Groundwater Compliance Monitoring Data Summary Report – May 2016

3003 Taylor Way
Tacoma, Washington

for
PRS Group, Inc.

May 2, 2016

GeoEngineers
Earth Science + Technology

Groundwater Compliance Monitoring Data Summary Report – May 2016

3003 Taylor Way
Tacoma, Washington

for
PRS Group, Inc.

May 2, 2016

GeoEngineers
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Groundwater Compliance Monitoring Data Summary Report – May 2016

3003 Taylor Way
Tacoma, Washington

File No. 19482-002-00

May 2, 2016

Prepared for:

PRS Group, Inc.
3003 Taylor Way
Tacoma, Washington 98421

Attention: Jay Johnson

Prepared by:

GeoEngineers, Inc.
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Jacob M. Letts, LG, LHG
Senior Hydrogeologist

Nick E. Rohrbach
Senior Environmental Scientist

Terry R. McPhetridge, LG, LHG
Associate

JML:NER:TRM:ch

GeoEngineers

Table of Contents

INTRODUCTION

This data summary report presents the results of groundwater compliance monitoring performed for the PRS Group, Inc. (PRS) at the PRS facility located at 3003 Taylor Way in Tacoma, Washington (Site) (Figure 1). Groundwater compliance monitoring at the PRS facility is being completed under Agreed Order DE 11357 between PRS and the Washington State Department of Ecology (Ecology). The groundwater compliance monitoring is intended to monitor releases of hazardous substances identified as chemicals of concern (COCs) in groundwater and complete remedial actions as requested by Ecology. The Agreed Order specifies that four quarters of groundwater compliance monitoring shall be completed, followed by an annual groundwater data analysis report; additional groundwater compliance monitoring events and reporting will proceed on an annual basis or as determined by Ecology. This Groundwater Compliance Monitoring Report is intended to summarize the four quarters of groundwater compliance monitoring and satisfy the first annual reporting requirement of the Agreed Order.

BACKGROUND

Ecology found PRS liable for the release of hazardous substances at the PRS facility as noted in a letter to Mr. Tom Smith of PRS dated March 5, 2015. The findings were based on evidence of releases and/or the presence of hazardous substances identified during previous investigations at the facility from 1991 through 1993 (Environmental Engineering & Consulting, 1992 and 1993), and 1996 (Secor, 1996). Releases and/or potential releases of hazardous substances at the Site include total petroleum hydrocarbons, benzene, tetrachloroethene, trichloroethylene, vinyl chloride, xylenes, arsenic, cadmium, and mercury based on information identified by Ecology.

PRS submitted a draft Groundwater Compliance Monitoring Plan (GWMP) to Ecology for comment and review in the fall 2014. GeoEngineers assisted PRS in finalizing the GWMP by developing standard operating procedures (SOPs) requested by Ecology. PRS submitted the final GWMP to Ecology on May 20, 2015. On October 27, 2015, PRS and Ecology entered into an Agreed Order (No. DE 11357) to facilitate completion of remedial actions at the Site. Additional details regarding the findings of previous investigations are summarized in the Agreed Order.

Quarterly groundwater compliance monitoring was initiated in June 2015 in accordance with the Agreed Order and the GWMP, and included the following elements:

- Perform four quarters of compliance groundwater monitoring at the Site in accordance with the Agreed Order and the GWMP.
- Monitoring of groundwater elevations and flow direction in the shallow and deep aquifers by measuring water levels at all existing monitoring wells at the Site.
- Monitoring the integrity of each groundwater monitoring well by conducting quarterly inspections.
- Sampling groundwater quarterly at nine monitoring wells including shallow aquifer monitoring wells CO-3A, SO-2A, SO-4A, MW-1A, MW-2A, and MW-3A and deep aquifer monitoring wells CO-3B, SO-4B, and MW-1B.
- Monitoring for indicators of natural attenuation including ferrous iron, sulfate, dissolved oxygen (DO), pH, electrical conductivity and oxidation-reduction potential (ORP).

- Analyzing groundwater samples for volatile organic compounds (VOCs), gasoline- and diesel-range hydrocarbons, total metals, polychlorinated biphenyls (PBCs), nitrate and sulfate.
- Summarizing results of quarterly monitoring in an annual groundwater monitoring report for Ecology's review. After completion of quarterly monitoring, groundwater compliance monitoring will commence on an annual basis or as directed by Ecology.

The results of the compliance groundwater monitoring conducted during June, September, and December 2015, and March 2016 are summarized below. The detected COC concentrations are compared to Ecology's Model Toxics Control Act (MTCA) groundwater cleanup levels.

GROUNDWATER COMPLIANCE MONITORING FIELD ACTIVITIES

The groundwater monitoring field activities were performed in general accordance with the final GWMP dated May 20, 2015. Groundwater samples were collected and groundwater levels were monitored quarterly in June 2015 (Q1), September 2015 (Q2), December 2015 (Q3) and March 2016 (Q4) from nine monitoring wells that included CO-3A, CO-3B, SO-2A, SO-4A, SO-4B, MW-1A, MW-1B, MW-2A, and MW-3A (Figure 2). Groundwater samples were submitted to Spectra Laboratories, Inc. (Spectra), in Tacoma, Washington, for analysis of the GWMP-identified COCs. The following sections summarize the background and results of compliance groundwater monitoring at the Site.

Each monitoring well was inspected by field personnel prior to and during each quarterly groundwater sampling event. Well conditions and/or potential repairs were documented in the field and communicated with PRS following the well inspections. Monitoring well monuments for MW-1A and MW-1B were replaced by PRS between the December 2015 and March 2016 monitoring events. Monitoring wells CO-3A and CO-3B may also require monument replacement due to bolt damage on each monument lid. No internal or external well casing damage and no significant sediment buildup was noted.

Monitoring wells were sampled using low-flow/low-turbidity sampling techniques to minimize the suspension of particulates in the samples. Groundwater samples were obtained from the wells using a peristaltic pump with dedicated flexible vinyl tubing. Groundwater was pumped at approximately 0.3 liters per minute from the approximate mid-point of the screened interval to collect the samples during each monitoring event.

The quarterly monitoring also included measurement of water quality parameters that are indicators of natural attenuation. Water quality parameters were measured using a Horiba U-22 or an YSI Professional Plus water quality meter with a flow-through cell during well purging activities. The measured water quality parameters were recorded in the field during monitoring activities and prior to sampling activities. Groundwater samples were collected once the water quality parameters generally varied by less than 10 percent on three consecutive measurements. Field measurements were documented on the field logs.

Following well purging, the flow-through cell was disconnected and the groundwater samples were collected in appropriate laboratory-prepared and -provided containers. The samples were protected and placed into a cooler with ice and delivered to Spectra for analysis following appropriate chain-of-custody procedures. Purge water was stored in a labeled 55-gallon drum for future permitted disposal by PRS. The groundwater samples were submitted for the following analyses to provide results as specified in the GWMP.

- Gasoline-range hydrocarbons by Ecology-approved method NWTPH-Gx.
- Diesel- and oil-range hydrocarbons by Ecology-approved method NWTPH-Dx.
- VOCs by United States Environmental Protection Agency (EPA) method 8260.
- PCBs by EPA method SW8082A.
- Total metals by EPA method 6020A.
- Nitrate by Method Systea Easy (1-Reagent).
- Sulfate by Method SM4500-SO4 E.

Ferrous iron and dissolved oxygen concentrations were evaluated in the field using a Hach field test kit. The results were recorded on the field logs prior to collection of samples for laboratory analysis.

Significant Observations

The monument for monitoring well MW-2A was observed to contain a dark liquid that exhibited hydrocarbon-like odor and sheen during the June 2015 (Q1) groundwater monitoring event. This well is located adjacent to a diesel fuel AST and under a fuel filter and dispenser fuel hose. It appeared that diesel fuel was released from the diesel fuel AST onto the Site impermeable surface and into the well monument. PRS was notified immediately and the liquid was removed by PRS using a vacuum truck and the interior of the monument was rinsed out. The well cap appeared to be adequately secured since there was no evidence of hydrocarbon staining observed on the inside of the well casing.

Sawdust and carpet were observed covering the monument lids for monitoring wells MW-1A and MW-1B during the March 2016 (Q4) monitoring event. The debris was removed by PRS followed by well inspections prior to groundwater sampling. The well lids were secure and there was no apparent debris inside the well monuments.

GROUNDWATER MONITORING PLAN DEVIATIONS

The procedures and requirements for compliance groundwater monitoring were completed in accordance with the GWMP with the following exceptions:

- DO was obtained and documented using a Horiba U-22 or an YSI Professional Plus water quality meter rather than a Hach Dissolved Oxygen AccuVac® field kit as specified in the SOP 300 during each of the four quarterly monitoring events. It was evaluated that the hand held water quality meters (appropriately calibrated according to manufacturer's specifications) could accurately obtain DO readings under 1 mg/L and achieved lower detection limits than the Hach Dissolved Oxygen AccuVac® field kit during the June 2015 event (Q1).
- The field duplicate and field blank quality control samples were erroneously omitted from analysis during the September 2015 event (Q2).
- Ferrous Iron concentrations were not recorded during monitoring activities during the September 2015 event (Q2).

- The data presented in this report are acceptable for their intended use and the omissions do not affect the quality of the data presented in this GWMR based on our review of the compliance groundwater monitoring data.

COMPLIANCE MONITORING RESULTS

The results from the 2015 and 2016 quarterly groundwater compliance monitoring, sample collection and analysis are summarized in the following sections. Table 1 summarizes monitoring well survey data and groundwater level measurements and elevations. Table 2 summarizes water quality parameter measurements, and Table 3 summarizes the results of chemical analyses. Appendix A contains the laboratory analytical reports, and Appendix B contains the laboratory data validation reports. Appendix C contains the Agreed Order and the GWMP.

Groundwater Conditions

Groundwater level measurements from the four quarterly monitoring events were reviewed to evaluate seasonal changes in groundwater elevation and flow direction in the shallow and deep aquifers at the PRS facility. Groundwater elevations in the shallow aquifer ranged between 9.16 and 13.28 feet (NAVD88) during the four quarterly monitoring events as presented in Table 1. In general, groundwater elevations in the shallow aquifer monitoring wells were approximately 2.5 feet higher during the Q3 (December 2015) and Q4 (March 2016) monitoring events than during the Q1 (June 2015) and Q2 (September 2015) monitoring events. Higher groundwater levels during the Q3 and Q4 events were likely attributed to seasonal fluctuations and greater precipitation during the winter and spring. The groundwater flow direction in the shallow aquifer was generally consistent during each of the four quarterly monitoring events with an inferred flow direction to the southeast or east-southeast (Figures 3 and 4).

Groundwater elevations in the deep aquifer ranged between 6.09 and 8.73 feet (NAVD88) during the four quarterly monitoring events as presented in Table 1. In general, groundwater elevations were approximately 1.5 to 2.5 feet higher in each well during the Q3 (December 2015) and Q4 (March 2016) monitoring events than during the Q1 (June 2015) and Q2 (September 2015) monitoring events. Higher groundwater levels during the Q3 and Q4 events were likely attributed to the seasonal fluctuations and greater precipitation during the winter and spring.

The groundwater flow direction in the deep aquifer was variable during the four quarterly monitoring events. The groundwater flow direction variability is likely related to adjacent utility corridors that influence the groundwater direction as documented by others. The groundwater flow direction was inferred to be to the northeast during the Q1 monitoring event (June 2015) and generally to the south during the Q2, Q3 and Q4 monitoring events (September and December 2015, and March 2016) (Figures 3 and 4).

Groundwater Quality Parameters

Groundwater quality parameters are considered useful indicators of geochemical conditions and natural attenuation processes in groundwater. The groundwater quality parameters measured included ferrous iron, pH, dissolved oxygen, conductivity, turbidity, temperature, and oxygen-reduction potential (ORP) during the quarterly monitoring events. The groundwater quality parameters are presented in Table 2.

In general, dissolved oxygen was lower in both the shallow and deep aquifers during the summer and fall (Q1 and Q2) monitoring events than during the winter and spring (Q3 and Q4) monitoring events. Additionally, the shallow aquifer groundwater temperature was generally higher (up to 10 degrees C higher) during the Q1 and Q2 monitoring events than during the Q3 and Q4 monitoring events. These results are consistent with groundwater conditions typical in drier months when the water table is lower and less groundwater is flowing through the aquifer.

The temperature of groundwater from the deep aquifer was less variable than groundwater from the shallow aquifer. Groundwater in the deep aquifer varied between 12.6 and 15.8 degrees Celsius during the four monitoring events. The groundwater quality parameters generally suggest slightly more reductive conditions in the deep aquifer as compared to the shallow aquifer as indicated by higher ferrous iron concentrations and lower ORP in groundwater identified from the deep aquifer (Table 2).

The conductivity results for the deep aquifer were generally higher (11.57 microSiemens per centimeter [µS/cm] average) than in the shallow aquifer (1.02 µS/cm average), indicating groundwater from the deep aquifer contained more dissolved solids than groundwater from the shallow aquifer. This could be attributed to higher salinity in the deeper aquifer that may be tidally influenced as indicated by others during prior studies (EMS, 2008).

Groundwater Compliance Monitoring Analyses

Chlorinated Organic Solvents and Associated Degradation Products, Monitoring Well SO-4A

Chlorinated solvents (VOCs) were detected in groundwater from one monitoring well, SO-4A.

- Tetrachloroethene (PCE) was detected in groundwater samples collected from shallow aquifer monitoring well SO-4A in December 2015 (8.4 micrograms per liter [µg/L] in the primary sample and 8.9 µg/L in the duplicate sample) and March 2016 (6.1 µg/L) at concentrations greater than the MTCA groundwater cleanup level of 5 µg/L.
- Vinyl chloride (VC) was detected in groundwater samples collected from monitoring well SO-4A in June 2015 (0.9 µg/L in the primary sample and 0.8 µg/L in the duplicate sample) and September 2015 (1.2 µg/L) at concentrations greater than the MTCA groundwater cleanup level of 0.2 µg/L.
- Cis-1,2-Dichloroethene (1,2-DCE) was detected in groundwater collected from monitoring well SO-4A at concentrations less than the MTCA groundwater cleanup level during the June and September 2015 quarterly monitoring events.
- Trichloroethene (TCE) was detected in groundwater samples collected from SO-4A at concentrations less than the MTCA groundwater cleanup level during the March 2016 event.

Other VOCs

Benzene, chlorobenzene, methyl-t-butyl ether and/or toluene were detected in groundwater from three shallow aquifer monitoring wells.

- Benzene was detected in groundwater samples collected from monitoring wells MW-1A and SO-4A during two or more quarters. The detected concentrations were less than the MTCA groundwater cleanup level with one exception: the March 2016 groundwater sample collected from monitoring well

MW-1A contained benzene at a concentration (9.3 µg/L) exceeding the MTCA groundwater cleanup level of 5 µg/L

- Chlorobenzene was detected in groundwater samples collected from monitoring well SO-4A during all quarterly monitoring events. The detected concentrations were less than the MTCA groundwater cleanup level.
- Methyl-t-butyl ether was detected in groundwater samples collected from monitoring well MW-1A in June 2015 and March 2016. The detected concentrations were less than the MTCA groundwater cleanup level.
- Toluene was detected in the groundwater sample collected from monitoring well MW-2A in September 2015. The detected concentration was less than the MTCA groundwater cleanup level.

Metals

Arsenic was the most common COC detected in groundwater during the 2015 and 2016 compliance groundwater monitoring events. Arsenic concentrations in groundwater exceeded the MTCA groundwater cleanup level at least twice in eight of the nine sampled wells.

- Arsenic was detected at concentrations greater than the MTCA groundwater cleanup level of 5 µg/L in groundwater samples collected from shallow aquifer monitoring wells CO-3A, MW-1A, MW-2A, MW-3A, SO-4A, and from deep aquifer monitoring wells CO-3B, and SO-4B during each of the four quarterly monitoring events. Arsenic was detected at concentrations greater than the MTCA groundwater cleanup level in groundwater samples collected from monitoring well SO-2A during the June and December 2015 events. Arsenic was detected at concentrations less than the MTCA groundwater cleanup level in monitoring well MW-1B during the June, September, and December 2015 monitoring events.
- Chromium was detected at concentrations less than the MTCA groundwater cleanup level of 50 µg/L in groundwater samples collected from each well during two or more quarterly monitoring events. Chromium was detected at concentrations between 0.6 and 24.9 µg/L in the wells during these events.
- Lead was detected at a concentration less than the MTCA groundwater cleanup level in the groundwater sample from monitoring well MW-3A during the December 2015 event.

Petroleum Hydrocarbons

- Gasoline-range petroleum hydrocarbons were detected in groundwater samples collected from monitoring well SO-4A in September 2015 and March 2016, and in the groundwater sample collected from monitoring well MW-1A in March 2016. The detected concentrations were generally low and close to the laboratory detection limit.
- Diesel- and oil-range petroleum hydrocarbons were not detected in the analyzed groundwater samples, including groundwater samples from monitoring well MW-2A which had suspected diesel fuel in the well monument during the Q1 monitoring event. Prior to sampling MW-2A during Q1, approximately three well volumes were purged and the well was left to sit overnight. No hydrocarbon sheen or odor were observed during sampling the following day; subsequent groundwater monitoring did not detect the presence of petroleum hydrocarbons in monitoring well MW-2A.

Data Quality Validation Summary

Data validation was completed on each set of compliance groundwater monitoring data. The laboratory followed the specified analytical methods based on the data validation. Accuracy was acceptable, as demonstrated by the surrogate, laboratory control sample (LCS), and matrix spike/matrix spike duplicate (MS/MSD) percent recovery values. Precision was acceptable, as demonstrated by the MS/MSD and laboratory/field duplicate relative percent deviation (RPD) values. The data are acceptable for the intended use, with the data qualifications noted in Table 3.

DISCUSSION

Chlorinated Solvents in Groundwater, Monitoring Well SO-4A

The results of groundwater compliance monitoring indicate that chlorinated solvents are present in groundwater at one location at the PRS facility. PCE and associated degradation products TCE, 1,2-DCE and vinyl chloride were detected in groundwater from shallow aquifer monitoring well (SO-4A). The solvents detected in groundwater from well SO-4A varied seasonally. Vinyl chloride and 1,2-DCE were the only chlorinated solvents detected in groundwater during the first two quarterly monitoring events (Q1 and Q2). While PCE and TCE were the only chlorinated solvents detected in groundwater during the last two quarterly monitoring events (Q3 and Q4) as shown in Table 2.

Groundwater elevations in the shallow aquifer were up to 2.7 feet higher during winter and spring (December and March) when the PCE and TCE were detected than during the summer and fall monitoring events, suggesting that PCE and TCE may be mobilizing from shallow soil to groundwater at this location during higher seasonal groundwater levels. However, chlorinated solvents were not detected in other monitoring wells during the compliance groundwater monitoring suggesting that natural attenuation processes (i.e., fluctuating seasonal groundwater levels and ORP) may be degrading PCE and TCE to their associated breakdown products in groundwater in this area.

