Laboratory Reference: 1408-044
 Project: 2331896107

NWTPH-Gx/BTEX

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW21R-0100						
Laboratory ID: 08-044-01						
Benzene	33	4.0	EPA 8021B	8-11-14	8-11-14	
Toluene	11	4.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	58	4.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	51	4.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	5.2	4.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	2700	400	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 99 71-112</i>						

Client ID: CHEV-GW-MW21R-1000						
Laboratory ID: 08-044-02						
Benzene	36	4.0	EPA 8021B	8-11-14	8-11-14	
Toluene	11	4.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	58	4.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	50	4.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	5.2	4.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	2900	400	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 107 71-112</i>						

Client ID: CHEV-GW-MW22R-0120						
Laboratory ID: 08-044-03						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 84 71-112</i>						

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NWTPH-Gx/BTEX

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW26R-0110						
Laboratory ID: 08-044-04						
Benzene	4.2	4.0	EPA 8021B	8-12-14	8-12-14	
Toluene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Ethyl Benzene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
m,p-Xylene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
o-Xylene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Gasoline	ND	400	NWTPH-Gx	8-12-14	8-12-14	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	<i>95</i>	<i>71-112</i>				

Date of Report: August 19, 2014
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**NWTPH-Gx/BTEX
 METHOD BLANK QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0811W4					
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	84	71-112				
Laboratory ID:	MB0812W2					
Benzene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Toluene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
o-Xylene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Gasoline	ND	100	NWTPH-Gx	8-12-14	8-12-14	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	86	71-112				

Date of Report: August 19, 2014
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**NWTPH-Gx/BTEX
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-060-04							
	ORIG	DUP						
Benzene	ND	ND	NA	NA	NA	NA	30	
Toluene	ND	ND	NA	NA	NA	NA	30	
Ethyl Benzene	ND	ND	NA	NA	NA	NA	30	
m,p-Xylene	ND	ND	NA	NA	NA	NA	30	
o-Xylene	ND	ND	NA	NA	NA	NA	30	
Gasoline	158	143	NA	NA	NA	10	30	
<i>Surrogate:</i>								
Fluorobenzene				87	87	71-112		
MATRIX SPIKES								
Laboratory ID:	08-063-02							
	ORIG	DUP						
Benzene	ND	ND	NA	NA	NA	NA	30	
Toluene	ND	ND	NA	NA	NA	NA	30	
Ethyl Benzene	ND	ND	NA	NA	NA	NA	30	
m,p-Xylene	ND	ND	NA	NA	NA	NA	30	
o-Xylene	ND	ND	NA	NA	NA	NA	30	
Gasoline	ND	ND	NA	NA	NA	NA	30	
<i>Surrogate:</i>								
Fluorobenzene				87	91	71-112		
Laboratory ID:	08-060-04							
	MS	MSD	MS	MSD	MS	MSD		
Benzene	53.3	50.4	50.0	50.0	ND	107	101	78-120
Toluene	53.5	50.7	50.0	50.0	ND	107	101	80-121
Ethyl Benzene	53.4	50.5	50.0	50.0	ND	107	101	81-120
m,p-Xylene	53.7	50.8	50.0	50.0	ND	107	102	81-119
o-Xylene	52.5	50.0	50.0	50.0	ND	105	100	79-117
<i>Surrogate:</i>								
Fluorobenzene					105	103	71-112	

Date of Report: August 19, 2014
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NWTPH-Dx

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW21R-0100						
Laboratory ID: 08-044-01						
Diesel Range Organics	ND	0.67	NWTPH-Dx	8-8-14	8-8-14	U1,X1
Lube Oil Range Organics	ND	0.43	NWTPH-Dx	8-8-14	8-8-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	107	50-150				

Client ID: CHEV-GW-MW21R-1000						
Laboratory ID: 08-044-02						
Diesel Range Organics	ND	0.76	NWTPH-Dx	8-8-14	8-8-14	U1,X1
Lube Oil Range Organics	ND	0.42	NWTPH-Dx	8-8-14	8-8-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	109	50-150				

Client ID: CHEV-GW-MW22R-0120						
Laboratory ID: 08-044-03						
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-8-14	8-8-14	X1
Lube Oil Range Organics	ND	0.42	NWTPH-Dx	8-8-14	8-8-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	128	50-150				

Client ID: CHEV-GW-MW26R-0110						
Laboratory ID: 08-044-04						
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-8-14	8-8-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-8-14	8-8-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	130	50-150				

Date of Report: August 19, 2014
 Samples Submitted: August 7, 2014
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 Project: 2331896107

**NWTPH-Dx
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0808W1					
Diesel Range Organics	ND	0.25	NWTPH-Dx	8-8-14	8-8-14	X1
Lube Oil Range Organics	ND	0.40	NWTPH-Dx	8-8-14	8-8-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	96	50-150				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	08-045-01									
	ORIG	DUP								
Diesel Range	ND	ND	NA	NA		NA	NA	NA	NA	U1
Lube Oil	19.9	6.73	NA	NA		NA	NA	99	NA	
Surrogate:										
o-Terphenyl						92	89	50-150		

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NITRATE (as Nitrogen)
EPA 353.2

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW21R-0100					
Laboratory ID:	08-044-01					
Nitrate	ND	0.050	EPA 353.2	8-7-14	8-7-14	

Client ID:	CHEV-GW-MW21R-1000					
Laboratory ID:	08-044-02					
Nitrate	ND	0.050	EPA 353.2	8-7-14	8-7-14	

Client ID:	CHEV-GW-MW22R-0120					
Laboratory ID:	08-044-03					
Nitrate	0.50	0.050	EPA 353.2	8-7-14	8-7-14	

Client ID:	CHEV-GW-MW26R-0110					
Laboratory ID:	08-044-04					
Nitrate	ND	0.050	EPA 353.2	8-7-14	8-7-14	

Date of Report: August 19, 2014
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 Project: 2331896107

**NITRATE (as Nitrogen)
 EPA 353.2
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0807W1					
Nitrate	ND	0.050	EPA 353.2	8-7-14	8-7-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	07-298-01							
	ORIG	DUP						
Nitrate	0.307	0.305	NA	NA	NA	NA	1	16

MATRIX SPIKE								
Laboratory ID:	07-298-01							
	MS	MS		MS				
Nitrate	2.45	2.00	0.307	107	84-119	NA	NA	