Geochemical indicators of natural attenuation fluctuated seasonally between slightly reductive and slightly oxidative conditions in both shallow and deep groundwater during compliance monitoring events performed at the PRS facility. Reductive conditions generally appeared to occur during winter and spring (Q3 and Q4) events, as indicated by a lower relative ORP and higher relative concentrations of ferrous iron. The groundwater natural attenuation conditions observed during the quarterly monitoring events (i.e., fluctuation between reductive and oxidative conditions) are anticipated to be favorable to the breakdown of chlorinated solvents and associated degradation products.

Arsenic in Shallow and Deep Groundwater

Arsenic was detected in groundwater within both the shallow and deep aquifers in the wells sampled during these events. The average concentration of arsenic in groundwater was 64 μg/L in the shallow aquifer and 13 μg/L in the deep aquifer over the four quarterly sampling events.

Groundwater samples collected from shallow aquifer well SO-4A had the highest concentrations of arsenic at the PRS facility. The average concentration of arsenic in well SO-4A was 241 μg/L during the four quarterly monitoring events. In comparison, the average concentration of arsenic detected in groundwater from the remaining shallow aquifer monitoring wells was 29 μg/L during the four quarterly monitoring events.

Arsenic is a common soil constituent in the Puget Sound region (Ecology, 1994). The detected concentrations of arsenic in both shallow and deep groundwater was generally within one order of magnitude (with the exception of groundwater at monitoring well SO-4A) and may be representative of area-wide background arsenic concentrations in groundwater.

Potential Future Groundwater Monitoring

A future annual groundwater compliance monitoring event has been scheduled to take place in March 2017 as annual groundwater compliance monitoring is a requirement of the Agreed Order. Compliance monitoring will be performed on the monitoring wells at the PRS facility. Reporting is anticipated to occur on an annual basis beginning April 2017.

REFERENCES

Environmental Engineering and Consulting, Inc., 1992. Phase 1 Report, Soil & Groundwater Investigation of Petroleum Reclaiming Services, Inc., 3003 Taylor Way, Tacoma, Washington. February 6, 1992.

Environmental Engineering and Consulting, Inc., 1993. Phase 2 Report, Soil and Groundwater Investigation of Petroleum Reclaiming Services, Inc., 3003 Taylor Way, Tacoma, Washington. March 19, 1993.

GeoEngineers, 2010c, Groundwater Compliance Monitoring Data Summary Report – May 2010, 318 State Avenue NE, Olympia, Washington, July 16, 2010.

PRS Group, Inc., 2015. Groundwater Monitoring Plan, PRS Group, Inc., May 20, 2015.

SECOR International Incorporated, 1996. Remedial Investigation Report, Petroleum Reclaiming Services, Inc., 3003 Taylor Way, Tacoma, Washington. October 2, 1996.

Washington State Department of Ecology, 1994. Natural Background Soil Metals Concentrations in Washington State. Publication No. 94-115. October 1994.

Washington State Department of Ecology, 2015a. Letter to Tom Smith of PRS Group, Inc., Re: Notice of Potential Liability under the Model Toxics Control Act for the Release of Hazardous Substances. March 5, 2015.

Washington State Department of Ecology, 2015b. Agreed Order DE 112357. Dated September 23, 2015. Executed on October 27, 2015.

LIMITATIONS

This Groundwater Monitoring Report has been prepared for use by PRS Group, Inc. GeoEngineers has performed these services in general accordance with the scope and limitations of our proposal.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted environmental science practices for groundwater monitoring in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Table 1

Groundwater Level Measurements

3003 Taylor Way

Tacoma, Washington

Location Designation	Northing (Y)[1]	Easting (X)[1]	TOC Elevation[2] (feet)	DTW TOC (feet)				Groundwater Elevation[2] (feet)			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Shallow Aquifer Wells											
CO-3A	709849.1407	1175630.5507	13.10	3.49	3.92	0.92	1.26	9.61	9.18	12.18	11.84
MW-1A	709713.2652	1175727.8917	14.21	4.88	5.05	2.74	2.73	9.33	9.16	11.47	11.48
MW-2A	709863.1699	1175714.5759	14.72	5.03	5.39	2.61	2.74	9.69	9.33	12.11	11.98
MW-3A	709868.2288	1175645.4877	13.91	4.18	4.60	1.72	1.84	9.73	9.31	12.19	12.07
SO-2A	709868.5338	1175582.5228	14.21	3.55	4.01	0.93	1.30	10.66	10.20	13.28	12.91
SO-4A	709800.9119	1175581.8993	14.61	4.84	4.80	2.12	2.58	9.77	9.81	12.49	12.03
Deep Aquifer Wells											
CO-3B	709843.1930	1175636.9974	12.92	6.57	6.47	4.19	4.92	6.35	6.45	8.73	8.00
MW-1B	709717.8682	1175726.3306	14.20	7.80	8.11	5.74	6.33	6.40	6.09	8.46	7.87
SO-4B	709817.2408	1175568.7243	14.10	7.58	7.78	5.44	6.17	6.52	6.32	8.66	7.93

Notes:

[1] Northing (Y) and Easting(X) are in Washington State Plane North Coordinate System, 83/91 grid values. Survey data provided by PRS Group, Inc.

[2] Vertical datum is NAVD88, US survey feet. Survey data provided by PRS Group, Inc.

Q1=June 2015; Q2=September 2015; Q3=December 2015; Q4=March 2016

DTW TOC = Depth to water below top of PVC well casing.

Table 2

Summary of Groundwater Quality Parameters[1]

3003 Taylor Way

Tacoma, Washington

Location ID	Sample Date	Ferrous Iron (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)
Shallow Aquifer Wells								
CO-3A	06/11/15	2.5	0.30	6.83	1.45	5.85	16.8	-104.5
	09/09/15	--	0.08	6.76	1.53	2.06	20.3	-146.4
	12/10/15	2.0	0.27	6.62	0.90	3.3	13.2	-177
	03/08/16	1.5	0.33	7.18	0.99	5.8	10.9	-175.0
MW-1A	06/11/15	2.5	0.20	6.62	1.57	0.98	15.3	-45.1
	09/08/15	--	0.13	6.63	1.43	1.81	19.3	-141.5
	12/11/15	2.0	0.24	6.75	1.33	1.2	15.8	-176.0
	03/09/16	1.5	0.33	7.11	1.70	3.8	13.1	-152.0
MW-2A	06/12/15	1.5	0.14	7.18	0.67	2.52	13.0	-133.7
	09/08/15	--	0.13	6.95	0.84	1.97	17.5	-141.0
	12/11/15	1.2	0.26	6.34	0.63	2.0	8.9	-133.0
	03/09/16	1.0	0.40	6.79	0.76	3.9	9.2	-105.0
MW-3A	06/11/15	2.5	0.20	6.76	0.90	0.89	16.8	-102.9
	09/09/15	--	0.08	6.70	1.19	3.50	20.9	-130.9
	12/11/15	2.0	0.29	6.46	0.69	2.6	13.0	-155.0
	03/09/16	1.5	0.31	7.06	0.78	4.9	10.6	-136.0
SO-2A	06/11/15	1.5	0.11	7.03	1.11	2.38	17.4	-100.3
	09/09/15	--	0.12	6.84	1.28	1.11	21.3	-111.7
	12/10/15	1.0	0.29	6.63	0.90	2.7	13.8	-182
	03/08/16	1.0	0.31	7.45	0.99	2.3	11.3	-176
SO-4A	06/11/15	2.0	0.20	6.62	0.82	1.60	15.3	-106.3
	09/08/15	--	0.08	6.51	1.03	2.02	18.7	-130.1
	12/10/15	1.5	0.27	6.10	0.47	1.2	12.6	-86.0
	03/08/16	1.5	0.29	6.63	0.49	3.4	11.2	-102.0
Deep Aquifer Wells								
CO-3B	06/11/15	4.5	0.10	7.15	11.18	1.42	14.6	-140.3
	09/09/15	--	0.15	7.02	11.58	1.38	14.6	-154.5
	12/10/15	4.0	0.26	7.03	16.40	2.70	14.2	-193
	03/08/16	3.5	0.28	7.86	18.10	3.20	13.9	-206
MW-1B	06/11/15	3.0	0.15	6.94	6.68	0.59	14.8	-17.2
	09/08/15	--	0.11	6.79	6.73	4.94	15.8	-108.8
	12/11/15	2.0	0.25	6.86	8.82	1.3	15.8	-141
	03/09/16	1.5	0.29	7.53	10.60	4.8	14.8	-156
SO-4B	06/11/15	3.5	0.14	6.99	9.49	2.34	15.2	-134.1
	09/08/15	--	0.13	6.87	9.87	1.07	15.4	-147.8
	12/10/15	3.0	0.17	6.36	14.20	1.3	12.6	-223
	03/08/16	3.0	0.30	8.09	15.20	1.2	14.9	-222

Notes:

[1] Groundwater quality parameters include the analytes ferrous iron and sulfate to evaluate and monitor natural attenuation. The results of sulfate analysis are included in Table 3.

ORP = Oxidation/reduction potential

mg/l = milligrams per liter

mv = Millivolts

uS/m = microSiemens per meter

C = Celsius

NTU = nephelometric turbidity unit

-- Parameter not measured

Table 3

Summary of Groundwater Monitoring Parameters[1]

3003 Taylor Way
Tacoma, Washington

				Conventionals		NWTPH-GX	NWTPH-DX		Metals			VOCs							
			Analyte	Nitrate	Sulfate	Gasoline-range hydrocarbons	Diesel-range hydrocarbons	Lube Oil-range Hydrocarbons	Arsenic	Chromium	Lead	Benzene	Chlorobenzene	cis-1,2-Dichloroethene	Methyl t-butyl ether	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride
			Units	mg/L as N	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Monitoring Well	Sample ID	Sample Date	Sample Type																
Shallow Aquifer Wells																			
CO-3A	CO-3A-0615	6/11/2015	N	7.8	3	50 U	100 U	500 U	14.6	1.6	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	CO-3A-150909	9/9/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	13.3	0.7	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	CO-3A-121015	12/10/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	13.1	2.3	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	CO-3A-030816	3/8/2016	N	0.06	11	50 U	100 U	500 U	10	0.8	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
MW-1A	MW-1A-0615	6/11/2015	N	0.01	34	50 U	100 U	500 U	46.2	3	0.5 U	0.88 J	1 U	1 U	2.24	1 U	1 U	1 U	0.2 UJ
	MW-1A-150908	9/8/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	54.3	4.3	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-1A-121115	12/11/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	61.1	5	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-1A-030916	3/9/2016	N	0.01 U	2.0 U	55	100 U	500 U	67.1	3.1	0.5 U	9.3	1 U	1 U	16.7	1 U	1 U	1 U	0.2 UJ
MW-2A	MW-2A-0615	6/11/2015	N	0.01 U	2.0 U	50 U	100 U	500 U	26.6	1.6	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	MW-2A-150908	9/8/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	39	1.1	0.5 U	1 U	1 U	1 U	1 U	1 U	2.3	1 U	0.2 U
	MW-2A-121115	12/11/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	20.6	1.5	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-2A-030916	3/9/2016	N	0.01 U	2.0 U	50 U	100 U	500 U	26	0.7	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
MW-3A	MW-3A-0615	6/11/2015	N	0.45	2.1	50 U	100 U	500 U	38.2	1.4	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	MW-3A-150909	9/9/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	57.2	1.6	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-3A-121115	12/11/2015	N	0.5 U	25	50 U	100 U	500 U	47.1	4.0	0.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-3A-030916	3/9/2016	N	0.02	2.0 U	50 U	100 U	500 U	35.2	1.1	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
SO-2A	SO-2A-0615	6/11/2015	N	0.01 U	2.0 U	50 U	100 U	500 U	9.9	1.1	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	SO-2A-150909	9/9/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	3.4	0.7	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	SO-2A-121015	12/10/2015	N	0.5 U	52	50 U	100 U	500 U	5.9	2.0	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	SO-2A-030816	3/8/2016	N	0.01 U	2.0 U	50 U	100 U	500 U	5.8 U	0.6	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
SO-4A	SO-4A-0615	6/11/2015	N	0.04 J	3.1 J	50	100 U	500 U	273	1.2	0.5 U	1.39	14.7	2.7	1 U	1 U	1 U	1 U	0.9 J
	SO-4A-9-0615[2]	6/11/2015	FD	0.07 J	7.8 J	52	100 U	500 U	280	1.3	0.5 U	1.47	15.6	2.86	1 U	1 U	1 U	1 U	0.8 J
	SO-4A-150908	9/8/2015	N	0.5 U	2.0 U	55	100 U	500 U	46.9	0.5 U	0.5 U	1.5	15.9	1.9	1 U	1 U	1 U	1 U	1.2
	SO-4A-121015	12/10/2015	N	1.4	39	50 U	100 U	500 U	197	0.8	0.5 U	1 U	1.9	1 U	1 U	8.4	1 U	1 U	0.2 U
	SO-4A-9-121015[3]	12/10/2015	FD	1.3	38	50 U	100 U	500 U	202	0.8	0.5 U	1 U	2.0	1 U	1 U	8.9	1 U	1 U	0.2 U
	SO-4A-030816	3/8/2016	N	0.02	27	76 J	100 U	500 U	519	0.5 U	0.5 U	1 U	1.5	1 U	1 U	6.1	1 U	1.2	0.2 UJ
Deep Aquifer Wells																			
MW-1B	MW-1B-0615	6/11/2015	N	0.01 U	2.0 U	50 U	100 U	500 U	2.3	12.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	MW-1B-150908	9/8/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	2.3	14	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-1B-121115	12/11/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	3.4	24.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	MW-1B-030916	3/9/2016	N	0.02	2.2	50 U	100 U	500 U	1 U	20.2	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
CO-3B	CO-3B-0615	6/11/2015	N	0.01 U	47	50 U	100 U	500 U	14.1	5.3	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	CO-3B-150909	9/9/2015	N	0.5 U	2.2	50 U	100 U	500 U	12.7	3.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	CO-3B-121015	12/10/2015	N	0.5 U	22	50 U	100 U	500 U	19.8	8.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	CO-3B-030816	3/8/2016	N	0.01 U	46	50 U	100 U	500 U	13.6	3.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	CO-3B-9-030816[4]	3/8/2016	FD	0.01 U	34	50 U	100 U	500 U	14.1	4.1	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
SO-4B	SO-4B-0615	6/11/2015	N	0.01 U	3.3	50 U	100 U	500 U	16.5	8.4	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
	SO-4B-150908	9/8/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	18.3	8.2	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	SO-4B-121015	12/10/2015	N	0.5 U	2.0 U	50 U	100 U	500 U	31.1	16.9	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
	SO-4B-030816	3/8/2016	N	0.01 U	6.2	50 U	100 U	500 U	27.8	10.8	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 UJ
MTCA Method A or B Cleanup Level				NA	25,600	1,000/800	500	500	5	50	15	5	160	16	20	5	1,000	5	0.2

Notes:

[1] The parameters presented are groundwater compliance monitoring parameters specified in the Groundwater Monitoring Plan (PRS Group, Inc., 2015). Only parameters with detections above the laboratory reporting limit are shown.

[2] Sample SO-4A-9-0615 is a field duplicate of sample SO-4A-0615.

[3] Sample SO-4A-9-121015 is a field duplicate of sample SO-4A-030915.

[4] Sample CO-3B-9-030816 is a field duplicate of sample CO-3B-030816.

MTCA = Model Toxics Control Act

µg/l = microgram per liter

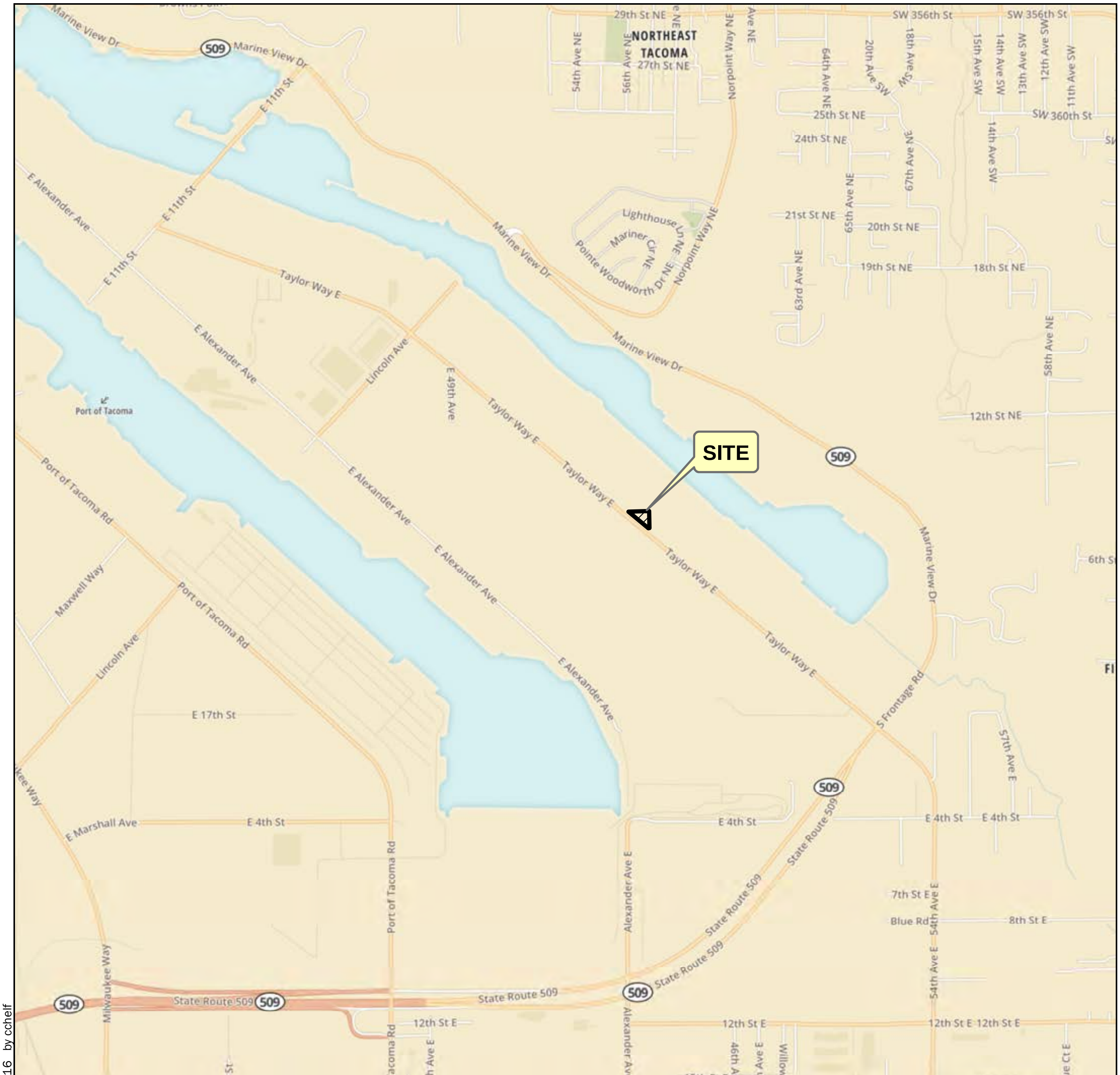
mg/l = milligram per liter

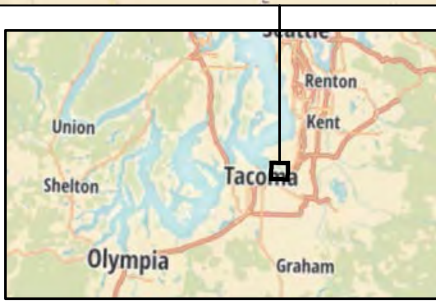
U = The analyte was not detected at a concentration greater than the identified reporting limit