SPIKE BLANK								
Laboratory ID:	SB0807W1							
	SB	SB		SB				
Nitrate	2.08	2.00	NA	104	86-114	NA	NA	

Date of Report: August 19, 2014
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SULFATE
ASTM D516-07

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW21R-0100					
Laboratory ID:	08-044-01					
Sulfate	ND	5.0	ASTM D516-07	8-9-14	8-9-14	

Client ID:	CHEV-GW-MW21R-1000					
Laboratory ID:	08-044-02					
Sulfate	ND	5.0	ASTM D516-07	8-9-14	8-9-14	

Client ID:	CHEV-GW-MW22R-0120					
Laboratory ID:	08-044-03					
Sulfate	120	25	ASTM D516-07	8-9-14	8-9-14	

Client ID:	CHEV-GW-MW26R-0110					
Laboratory ID:	08-044-04					
Sulfate	1600	500	ASTM D516-07	8-9-14	8-9-14	

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**SULFATE
 ASTM D516-07
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0809W1					
Sulfate	ND	5.0	ASTM D516-07	8-9-14	8-9-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-005-04							
	ORIG	DUP						
Sulfate	14.7	14.5	NA	NA	NA	NA	1	10

MATRIX SPIKE								
Laboratory ID:	08-005-04							
	MS	MS		MS				
Sulfate	36.2	20.0	14.7	108	82-123	NA	NA	

SPIKE BLANK								
Laboratory ID:	SB0809W1							
	SB	SB		SB				
Sulfate	9.54	10.0	NA	95	91-114	NA	NA	

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TOTAL ALKALINITY
SM 2320B

Matrix: Water
 Units: mg CaCO₃/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW21R-0100					
Laboratory ID:	08-044-01					
Total Alkalinity	1800	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW21R-1000					
Laboratory ID:	08-044-02					
Total Alkalinity	1900	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW22R-0120					
Laboratory ID:	08-044-03					
Total Alkalinity	280	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW26R-0110					
Laboratory ID:	08-044-04					
Total Alkalinity	320	2.0	SM 2320B	8-12-14	8-12-14	

Date of Report: August 19, 2014
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**TOTAL ALKALINITY
 SM 2320B
 QUALITY CONTROL**

Matrix: Water
 Units: mg CaCO₃/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812W1					
Total Alkalinity	ND	2.0	SM 2320B	8-12-14	8-12-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-044-03							
	ORIG	DUP						
Total Alkalinity	280	278	NA	NA	NA	1	10	

SPIKE BLANK								
Laboratory ID:	SB0812W1							
	SB	SB		SB				
Total Alkalinity	108	100	NA	108	89-112	NA	NA	

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CHLORIDE
SM 4500-Cl E

Matrix: Water
Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW21R-0100					
Laboratory ID:	08-044-01					
Chloride	150	10	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW21R-1000					
Laboratory ID:	08-044-02					
Chloride	140	10	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW22R-0120					
Laboratory ID:	08-044-03					
Chloride	560	20	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW26R-0110					
Laboratory ID:	08-044-04					
Chloride	9400	400	SM 4500-Cl E	8-12-14	8-12-14	

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**CHLORIDE
 SM 4500-Cl E
 QUALITY CONTROL**

Matrix: Water

Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812W1					
Chloride	ND	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-057-01							
	ORIG	DUP						
Chloride	6.88	6.92	NA	NA	NA	NA	1	11

MATRIX SPIKE

Laboratory ID:	08-057-01							
	MS	MS		MS				
Chloride	62.9	50.0	6.88	112	94-126	NA	NA	

SPIKE BLANK

Laboratory ID:	SB0812W1							
	SB	SB		SB				
Chloride	52.1	50.0	NA	104	94-124	NA	NA	

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**DISSOLVED MANGANESE
EPA 6010C**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-044-01					
Client ID:	CHEV-GW-MW21R-0100					
Manganese	3700	56	6010C		8-12-14	
Lab ID:	08-044-02					
Client ID:	CHEV-GW-MW21R-1000					
Manganese	3700	56	6010C		8-12-14	
Lab ID:	08-044-03					
Client ID:	CHEV-GW-MW22R-0120					
Manganese	510	11	6010C		8-11-14	
Lab ID:	08-044-04					
Client ID:	CHEV-GW-MW26R-0110					
Manganese	150	11	6010C		8-11-14	

Date of Report: August 19, 2014
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**DISSOLVED MANGANESE
EPA 6010C
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0811D1

Analyte	Method	Result	PQL
Manganese	6010C	ND	11

Date of Report: August 19, 2014
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**DISSOLVED MANGANESE
EPA 6010C
DUPLICATE QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-047-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Manganese	481	488	1	11	

Date of Report: August 19, 2014
Samples Submitted: August 7, 2014
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**DISSOLVED MANGANESE
EPA 6010C
MS/MSD QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-047-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Manganese	556	1100	111	1140	119	4	



Data Qualifiers and Abbreviations

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

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



Analytical Resources, Incorporated
Analytical Chemists and Consultants

14 August 2014

David Baumeister
OnSite Environmental, Inc.
14648 NE 95th
Redmond, WA 98052

RE: Client Project: 2331896107; 08-044
ARI Job No: YV81

Dear David:

Please find enclosed the chain-of-custody (COC) record and the final results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted four water samples on August 11, 2014. The samples were analyzed for methane as requested.

The percent recoveries for the surrogate, propane, were low following the initial analyses of samples CHEV-GW-MW21R-0100 and CHEV-GW-MW21R-1000. Both samples were re-analyzed. The percent recoveries for propane were low for the re-analyses of both samples. It was concluded that the sample matrices were the cause of the low surrogate recoveries. No further corrective actions were taken. The results for both analyses have been submitted for comparison.

The remaining analyses proceeded without incident of note.

An electronic copy of these reports will remain on file at ARI. Should you have any questions, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.


Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file YV81

MDH/mdh



Subcontract Laboratory: Analytical Resources, Inc.

4611 S 134th Pl, Ste. 100 Tukwila, WA 98168

Date/Time:

Turnaround Request:

1 Day 2 Day 3 Day

Standard

Other:

Laboratory Reference #:

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number:

Project Name:

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of

08-044

Date/Time:

[illegible]

YV81 : 00002



Cooler Receipt Form

ARI Client: OnSite Environmental

Project Name _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: YV81

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2 0-6 0 °C for chemistry)

Time: 1230 5.3

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: CA Date: 8/11/14 Time: 1230

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO NO

What kind of packing material was used? ... Bubble Wrap Wet Ice GePacks Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI... NA

Was Sample Split by ARI. NA YES Date/Time: _____ Equipment: _____ Split by: _____

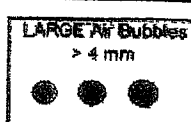
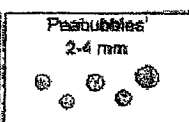
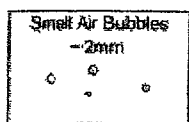
Samples Logged by: CA Date: 8/11/14 Time: 1345

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

Sample ID Cross Reference Report



ARI Job No: YV81
Client: OnSite Environmental, Inc.
Project Event: 2331896107
Project Name: N/A

Sample ID	ARI		Matrix	Sample Date/Time	VTSR
	Lab ID	LIMS ID			
1. CHEV-GW-MW21R-0100	YV81A	14-16393	Water	08/06/14 12:15	08/11/14 12:30
2. CHEV-GW-MW21R-1000	YV81B	14-16394	Water	08/06/14 12:30	08/11/14 12:30
3. CHEV-GW-MW22R-0120	YV81C	14-16395	Water	08/06/14 15:10	08/11/14 12:30
4. CHEV-GW-MW26R-0110	YV81D	14-16396	Water	08/06/14 14:10	08/11/14 12:30

ORGANICS ANALYSIS DATA SHEET

METHANE ETHANE ETHENE

Modified RSK 175

Page 1 of 1

Matrix: Water

QC Report No: YV81-OnSite Environmental, Inc.

Project: 2331896107

NA

Date Received: 08/11/14

Data Release Authorized: *[Signature]*

Reported: 08/13/14

ARI ID	Sample ID	Analysis Date	DL	Analyte	RL	Result
YV81A 14-16393	CHEV-GW-MW21R-0100	08/12/14	1.0	Methane	0.7	5,130
YV81ARE 14-16393	CHEV-GW-MW21R-0100	08/13/14	1.0	Methane	0.7	4,700
YV81B 14-16394	CHEV-GW-MW21R-1000	08/12/14	1.0	Methane	0.7	6,190
YV81BRE 14-16394	CHEV-GW-MW21R-1000	08/13/14	1.0	Methane	0.7	4,920
YV81C 14-16395	CHEV-GW-MW22R-0120	08/12/14	1.0	Methane	0.7	< 0.7 U
YV81D 14-16396	CHEV-GW-MW26R-0110	08/12/14	1.0	Methane	0.7	12.1
081214MB	Method Blank	08/12/14	1.0	Methane	0.7	< 0.7 U
081314MB	Method Blank	08/13/14	1.0	Methane	0.7	< 0.7 U

Reported in ug/L (ppb)

ORGANICS ANALYSIS DATA SHEET

METHANE ETHANE ETHENE

Modified RSK 175

Page 1 of 1

Matrix: Water

QC Report No: YV81-OnSite Environmental, Inc.

Project: 2331896107

NA

Date Received: 08/11/14

Data Release Authorized: *mw*

Reported: 08/13/14

ARI ID	Analysis Date	Analyte	Spike	Result	Recovery	RPD
081214LCS	08/12/14	Methane	654	661	101.0%	0.0%
081214LCSD				661	101.0%	
081314LCS	08/13/14	Methane	654	660	100.9%	2.5%
081314LCSD				644	98.4%	

Reported in ug/L (ppb)

RSK 175 WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YV81-OnSite Environmental, Inc.
Project: 2331896107

<u>ARI ID</u>	<u>Client ID</u>	<u>PRP</u>	<u>TOT OUT</u>
YV81A	CHEV-GW-MW21R-0100	66.1%*	1
YV81ARE	CHEV-GW-MW21R-0100	68.3%*	1
YV81B	CHEV-GW-MW21R-1000	62.8%*	1
YV81BRE	CHEV-GW-MW21R-1000	70.0%*	1
YV81C	CHEV-GW-MW22R-0120	91.7%	0
YV81D	CHEV-GW-MW26R-0110	91.7%	0
MB-081214	Method Blank	99.5%	0
MB-081314	Method Blank	108%	0
LCS-081214	Lab Control	101%	0
LCS-081314	Lab Control	110%	0
LCSD-081214	Lab Control Dup	95.0%	0
LCSD-081314	Lab Control Dup	107%	0

LCS/MB LIMITS QC LIMITS

(PRP) = Propane (72-122) (72-122)

Log Number Range: 14-16393 to 14-16396



Chain of Custody

Laboratory Number:

08-044

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☒ ~~Standard (7 Days)~~

(IPH analysis 5 Days)

☐ _____ (other)

Company:	PARAMETRIX
Project Number:	2331896 107
Project Name:	FORMER CHEVRON
Project Manager:	DAVID DINKUHN
Sampled by:	WALTER HOBBS

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix
1	CHEV-GW-MW21R-0100	8-6-14	1215	GW
2	CHEV-GW-MW21R-1000	8-6-14	1230	GW
3	CHEV-GW-MW22R-0120	8-6-14	1510	GW
4	CHEV-GW-MW26R-0110	8-6-14	1410	GW

Lab ID	Sample Identification
1	CHEV-GW-MW21R-0100
2	CHEV-GW-MW21R-1000
3	CHEV-GW-MW22R-0120
4	CHEV-GW-MW26R-0110

[illegible]

Signature	Company	Date	Time	Comments/Special Instructions
<i>[Signature]</i>	PARAMETRIX	8-6-14	1:54	* FIELD FILTERED
<i>[Signature]</i>	Thunderbox Delivery	8/6/14	5:54	* SILICA GEL CLEAN UP ON DSL
<i>[Signature]</i>	Thunderbox Delivery	~~8/6/14~~	8/7/14	can
<i>[Signature]</i>	OSE	8/7	8:30	*** - NITRATE, SULFATE, ALKALINITY CHLORIDE

Reviewed/Date	Reviewed/Date	Chromatograms with final report
		Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs)



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

August 18, 2014

David Dinkuhn
Parametrix, Inc.
4660 Kitsap Way, Suite A
Bremerton, WA 98312

Re: Analytical Data for Project 2331896107
Laboratory Reference No. 1408-060

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on August 8, 2014.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "DB", with a long horizontal line extending to the right.