J = The analyte concentration is estimated

Bold indicates analyte was detected

Gray shading indicates concentration is greater than cleanup level





N
W E
S

2,000 0 2,000

Feet

Vicinity Map

PRS Plant
Tacoma, Washington

GEOENGINEERS

Figure 1

Notes:

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

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

P:\19\19482002\GIS\1948200200_T0200_F01_VM.mxd Date Exported: 04/05/16 by ccheif

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

Data Source: Aerial from Google Earth Pro 2015

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

MW-1A Shallow Aquifer Monitoring Well

MW-1B Deep Aquifer Monitoring Well

N
W E
S

30 0 30
Feet

Groundwater Compliance Monitoring Locations

PRS Plant
Tacoma, Washington

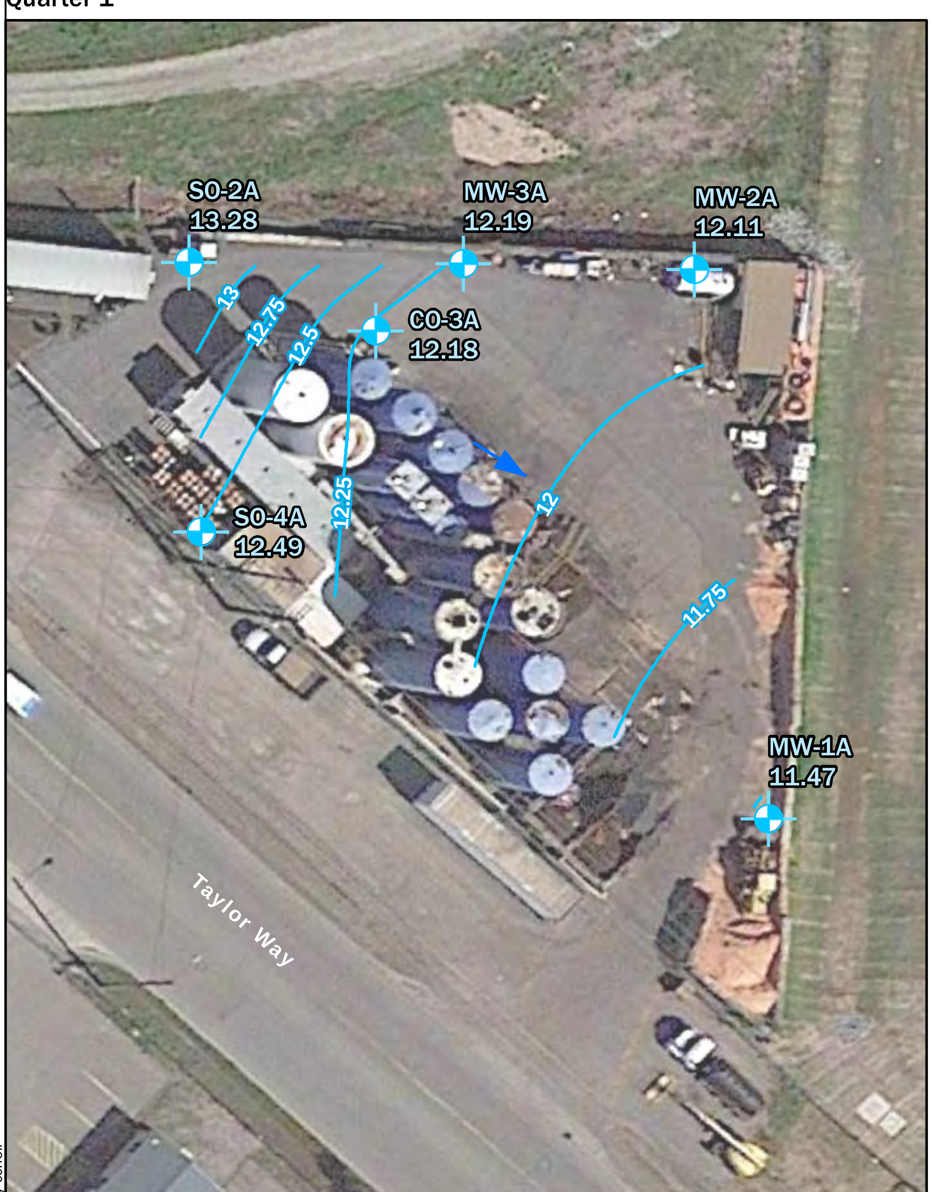
GEOENGINEERS

Figure 2

P:\19\1948202\GIS\MXD\194820200_T0200_F02_Locations.mxd Date Exported: 04/06/16 by ccheif

Quarter 1

Quarter 2



Quarter 3

Quarter 4

Legend

MW-1A 9.33 — Shallow Aquifer Monitoring Well and Groundwater Elevation (NAVD 88)

Inferred Groundwater Flow Direction, Shallow Aquifer

9.25 — Inferred Groundwater Elevation Contours

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Q1 water level measurements taken on June 11, 2015 between 7:58 AM and 2:18 PM.
4. Q2 water level measurements taken on September 8, 2015 between 7:30 AM and 2:07 PM.
5. Q3 water level measurements taken on December 10, 2015 between 8:36 AM and 9:50 AM.
6. Q4 Water level measurements taken on March 8, 2016 between 8:34 AM and 9:47 AM
7. Groundwater elevation contours estimated using Surfer (Golden Software) 8.0 contouring software using the Natural Neighbor gridding method.
8. Groundwater elevations calculated based on survey data provided by PRS Group, Inc.

Data Source: Aerial from Google Earth Pro 2015

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

N W E S

50 0 50

Feet

Groundwater Elevations - Shallow Aquifer
Quarters 1-4

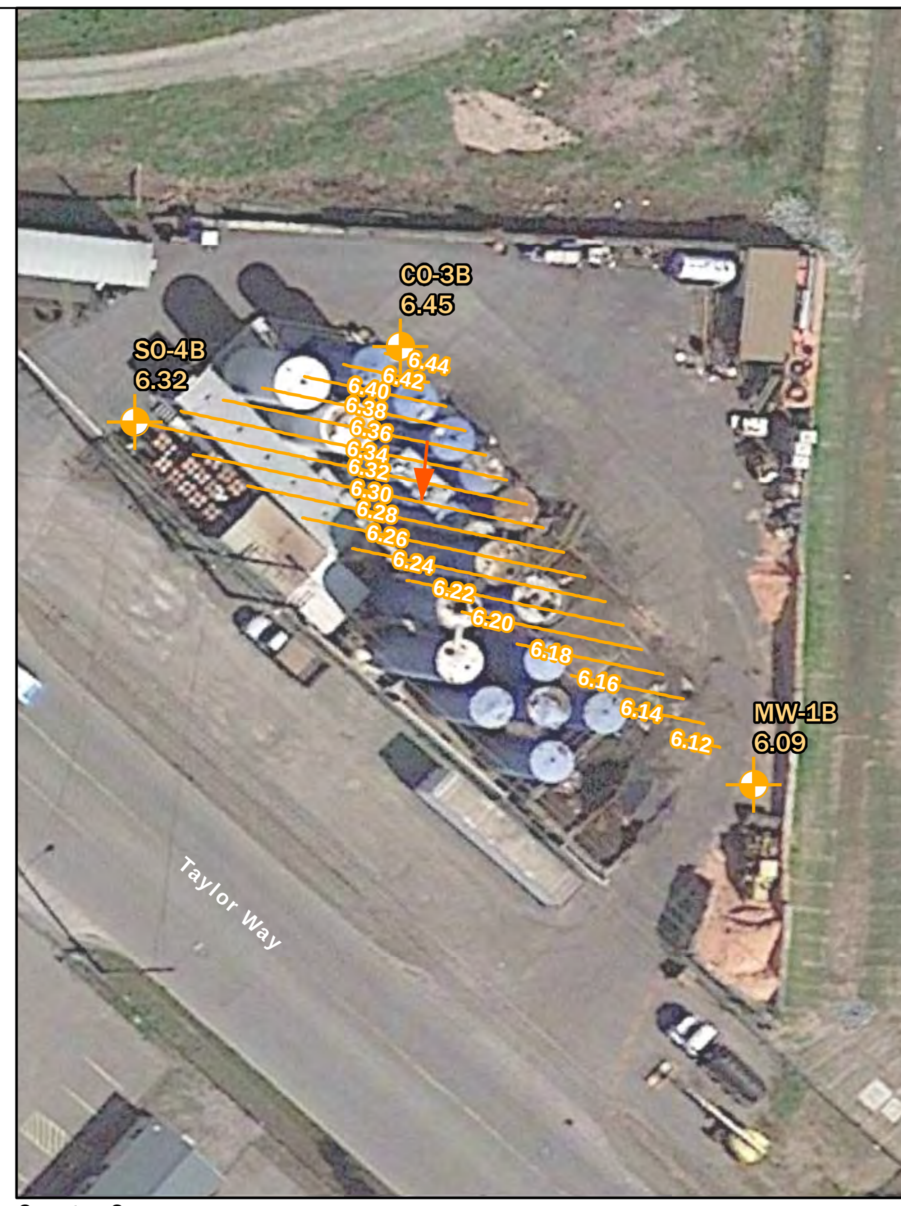
PRS Plant
Tacoma, Washington

GeoEngineers

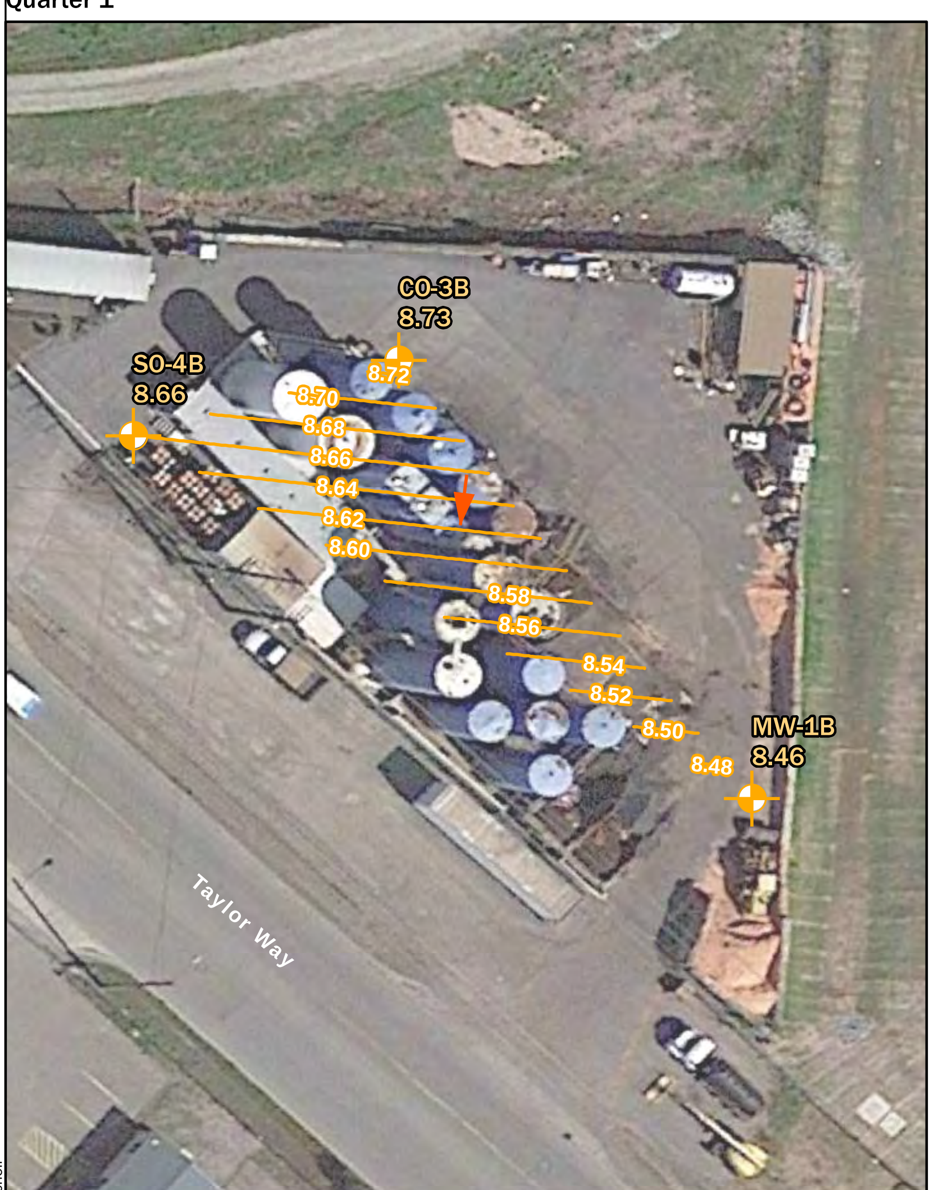
Figure 3

P:\19\1948202\GIS\MXD\1948200200_T0200_F03_Shallow.mxd Date Exported: 04/26/16 by cchelf

Quarter 1



Quarter 2



Quarter 3

Quarter 4

P:\19\1948200\GIS\MXD\1948200200_T0200_F04_Deep.mxd Date Exported: 04/26/16 by cchelf

Legend

MW-1B 6.40 — Deep Aquifer Monitoring Well and Groundwater Elevation (NAVD 88)

Inferred Groundwater Flow Direction, Deep Aquifer

6.50 — Inferred Groundwater Elevation Contours

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Q1 water level measurements taken on June 11, 2015 between 7:58 AM and 2:18 PM.
4. Q2 water level measurements taken on September 8, 2015 between 7:30 AM and 2:07 PM.
5. Q3 water level measurements taken on December 10, 2015 between 8:36 AM and 9:50 AM.
6. Q4 Water level measurements taken on March 8, 2016 between 8:34 AM and 9:47 AM
7. Groundwater elevation contours estimated using Surfer (Golden Software) 8.0 contouring software using the Natural Neighbor gridding method.
8. Groundwater elevations calculated based on survey data provided by PRS Group, Inc.

Data Source: Aerial from Google Earth Pro 2015

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

N W E S

50 0 50

Feet

Groundwater Elevations - Deep Aquifer
Quarters 1-4

PRS Plant
Tacoma, Washington

GEOENGINEERS

Figure 4

APPENDIX A

Laboratory Analytical Reports

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 28, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay Johnson

Case Narrative
Client Project: Groundwater Monitoring, Q-2
Spectra Projects: 2015060363, 2015060364

A total of nine analytical water samples were received on June 11, 2015 for a variety of analyses including Volatile Organic Compounds, PCB's, Petroleum Hydrocarbons, Metals, Nitrate and Sulfate. An additional sample was received the next day, although part of the same quarterly sampling event. In addition to the groundwater samples received, a trip blank was submitted each day along with the samples for VOC analysis. The samples were received cold and intact: 06/11/15 at 1655: Cooler temperature 3.5C, Sample temperature 14.1C. 06/12/15 at 1006: Cooler temperature not recorded, Sample temperature 8.2 C. On June 12, 2015 the client was contacted to confirm that NWTPH-Dx was to be run on all nine samples submitted on June 11, 2015, and that SGT-HEM was not needed. This was the case, as expected, based upon the previously submitted sampling plan. Additional aliquots of sample #1 (MW-1A-0615) were submitted for quality control purposes.

In the hardcopy of the analytical report, all analytes not detected at or above the Method Reporting Limit (MRL) are reported as "< X", where "X" is the reporting limit. The only analyte reported below the MRL was Benzene on Spectra sample #1 (Client ID MW-1A-0615). The reported value of 0.88 ug/L was J-flagged as an estimate, as it is below the MRL but above the MDL, and because this sample was run in duplicate, both spiked and unspiked. The duplicate Benzene value was measured right at the MRL, at 1.00 ug/L.

Quality control samples included, but were not limited to, trip blanks (for VOC's), method blanks, spiked blanks, also known as laboratory control samples (LCS), matrix spikes (MS), sample duplicates, and/or spiked duplicates (MSD). In most cases, precision was measured using spiked pairs (MS/MSD). This is to insure that there is a measureable quantity present for the computation of Relative Percent Difference (RPD). Although the Petroleum Hydrocarbon Methods suggest sample duplicates, spiked duplicates were chosen for the NWTPH-Dx analysis, as it was not anticipated to find diesel in the samples, and it seemed likely the unspiked sample and duplicate would yield non-detect results--as was in fact the case. Given the unknown nature of the VOC results, both a spiked and unspiked duplicate were performed.

Metals--Arsenic, Chromium, and Lead-- were analyzed by ICP-MS Method SW 846 6020A, with the collision cell. This was to eliminate potential interference from chloride, given the proximity of the sampling location to saltwater.

Full VOC analysis was performed on June 15, 2015 using the typical 5ml sparge. Additional aliquots were reanalyzed on June 23, 2015 for vinyl chloride using a 25ml sparge. This was done to achieve a Method Reporting Limit of 0.2 ug/L for vinyl chloride, which is the MTCA Method A limit for groundwater. Only the vinyl chloride result was reported from the 25ml sparge, as the large sample volume is not ideal for all analytes, nor necessary to achieve desired reporting limits.

Please feel free to call with any questions regarding these samples.

Sincerely

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

P.O.#:	2573
Project:	GW Monitoring 2nd Qtr 2015
Client ID:	MW-1A-0615
Sample Matrix:	Water
Date Sampled:	06/11/2015
Date Received:	06/11/2015
Spectra Project:	2015060363
Spectra Number:	1

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	34	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	46.2	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	3.0	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	0.88 J	µg/L	SW846 8260C

J = Estimated value. Result is below the MRL of 1.0 but above the MDL of 0.40 ug/L.

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Toluene-d8	107	NWTPH-G	1,2-Dichloroethane-d4	114	SW846 8260C
4-Bromofluorobenzene	120	NWTPH-G	4-Bromofluorobenzene	120	SW846 8260C
p-Terphenyl	99	NWTPH-D	Toluene-d8	102	SW846 8260C
Dibromofluoromethane	109	SW846 8260C	Decachlorobiphenyl	92	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: MW-1A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 1

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	2.24	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

J = Estimated value. Result is below the MRL of 1.0 but above the MDL of 0.40 ug/L.