David Baumeister
Project Manager

Enclosures

Date of Report: August 18, 2014
Samples Submitted: August 8, 2014
Laboratory Reference: 1408-060
Project: 2331896107

Case Narrative

Samples were collected on August 6 and 7, 2014 and received by the laboratory on August 8, 2014. They were maintained at the laboratory at a temperature of 2°C to 6°C.

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

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NWTPH-Gx/BTEX

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW13R-0140						
Laboratory ID: 08-060-01						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	

Surrogate: Percent Recovery Control Limits
 Fluorobenzene 83 71-112

Client ID: CHEV-GW-MW4R-0140						
Laboratory ID: 08-060-02						
Benzene	92	4.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	4.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	9.0	4.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	5.5	4.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	4.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	980	400	NWTPH-Gx	8-11-14	8-11-14	

Surrogate: Percent Recovery Control Limits
 Fluorobenzene 104 71-112

Client ID: CHEV-GW-MW25-0130						
Laboratory ID: 08-060-03						
Benzene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Toluene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Ethyl Benzene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
m,p-Xylene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
o-Xylene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Gasoline	1400	400	NWTPH-Gx	8-12-14	8-12-14	

Surrogate: Percent Recovery Control Limits
 Fluorobenzene 91 71-112

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NWTPH-Gx/BTEX

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW10R-0130						
Laboratory ID: 08-060-04						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	160	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 87 71-112</i>						

Client ID: CHEV-GW-MW11-0120						
Laboratory ID: 08-060-05						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 86 71-112</i>						

Client ID: CHEV-GW-MW9R-0130						
Laboratory ID: 08-060-06						
Benzene	340	4.0	EPA 8021B	8-12-14	8-12-14	
Toluene	6.5	4.0	EPA 8021B	8-12-14	8-12-14	
Ethyl Benzene	19	4.0	EPA 8021B	8-12-14	8-12-14	
m,p-Xylene	8.2	4.0	EPA 8021B	8-12-14	8-12-14	
o-Xylene	ND	4.0	EPA 8021B	8-12-14	8-12-14	
Gasoline	1100	400	NWTPH-Gx	8-12-14	8-12-14	
<i>Surrogate: Percent Recovery Control Limits</i>						
<i>Fluorobenzene 96 71-112</i>						

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NWTPH-Gx/BTEX

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW27-0110						
Laboratory ID: 08-060-07						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	84	71-112				

Client ID: CHEV-GW-MW20R-0100						
Laboratory ID: 08-060-08						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	83	71-112				

Client ID: TRIP BLANKS						
Laboratory ID: 08-060-09						
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Fluorobenzene</i>	92	71-112				

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**NWTPH-Gx/BTEX
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0811W3					
Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Toluene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
o-Xylene	ND	1.0	EPA 8021B	8-11-14	8-11-14	
Gasoline	ND	100	NWTPH-Gx	8-11-14	8-11-14	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	94	71-112				

Laboratory ID:	MB0812W2					
Benzene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Toluene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Ethyl Benzene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
m,p-Xylene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
o-Xylene	ND	1.0	EPA 8021B	8-12-14	8-12-14	
Gasoline	ND	100	NWTPH-Gx	8-12-14	8-12-14	
Surrogate:	Percent Recovery	Control Limits				
Fluorobenzene	86	71-112				

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-060-04							
	ORIG	DUP						
Benzene	ND	ND	NA	NA	NA	NA	NA	30
Toluene	ND	ND	NA	NA	NA	NA	NA	30
Ethyl Benzene	ND	ND	NA	NA	NA	NA	NA	30
m,p-Xylene	ND	ND	NA	NA	NA	NA	NA	30
o-Xylene	ND	ND	NA	NA	NA	NA	NA	30
Gasoline	158	143	NA	NA	NA	NA	10	30
Surrogate:								
Fluorobenzene				87	87	71-112		

MATRIX SPIKES

Laboratory ID:	08-055-01									
	MS	MSD	MS	MSD		MS	MSD			
Benzene	50.9	54.7	50.0	50.0	ND	102	109	78-120	7	12
Toluene	53.2	55.4	50.0	50.0	ND	106	111	80-121	4	12
Ethyl Benzene	51.0	55.0	50.0	50.0	ND	102	110	81-120	8	13
m,p-Xylene	52.4	55.1	50.0	50.0	ND	105	110	81-119	5	13
o-Xylene	50.5	53.9	50.0	50.0	ND	101	108	79-117	7	13
Surrogate:										
Fluorobenzene						103	106	71-112		

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NWTPH-Dx

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: CHEV-GW-MW4R-0140						
Laboratory ID:	08-060-02					
Diesel Range Organics	0.62	0.26	NWTPH-Dx	8-12-14	8-12-14	X1,M
Lube Oil Range Organics	1.2	0.42	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	113	50-150				

Client ID: CHEV-GW-MW25-0130						
Laboratory ID:	08-060-03					
Diesel Fuel #1	4.9	0.26	NWTPH-Dx	8-12-14	8-12-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	113	50-150				

Client ID: CHEV-GW-MW10R-0130						
Laboratory ID:	08-060-04					
Diesel Range Organics	0.32	0.26	NWTPH-Dx	8-12-14	8-12-14	X1,M
Lube Oil Range Organics	0.58	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	111	50-150				

Client ID: CHEV-GW-MW11-0120						
Laboratory ID:	08-060-05					
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-12-14	8-12-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	122	50-150				

Client ID: CHEV-GW-MW9R-0130						
Laboratory ID:	08-060-06					
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-12-14	8-12-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	116	50-150				

Client ID: CHEV-GW-MW27-0110						
Laboratory ID:	08-060-07					
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-12-14	8-12-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	100	50-150				

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NWTPH-Dx

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW20R-0100					
Laboratory ID:	08-060-08					
Diesel Range Organics	ND	0.26	NWTPH-Dx	8-12-14	8-12-14	X1
Lube Oil Range Organics	ND	0.41	NWTPH-Dx	8-12-14	8-12-14	X1
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	<i>124</i>	<i>50-150</i>				