Surrogate	Recovery	Method
Toluene-d8	107	NWTPH-G
4-Bromofluorobenzene	120	NWTPH-G
p-Terphenyl	99	NWTPH-D
Dibromofluoromethane	109	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	114	SW846 8260C
4-Bromofluorobenzene	120	SW846 8260C
Toluene-d8	102	SW846 8260C
Decachlorobiphenyl	92	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: MW-1B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number:2

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	2.3	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	12.9	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
4-Bromofluorobenzene	124	NWTPH-G	4-Bromofluorobenzene	120	SW846 8260C
Toluene-d8	107	NWTPH-G	Dibromofluoromethane	111	SW846 8260C
p-Terphenyl	95	NWTPH-D	Decachlorobiphenyl	86	SW846 8082A
1,2-Dichloroethane-d4	117	SW846 8260C	Toluene-d8	102	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: MW-1B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 2

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	124	NWTPH-G
Toluene-d8	107	NWTPH-G
p-Terphenyl	95	NWTPH-D
1,2-Dichloroethane-d4	117	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	120	SW846 8260C
Dibromofluoromethane	111	SW846 8260C
Decachlorobiphenyl	86	SW846 8082A
Toluene-d8	102	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: CO-3A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 3

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	7.8	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	3.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	14.6	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	1.6	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C	Toluene-d8	105	NWTPH-G
4-Bromofluorobenzene	115	SW846 8260C	Toluene-d8	101	SW846 8260C
p-Terphenyl	110	NWTPH-D	Decachlorobiphenyl	102	SW846 8082A
4-Bromofluorobenzene	116	NWTPH-G	Dibromofluoromethane	113	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

P.O.#:	2573
Project:	GW Monitoring 2nd Qtr 2015
Client ID:	CO-3A-0615
Sample Matrix:	Water
Date Sampled:	06/11/2015
Date Received:	06/11/2015
Spectra Project:	2015060363
Spectra Number:	3

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
4-Bromofluorobenzene	115	SW846 8260C
p-Terphenyl	110	NWTPH-D
4-Bromofluorobenzene	116	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	105	NWTPH-G
Toluene-d8	101	SW846 8260C
Decachlorobiphenyl	102	SW846 8082A
Dibromofluoromethane	113	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: CO-3B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 4

Analyte	Result	Units	Method
Nitrate	<0.01	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	47	mg/L	SM 4500-SO4 E
Arsenic	14.1	µg/L	SW846 6020A
Chromium	5.3	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.00	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.00	µg/L	SW846 8260C
4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
4-Bromofluorobenzene	120	SW846 8260C
p-Terphenyl	100	NWTPH-D
Toluene-d8	102	SW846 8260C
4-Bromofluorobenzene	125	NWTPH-G
Toluene-d8	107	NWTPH-G
Decachlorobiphenyl	89	SW846 8082A
Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: CO-3B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 4

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
4-Bromofluorobenzene	120	SW846 8260C
p-Terphenyl	100	NWTPH-D
Toluene-d8	102	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	125	NWTPH-G
Toluene-d8	107	NWTPH-G
Decachlorobiphenyl	89	SW846 8082A
Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-2A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 5

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	9.9	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	1.1	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	119	SW846 8260C	4-Bromofluorobenzene	119	NWTPH-G
4-Bromofluorobenzene	120	SW846 8260C	Toluene-d8	105	NWTPH-G
p-Terphenyl	107	NWTPH-D	Decachlorobiphenyl	102	SW846 8082A
Toluene-d8	101	SW846 8260C	Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-2A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 5

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	119	SW846 8260C
4-Bromofluorobenzene	120	SW846 8260C
p-Terphenyl	107	NWTPH-D
Toluene-d8	101	SW846 8260C
4-Bromofluorobenzene	119	NWTPH-G
Toluene-d8	105	NWTPH-G
Decachlorobiphenyl	102	SW846 8082A
Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: MW-3A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 6

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.45	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	2.1	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	38.2	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	1.4	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	120	SW846 8260C	4-Bromofluorobenzene	121	NWTPH-G
4-Bromofluorobenzene	117	SW846 8260C	Toluene-d8	106	NWTPH-G
p-Terphenyl	85	NWTPH-D	Decachlorobiphenyl	100	SW846 8082A
Toluene-d8	102	SW846 8260C	Dibromofluoromethane	118	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: MW-3A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 6

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	120	SW846 8260C
4-Bromofluorobenzene	117	SW846 8260C
p-Terphenyl	85	NWTPH-D
Toluene-d8	102	SW846 8260C
4-Bromofluorobenzene	121	NWTPH-G
Toluene-d8	106	NWTPH-G
Decachlorobiphenyl	100	SW846 8082A
Dibromofluoromethane	118	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-4B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 7

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	3.3	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	16.5	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	8.4	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C	4-Bromofluorobenzene	122	NWTPH-G
4-Bromofluorobenzene	119	SW846 8260C	Toluene-d8	106	NWTPH-G
p-Terphenyl	87	NWTPH-D	Decachlorobiphenyl	103	SW846 8082A
Toluene-d8	102	SW846 8260C	Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-4B-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 7

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	<1.00	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	119	SW846 8260C
p-Terphenyl	87	NWTPH-D
Toluene-d8	102	SW846 8260C
4-Bromofluorobenzene	122	NWTPH-G
Toluene-d8	106	NWTPH-G
Decachlorobiphenyl	103	SW846 8082A
Dibromofluoromethane	114	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

P.O.#:	2573
Project:	GW Monitoring 2nd Qtr 2015
Client ID:	SO-4A-0615
Sample Matrix:	Water
Date Sampled:	06/11/2015
Date Received:	06/11/2015
Spectra Project:	2015060363
Spectra Number:	8

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	0.04	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	50	µg/L	NWTPH-G
Sulfate	3.1	mg/L	SM 4500-SO4 E
Arsenic	273	µg/L	SW846 6020A
Chromium	1.2	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.00	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.00	µg/L	SW846 8260C
4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	1.39	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C
4-Bromofluorobenzene	114	SW846 8260C
p-Terphenyl	94	NWTPH-D
Toluene-d8	99	SW846 8260C
4-Bromofluorobenzene	118	NWTPH-G
Toluene-d8	104	NWTPH-G
Decachlorobiphenyl	101	SW846 8082A
Dibromofluoromethane	115	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-4A-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 8

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C	Styrene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C	Tetrachloroethene	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C	Toluene	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C	Total Xylenes	<2.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C	Trichloroethene	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C	Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C	Vinyl Acetate	<10	µg/L	SW846 8260C
Chlorobenzene	14.7	µg/L	SW846 8260C	Vinyl chloride	0.90	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C	cis-1,2-Dichloroethene	2.70	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C	cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C	n-Butylbenzene	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C	n-Propylbenzene	<1.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C	sec-Butylbenzene	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C	tert-Butylbenzene	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C	trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C	trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C				
Isopropylbenzene	<1.00	µg/L	SW846 8260C				
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C				
Methylene chloride	<5.00	µg/L	SW846 8260C				
Naphthalene	<1.00	µg/L	SW846 8260C				

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C	4-Bromofluorobenzene	118	NWTPH-G
4-Bromofluorobenzene	114	SW846 8260C	Toluene-d8	104	NWTPH-G
p-Terphenyl	94	NWTPH-D	Decachlorobiphenyl	101	SW846 8082A
Toluene-d8	99	SW846 8260C	Dibromofluoromethane	115	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-4A-9-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 9

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.07	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.00	µg/L	SW846 8260C
Gasoline	52	µg/L	NWTPH-G	1,2-Dichloropropane	<1.00	µg/L	SW846 8260C
Sulfate	7.8	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C
Arsenic	280	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C
Chromium	1.3	µg/L	SW846 6020A	1,3-Dichloropropane	<1.00	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.00	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	1.47	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C	4-Bromofluorobenzene	116	NWTPH-G
4-Bromofluorobenzene	114	SW846 8260C	Toluene-d8	105	NWTPH-G
p-Terphenyl	80	NWTPH-D	Decachlorobiphenyl	98	SW846 8082A
Toluene-d8	100	SW846 8260C	Dibromofluoromethane	118	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: SO-4A-9-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 9

Analyte	Result	Units	Method
Bromobenzene	<1.00	µg/L	SW846 8260C
Bromochloromethane	<1.00	µg/L	SW846 8260C
Bromodichloromethane	<1.00	µg/L	SW846 8260C
Bromoform	<1.00	µg/L	SW846 8260C
Bromomethane	<1.00	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
Chlorobenzene	15.6	µg/L	SW846 8260C
Chlorodibromomethane	<1.00	µg/L	SW846 8260C
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	0.80	µg/L	SW846 8260C
cis-1,2-Dichloroethene	2.86	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
4-Bromofluorobenzene	114	SW846 8260C
p-Terphenyl	80	NWTPH-D
Toluene-d8	100	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	116	NWTPH-G
Toluene-d8	105	NWTPH-G
Decachlorobiphenyl	98	SW846 8082A
Dibromofluoromethane	118	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: TPI-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 10

Analyte	Result	Units	Method	Analyte	Result	Units	Method
1,1,1,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.00	µg/L	SW846 8260C	2-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.00	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.00	µg/L	SW846 8260C	4-Chlorotoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloroethene	<1.00	µg/L	SW846 8260C	4-Isopropyltoluene	<1.00	µg/L	SW846 8260C
1,1-Dichloropropene	<1.00	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.00	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.00	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.00	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.00	µg/L	SW846 8260C	Bromobenzene	<1.00	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.00	µg/L	SW846 8260C	Bromochloromethane	<1.00	µg/L	SW846 8260C
1,2-Dichloroethane	<1.00	µg/L	SW846 8260C	Bromodichloromethane	<1.00	µg/L	SW846 8260C
1,2-Dichloropropane	<1.00	µg/L	SW846 8260C	Bromoform	<1.00	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.00	µg/L	SW846 8260C	Bromomethane	<1.00	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.00	µg/L	SW846 8260C	Carbon Disulfide	<10	µg/L	SW846 8260C
1,3-Dichloropropane	<1.00	µg/L	SW846 8260C	Carbon Tetrachloride	<1.00	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.00	µg/L	SW846 8260C	Chlorobenzene	<1.00	µg/L	SW846 8260C
2,2-Dichloropropane	<1.00	µg/L	SW846 8260C	Chlorodibromomethane	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	108	SW846 8260C
1,2-Dichloroethane-d4	112	SW846 8260C
4-Bromofluorobenzene	121	SW846 8260C
Toluene-d8	102	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

08/12/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

P.O.#: 2573
Project: GW Monitoring 2nd Qtr 2015
Client ID: TPI-0615
Sample Matrix: Water
Date Sampled: 06/11/2015
Date Received: 06/11/2015
Spectra Project: 2015060363
Spectra Number: 10

Analyte	Result	Units	Method
Chloroethane	<2.00	µg/L	SW846 8260C
Chloroform	<1.00	µg/L	SW846 8260C
Chloromethane	<2.00	µg/L	SW846 8260C
Dibromomethane	<1.00	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.00	µg/L	SW846 8260C
Ethylbenzene	<1.00	µg/L	SW846 8260C
Hexachlorobutadiene	<1.00	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.00	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.00	µg/L	SW846 8260C
Methylene chloride	<5.00	µg/L	SW846 8260C
Naphthalene	<1.00	µg/L	SW846 8260C
Styrene	<1.00	µg/L	SW846 8260C
Tetrachloroethene	<1.00	µg/L	SW846 8260C
Toluene	<1.00	µg/L	SW846 8260C
Total Xylenes	<2.00	µg/L	SW846 8260C
Trichloroethene	<1.00	µg/L	SW846 8260C
Trichlorofluoromethane	<1.00	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C
n-Butylbenzene	<1.00	µg/L	SW846 8260C
n-Propylbenzene	<1.00	µg/L	SW846 8260C
sec-Butylbenzene	<1.00	µg/L	SW846 8260C
tert-Butylbenzene	<1.00	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.00	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.00	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	108	SW846 8260C
1,2-Dichloroethane-d4	112	SW846 8260C
4-Bromofluorobenzene	121	SW846 8260C
Toluene-d8	102	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Spectra Project:
Spectra #
Applies to Sample #1-10

Date Received: 6/11/2015
Date Analyzed: 6/16/2015
Dilution: 1
< = less than
2015060363
Method Blank

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10.00	trans-1,2,-Dichloroethene	< 1.00
Acetonitrile	< 10.00	1,2-Dichloropropane	< 1.00
Acrolein	< 10.00	1,3-Dichloropropane	< 1.00
Acrylonitrile	< 10.00	cis-1,3-Dichloropropene	< 1.00
Benzene	< 1.00	trans-1,3-Dichloropropene	< 1.00
Bromobenzene	< 1.00	2,2-Dichloropropane	< 1.00
Bromochloromethane	< 1.00	1,1-Dichloropropene	< 1.00
Bromodichloromethane	< 1.00	Ethylbenzene	< 1.00
Bromoform	< 1.00	2-Hexanone (MBK)	< 10.00
Bromomethane	< 1.00	Hexachlorobutadiene	< 1.00
2-Butanone (MEK)	< 10.00	Iodomethane	< 10.00
n-Butylbenzene	< 1.00	Isopropylbenzene	< 1.00
sec-Butylbenzene	< 1.00	p-Isopropyltoluene	< 1.00
tert-Butylbenzene	< 1.00	Methylene chloride	< 5.00
Carbon Disulfide	< 10.00	4-Methyl-2-pentanone (MIBK)	< 10.00
Carbon tetrachloride	< 1.00	MTBE	< 1.00
Chlorobenzene	< 1.00	Naphthalene	< 1.00
Chlorodibromomethane	< 1.00	n-Propylbenzene	< 1.00
Chloroethane	< 2.00	Styrene	< 1.00
2-Chloroethyl Vinyl ether	< 10.00	1,1,1,2-Tetrachloroethane	< 1.00
Chloroform	< 1.00	1,1,2,2-Tetrachloroethane	< 1.00
Chloromethane	< 2.00	Tetrachloroethene	< 1.00
2-Chlorotoluene	< 1.00	Toluene	< 1.00
4-Chlorotoluene	< 1.00	Total Xylenes	< 2.00
1,2-Dibromo-3-Chloropropane (DBCP)	< 10.00	1,2,3-Trichlorobenzene	< 1.00
1,2-Dibromoethane (EDB)	< 1.00	1,2,4-Trichlorobenzene	< 1.00
Dibromomethane	< 1.00	1,1,1-Trichloroethane	< 1.00
1,2-Dichlorobenzene	< 1.00	1,1,2-Trichloroethane	< 1.00
1,3-Dichlorobenzene	< 1.00	Trichloroethene	< 1.00
1,4-Dichlorobenzene	< 1.00	Trichlorofluoromethane	< 1.00
Dichlorodifluoromethane	< 1.00	1,2,3-Trichloropropane	< 1.00
1,1-Dichloroethane	< 1.00	1,2,4-Trimethylbenzene	< 1.00
1,2-Dichloroethane	< 1.00	1,3,5-Trimethylbenzene	< 1.00
1,1-Dichloroethene	< 1.00	Vinyl Acetate	< 10.00
cis-1,2-Dichloroethene	< 1.00	Vinyl chloride	< 0.20

SURROGATE RECOVERIES

Dibromofluoromethane	106	%
1,2-Dichloroethane-d4	109	%
Toluene-d8	103	%
4-Bromofluorobenzene	121	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 28, 2015

Petroleum Reclaiming Service, Inc.	Sample matrix: Water	Date Received: 6/11/2015
3003 Taylor Way		Date Analyzed: 6/15/2015
Tacoma, WA 98421		Dilution: 1
Attn: Jay		< = less than
	Spectra Project:	**2015060363**
	Spectra #	**2015060363-1 Duplicate**
	Applies to Sample #1-10	

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10.00	trans-1,2,-Dichloroethene	< 1.00
Acetonitrile	< 10.00	1,2-Dichloropropane	< 1.00
Acrolein	< 10.00	1,3-Dichloropropane	< 1.00
Acrylonitrile	< 10.00	cis-1,3-Dichloropropene	< 1.00
Benzene	1.00	trans-1,3-Dichloropropene	< 1.00
Bromobenzene	< 1.00	2,2-Dichloropropane	< 1.00
Bromochloromethane	< 1.00	1,1-Dichloropropene	< 1.00
Bromodichloromethane	< 1.00	Ethylbenzene	< 1.00
Bromoform	< 1.00	2-Hexanone (MBK)	< 10.00
Bromomethane	< 1.00	Hexachlorobutadiene	< 1.00
2-Butanone (MEK)	< 10.00	Iodomethane	< 10.00
n-Butylbenzene	< 1.00	Isopropylbenzene	< 1.00
sec-Butylbenzene	< 1.00	p-Isopropyltoluene	< 1.00
tert-Butylbenzene	< 1.00	Methylene chloride	< 5.00
Carbon Disulfide	< 10.00	4-Methyl-2-pentanone (MIBK)	< 10.00
Carbon tetrachloride	< 1.00	MTBE	2.19
Chlorobenzene	< 1.00	Naphthalene	< 1.00
Chlorodibromomethane	< 1.00	n-Propylbenzene	< 1.00
Chloroethane	< 2.00	Styrene	< 1.00
2-Chloroethyl Vinyl ether	< 10.00	1,1,1,2-Tetrachloroethane	< 1.00
Chloroform	< 1.00	1,1,2,2-Tetrachloroethane	< 1.00
Chloromethane	< 2.00	Tetrachloroethene	< 1.00
2-Chlorotoluene	< 1.00	Toluene	< 1.00
4-Chlorotoluene	< 1.00	Total Xylenes	< 2.00
1,2-Dibromo-3-Chloropropane (DBCP)	< 10.00	1,2,3-Trichlorobenzene	< 1.00
1,2-Dibromoethane (EDB)	< 1.00	1,2,4-Trichlorobenzene	< 1.00
Dibromomethane	< 1.00	1,1,1-Trichloroethane	< 1.00
1,2-Dichlorobenzene	< 1.00	1,1,2-Trichloroethane	< 1.00
1,3-Dichlorobenzene	< 1.00	Trichloroethene	< 1.00
1,4-Dichlorobenzene	< 1.00	Trichlorofluoromethane	< 1.00
Dichlorodifluoromethane	< 1.00	1,2,3-Trichloropropane	< 1.00
1,1-Dichloroethane	< 1.00	1,2,4-Trimethylbenzene	< 1.00
1,2-Dichloroethane	< 1.00	1,3,5-Trimethylbenzene	< 1.00
1,1-Dichloroethene	< 1.00	Vinyl Acetate	< 10.00
cis-1,2-Dichloroethene	< 1.00	Vinyl chloride	< 0.20

SURROGATE RECOVERIES

Dibromofluoromethane	110	%
1,2-Dichloroethane-d4	116	%
Toluene-d8	102	%
4-Bromofluorobenzene	114	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 30, 2015

		Date Received:	6/11/2015
		Date Analyzed:	6/23/2015
Petroleum Reclaiming Service, Inc.	Sample matrix: Water	Dilution:	1
3003 Taylor Way		< = less than	
Tacoma, WA 98421	**Spectra Project:**	**2015060363**	
Attn: Jay	**Spectra #**	**Method Blank**	
	Applies to Sample #1-9	**25ml Sparge--Vinyl Chloride**	

VOLATILE ORGANIC ANALYSIS		**METHOD 624/8260**
Compound	ug/L	25 ml Sparge
Vinyl Chloride	< 0.20	