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**NWTPH-Dx
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812W1					
Diesel Range Organics	ND	0.25	NWTPH-Dx	8-12-14	8-12-14	
Lube Oil Range Organics	ND	0.40	NWTPH-Dx	8-12-14	8-12-14	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>o-Terphenyl</i>	<i>106</i>	<i>50-150</i>				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	08-055-02									
	ORIG	DUP								
Diesel Range	ND	ND	NA	NA		NA	NA	NA	NA	
Lube Oil Range	ND	ND	NA	NA		NA	NA	NA	NA	
Surrogate:										
o-Terphenyl						110	101	50-150		

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NITRATE (as Nitrogen)
EPA 353.2

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW4R-0140					
Laboratory ID:	08-060-02					
Nitrate	ND	0.050	EPA 353.2	8-18-14	8-18-14	

Client ID:	CHEV-GW-MW25-0130					
Laboratory ID:	08-060-03					
Nitrate	0.068	0.050	EPA 353.2	8-18-14	8-18-14	

Client ID:	CHEV-GW-MW10R-0130					
Laboratory ID:	08-060-04					
Nitrate	ND	0.050	EPA 353.2	8-18-14	8-18-14	

Client ID:	CHEV-GW-MW11-0120					
Laboratory ID:	08-060-05					
Nitrate	0.050	0.050	EPA 353.2	8-18-14	8-18-14	

Client ID:	CHEV-GW-MW27-0110					
Laboratory ID:	08-060-07					
Nitrate	ND	0.050	EPA 353.2	8-8-14	8-18-14	

Client ID:	CHEV-GW-MW20R-0100					
Laboratory ID:	08-060-08					
Nitrate	ND	0.050	EPA 353.2	8-18-14	8-18-14	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NITRATE (as Nitrogen)
EPA 353.2
QUALITY CONTROL

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0818W1					
Nitrate	ND	0.050	EPA 353.2	8-18-14	8-18-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-057-02							
	ORIG	DUP						
Nitrate	0.169	0.164	NA	NA	NA	NA	3	16

MATRIX SPIKE								
Laboratory ID:	08-057-02							
	MS	MS		MS				
Nitrate	2.36	2.00	0.169	110	84-119	NA	NA	

SPIKE BLANK								
Laboratory ID:	SB0818W1							
	SB	SB		SB				
Nitrate	2.09	2.00	NA	105	86-114	NA	NA	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

NITRATE (as Nitrogen)
EPA 353.2
QUALITY CONTROL

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0808F1					
Nitrate	ND	0.050	EPA 353.2	8-8-14	8-18-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-060-07							
	ORIG	DUP						
Nitrate	ND	ND	NA	NA	NA	NA	16	

MATRIX SPIKE								
Laboratory ID:	08-060-07							
	MS	MS		MS				
Nitrate	2.20	2.00	ND	110	84-119	NA	NA	

SPIKE BLANK								
Laboratory ID:	SB0808F1							
	SB	SB		SB				
Nitrate	2.05	2.00	NA	103	86-114	NA	NA	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

SULFATE
ASTM D516-07

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW4R-0140					
Laboratory ID:	08-060-02					
Sulfate	ND	5.0	ASTM D516-07	8-17-14	8-17-14	

Client ID:	CHEV-GW-MW25-0130					
Laboratory ID:	08-060-03					
Sulfate	40	10	ASTM D516-07	8-17-14	8-17-14	

Client ID:	CHEV-GW-MW10R-0130					
Laboratory ID:	08-060-04					
Sulfate	ND	5.0	ASTM D516-07	8-17-14	8-17-14	

Client ID:	CHEV-GW-MW11-0120					
Laboratory ID:	08-060-05					
Sulfate	ND	5.0	ASTM D516-07	8-17-14	8-17-14	

Client ID:	CHEV-GW-MW27-0110					
Laboratory ID:	08-060-07					
Sulfate	ND	5.0	ASTM D516-07	8-17-14	8-17-14	

Client ID:	CHEV-GW-MW20R-0100					
Laboratory ID:	08-060-08					
Sulfate	19	5.0	ASTM D516-07	8-17-14	8-17-14	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**SULFATE
 ASTM D516-07
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0817W1					
Sulfate	ND	5.0	ASTM D516-07	8-17-14	8-17-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-057-01							
	ORIG	DUP						
Sulfate	50.0	52.5	NA	NA	NA	NA	5	10

MATRIX SPIKE

Laboratory ID:	08-057-01							
	MS	MS		MS				
Sulfate	107	50.0	50.0	114	82-123	NA	NA	

SPIKE BLANK

Laboratory ID:	SB0817W1							
	SB	SB		SB				
Sulfate	9.87	10.0	NA	99	91-114	NA	NA	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

TOTAL ALKALINITY
SM 2320B

Matrix: Water
 Units: mg CaCO₃/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW4R-0140					
Laboratory ID:	08-060-02					
Total Alkalinity	3300	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW25-0130					
Laboratory ID:	08-060-03					
Total Alkalinity	340	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW10R-0130					
Laboratory ID:	08-060-04					
Total Alkalinity	290	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW11-0120					
Laboratory ID:	08-060-05					
Total Alkalinity	280	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW27-0110					
Laboratory ID:	08-060-07					
Total Alkalinity	370	2.0	SM 2320B	8-12-14	8-12-14	
Client ID:	CHEV-GW-MW20R-0100					
Laboratory ID:	08-060-08					
Total Alkalinity	300	2.0	SM 2320B	8-12-14	8-12-14	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**TOTAL ALKALINITY
 SM 2320B
 QUALITY CONTROL**

Matrix: Water
 Units: mg CaCO₃/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812W1					
Total Alkalinity	ND	2.0	SM 2320B	8-12-14	8-12-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-044-03							
	ORIG	DUP						
Total Alkalinity	280	278	NA	NA	NA	NA	1	10

SPIKE BLANK								
Laboratory ID:	SB0812W1							
	SB	SB		SB				
Total Alkalinity	108	100	NA	108	89-112	NA	NA	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

CHLORIDE
SM 4500-Cl E

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	CHEV-GW-MW4R-0140					
Laboratory ID:	08-060-02					
Chloride	270	20	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW25-0130					
Laboratory ID:	08-060-03					
Chloride	530	20	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW10R-0130					
Laboratory ID:	08-060-04					
Chloride	7.8	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW11-0120					
Laboratory ID:	08-060-05					
Chloride	10	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW27-0110					
Laboratory ID:	08-060-07					
Chloride	12	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Client ID:	CHEV-GW-MW20R-0100					
Laboratory ID:	08-060-08					
Chloride	25	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**CHLORIDE
 SM 4500-Cl E
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0812W1					
Chloride	ND	2.0	SM 4500-Cl E	8-12-14	8-12-14	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE								
Laboratory ID:	08-057-01							
	ORIG	DUP						
Chloride	6.88	6.92	NA	NA	NA	NA	1	11

MATRIX SPIKE								
Laboratory ID:	08-057-01							
	MS	MS		MS				
Chloride	62.9	50.0	6.88	112	94-126	NA	NA	

SPIKE BLANK								
Laboratory ID:	SB0812W1							
	SB	SB		SB				
Chloride	52.1	50.0	NA	104	94-124	NA	NA	

Date of Report: August 18, 2014
 Samples Submitted: August 8, 2014
 Laboratory Reference: 1408-060
 Project: 2331896107

**DISSOLVED MANGANESE
EPA 6010C**

Matrix: Water
 Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-060-02					
Client ID:	CHEV-GW-MW4R-0140					
Manganese	5800	56	6010C		8-13-14	
Lab ID:	08-060-03					
Client ID:	CHEV-GW-MW25-0130					
Manganese	96	11	6010C		8-12-14	
Lab ID:	08-060-04					
Client ID:	CHEV-GW-MW10R-0130					
Manganese	3400	56	6010C		8-13-14	
Lab ID:	08-060-05					
Client ID:	CHEV-GW-MW11-0120					
Manganese	3700	56	6010C		8-13-14	
Lab ID:	08-060-07					
Client ID:	CHEV-GW-MW27-0110					
Manganese	6800	56	6010C		8-13-14	
Lab ID:	08-060-08					
Client ID:	CHEV-GW-MW20R-0100					
Manganese	2500	56	6010C		8-13-14	

Date of Report: August 18, 2014
Samples Submitted: August 8, 2014
Laboratory Reference: 1408-060
Project: 2331896107

**DISSOLVED MANGANESE
EPA 6010C
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0808F1

Analyte	Method	Result	PQL
Manganese	6010C	ND	11

Date of Report: August 18, 2014
Samples Submitted: August 8, 2014
Laboratory Reference: 1408-060
Project: 2331896107

**DISSOLVED MANGANESE
EPA 6010C
DUPLICATE QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-065-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Manganese	142	144	2	11	

Date of Report: August 18, 2014
Samples Submitted: August 8, 2014
Laboratory Reference: 1408-060
Project: 2331896107

**DISSOLVED MANGANESE
EPA 6010C
MS/MSD QUALITY CONTROL**

Date Analyzed: 8-12-14

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-065-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Manganese	1110	1320	106	1370	111	4	



Data Qualifiers and Abbreviations

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

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



Analytical Resources, Incorporated
Analytical Chemists and Consultants

14 August 2014

David Baumeister
OnSite Environmental, Inc.
14648 NE 95th
Redmond, WA 98052

RE: Client Project: 2331896107; 08-060
ARI Job No: YV78

Dear David:

Please find enclosed the chain-of-custody (COC) record and the final results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted six water samples on August 11, 2014. The samples were analyzed for methane as requested.

The percent recovery for the surrogate, propane, was low following the initial analysis of sample CHEV-GW-MW4R-0140. This sample was re-analyzed. The percent recovery for propane was low for the re-analysis. It was concluded that the sample matrix was the cause of the low surrogate recovery. No further corrective actions were taken. The results for both analyses have been submitted for comparison.

The remaining analyses proceeded without incident of note.

An electronic copy of these reports will remain on file at ARI. Should you have any questions, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.


Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file YV78

MDH/mdh



Date/Time: _____



Date/Time: _____

Project Name:

08-060

Project Name:



YV78:00002



Cooler Receipt Form

ARI Client: Offsite Environmental

Project Name: _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: YV78

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? _____

YES NO

Were custody papers included with the cooler? _____

YES NO

Were custody papers properly filled out (ink, signed, etc.) _____

YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: 1230

5.3

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 9087852

Cooler Accepted by: CA

Date: 8/11/14

Time: 1230

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES NO

What kind of packing material was used? _____ Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA YES NO

Were all bottles sealed in individual plastic bags? _____

YES NO

Did all bottles arrive in good condition (unbroken)? _____

YES NO

Were all bottle labels complete and legible? _____

YES NO

Did the number of containers listed on COC match with the number of containers received? _____

YES NO

Did all bottle labels and tags agree with custody papers? _____

YES NO

Were all bottles used correct for the requested analyses? _____

YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...

NA YES NO

Were all VOC vials free of air bubbles? _____

NA YES NO

Was sufficient amount of sample sent in each bottle? _____

YES NO

Date VOC Trip Blank was made at ARI: _____

NA

Was Sample Split by ARI: NA YES

Date/Time: _____

Equipment: _____

Split by: _____

Samples Logged by: CA

Date: 8/11/14

Time: 1345

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

CHEV - GW - MW4R - 0140 = ~~4/3/3~~ CA

CHEV - GW - MW21R - 0100 = ~~4/3/3~~ CA

CHEV - GW - MW21R - 1000 = ~~4/3/3~~ CA

By: CA

Date: 8/11/14

CA

Small Air Bubbles
- 2mm

Peabubbles
2-4 mm

LARGE Air Bubbles
4 mm

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

Sample ID Cross Reference Report



ARI Job No: YV78
Client: OnSite Environmental, Inc.
Project Event: 2331896107
Project Name: N/A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. CHEV-GW-MW4R-0140	YV78A	14-16387	Water	08/06/14 17:25	08/11/14 12:30
2. CHEV-GW-MW25-0130	YV78B	14-16388	Water	08/07/14 08:40	08/11/14 12:30
3. CHEV-GW-MW10R-0130	YV78C	14-16389	Water	08/07/14 10:20	08/11/14 12:30
4. CHEV-GW-MW11-0120	YV78D	14-16390	Water	08/07/14 11:40	08/11/14 12:30
5. CHEV-GW-MW27-0110	YV78E	14-16391	Water	08/07/14 13:42	08/11/14 12:30
6. CHEV-GW-MW20R-0100	YV78F	14-16392	Water	08/07/14 14:40	08/11/14 12:30

ORGANICS ANALYSIS DATA SHEET

METHANE ETHANE ETHENE

Modified RSK 175

Page 1 of 1

Matrix: Water



QC Report No: YV78-OnSite Environmental, Inc.