SURROGATE RECOVERIES

Dibromofluoromethane	104	%
1,2-Dichloroethane-d4	104	%
Toluene-d8	94	%
4-Bromofluorobenzene	98	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 28, 2015

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/ 8260C
Spectra Project: 2015060363
Date Analyzed: 6/15/2015
Units: ug/L
Applies to Spectra #'s: #1-10

GCMS VOLATILE ORGANIC ANALYSIS
Laboratory Control Sample (LCS) Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	SPIKE RESULT	LCS %REC
1,1-Dichloroethene	<1	10.00	8.01	80
Benzene	<1	10.00	9.31	93
Trichloroethene	<1	10.00	9.23	92
Toluene	<1	10.00	9.66	97
Chlorobenzene	<1	10.00	10.05	101

Surrogate Recoveries (%)	LCS
Dibromofluoromethane	101
1,2-Dichloroethane-d4	104
Toluene-d8	103
4-Bromofluorobenzene	116

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/8260C
Spectra Project: 2015060363
Date Analyzed: 6/15/2015
Units: ug/L
Applies to Spectra #'s: #1-10
Spiked Sample 2015060363-1

GCMS VOLATILE ORGANIC ANALYSIS
Matrix Spike/ Matrix Spike Duplicate Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	MS RESULT	MS %REC	MSD RESULT	MSD %REC	RPD
1,1-Dichloroethene	<1	10.0	8.43	84	8.57	86	1.6
Benzene	0.88	10.0	10.66	98	10.83	100	1.7
Trichloroethene	<1	10.0	9.45	95	9.49	95	0.4
Toluene	<1	10.0	9.86	99	9.97	100	1.1
Chlorobenzene	<1	10.0	10.52	105	10.42	104	1.0
(Results after dilution)							

Surrogates	MS	MSD
Dibromofluoromethane	117	113
1,2-Dichloroethane-d4	124	123
Toluene-d8	101	102
4-Bromofluorobenzene	113	116

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 608
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015060363
Applies to Spectra # 1-5

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 060363-1

Date Extracted: 6/30/2015
Date Analyzed: 7/1/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.70	140%	0.73	146%	4%

BLANK SPIKE (LCS)

Date Extracted: 6/18/2015 Date Analyzed: 6/29/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.635	127.0

METHOD BLANK

Date Extracted: 6/18/2015 Date Analyzed: 6/29/2015

PCB's <0.1

Surrogate Percent Recoveries:

Decachlorobiphenyl 107%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 608
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015060363
Applies to Spectra # 6-9

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 060363-1

Date Extracted: 6/30/2015
Date Analyzed: 7/1/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.70	140%	0.73	146%	4%

BLANK SPIKE (LCS)

Date Extracted: 6/26/2015
Date Analyzed: 6/29/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.72	144.0

METHOD BLANK

Date Extracted: 6/26/2015
Date Analyzed: 6/29/2015

PCB's <0.1

Surrogate Percent Recoveries:

Decachlorobiphenyl 96%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 29, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method:	NWTPH-G
Sample Matrix:	Water
Units:	ug/L
Spectra Project:	2015060363
Applies to Spectra #	1-9

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

DUPLICATE

Duplicate Sample # 2015060363-1
Date Analyzed: 6/15/2015

Compound	Sample Result	Duplicate Result	RPD
Gasoline	<50	<50	0

BLANK SPIKE (LCS)

Date Analyzed 6/15/2015

	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
LCS	<50	250	280	112

Surrogate Recoveries:

Toluene-d8	101
BFB	132

METHOD BLANK

Date Analyzed 6/15/2015

WTPH-G <50

Surrogate Recoveries:

Toluene-d8	107
BFB	121

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 29, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method:	NWTPH-Dx
Sample Matrix:	Water
Spectra Project:	2015060363
Applies to Spectra #:	1-5
Units:	ug/L

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2015060363-1

Date Extracted: 6/25/2015
Date Analyzed: 6/26/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	% RPD
Diesel	<100	2500	2275	91	2248	90	1

BLANK SPIKE (LCS)

Date Extracted: 6/19/2015
Date Analyzed: 6/26/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	2184	87.4

Surrogate Percent Recoveries:

p-terphenyl 99%

METHOD BLANK

Date Extracted: 6/19/2015
Date Analyzed: 6/26/2015

WTPH-D	<100
Heavy Oils	<500

Surrogate Percent Recoveries:

p-terphenyl 98%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 29, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-Dx
Sample Matrix: Water
Spectra Project: 2015060363
Applies to Spectra #: 6-9
Units: ug/L

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2015060363-1

Date Extracted: 6/25/2015
Date Analyzed: 6/26/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	% RPD
Diesel	<100	2500	2275	91	2248	90	1

BLANK SPIKE (LCS)

Date Extracted: 6/25/2015
Date Analyzed: 6/26/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	2254	90.2

Surrogate Percent Recoveries:

p-terphenyl 97%

METHOD BLANK

Date Extracted: 6/25/2015
Date Analyzed: 6/26/2015

WTPH-D <100

Heavy Oils <500

Surrogate Percent Recoveries:

p-terphenyl 87%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

June 18, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	ug/L
Spectra Project:	2015060363
Applies to Spectra #'s	1-9

QUALITY CONTROL RESULTS

ICP-MS Metals - EPA Method 200.8 - Water

Laboratory Fortified Blank (LFB)

Date Digested: 6/18/2015 Date Analyzed: 6/18/2015

Element	CAS #	Result
Arsenic	7440-38-2	< 0.5
Chromium	7440-47-3	< 0.5
Lead	7439-92-1	< 0.5

Laboratory Fortified Blank (LFB)

Date Digested: 6/18/2015 Date Analyzed: 6/18/2015

Element	Spike Added	LCS Conc.	LCS %Rec
Arsenic	100.0	96.46	96.5
Chromium	100.0	94.37	94.4
Lead	100.0	97.71	97.7

LCS Recovery limits 85-115%

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Digested: 6/18/2015 Date Analyzed: 6/18/2015
Sample Spiked: 2015060317-1

Element	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Arsenic	0.80	100.0	97.66	96.9	97.07	96.3	0.6
Chromium	2.38	100.0	93.16	90.8	92.67	90.3	0.5
Lead	2.52	100.0	111.50	109.0	104.50	102.0	6.6

Recovery Limits 70-130%
RPD Limit 20

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units: mg/L
Spectra Project: 2015060363
Applies to Samples: #1-9

QUALITY CONTROL RESULTS

Nitrate Method Colorimetric Easy 1-Reagent

Method Blank

Date Analyzed: 6/12/15

	Result	
Nitrate as N	<0.01	mg/L

Blank Spike (LCS)

Date Analyzed: 6/12/15

	Spike Added	LCS Conc.	LCS %Rec
Nitrate as N	0.50	0.498	99.6

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Analyzed: 6/12/15

Sample Spiked: 2015060363-1

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Nitrate as N	0.01	0.50	0.46	89.8	0.44	86.2	4.09

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

July 20, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	mg/L
Spectra Project:	2015060363
Applies to Samples:	1-9

QUALITY CONTROL RESULTS
Sulfate Method AASHTO T290/375.4/SM 4500E

Method Blank

Date Analyzed: 6/17/15

	Result	
Sulfate	<2.0	mg/L

Blank Spike (LCS)

Date Analyzed: 6/17/15

	Spike Added	LCS Conc.	LCS %Rec
Sulfate	25.0	23.6	94.4

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Analyzed: 6/17/15

Sample Spiked: 2015060363-1

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Sulfate	33.6	25	53.7	80.4	54.7	84.4	4.85

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

2015060323

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

CHAIN of CUSTODY

STANDARD [X] RUSH [ ]

CLIENT: PRS Group

ADDRESS:

ADDRESS CHANGE [ ]

PROJECT: Ground Water Monitoring 2nd qtr 20

CONTACT: Jay/Nick @geoEngineers

PHONE: 253-383-4175/253-7 FAX:

e-MAIL: jay@prsplant.net - nrohrbach@ge

Prefer FAX [ ] or e-MAIL [X]

PURCHASE ORDER # 2573

#	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-G	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)	8260/624 VOA 8260B	8260 CHLOR SOLVENTS	8270/625 SEMI VOA	8270 PAH/PNA	8082/608 PCB
1	MW-1A-0615	6/11/15	0900	W	21				X	X			X				X
2	MW-1B-0615	↓	0905	W	7				X	X			X				X
3	CO-3A-0615		1050	W	7				X	X			X				X
4	CO-3B-0615		1100	W	7				X	X			X				X
5	SO-2A-0615		1315	W	7				X	X			X				X
6	MW-3A-0615		1325	W	7				X	X			X				X
7	SO-4B-0615		1745	W	7				X		X		X				X
8	SO-4A-0615		1505	W	7				X		X		X				X
9	SO-4A-9-0615		1510	W	7				X		X		X				X
0	TPI-0615	↓											X				

#	TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) ①	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)	Cu, Zn, Ni	PH 9040/9045	TX/TOX 9076	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	Grain Size (Subcontract)	% solids	fecal chloroform	Nitrate 353.2	Sulfate 335.4
1		X													X	X
2		X													X	X
3		X													X	X
4		X													X	X
5		X													X	X
6		X													X	X
7		X													X	X
8		X													X	X
9		X													X	X
0																

SPECIAL INSTRUCTIONS/COMMENTS:

① Cu, As, Pb

MW-1A-0615 MS/MSD

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	[signature]	John Dach	GEI	6/11/15	1655
RECEIVED BY	[signature]	Lori Hamilton	Spectra	6-11-15	4:55
RELINQUISHED BY					
RECEIVED BY					

RETURN SAMPLES [ ] (Shipping Fee Applies) DISPOSE SAMPLES [X]

Payment Terms: Net 30 days. Past due accounts subject to 1 1/2 % per month interest. Customer agrees to pay all costs of collection including reasonable attorney's fees and all other costs of collection regardless of whether suit is filed in Pierce Co., WA venue. *Spectra Analytical, Inc.*

Spectra Laboratories
Sample Receiving Checklist

Client PRS Group   Spectra Project # 2015060363

Project Name Groundwater Mon. 2nd Qtr 2015

Received Date: 6-11-15 Received Time: 4:55 pm By MJN

Shipped via: UPS USPS FEDEX Hand Delivered Other

Tracking Number

Papers/Cooler:

Type of shipping container: Cooler Box None Other 4 large Coolers

Cooler Temperature 3.5 °C Sample Temperature 14.1 °C

Custody papers included?.. Yes No

Were custody papers properly filled out (ink, signed, etc)?.......... Yes No N/A

Custody Seals:

Were custody seals on outside of samples/containers?................Yes No

Intact?..Yes No N/A

Custody seal info (date/name/label)

LOGIN:

Were Papers/Bottle labels legible?.......................................Yes No N/A

Did all bottle labels and tags agree with custody papers?..............Yes No N/A

Did all sample containers arrive in good condition (unbroken, etc)..Yes No

Was sufficient amount of sample sent for the tests indicated?........Yes No N/A

Were the bottles provided correct for the analyses requested?........Yes No

Were VOA vials free of air bubbles?......................................Yes No N/A

Was correct preservation added to samples?............................Yes No N/A

If no, Sample Control added preservative to the following:

Sample Number	Reagent	Analyte

Explain any discrepancies: Samples 7-9 marked for Method 1664-SGT-HEM on C.O.C. Client contacted, indicated test should be NWTPH-Dx, as for other samples. ~SH

Initials: [illegible]   Date: 06/12/15

Word Users/sample management/sample management/sample check in doc

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

October 30, 2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay Johnson

Case Narrative
Client Project: Groundwater Monitoring, Q-2*
*(Sampling Event #2 of 2015)
Spectra Project: 2015090231

A total of nine analytical water samples collected over a two-day period--09/08/15 & 09/09/15-- were received on September 09, 2015 for a variety of analyses including Volatile Organic Compounds, PCB's, NWTH-Dx, Metals, Nitrate and Sulfate. In addition to the groundwater samples received, a trip blank was also submitted for VOC analysis. The samples were received cold and intact on 09/09/15 at 1210: Cooler temperature 10.4 C; Sample temperature 7.6 C. Additional aliquots of sample #1 (MW-1A-150908) were submitted for quality control purposes.

In the hardcopy of the analytical report, all analytes not detected at or above the Method Reporting Limit (MRL) are reported as "< X", where "X" is the reporting limit.

Quality control samples included, but were not limited to, trip blanks (for VOC's), method blanks, spiked blanks, also known as laboratory control samples (LCS), matrix spikes (MS), sample duplicates, and/or spiked duplicates (MSD). In most cases, precision was measured using spiked pairs (MS/MSD). This is to insure that there is a measureable quantity present for the computation of Relative Percent Difference (RPD). Although the Petroleum Hydrocarbon Methods suggest sample duplicates, spiked duplicates were chosen for the NWTPH-Dx analysis, as no diesel-range organics were found in the samples from the previous quarter, and it seemed likely that an unspiked sample and duplicate would yield non-detect results--as was in fact the case. As was done for the June, 2015 samples, both a spiked and unspiked duplicate were performed for VOC's. The unspiked duplicate for VOC's was performed using the 5ml sparge on sample MW-1A. A duplicate 25ml sparge was not performed on this sample, which was non-detect for vinyl chloride. However, sample #SO-4A showed reportable amounts of vinyl chloride from both the 25ml sparge, at 1.17 ug/L, and the 5ml sparge, at 1.22ug/L, for an RPD of 4.2%.

Metals--Arsenic, Chromium, and Lead-- were analyzed by ICP-MS Method SW 846 6020A, with the collision cell. This was to eliminate potential interference from chloride, given the proximity of the sampling location to saltwater.

VOC analysis was performed in two ways: using the typical 5ml sparge for all analytes except vinyl chloride, and using a 25ml sparge specifically for vinyl chloride. This was done to achieve a Method Reporting Limit of 0.2 ug/L for vinyl chloride, which is the MTCA Method A limit for groundwater. Only the vinyl chloride result was reported from the 25ml sparge, as the large sample volume is not ideal for all analytes, nor necessary to achieve desired reporting limits.

Please feel free to call with any questions regarding these samples.

Sincerely

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-1A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 1

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	54.3	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	4.3	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Toluene-d8	98	NWTPH-G	1,2-Dichloroethane-d4	119	SW846 8260C
4-Bromofluorobenzene	107	NWTPH-G	4-Bromofluorobenzene	93	SW846 8260C
p-Terphenyl	82	NWTPH-D	Toluene-d8	85	SW846 8260C
Dibromofluoromethane	124	SW846 8260C	Decachlorobiphenyl	79	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-1A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 1

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	98	NWTPH-G
4-Bromofluorobenzene	107	NWTPH-G
p-Terphenyl	82	NWTPH-D
Dibromofluoromethane	124	SW846 8260C
1,2-Dichloroethane-d4	119	SW846 8260C
4-Bromofluorobenzene	93	SW846 8260C
Toluene-d8	85	SW846 8260C
Decachlorobiphenyl	79	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-1B-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:2

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	2.3	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	14.0	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
p-Terphenyl	81	NWTPH-D	1,2-Dichloroethane-d4	112	SW846 8260C
4-Bromofluorobenzene	114	NWTPH-G	4-Bromofluorobenzene	101	SW846 8260C
Toluene-d8	102	NWTPH-G	Decachlorobiphenyl	82	SW846 8082A
Dibromofluoromethane	116	SW846 8260C	Toluene-d8	88	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-1B-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:2

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	81	NWTPH-D
4-Bromofluorobenzene	114	NWTPH-G
Toluene-d8	102	NWTPH-G
Dibromofluoromethane	116	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	112	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	82	SW846 8082A
Toluene-d8	88	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-2A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:3

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	< 2.0	mg/L	SM 4500-SO4 E
Arsenic	39.0	µg/L	SW846 6020A
Chromium	1.1	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	77	NWTPH-D
4-Bromofluorobenzene	115	NWTPH-G
Toluene-d8	89	SW846 8260C
Toluene-d8	103	NWTPH-G

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	120	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	122	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-2A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:3

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	2.3	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	77	NWTPH-D
4-Bromofluorobenzene	115	NWTPH-G
Toluene-d8	89	SW846 8260C
Toluene-d8	103	NWTPH-G
1,2-Dichloroethane-d4	120	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	122	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: SO-4A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 4

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	55	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	46.9	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	< 0.5	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	1.5	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
p-Terphenyl	81	NWTPH-D	1,2-Dichloroethane-d4	115	SW846 8260C
Toluene-d8	86	SW846 8260C	4-Bromofluorobenzene	98	SW846 8260C
4-Bromofluorobenzene	106	NWTPH-G	Decachlorobiphenyl	85	SW846 8082A
Toluene-d8	99	NWTPH-G	Dibromofluoromethane	123	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: SO-4A-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:4

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	15.9	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	1.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	1.9	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	81	NWTPH-D
Toluene-d8	86	SW846 8260C
4-Bromofluorobenzene	106	NWTPH-G
Toluene-d8	99	NWTPH-G

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	115	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Decachlorobiphenyl	85	SW846 8082A
Dibromofluoromethane	123	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

12/03/2015

Project: Ground Water Monitoring
Client ID: SO-4B-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:5

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	18.3	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	8.2	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
p-Terphenyl	85	NWTPH-D	1,2-Dichloroethane-d4	122	SW846 8260C
Toluene-d8	91	SW846 8260C	4-Bromofluorobenzene	103	SW846 8260C
4-Bromofluorobenzene	121	NWTPH-G	Decachlorobiphenyl	97	SW846 8082A
Toluene-d8	105	NWTPH-G	Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: SO-4B-150908
Sample Matrix: Water
Date Sampled: 09/08/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 5

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	85	NWTPH-D
Toluene-d8	91	SW846 8260C
4-Bromofluorobenzene	121	NWTPH-G
Toluene-d8	105	NWTPH-G

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
4-Bromofluorobenzene	103	SW846 8260C
Decachlorobiphenyl	97	SW846 8082A
Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Project:	Ground Water Monitoring
Client ID:	CO-3B-150909
Sample Matrix:	Water
Date Sampled:	09/09/2015
Date Received:	09/09/2015
Spectra Project:	2015090231
Spectra Number:	6

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	2.2	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	12.7	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	3.9	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C	Toluene-d8	100	NWTPH-G
p-Terphenyl	83	NWTPH-D	4-Bromofluorobenzene	98	SW846 8260C
Toluene-d8	87	SW846 8260C	Decachlorobiphenyl	88	SW846 8082A
4-Bromofluorobenzene	112	NWTPH-G	Dibromofluoromethane	125	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: CO-3B-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:6

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
p-Terphenyl	83	NWTPH-D
Toluene-d8	87	SW846 8260C
4-Bromofluorobenzene	112	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	100	NWTPH-G
4-Bromofluorobenzene	98	SW846 8260C
Decachlorobiphenyl	88	SW846 8082A
Dibromofluoromethane	125	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: CO-3A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 7

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	13.3	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	0.7	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C	Toluene-d8	100	NWTPH-G
p-Terphenyl	94	NWTPH-D	4-Bromofluorobenzene	104	SW846 8260C
Toluene-d8	86	SW846 8260C	Decachlorobiphenyl	93	SW846 8082A
4-Bromofluorobenzene	115	NWTPH-G	Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: CO-3A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 7

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
p-Terphenyl	94	NWTPH-D
Toluene-d8	86	SW846 8260C
4-Bromofluorobenzene	115	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	100	NWTPH-G
4-Bromofluorobenzene	104	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A
Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-3A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 8

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	< 2.0	mg/L	SM 4500-SO4 E
Arsenic	57.2	µg/L	SW846 6020A
Chromium	1.6	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
p-Terphenyl	90	NWTPH-D
Toluene-d8	88	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G
Toluene-d8	102	NWTPH-G
4-Bromofluorobenzene	110	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: MW-3A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 8

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
p-Terphenyl	90	NWTPH-D
Toluene-d8	88	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	102	NWTPH-G
4-Bromofluorobenzene	110	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	124	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: SO-2A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:9

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	< 2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	3.4	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	0.7	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	115	SW846 8260C	Toluene-d8	104	NWTPH-G
p-Terphenyl	79	NWTPH-D	4-Bromofluorobenzene	105	SW846 8260C
Toluene-d8	90	SW846 8260C	Decachlorobiphenyl	87	SW846 8082A
4-Bromofluorobenzene	118	NWTPH-G	Dibromofluoromethane	115	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: SO-2A-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number:9

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	115	SW846 8260C
p-Terphenyl	79	NWTPH-D
Toluene-d8	90	SW846 8260C
4-Bromofluorobenzene	118	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	104	NWTPH-G
4-Bromofluorobenzene	105	SW846 8260C
Decachlorobiphenyl	87	SW846 8082A
Dibromofluoromethane	115	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: TB-1-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 10

Analyte	Result	Units	Method	Analyte	Result	Units	Method
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C	Bromobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Bromochloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C	Bromodichloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C	Bromoform	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Bromomethane	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Carbon Disulfide	<10	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C	Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Chlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C	Chlorodibromomethane	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
1,2-Dichloroethane-d4	119	SW846 8260C
Toluene-d8	87	SW846 8260C
4-Bromofluorobenzene	103	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/03/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Ground Water Monitoring
Client ID: TB-1-150909
Sample Matrix: Water
Date Sampled: 09/09/2015
Date Received: 09/09/2015
Spectra Project: 2015090231
Spectra Number: 10

Analyte	Result	Units	Method
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
1,2-Dichloroethane-d4	119	SW846 8260C
Toluene-d8	87	SW846 8260C
4-Bromofluorobenzene	103	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
2221 Ross Way, Tacoma, WA 98421
(253) 272-4850 Fax (253) 572-9838
www.spectra-lab.com info@spectra-lab.com

SPECIAL INSTRUCTIONS/COMMENTS:
① Cr, As, Pb
mw-1A-150908 has ms/msp

Return Samples Y N x Page 1 of 1

CHAIN of CUSTODY

SPECTRA PROJECT # W1509023l

STANDARD X RUSH

ADDRESS CHANGE ☐

CLIENT: PRS Group ADDRESS: 3003 Taylor Way
PROJECT: Ground Water Monitoring
CONTACT: JAY/NICK @ GeoEngineers
SAMPLED BY: Paul Robinette
PHONE: 253-383-4175 FAX:
e-MAIL: jay@prsplant.net nrohrbach@geoengineers.com Prefer FAX ☐ or e-MAIL ☒
PURCHASE ORDER #:

	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	HYDROCARBONS: NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-G	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)	ORGANICS: 8260/624 VOA 8260B	8260 CHLOR SOLVENTS	8270/625 SEMI VOA	8270 PAH/PNA	8082/608 PCB	METALS: TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) ①	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)	OTHER: PH 9040/9045	TX/TOX 9076	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	Nitrate 353.3	Sulfate 375.4
1	mw-1A-150908	9/8	1015	w	21				X	X			X				X		X									X	X
2	mw-1B-150908	9/8	1125	w	7				X	X			X				X		X									X	X
3	mw-2A-150908	9/8	1225	w	7				X	X			X				X		X									X	X
4	SO-4A-150908	9/8	1340	w	7				X	X			X				X		X									X	X
5	SO-4B-150908	9/8	1440	w	7				X	X			X				X		X									X	X
6	CO-3B-150909	9/9	0815	w	6				X	X			X				X		X									X	X
7	CO-3A-150909	9/9	0905	w	6				X	X			X				X		X									X	X
8	mw-3A-150909	9/9	1020	w	6				X	X			X				X		X									X	X
9	SO-2A-150909	9/9	1120	w	6				X	X			X				X		X									X	X
0	TB-1-150909	9/9		w	2								X																

LAB USE ONLY
Shipped Via: US Mail UPS Fed Ex Courier Client
Shipping Container: Cooler Box Envelope None
Tracking #
Custody Seals Y N Intact: Y N
Cooler Temp. 10.4 Sample Temp. 7.6

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	Paul Robinette	Paul Robinette	GEI	9/9/15	1210
RECEIVED BY	Karie Kindre	Karie Kindre	Spectra	9/9	12:10
RELINQUISHED BY					
RECEIVED BY					

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay Johnson

Case Narrative
Client Project: Groundwater Monitoring, Q-3*
*(Sampling Event #3 of 2015)
Spectra Project: 2015120354

A total of twelve analytical water samples collected over a two-day period—12/10/15 & 12/11/15-- were received on December 11, 2015 for a variety of analyses including: Volatile Organic Compounds, PCB's, NWTH-Dx, Metals, Nitrate and Sulfate. In addition to the groundwater samples received, five trip blanks were also submitted for VOC analysis. The samples were received cold and intact on 12/11/15 at 15:20; cooler temperature 1.9 C, and sample temperature 4.8 C. Additional aliquots of sample #1 (MW-1A-121115) were submitted for quality control purposes.

In the hardcopy of the analytical report, all analytes not detected at or above the Method Reporting Limit (MRL) are reported as "< X", where "X" is the reporting limit.

Quality control samples included, but were not limited to, trip blanks (for VOC's), method blanks, spiked blanks, also known as laboratory control samples (LCS), matrix spikes (MS), sample duplicates, and/or spiked duplicates (MSD). In most cases, precision was measured using spiked pairs (MS/MSD). This is to insure that there is a measureable quantity present for the computation of Relative Percent Difference (RPD). Although the Petroleum Hydrocarbon Methods suggest sample duplicates, spiked duplicates were chosen for the NWTPH-Dx analysis, as no diesel-range organics were found in the samples from the previous quarters, and it seemed likely that an unspiked sample and duplicate would yield non-detect results--as was in fact the case. As was done for the June and September 2015 samples, both a spiked and unspiked duplicate were performed for VOC's. The unspiked duplicate for VOC's was performed using the 5ml sparge on sample MW-1A. A duplicate 25ml sparge was not performed on this sample, which was non-detect for vinyl chloride. The laboratory control sample for NWTPH-Dx that was extracted on 12/19/15 which applied to samples 6-11 and 17 experienced a glassware malfunction the night of extraction. Due to this, the LCS recovery was only 22% which falls outside the current LCS recovery control limits of 43%-122%. This problem was isolated to only the LCS, and did not affect the associated samples, nor the recovery of the MS/MSD, which had normal surrogate and spike recoveries. The root cause was identified as an internal micro-fracture within the heated extractor body, which allowed extraction solvent to escape undetected.

Metals--Arsenic, Chromium, and Lead-- were analyzed by ICP-MS Method SW 846 6020A, with the collision cell. This was to eliminate potential interference from chloride, given the proximity of the sampling location to saltwater.

VOC analysis was performed in two ways: using the typical 5ml sparge for all analytes except vinyl chloride, and using a 25ml sparge specifically for vinyl chloride. This was done to achieve a Method Reporting Limit of 0.2 ug/L for vinyl chloride, which is the MTCA Method A limit for groundwater. Only the vinyl chloride result was reported from the 25ml sparge, as the large sample volume is not ideal for all analytes, nor necessary to achieve desired reporting limits.

Please feel free to call with any questions regarding these samples.

Sincerely,

for

Steven G. Hibbs
Laboratory Manager

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-1A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 1

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	61.1	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	5.0	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	111	NWTPH-G
4-Bromofluorobenzene	135	NWTPH-G
p-Terphenyl	71	NWTPH-D
Dibromofluoromethane	110	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	112	SW846 8260C
Toluene-d8	95	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-1A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 1

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	111	NWTPH-G
4-Bromofluorobenzene	135	NWTPH-G
p-Terphenyl	71	NWTPH-D
Dibromofluoromethane	110	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	112	SW846 8260C
Toluene-d8	95	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-1B-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:2

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	<2.0	mg/L	SM 4500-SO4 E
Arsenic	3.4	ug/L	SW846 6020A
Chromium	24.9	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	118	SW846 8260C
p-Terphenyl	74	NWTPH-D
4-Bromofluorobenzene	134	NWTPH-G
Toluene-d8	112	NWTPH-G
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	86	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-1B-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:2

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	118	SW846 8260C
p-Terphenyl	74	NWTPH-D
4-Bromofluorobenzene	134	NWTPH-G
Toluene-d8	112	NWTPH-G
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	86	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-2A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:3

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	20.6	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	1.5	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	117	SW846 8260C
Dibromofluoromethane	114	SW846 8260C
p-Terphenyl	64	NWTPH-D
4-Bromofluorobenzene	136	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-2A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 3

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	117	SW846 8260C
Dibromofluoromethane	114	SW846 8260C
p-Terphenyl	64	NWTPH-D
4-Bromofluorobenzene	136	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-3A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 4

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	25	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	47.1	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	4.0	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	0.8	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	119	SW846 8260C
p-Terphenyl	92	NWTPH-D
Toluene-d8	95	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	111	NWTPH-G
4-Bromofluorobenzene	97	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: MW-3A-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:4

Analyte	Result	Units	Method
Bromobenzene	<1.0	μg/L	SW846 8260C
Bromochloromethane	<1.0	μg/L	SW846 8260C
Bromodichloromethane	<1.0	μg/L	SW846 8260C
Bromoform	<1.0	μg/L	SW846 8260C
Bromomethane	<1.0	μg/L	SW846 8260C
Carbon Disulfide	<10	μg/L	SW846 8260C
Carbon Tetrachloride	<1.0	μg/L	SW846 8260C
Chlorobenzene	<1.0	μg/L	SW846 8260C
Chlorodibromomethane	<1.0	μg/L	SW846 8260C
Chloroethane	<2.0	μg/L	SW846 8260C
Chloroform	<1.0	μg/L	SW846 8260C
Chloromethane	<2.0	μg/L	SW846 8260C
Dibromomethane	<1.0	μg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	μg/L	SW846 8260C
Ethylbenzene	<1.0	μg/L	SW846 8260C
Hexachlorobutadiene	<1.0	μg/L	SW846 8260C
Iodomethane	<10	μg/L	SW846 8260C
Isopropylbenzene	<1.0	μg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	μg/L	SW846 8260C
Methylene chloride	<5.0	μg/L	SW846 8260C
Naphthalene	<1.0	μg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	μg/L	SW846 8260C
Tetrachloroethene	<1.0	μg/L	SW846 8260C
Toluene	<1.0	μg/L	SW846 8260C
Total Xylenes	<2.0	μg/L	SW846 8260C
Trichloroethene	<1.0	μg/L	SW846 8260C
Trichlorofluoromethane	<1.0	μg/L	SW846 8260C
Vinyl Acetate	<10	μg/L	SW846 8260C
Vinyl chloride	<0.2	μg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	μg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	μg/L	SW846 8260C
n-Butylbenzene	<1.0	μg/L	SW846 8260C
n-Propylbenzene	<1.0	μg/L	SW846 8260C
sec-Butylbenzene	<1.0	μg/L	SW846 8260C
tert-Butylbenzene	<1.0	μg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	μg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	μg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	119	SW846 8260C
p-Terphenyl	92	NWTPH-D
Toluene-d8	95	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	111	NWTPH-G
4-Bromofluorobenzene	97	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project:	Groundwater Monitoring
Client ID:	CO-3A-121015
Sample Matrix:	Water
Date Sampled:	12/10/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	5

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	<2.0	mg/L	SM 4500-SO4 E
Arsenic	13.1	ug/L	SW846 6020A
Chromium	2.3	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C

Analyte	Result	Units	Method
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	123	SW846 8260C
p-Terphenyl	82	NWTPH-D
1,2-Dichloroethane-d4	123	SW846 8260C
4-Bromofluorobenzene	108	SW846 8260C

Surrogate	Recovery	Method
Decachlorobiphenyl	102	SW846 8082A
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories

...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Project:	Groundwater Monitoring
Client ID:	CO-3A-121015
Sample Matrix:	Water
Date Sampled:	12/10/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	5

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	123	SW846 8260C
p-Terphenyl	82	NWTPH-D
1,2-Dichloroethane-d4	123	SW846 8260C
4-Bromofluorobenzene	108	SW846 8260C

Surrogate	Recovery	Method
Decachlorobiphenyl	102	SW846 8082A
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: CO-3B-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 6

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	22	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	19.8	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	8.9	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	111	SW846 8260C
Decachlorobiphenyl	95	SW846 8082A
Dibromofluoromethane	122	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	68	NWTPH-D
Toluene-d8	100	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	117	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: CO-3B-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 6

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	111	SW846 8260C
Decachlorobiphenyl	95	SW846 8082A
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	68	NWTPH-D
Toluene-d8	100	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	117	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Project:	Groundwater Monitoring
Client ID:	SO-2A-121015
Sample Matrix:	Water
Date Sampled:	12/10/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	7

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	52	mg/L	SM 4500-SO4 E
Arsenic	5.9	ug/L	SW846 6020A
Chromium	2.0	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	70	NWTPH-D
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	131	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-2A-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 7

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C	Styrene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C	Tetrachloroethene	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C	Toluene	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C	Total Xylenes	<2.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C	Trichloroethene	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C	Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C	Vinyl Acetate	<10	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C	Vinyl chloride	<0.2	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C	cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C	cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C	n-Butylbenzene	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C	n-Propylbenzene	<1.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C	sec-Butylbenzene	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C	tert-Butylbenzene	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C	trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C	trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C				
Isopropylbenzene	<1.0	µg/L	SW846 8260C				
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C				
Methylene chloride	<5.0	µg/L	SW846 8260C				
Naphthalene	<1.0	µg/L	SW846 8260C				

Surrogate	Recovery	Method	Surrogate	Recovery	Method
1,2-Dichloroethane-d4	122	SW846 8260C	p-Terphenyl	70	NWTPH-D
4-Bromofluorobenzene	100	SW846 8260C	Toluene-d8	96	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A	4-Bromofluorobenzene	131	NWTPH-G
Dibromofluoromethane	122	SW846 8260C	Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-4A-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 8

Analyte	Result	Units	Method
Nitrate	1.4	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	39	mg/L	SM 4500-SO4 E
Arsenic	197	ug/L	SW846 6020A
Chromium	0.8	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C

Analyte	Result	Units	Method
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A
Dibromofluoromethane	120	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	70	NWTPH-D
Toluene-d8	93	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	109	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-4A-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 8

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	1.9	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	8.4	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	118	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A
Dibromofluoromethane	120	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	70	NWTPH-D
Toluene-d8	93	SW846 8260C
4-Bromofluorobenzene	139	NWTPH-G
Toluene-d8	109	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-4B-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:9

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	31.1	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	16.9	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	120	SW846 8260C
4-Bromofluorobenzene	105	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	122	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	79	NWTPH-D
Toluene-d8	99	SW846 8260C
4-Bromofluorobenzene	140	NWTPH-G
Toluene-d8	115	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-4B-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number:9

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	120	SW846 8260C
4-Bromofluorobenzene	105	SW846 8260C
Decachlorobiphenyl	83	SW846 8082A
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	79	NWTPH-D
Toluene-d8	99	SW846 8260C
4-Bromofluorobenzene	140	NWTPH-G
Toluene-d8	115	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Rinsate Blank #1-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 10

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	< 0.5	ug/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	< 0.5	ug/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	ug/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.10	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A
Dibromofluoromethane	127	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	80	NWTPH-D
Toluene-d8	97	SW846 8260C
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	113	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Rinsate Blank #1-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 10

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	101	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A
Dibromofluoromethane	127	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	80	NWTPH-D
Toluene-d8	97	SW846 8260C
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	113	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Project:	Groundwater Monitoring
Client ID:	Field Blank #1-121115
Sample Matrix:	Water
Date Sampled:	12/11/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	11

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	<0.5	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	<2.0	mg/L	SM 4500-SO4 E
Arsenic	< 0.5	ug/L	SW846 6020A
Chromium	< 0.5	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A
Dibromofluoromethane	128	SW846 8260C
p-Terphenyl	79	NWTPH-D
Toluene-d8	95	SW846 8260C
4-Bromofluorobenzene	136	NWTPH-G
Toluene-d8	111	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Field Blank #1-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 11

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	100	SW846 8082A
Dibromofluoromethane	128	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	79	NWTPH-D
Toluene-d8	95	SW846 8260C
4-Bromofluorobenzene	136	NWTPH-G
Toluene-d8	111	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project:	Groundwater Monitoring
Client ID:	Trip Blank #1-121115
Sample Matrix:	Water
Date Sampled:	12/11/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	12

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
4-Bromofluorobenzene	130	NWTPH-G
Dibromofluoromethane	120	SW846 8260C
1,2-Dichloroethane-d4	122	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	95	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #1-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 12

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
4-Bromofluorobenzene	130	NWTPH-G
Dibromofluoromethane	120	SW846 8260C
1,2-Dichloroethane-d4	122	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	95	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #2-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 13

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C	Bromobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Bromochloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C	Bromodichloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C	Bromoform	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Bromomethane	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Carbon Disulfide	<10	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C	Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	130	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Dibromofluoromethane	123	SW846 8260C
4-Bromofluorobenzene	134	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
Toluene-d8	94	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #2-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 13

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	130	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Dibromofluoromethane	123	SW846 8260C
4-Bromofluorobenzene	134	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
Toluene-d8	94	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #3-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 14

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Dibromofluoromethane	124	SW846 8260C
Toluene-d8	95	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	136	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project:	Groundwater Monitoring
Client ID:	Trip Blank #3-121115
Sample Matrix:	Water
Date Sampled:	12/11/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	14

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	125	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Dibromofluoromethane	124	SW846 8260C
Toluene-d8	95	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	136	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Project:	Groundwater Monitoring
Client ID:	Trip Blank #4-121115
Sample Matrix:	Water
Date Sampled:	12/11/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	15

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	131	SW846 8260C
4-Bromofluorobenzene	106	SW846 8260C
Dibromofluoromethane	130	SW846 8260C
Toluene-d8	96	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	138	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #4-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 15

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	131	SW846 8260C
4-Bromofluorobenzene	106	SW846 8260C
Dibromofluoromethane	130	SW846 8260C
Toluene-d8	96	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	138	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #5-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 16

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C	Bromobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Bromochloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C	Bromodichloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C	Bromoform	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Bromomethane	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Carbon Disulfide	<10	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C	Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Dibromofluoromethane	122	SW846 8260C
Toluene-d8	94	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: Trip Blank #5-121115
Sample Matrix: Water
Date Sampled: 12/11/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 16

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Dibromofluoromethane	122	SW846 8260C
Toluene-d8	94	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	132	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Project:	Groundwater Monitoring
Client ID:	SO-4A-9-121015
Sample Matrix:	Water
Date Sampled:	12/10/2015
Date Received:	12/11/2015
Spectra Project:	2015120354
Spectra Number:	17

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	1.3	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	38	mg/L	SM 4500-SO4 E
Arsenic	202	ug/L	SW846 6020A
Chromium	0.8	ug/L	SW846 6020A
Lead	< 0.5	ug/L	SW846 6020A
PCB	<0.10	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	96	SW846 8260C
Decachlorobiphenyl	95	SW846 8082A
Dibromofluoromethane	121	SW846 8260C
p-Terphenyl	79	NWTPH-D
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	134	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/07/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: Groundwater Monitoring
Client ID: SO-4A-9-121015
Sample Matrix: Water
Date Sampled: 12/10/2015
Date Received: 12/11/2015
Spectra Project: 2015120354
Spectra Number: 17

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	2.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	8.9	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.2	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	96	SW846 8260C
Decachlorobiphenyl	95	SW846 8082A
Dibromofluoromethane	121	SW846 8260C
p-Terphenyl	79	NWTPH-D
Toluene-d8	96	SW846 8260C
4-Bromofluorobenzene	134	NWTPH-G
Toluene-d8	112	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/sgh

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-Dx
Sample Matrix: Water
Spectra Project: 2015120354
Applies to Spectra #: 1-11, 17

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS
MS/MSD

Spiked Sample: 2015120354-1
Units: ug/L

Date Extracted: 12/18/2015
Date Analyzed: 12/21/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	% RPD
Diesel	<100	2500	2161	86	2001	80	7.7

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method:	NWTPH-Dx
Sample Matrix:	Water
Spectra Project:	2015120354
Applies to Spectra #:	1-5

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

LABORATORY CONTROL SAMPLE (LCS)

Spiked Sample:	Method Blank	Date Extracted:	12/18/2015
Units:	ug/L	Date Analyzed:	12/21/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	1375	55

METHOD BLANK

Date Extracted:	12/18/2015	Date Analyzed:	12/21/2015
Units:	ug/L		

Diesel	<100
Heavy Oil	<500

Surrogate Recoveries:

p-terphenyl 69%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-Dx
Sample Matrix: Water
Spectra Project: 2015120354
Applies to Spectra #: 6-11, 17

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

LABORATORY CONTROL SAMPLE (LCS)

Spiked Sample: Method Blank
Units: ug/L
Date Extracted: 12/19/2015
Date Analyzed: 12/22/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	538	22*

*Low LCS recovery due to extraction glass failure. See case narrative for further explanation.