Project: 2331896107

NA

Date Received: 08/11/14

Data Release Authorized: *MMW*

Reported: 08/13/14

ARI ID	Sample ID	Analysis Date	DL	Analyte	RL	Result
YV78A 14-16387	CHEV-GW-MW4R-0140	08/12/14	1.0	Methane	0.7	776
YV78ARE 14-16387	CHEV-GW-MW4R-0140	08/12/14	1.0	Methane	0.7	704
YV78B 14-16388	CHEV-GW-MW25-0130	08/12/14	1.0	Methane	0.7	63.1
YV78C 14-16389	CHEV-GW-MW10R-0130	08/12/14	1.0	Methane	0.7	279
YV78D 14-16390	CHEV-GW-MW11-0120	08/12/14	1.0	Methane	0.7	805
YV78E 14-16391	CHEV-GW-MW27-0110	08/12/14	1.0	Methane	0.7	10,900
YV78F 14-16392	CHEV-GW-MW20R-0100	08/12/14	1.0	Methane	0.7	1,650
081214MB	Method Blank	08/12/14	1.0	Methane	0.7	< 0.7 U

Reported in ug/L (ppb)

ORGANICS ANALYSIS DATA SHEET

METHANE ETHANE ETHENE

Modified RSK 175

Page 1 of 1

Matrix: Water



QC Report No: YV78-OnSite Environmental, Inc.

Project: 2331896107

NA

Date Received: 08/11/14

Data Release Authorized: *[Signature]*

Reported: 08/13/14

ARI ID	Analysis Date	Analyte	Spike	Result	Recovery	RPD
081214LCS	08/12/14	Methane	654	661	101.0%	0.0%
081214LCSD				661	101.0%	

Reported in ug/L (ppb)

ORGANICS ANALYSIS DATA SHEET

METHANE ETHANE ETHENE

Modified RSK 175

Page 1 of 1

Matrix: Water

QC Report No: YV78-OnSite Environmental, Inc.

Project: 2331896107

NA

Date Received: 08/11/14

Data Release Authorized: 

Reported: 08/13/14

Analyte	Date	Spike Type	Sample	Spike	Spike Added	Recovery	RPD
ARI ID: YV78B Client ID: CHEV-GW-MW25-0130							
Methane	08/12/14	MS	63.1	609	654	83.4%	4.8%
	08/12/14	MSD		639		88.0%	

Reported in ug/L (ppb)

RSK 175 WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YV78-OnSite Environmental, Inc.
Project: 2331896107

<u>ARI ID</u>	<u>Client ID</u>	<u>PRP</u>	<u>TOT OUT</u>
YV78A	CHEV-GW-MW4R-0140	62.8%*	1
YV78ARE	CHEV-GW-MW4R-0140	71.1%*	1
YV78B	CHEV-GW-MW25-0130	83.4%	0
YV78BMS	CHEV-GW-MW25-0130	86.7%	0
YV78BMSD	CHEV-GW-MW25-0130	86.1%	0
YV78C	CHEV-GW-MW10R-0130	90.0%	0
YV78D	CHEV-GW-MW11-0120	88.9%	0
YV78E	CHEV-GW-MW27-0110	83.9%	0
YV78F	CHEV-GW-MW20R-0100	88.4%	0
MB-081214	Method Blank	99.5%	0
LCS-081214	Lab Control	101%	0
LCSD-081214	Lab Control Dup	95.0%	0

LCS/MB LIMITS QC LIMITS

(PRP) = Propane (72-122) (72-122)

Log Number Range: 14-16387 to 14-16392



OnSite Environmental Inc.

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

Chain of Custody

Page 1 of 1

Laboratory Number: 08-060

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☒ Standard (7 Days)
(1PH analysis 5 Days)

☐ (other) _____

Company: PARAMETRIX

Project Number: 2331896167

Project Name: FORMER CHEVRON

Project Manager: DAVID DIN KUHN

Sampled by: WALTER HARVEY

Lab ID	Sample Identification
1	CHEV-GW-MW13R-0140
2	CHEV-GW-MW4R-0140
3	CHEV-GW-MW25-0130
4	CHEV-GW-MW10R-0130
5	CHEV-GW-MW11-0120
6	CHEV-GW-MW9R-0130
7	CHEV-GW-MW27-0110
8	CHEV-GW-MW20R-0100
9	TRIP BALVICS

Signature	Company	Date	Time	Comments/Special Instructions
	PARAMETRIX	8-7-14	1610	* FIELD FILTERED
	Thursday Del.	8-7-14	1610	
	Thursday Del.	8-8-14	8:55AM	
	Friday Del.	8/8/14	855	

*** SILICA GEL CLEANUP ON DSL
*** - NITRATE, SULFATE, ALKALINITY,
CHLORIDE

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐

Electronic Data Deliverables (EDDs) ☒



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

August 13, 2014

David Dinkuhn
Parametrix, Inc.
4660 Kitsap Way, Suite A
Bremerton, WA 98312

Re: Analytical Data for Project 2331896107
Laboratory Reference No. 1408-096

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on August 8, 2014.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "DB", followed by a long horizontal flourish.

David Baumeister
Project Manager

Enclosures



Analytical Resources, Incorporated
Analytical Chemists and Consultants

11 August 2014

David Baumeister
OnSite Environmental, Inc.
14648 NE 95th
Redmond, WA 98052

RE: Client Project: Former Chevron; 2331896107
ARI Job No: YV56

Dear David:

Please find enclosed the chain-of-custody (COC) record and the final results for the samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted ten water samples on August 8, 2014. The samples were analyzed for ferrous iron as requested. It was noted prior to analysis that the bottles for two samples (CHEV-GW-MW21R-0100 and CHEV-GW-MW-21R-1000) contained headspace.

These analyses proceeded without incident of note.

An electronic copy of these reports will remain on file at ARI. Should you have any questions, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.


Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

Enclosures

cc: file YV56

MDH/mdh



OnSite Environmental Inc.

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

Chain of Custody

206-695-6200

Turnaround Request (in working days)			Laboratory Number:																		
(Check One)																					
☐ Same Day ☐ 1 Day																					
☐ 2 Days ☐ 3 Days																					
☐ Standard (7 Days) (TPH analysis 5 Days)																					
☐ (other) _____																					
Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-DX	Volatiles 8260C	Halogenated Volatiles 8260C	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals/ MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664A	% Moisture	
	CHV-GW-MW21R-0100	8-6-14	1215	GW																	
	MW21R-1000		1230																		
	MW22R-0120		1510																		
	MW-26R-0110		1410																		
	MW11-0120		1410																		
	MW12R-0140		1627																		
	MW4R-0140		1725																		
	MW25-0130	8-7-14	0840																		
	MW10R-0130		1020																		
	MW27-0110		1342																		
	MW20R-0100		1440																		
Signature		Company		Date		Time		Comments/Special Instructions													
Relinquished		Parametric		8-7-14		1610															
Received		Thundersong Del.		8-7-14		16:10															
Relinquished		Thundersong Del.		8-8-14		9:33															
Received		ARI		8-8-14		0935															
Relinquished																					
Received																					
Reviewed/Date		Reviewed/Date		Chromatograms with final report ☐																	



Cooler Receipt Form

ARI Client: Parametrix

Project Name: FORMER CHEVRON

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: YU56

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.6

Time: 0935

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90872952

Cooler Accepted by: CA Date: 8/8/14 Time: 0935

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI..... NA

Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JS Date: 8-8-14 Time: 950

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

Small Air Bubbles -2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm	Small → "sm" (< 2 mm) Peabubbles → "pb" (2 to < 4 mm) Large → "lg" (4 to < 6 mm) Headspace → "hs" (> 6 mm)
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Sample ID Cross Reference Report



ARI Job No: YV56
Client: OnSite Environmental, Inc.
Project Event: 2331896107
Project Name: Former Chevron

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. CHEV-GW-MW21R-0100	YV56A	14-16249	Water	08/06/14 12:15	08/08/14 09:35
2. CHEV-GW-MW21R-1000	YV56B	14-16250	Water	08/06/14 12:30	08/08/14 09:35
3. CHEV-GW-MW22R-0120	YV56C	14-16251	Water	08/06/14 15:10	08/08/14 09:35
4. CHEV-GW-MW26R-0110	YV56D	14-16252	Water	08/06/14 14:10	08/08/14 09:35
5. CHEV-GW-MW11-0120	YV56E	14-16253	Water	08/06/14 11:40	08/08/14 09:35
6. CHEV-GW-MW4R-0140	YV56F	14-16254	Water	08/06/14 17:25	08/08/14 09:35
7. CHEV-GW-MW25-0130	YV56G	14-16255	Water	08/07/14 08:40	08/08/14 09:35
8. CHEV-GW-MW10R-0130	YV56H	14-16256	Water	08/07/14 10:20	08/08/14 09:35
9. CHEV-GW-MW27-0110	YV56I	14-16257	Water	08/07/14 13:42	08/08/14 09:35
10. CHEV-GW-MW20R-0100	YV56J	14-16258	Water	08/07/14 14:40	08/08/14 09:35



Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but $\geq$ the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.



Analytical Resources,
Incorporated
Analytical Chemists and
Consultants

- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" (**Dioxin/Furan analysis only**)
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. (**Dioxin/Furan analysis only**)
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. (**Dioxin/Furan analysis only**)



Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

INORGANICS ANALYSIS DATA SHEET
Ferrous Iron by Method SM3500 FeD



Data Release Authorized: 
Reported: 08/11/14
Date Received: 08/08/14
Page 1 of 1

QC Report No: YV56-OnSite Environmental, Inc.
Project: Former Chevron
2331896107

Client/ ARI ID	Date Sampled	Matrix	Analysis Date & Batch	RL	Result
CHEV-GW-MW21R-0100 YV56A 14-16249	08/06/14	Water	08/08/14 080814#1	0.800	8.18
CHEV-GW-MW21R-1000 YV56B 14-16250	08/06/14	Water	08/08/14 080814#1	0.800	7.62
CHEV-GW-MW22R-0120 YV56C 14-16251	08/06/14	Water	08/08/14 080814#1	0.040	< 0.040 U
CHEV-GW-MW26R-0110 YV56D 14-16252	08/06/14	Water	08/08/14 080814#1	0.040	0.385
CHEV-GW-MW11-0120 YV56E 14-16253	08/06/14	Water	08/08/14 080814#1	0.800	36.8
CHEV-GW-MW4R-0140 YV56F 14-16254	08/06/14	Water	08/08/14 080814#1	0.800	11.5
CHEV-GW-MW25-0130 YV56G 14-16255	08/07/14	Water	08/08/14 080814#1	0.800	13.1
CHEV-GW-MW10R-0130 YV56H 14-16256	08/07/14	Water	08/08/14 080814#1	0.800	30.4
CHEV-GW-MW27-0110 YV56I 14-16257	08/07/14	Water	08/08/14 080814#1	2.00	49.4
CHEV-GW-MW20R-0100 YV56J 14-16258	08/07/14	Water	08/08/14 080814#1	0.800	33.2

Reported in mg/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
YV56-OnSite Environmental, Inc.

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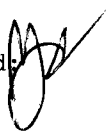
Matrix: Water
Data Release Authorized: 
Reported: 08/11/14

Project: Former Chevron
Event: 2331896107
Date Sampled: NA
Date Received: NA

Analyte	Date/Time	Units	Blank
Ferrous Iron	08/08/14 13:17	mg/L	< 0.040 U

LAB CONTROL RESULTS-CONVENTIONALS
YV56-OnSite Environmental, Inc.

ANALYTICAL
RESOURCES
INCORPORATED 

Matrix: Water
Data Release Authorized: 
Reported: 08/11/14

Project: Former Chevron
Event: 2331896107
Date Sampled: NA
Date Received: NA

Analyte	Date/Time	Units	LCS	Spike Added	Recovery
Ferrous Iron	08/08/14 13:17	mg/L	0.495	0.500	99.0%

REPLICATE RESULTS-CONVENTIONALS
YV56-OnSite Environmental, Inc.



Matrix: Water
Data Release Authorized:
Reported: 08/11/14

A handwritten signature in black ink, appearing to be 'JZ' or similar, written over the 'Data Release Authorized' line.

Project: Former Chevron
Event: 2331896107
Date Sampled: 08/06/14
Date Received: 08/08/14

Analyte	Date	Units	Sample	Replicate (s)	RPD/RSD
ARI ID: YV56A Client ID: CHEV-GW-MW21R-0100					
Ferrous Iron	08/08/14	mg/L	8.18	8.50	3.8%