METHOD BLANK

Date Extracted: 12/19/2015
Date Analyzed: 12/22/2015
Units: ug/L

Diesel	<100
Heavy Oil	<500

Surrogate Recoveries:

p-terphenyl 69%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2015120354
Applies to Spectra Samples: 1-5

QUALITY CONTROL RESULTS
NWTPH-Dx

Initial Calibration Verification

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2501	2500	100.0%	85-115%
Oil	5043	5000	100.9%	85-115%

Continuing Calibration Verification 1

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2500	2500	100.0%	85-115%
Oil	4489	5000	89.8%	85-115%

Continuing Calibration Verification 2

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2614	2500	104.6%	85-115%
Oil	5460	5000	109.2%	85-115%

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2015120354
Applies to Spectra Samples: 6-11 & 17

QUALITY CONTROL RESULTS
NWTPH-Dx

Initial Calibration Verification

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2441	2500	97.6%	85-115%
Oil	5278	5000	105.6%	85-115%

Continuing Calibration Verification 1

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2440	2500	97.6%	85-115%
Oil	5188	5000	103.8%	85-115%

Continuing Calibration Verification 2

Date Analyzed: 12/21/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Diesel	2476	2500	99.0%	85-115%
Oil	5267	5000	105.3%	85-115%

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/ 8260C
Spectra Project: 2015120354
Date Analyzed: 12/22/2015
Units: ug/L
Applies to Spectra #'s: #1-17

GCMS VOLATILE ORGANIC ANALYSIS
Laboratory Control Sample (LCS) Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	SPIKE RESULT	LCS %REC
1,1-Dichloroethene	<1	10.00	10.29	103
Benzene	<1	10.00	10.35	104
Trichloroethene	<1	10.00	9.98	100
Toluene	<1	10.00	10.07	101
Chlorobenzene	<1	10.00	9.97	100

Surrogate Recoveries (%)	LCS
Dibromofluoromethane	109
1,2-Dichloroethane-d4	118
Toluene-d8	102
4-Bromofluorobenzene	126

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 7, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Spectra Project: **2015120354**
Spectra # **Method Blank**
Applies to Sample #1-17 **5ml Sparge**

Date Received: 12/11/2015
Date Analyzed: 12/22/2015
Dilution: 1
< = less than

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10.00	trans-1,2,-Dichloroethene	< 1.00
Acetonitrile	< 10.00	1,2-Dichloropropane	< 1.00
Acrolein	< 10.00	1,3-Dichloropropane	< 1.00
Acrylonitrile	< 10.00	cis-1,3-Dichloropropene	< 1.00
Benzene	< 1.00	trans-1,3-Dichloropropene	< 1.00
Bromobenzene	< 1.00	2,2-Dichloropropane	< 1.00
Bromochloromethane	< 1.00	1,1-Dichloropropene	< 1.00
Bromodichloromethane	< 1.00	Ethylbenzene	< 1.00
Bromoform	< 1.00	2-Hexanone (MBK)	< 10.00
Bromomethane	< 1.00	Hexachlorobutadiene	< 1.00
2-Butanone (MEK)	< 10.00	Iodomethane	< 10.00
n-Butylbenzene	< 1.00	Isopropylbenzene	< 1.00
sec-Butylbenzene	< 1.00	p-Isopropyltoluene	< 1.00
tert-Butylbenzene	< 1.00	Methylene chloride	< 5.00
Carbon Disulfide	< 10.00	4-Methyl-2-pentanone (MIBK)	< 10.00
Carbon tetrachloride	< 1.00	MTBE	< 1.00
Chlorobenzene	< 1.00	Naphthalene	< 1.00
Chlorodibromomethane	< 1.00	n-Propylbenzene	< 1.00
Chloroethane	< 2.00	Styrene	< 1.00
2-Chloroethyl Vinyl ether	< 10.00	1,1,1,2-Tetrachloroethane	< 1.00
Chloroform	< 1.00	1,1,2,2-Tetrachloroethane	< 1.00
Chloromethane	< 2.00	Tetrachloroethene	< 1.00
2-Chlorotoluene	< 1.00	Toluene	< 1.00
4-Chlorotoluene	< 1.00	Total Xylenes	< 2.00
1,2-Dibromo-3-Chloropropane (DBCP)	< 10.00	1,2,3-Trichlorobenzene	< 1.00
1,2-Dibromoethane (EDB)	< 1.00	1,2,4-Trichlorobenzene	< 1.00
Dibromomethane	< 1.00	1,1,1-Trichloroethane	< 1.00
1,2-Dichlorobenzene	< 1.00	1,1,2-Trichloroethane	< 1.00
1,3-Dichlorobenzene	< 1.00	Trichloroethene	< 1.00
1,4-Dichlorobenzene	< 1.00	Trichlorofluoromethane	< 1.00
Dichlorodifluoromethane	< 1.00	1,2,3-Trichloropropane	< 1.00
1,1-Dichloroethane	< 1.00	1,2,4-Trimethylbenzene	< 1.00
1,2-Dichloroethane	< 1.00	1,3,5-Trimethylbenzene	< 1.00
1,1-Dichloroethene	< 1.00	Vinyl Acetate	< 10.00
cis-1,2-Dichloroethene	< 1.00	Vinyl chloride	< 1.00

SURROGATE RECOVERIES

Dibromofluoromethane	111	%
1,2-Dichloroethane-d4	114	%
Toluene-d8	97	%
4-Bromofluorobenzene	99	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 9, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Date Received:	12/11/2015
Date Analyzed:	12/23/2015
Dilution:	1
< = less than	

Spectra Project: **2015120354**
Spectra # **Method Blank**
Applies to Sample #1-17 **25ml Sparge--Vinyl Chloride**

VOLATILE ORGANIC ANALYSIS **METHOD 624/8260**

Compound	ug/L	25 ml Sparge
Vinyl Chloride	< 0.20	

SURROGATE RECOVERIES

Dibromofluoromethane	103	%
1,2-Dichloroethane-d4	101	%
Toluene-d8	97	%
4-Bromofluorobenzene	98	%

for

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/8260C
Spectra Project: 2015120354
Date Analyzed: 12/22/2015
Units: ug/L
Applies to Spectra #'s: #1-17
Spiked Sample 2015120354-1

GCMS VOLATILE ORGANIC ANALYSIS
Matrix Spike/ Matrix Spike Duplicate Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	MS RESULT	MS %REC	MSD RESULT	MSD %REC	RPD
1,1-Dichloroethene	<1	10.0	9.28	93	10.05	101	8.0
Benzene	<1	10.0	10.45	105	10.79	108	3.2
Trichloroethene	<1	10.0	9.06	91	9.92	99	9.1
Toluene	<1	10.0	8.71	87	9.39	94	7.5
Chlorobenzene	<1	10.0	9.05	91	9.63	96	6.2

(Results after dilution)

Surrogates	MS	MSD
Dibromofluoromethane	108	106
1,2-Dichloroethane-d4	110	108
Toluene-d8	103	104
4-Bromofluorobenzene	96	99

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

October 30, 2015

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Project: GW Monitoring, December 2015
Sample matrix: Water

Spectra Project:
Sample #: 2015120354-1
Applies to Sample #1-17

Date Received: 12/11/15
Date Analyzed: 12/22/15
Dilution: 1
< = less than
2015090231
Duplicate Analysis
5ml Sparge

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10	trans-1,2,-Dichloroethene	< 1
Acetonitrile	< 10	1,2-Dichloropropane	< 1
Acrolein	< 10	1,3-Dichloropropane	< 1
Acrylonitrile	< 10	cis-1,3-Dichloropropene	< 1
Benzene	< 1	trans-1,3-Dichloropropene	< 1
Bromobenzene	< 1	2,2-Dichloropropane	< 1
Bromochloromethane	< 1	1,1-Dichloropropene	< 1
Bromodichloromethane	< 1	Ethylbenzene	< 1
Bromoform	< 1	2-Hexanone (MBK)	< 10
Bromomethane	< 1	Hexachlorobutadiene	< 1
2-Butanone (MEK)	< 10	Iodomethane	< 10
n-Butylbenzene	< 1	Isopropylbenzene	< 1
sec-Butylbenzene	< 1	p-Isopropyltoluene	< 1
tert-Butylbenzene	< 1	Methylene chloride	< 5
Carbon Disulfide	< 10	4-Methyl-2-pentanone (MIBK)	< 10
Carbon tetrachloride	< 1	MTBE	< 1
Chlorobenzene	< 1	Naphthalene	< 1
Chlorodibromomethane	< 1	n-Propylbenzene	< 1
Chloroethane	< 2	Styrene	< 1
2-Chloroethyl Vinyl ether	< 10	1,1,1,2-Tetrachloroethane	< 1
Chloroform	< 1	1,1,2,2-Tetrachloroethane	< 1
Chloromethane	< 2	Tetrachloroethene	< 1
2-Chlorotoluene	< 1	Toluene	< 1
4-Chlorotoluene	< 1	Total Xylenes	< 2
1,2-Dibromo-3-Chloropropane (DBCP)	< 10	1,2,3-Trichlorobenzene	< 1
1,2-Dibromoethane (EDB)	< 1	1,2,4-Trichlorobenzene	< 1
Dibromomethane	< 1	1,1,1-Trichloroethane	< 1
1,2-Dichlorobenzene	< 1	1,1,2-Trichloroethane	< 1
1,3-Dichlorobenzene	< 1	Trichloroethene	< 1
1,4-Dichlorobenzene	< 1	Trichlorofluoromethane	< 1
Dichlorodifluoromethane	< 1	1,2,3-Trichloropropane	< 1
1,1-Dichloroethane	< 1	1,2,4-Trimethylbenzene	< 1
1,2-Dichloroethane	< 1	1,3,5-Trimethylbenzene	< 1
1,1-Dichloroethene	< 1	Vinyl Acetate	< 10
cis-1,2-Dichloroethene	< 1	Vinyl chloride	< 1

SURROGATE RECOVERIES

Dibromofluoromethane	115 %
1,2-Dichloroethane-d4	114 %
Toluene-d8	94 %
4-Bromofluorobenzene	95 %

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2015120354
Applies to Spectra Samples: 1-17

QUALITY CONTROL RESULTS
NWTPH-Gx

Initial Calibration Verification

Date Analyzed: 12/22/2015
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	258	250	103.2%	85-115%

Continuing Calibration Verification 1

Date Analyzed: 12/22/2015
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	274	250	109.6%	85-115%

Continuing Calibration Verification 2

Date Analyzed: 12/22/2015
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	275	250	110.0%	85-115%

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 9, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-G
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015120354
Applies to Spectra # 1 - 17

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

DUPLICATE

Duplicate Sample # 2015120354-1
Date Analyzed: 12/22/2016

Compound	Sample Result	Duplicate Result	RPD
Gasoline	<50	<50	0

BLANK SPIKE (LCS)

Date Analyzed 12/22/2016

	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
LCS	<50	250	258	103.2

Surrogate Recoveries:

Toluene-d8	115%
BFB	131%

METHOD BLANK

Date Analyzed 12/22/2016

WTPH-G <50

Surrogate Recoveries:

Toluene-d8	113%
BFB	133%

SPECTRA LABORATORIES

for

Steven G. Hibbs, Laboratory Manager

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2015120354
Applies to Spectra Samples: 1-11, 17

QUALITY CONTROL RESULTS
Polychlorinated Biphenyls (PCBs) - EPA Method SW846-8082A

Initial Calibration Verification

Date Analyzed: 10/5/2015
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	93	100	93.0%	80-120%
Arochlor 1260	93	100	93.0%	80-120%

Continuing Calibration Verification 1

Date Analyzed: 10/5/2015
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	116	100	116.0%	80-120%
Arochlor 1260	111	100	111.0%	80-120%

Continuing Calibration Verification 2

Date Analyzed: 10/5/2015
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	114	100	114.0%	80-120%
Arochlor 1260	113	100	113.0%	80-120%

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015120354
Applies to Spectra # 6-11,17

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2015120354-1

Date Extracted: 1/4/2016
Date Analyzed: 1/5/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.43	85%	0.40	80%	5.6

BLANK SPIKE (LCS)

Date Extracted: 12/27/2015
Date Analyzed: 12/30/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.57	114%

METHOD BLANK

Date Extracted: 12/27/2015
Date Analyzed: 12/30/2015

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 101%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015120354
Applies to Spectra # 1, 3-5

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2015120354-1

Date Extracted: 1/4/2016
Date Analyzed: 1/5/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.43	85%	0.40	80%	5.6

BLANK SPIKE (LCS)

Date Extracted: 12/26/2015
Date Analyzed: 12/30/2015

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.46	92%

METHOD BLANK

Date Extracted: 12/26/2015
Date Analyzed: 12/30/2015

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 90%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 5, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2015120354
Applies to Spectra # 2

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2015120354-1

Date Extracted: 1/4/2016
Date Analyzed: 1/5/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.43	85%	0.40	80%	5.6

BLANK SPIKE (LCS)

Date Extracted: 1/4/2016
Date Analyzed: 1/5/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.41	81%

METHOD BLANK

Date Extracted: 1/4/2016
Date Analyzed: 1/5/2016

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 73%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/16/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	ug/L
Spectra Project:	2015120354
Applies to Spectra #'s	1-11,17
Analyst:	SCJ

QUALITY CONTROL RESULTS

ICP-MS Metals - SW846 6020A - Water

Initial Quality Control Standard/Blank Results

Date Analyzed: 12/16/2015

Element	Standard Value	Conc.	%Rec	QC Limit	Blank Result
Arsenic	100	100.20	100.2	90-110%	< 0.5
Chromium	100	102.50	102.5	90-110%	< 0.5
Lead	100	102.70	102.7	90-110%	< 0.5

Continuing Calibration Verfication/Blank Results

Date Analyzed: 12/16/2015

Element	Standard Value	Conc.	%Rec	QC Limit	Blank Result
Arsenic	100	104.70	104.7	90-110%	< 0.5
Chromium	100	98.68	98.7	90-110%	< 0.5
Lead	100	90.43	90.4	90-110%	< 0.5

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

12/16/2015

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	ug/L
Spectra Project:	2015120354
Applies to Spectra #'s	1-11,17
Analyst:	SCJ

QUALITY CONTROL RESULTS
ICP-MS Metals - SW846 6020A - Water

Laboratory Reagent Blank (LRB)

Date Digested: 12/16/2015 Date Analyzed: 12/16/2015

Element	CAS #	Result
Arsenic	7440-38-2	< 0.5
Chromium	7440-47-3	< 0.5
Lead	7439-92-1	< 0.5

Laboratory Fortified Blank (LFB)

Date Digested: 12/16/2015 Date Analyzed: 12/16/2015

Element	Spike Added	LCS Conc.	LCS %Rec
Arsenic	100.0	101.90	101.9
Chromium	100.0	104.00	104.0
Lead	100.0	100.10	100.1

LCS Recovery limits 85-115%

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Digested: 12/16/2015 Date Analyzed: 12/16/2015
Sample Spiked: 2015120354-1

Element	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Arsenic	61.13	100.0	160.90	99.8	164.90	103.8	3.9
Chromium	4.97	100.0	98.24	93.3	100.90	95.9	2.8
Lead	0.00	100.0	120.40	120.4	116.40	116.4	3.4

Recovery Limits 70-130%
RPD Limit 20

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 9, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	mg/L
Spectra Project:	2015120354
Applies to Samples:	1-11, 17

QUALITY CONTROL RESULTS
Sulfate Method AASHTO T290/375.4/SM 4500E

Method Blank

Date Analyzed: 12/17/15

	Result	
Sulfate	<2.0	mg/L

Blank Spike (LCS)

Date Analyzed: 12/17/15

	Spike Added	LCS Conc.	LCS %Rec
Sulfate	25.0	25.7	102.8

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample Spiked: 2015120354-1

Date Analyzed: 12/17/15

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Sulfate	0.0	25	25.7	102.8	24.5	98.0	4.8

SPECTRA LABORATORIES

for

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

February 9, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units: mg/L
Spectra Project: 2015120354
Applies to Samples: #1-11, 17

QUALITY CONTROL RESULTS

Nitrate Method Colorimetric Easy 1-Reagent

Method Blank

Date Analyzed: 12/19/15

	Result	
Nitrate as N	<0.01	mg/L

Blank Spike (LCS)

Date Analyzed: 12/19/15

	Spike Added	LCS Conc.	LCS %Rec
Nitrate as N	0.50	0.490	98.0

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Analyzed: 12/19/15

Sample Spiked: 2015120354-1

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Nitrate as N	0.016	0.250	0.253	94.8	0.255	95.6	0.84

SPECTRA LABORATORIES

for

Steven G. Hibbs
Laboratory Manager

Spectra Laboratories
Sample Receiving Checklist

Client PRS Group Spectra Project # 2015 120354

Project Name Groundwater Monitoring

Received Date: 12-11-15 Received Time: 3:20 By MN & LN

Shipped via: UPS USPS FEDEX Hand Delivered Other ________

Tracking Number ________

Papers/Cooler:

Type of shipping container: Cooler Box None Other ________

Cooler Temperature 1.9 °C Sample Temperature 4.8 °C

Custody papers included?.. Yes No

Were custody papers properly filled out (ink, signed, etc)?.......... Yes No N/A

Custody Seals:

Were custody seals on outside of samples/containers?................ Yes No

Intact?... Yes No N/A

Custody seal info (date/name/label) ________

Were Papers/Bottle labels legible?.. Yes No N/A

Did all bottle labels and tags agree with custody papers?............. Yes No N/A

LOGIN:

Did all sample containers arrive in good condition (unbroken, etc)... Yes No

Was sufficient amount of sample sent for the tests indicated?......... Yes No N/A

Were the bottles provided correct for the analyses requested?........ Yes No

Were VOA vials free of air bubbles?.. Yes No N/A

Was correct preservation added to samples?............................. Yes No N/A

If no, Sample Control added preservative to the following:

Sample Number	Reagent	Analyte

Explain any discrepancies: ________

Initials: JD **Date:** 12/11 J:UserShares/sample management/sample management/sample check in

SPECTRA Laboratories
2221 Ross Way, Tacoma, WA 98421
(253) 272-4850 Fax (253) 572-9838
www.spectra-lab.com info@spectra-lab.com

SPECIAL INSTRUCTIONS/COMMENTS:
* TOTAL METALS BY 6020 (Cr, As, Pb)
* GEOENGINEERS PROJECT #: 019482-002-00
Return Samples Y N X Page 2 of 2

CHAIN of CUSTODY

SPECTRA PROJECT # 2015120254

STANDARD X RUSH

ADDRESS CHANGE

CLIENT: PRS GROUP
ADDRESS:
PROJECT: GROUND WATER MONITORING
CONTACT: JAY/NICK@GEOENGINEERS
SAMPLED BY: BRIAN ANDERSON
PHONE: 253-383-4175 FAX:
e-MAIL: JAY@PRSPLANT.NET NROHRBACH@GEOENGINEERS.COM Prefer FAX or e-MAIL
PURCHASE ORDER #:

	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-G X	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)	8260/624 VOA VOCs 8260B	8260 CHLOR SOLVENTS	8270/625 SEMI VOA	8270 PAH/PNA	8082/608 PCB	TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) SEE NOTE	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)	PH 9040/9045	TX/TOX 9076	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	NITRATE BY EPA 353.2	SULFATE BY EPA 375.4
1	FIELD BLANK#1-121115	12-11-15	1245	W	7				X	X			X				X		X									X	X
2	TRIP BLANK#1-121115	12-11-15	—	W	1				X				X																
3	TRIP BLANK#2-121115	12-11-15	—	W	1				X				X																
4	TRIP BLANK#3-121115	12-11-15	—	W	1				X				X																
5	TRIP BLANK#4-121115	12-11-15	—	W	1				X				X																
6	TRIP BLANK#5-121115	12-11-15	—	W	1				X				X																
7	SO-4A-9-121015	12-10-15	1100	W	7				X	X			X				X		X									X	X
8																													
9																													
0																													

LAB USE ONLY
Shipped Via: US Mail UPS Fed Ex Courier Client
Shipping Container: Cooler Box Envelope None
Tracking #
Custody Seals: Y N Intact: Y N
Cooler Temp. 1.9 Sample Temp. 4.8

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	B. Anderson	B. ANDERSON	GEOENGINEERS	12-11-15	
RECEIVED BY	Lori Hamilton	Lori Hamilton	Spectra	12-11-15	3:20
RELINQUISHED BY					
RECEIVED BY					

Payment Terms: Net 30 days. Past due accounts subject to 1 1/2 % per month interest. Customer agrees to pay all costs of collection including reasonable attorney's fees and all other costs of collection regardless of whether suit is filed in Pierce Co., WA venue. *Spectra Analytical, Inc.*

SPECTRA Laboratories
2221 Ross Way, Tacoma, WA 98421
(253) 272-4850 Fax (253) 572-9838
www.spectra-lab.com info@spectra-lab.com

SPECIAL INSTRUCTIONS/COMMENTS:
*TOTAL METALS BY 6020 (Cr, As, Pb)
*GEOENGINEERS PROJECT #: 019482-002-00

Return Samples Y N X Page 1 of 2

CHAIN of CUSTODY

SPECTRA PROJECT # 1015110354

STANDARD ✓ RUSH

CLIENT: PRS GROUP
ADDRESS:
ADDRESS CHANGE
PROJECT: GROUNDWATER MONITORING
CONTACT: JAY/NICK@GEOENGINEERS
SAMPLED BY: 253-383-4175/BRIAN ANDERSON
PHONE: 253-383-4175 FAX:
e-MAIL: JAY@PRSPLANT.NET NROHRBACH@GEOENGINEERS.COM Prefer FAX or e-MAIL
PURCHASE ORDER #:

#	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-G X	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)
1	MW-1A-121115	12-11-15	1023	W	21				X	X		
2	MW-1B-121115	12-11-15	1143	W	7				X	X		
3	MW-2A-121115	12-11-15	~~1300~~ 0919	W	7				X	X		
4	MW-3A-121115	12-11-15	0830	W	7				X	X		
5	CO-3A-121015	12-10-15	1355	W	7				X	X		
6	CO-3B-121015	12-10-15	1500	W	7				X	X		
7	SO-2A-121015	12-10-15	1300	W	7				X	X		
8	SO-4A-121015	12-10-15	1030	W	7				X	X		
9	SO-4B-121015	12-10-15	1155	W	7				X	X		
0	RINSATE BLANK#1-121115	12-11-15	1230	W	7				X	X		

#	8260/624 VOA VOC 8260B	8260 CHLOR SOLVENTS	8270/625 SEMI VOA	8270 PAH/PNA	8082/608 PCB	TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) SEE NOTE	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)
1	X				X		X		
2	X				X		X		
3	X				X		X		
4	X				X		X		
5	X				X		X		
6	X				X		X		
7	X				X		X		
8	X				X		X		
9	X				X		X		
0	X				X		X		

#	PH 9040/9045	TX/TOX 9076	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	NITRATE BY EPA 353.3	SULFATE BY EPA 375.4	MS/MSD VOLUME
1							X	X	X
2							X	X	
3							X	X	
4							X	X	
5							X	X	
6							X	X	
7							X	X	
8							X	X	
9							X	X	
0							X	X	

LAB USE ONLY
Shipped Via: US Mail UPS Fed Ex Courier Client
Shipping Container: Cooler Box Envelope None
Tracking #
Custody Seals: Y N Intact: Y N
Cooler Temp. 1.9 Sample Temp. 4.8

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	B. Anderson	B. ANDERSON	GEOENGINEERS	12-11-15	
RECEIVED BY	Lori Hamilton	Lori Hamilton	Spectra	12-11-15	3:20
RELINQUISHED BY					
RECEIVED BY					

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay Johnson

Case Narrative
Client Project: 19482-002-00 Ground Water
Spectra Project: 2016030273

A total of twelve analytical water samples collected over a two-day period—03/08/16 & 03/09/16-- were received on March 9th 2016 for a variety of analyses including: Volatile Organic Compounds, PCB's, NWTH-Dx, Metals, Nitrate and Sulfate. In addition to the groundwater samples received, five trip blanks were also submitted for VOC analysis. The samples were received cold and intact on 03/09/16 at 16:20; cooler temperature 0.7 C, and sample temperature 2.9 C. Additional aliquots of sample #5 (CO-3A-030816) were submitted for quality control purposes.

In the hardcopy of the analytical report, all analytes not detected at or above the Method Reporting Limit (MRL) are reported as "< X", where "X" is the reporting limit.

Quality control samples included, but were not limited to, trip blanks (for VOC's), method blanks, spiked blanks, also known as laboratory control samples (LCS), matrix spikes (MS), sample duplicates, and/or spiked duplicates (MSD). In most cases, precision was measured using spiked pairs (MS/MSD). This is to insure that there is a measureable quantity present for the computation of Relative Percent Difference (RPD). Although the Petroleum Hydrocarbon Methods suggest sample duplicates, spiked duplicates were chosen for the NWTPH-Dx analysis, as no diesel-range organics were found in the samples from the previous quarters, and it seemed likely that an unspiked sample and duplicate would yield non-detect results--as was in fact the case. As was done for the June, September, and December 2015 samples, both a spiked and unspiked duplicate were performed for VOC's. The unspiked duplicate for VOC's was performed using the 5ml sparge on sample CO-3A-030816. A duplicate 25ml sparge was performed on sample SO-4B-030816, which was non-detect for vinyl chloride.

Metals--Arsenic, Chromium, and Lead-- were analyzed by ICP-MS Method SW 846 6020A, with the collision cell. This was to eliminate potential interference from chloride, given the proximity of the sampling location to saltwater.

VOC analysis was performed in two ways: using the typical 5ml sparge for all analytes except vinyl chloride, and using a 25ml sparge specifically for vinyl chloride. This was done to achieve a Method Reporting Limit of 0.2 ug/L for vinyl chloride, which is the MTCA Method A limit for groundwater. Only the vinyl chloride result was reported from the 25ml sparge, as the large sample volume is not ideal for all analytes, nor necessary to achieve desired reporting limits.

Please feel free to call with any questions regarding these samples.

Sincerely,

for

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: MW-1A-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 1

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	55	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	67.1	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	3.1	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	9.3	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	106	NWTPH-G
4-Bromofluorobenzene	125	NWTPH-G
p-Terphenyl	85	NWTPH-D
Dibromofluoromethane	115	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	116	SW846 8260C
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	90	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	MW-1A-030916
Sample Matrix:	Water
Date Sampled:	03/09/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	1

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	16.7	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	106	NWTPH-G
4-Bromofluorobenzene	125	NWTPH-G
p-Terphenyl	85	NWTPH-D
Dibromofluoromethane	115	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	116	SW846 8260C
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	90	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	MW-1B-030916
Sample Matrix:	Water
Date Sampled:	03/09/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	2

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.02	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	2.2	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	1.0	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	20.2	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	131	NWTPH-G
Toluene-d8	109	NWTPH-G
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	118	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	80	NWTPH-D
Toluene-d8	92	SW846 8260C
4-Bromofluorobenzene	104	SW846 8260C
Decachlorobiphenyl	96	SW846 8082A

SPECTRA LABORATORIES

for

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: MW-1B-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:2

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	131	NWTPH-G
Toluene-d8	109	NWTPH-G
1,2-Dichloroethane-d4	121	SW846 8260C
Dibromofluoromethane	118	SW846 8260C

Surrogate	Recovery	Method
p-Terphenyl	80	NWTPH-D
Toluene-d8	92	SW846 8260C
4-Bromofluorobenzene	104	SW846 8260C
Decachlorobiphenyl	96	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: MW-2A-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:3

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	26.0	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	0.7	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	126	SW846 8260C
Dibromofluoromethane	124	SW846 8260C
p-Terphenyl	84	NWTPH-D
4-Bromofluorobenzene	126	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	109	NWTPH-G
Toluene-d8	91	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: MW-2A-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:3

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	126	SW846 8260C
Dibromofluoromethane	124	SW846 8260C
p-Terphenyl	84	NWTPH-D
4-Bromofluorobenzene	126	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	109	NWTPH-G
Toluene-d8	91	SW846 8260C
4-Bromofluorobenzene	102	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: MW-3A-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:4

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.02	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	35.2	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	1.1	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Dibromofluoromethane	126	SW846 8260C	Toluene-d8	90	SW846 8260C
1,2-Dichloroethane-d4	126	SW846 8260C	4-Bromofluorobenzene	123	NWTPH-G
4-Bromofluorobenzene	99	SW846 8260C	Toluene-d8	107	NWTPH-G
p-Terphenyl	75	NWTPH-D	Decachlorobiphenyl	104	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: MW-3A-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 4

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	126	SW846 8260C
1,2-Dichloroethane-d4	126	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
p-Terphenyl	75	NWTPH-D

Surrogate	Recovery	Method
Toluene-d8	90	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G
Toluene-d8	107	NWTPH-G
Decachlorobiphenyl	104	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	CO-3A-030816
Sample Matrix:	Water
Date Sampled:	03/08/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	5

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	0.06	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	11	mg/L	SM 4500-SO4 E
Arsenic	10.0	µg/L	SW846 6020A
Chromium	0.8	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	121	SW846 8260C
p-Terphenyl	85	NWTPH-D
1,2-Dichloroethane-d4	123	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Decachlorobiphenyl	95	SW846 8082A
Toluene-d8	93	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: CO-3A-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:5

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	121	SW846 8260C
p-Terphenyl	85	NWTPH-D
1,2-Dichloroethane-d4	123	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C

Surrogate	Recovery	Method
Decachlorobiphenyl	95	SW846 8082A
Toluene-d8	93	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G
Toluene-d8	110	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: CO-3B-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:6

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent
Diesel	<100	µg/L	NWTPH-D
Oil	<500	µg/L	NWTPH-D
Gasoline	<50	µg/L	NWTPH-G
Sulfate	46	mg/L	SM 4500-SO4 E
Arsenic	13.6	µg/L	SW846 6020A
Chromium	3.9	µg/L	SW846 6020A
Lead	< 0.5	µg/L	SW846 6020A
PCB	<0.1	µg/L	SW846 8082A
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C

Analyte	Result	Units	Method
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	88	NWTPH-D
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C

Surrogate	Recovery	Method
Decachlorobiphenyl	89	SW846 8082A
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	128	NWTPH-G
Toluene-d8	111	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: CO-3B-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:6

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	88	NWTPH-D
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	100	SW846 8260C
Decachlorobiphenyl	89	SW846 8082A
Toluene-d8	94	SW846 8260C
4-Bromofluorobenzene	128	NWTPH-G
Toluene-d8	111	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: CO-3B-9-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 7

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	34	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	14.1	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	4.1	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C	4-Bromofluorobenzene	97	SW846 8260C
p-Terphenyl	82	NWTPH-D	Decachlorobiphenyl	91	SW846 8082A
Toluene-d8	90	SW846 8260C	4-Bromofluorobenzene	122	NWTPH-G
1,2-Dichloroethane-d4	123	SW846 8260C	Toluene-d8	107	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: CO-3B-9-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 7

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	82	NWTPH-D
Toluene-d8	90	SW846 8260C
1,2-Dichloroethane-d4	123	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	97	SW846 8260C
Decachlorobiphenyl	91	SW846 8082A
4-Bromofluorobenzene	122	NWTPH-G
Toluene-d8	107	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: SO-2A-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 8

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	5.8	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	0.6	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	74	NWTPH-D
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	106	NWTPH-G
1,2-Dichloroethane-d4	126	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	SO-2A-030816
Sample Matrix:	Water
Date Sampled:	03/08/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	8

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	122	SW846 8260C
p-Terphenyl	74	NWTPH-D
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	123	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	106	NWTPH-G
1,2-Dichloroethane-d4	126	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: SO-4A-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number:9

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	0.02	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	76	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	27	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	519	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	< 0.5	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

*Recovery outside control limits.

Surrogate	Recovery	Method
Dibromofluoromethane	120	SW846 8260C
p-Terphenyl	86	NWTPH-D
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	168*	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	105	NWTPH-G
1,2-Dichloroethane-d4	118	SW846 8260C
4-Bromofluorobenzene	132*	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A

SPECTRA LABORATORIES

[signature] for

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	SO-4A-030816
Sample Matrix:	Water
Date Sampled:	03/08/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	9

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	1.5	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	6.1	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	1.2	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

*Recovery outside control limits.

Surrogate	Recovery	Method
Dibromofluoromethane	120	SW846 8260C
p-Terphenyl	86	NWTPH-D
Toluene-d8	89	SW846 8260C
4-Bromofluorobenzene	168*	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	105	NWTPH-G
1,2-Dichloroethane-d4	118	SW846 8260C
4-Bromofluorobenzene	132*	SW846 8260C
Decachlorobiphenyl	93	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: SO-4B-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 10

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	6.2	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	27.8	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	10.8	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

*Recovery outside control limits.

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Dibromofluoromethane	125	SW846 8260C	Toluene-d8	107	NWTPH-G
p-Terphenyl	94	NWTPH-D	1,2-Dichloroethane-d4	130	SW846 8260C
Toluene-d8	90	SW846 8260C	4-Bromofluorobenzene	123*	SW846 8260C
4-Bromofluorobenzene	158*	NWTPH-G	Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: SO-4B-030816
Sample Matrix: Water
Date Sampled: 03/08/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 10

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

*Recovery outside control limits.

Surrogate	Recovery	Method
Dibromofluoromethane	125	SW846 8260C
p-Terphenyl	94	NWTPH-D
Toluene-d8	90	SW846 8260C
4-Bromofluorobenzene	158*	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	107	NWTPH-G
1,2-Dichloroethane-d4	130	SW846 8260C
4-Bromofluorobenzene	123*	SW846 8260C
Decachlorobiphenyl	101	SW846 8082A

SPECTRA LABORATORIES

for

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Rinsate Blank #1-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 11

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	0.8	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	< 0.5	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Dibromofluoromethane	121	SW846 8260C	Toluene-d8	108	NWTPH-G
p-Terphenyl	82	NWTPH-D	1,2-Dichloroethane-d4	123	SW846 8260C
Toluene-d8	91	SW846 8260C	4-Bromofluorobenzene	104	SW846 8260C
4-Bromofluorobenzene	126	NWTPH-G	Decachlorobiphenyl	99	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	Rinsate Blank #1-030916
Sample Matrix:	Water
Date Sampled:	03/09/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	11

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	121	SW846 8260C
p-Terphenyl	82	NWTPH-D
Toluene-d8	91	SW846 8260C
4-Bromofluorobenzene	126	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	108	NWTPH-G
1,2-Dichloroethane-d4	123	SW846 8260C
4-Bromofluorobenzene	104	SW846 8260C
Decachlorobiphenyl	99	SW846 8082A

SPECTRA LABORATORIES

for

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project:	19482-002-00 Ground Water
Client ID:	Field Blank #1-030916
Sample Matrix:	Water
Date Sampled:	03/09/2016
Date Received:	03/09/2016
Spectra Project:	2016030273
Spectra Number:	12

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Nitrate	< 0.01	mg/L-N	Easy1-Reagent	1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
Diesel	<100	µg/L	NWTPH-D	1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Oil	<500	µg/L	NWTPH-D	1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
Gasoline	<50	µg/L	NWTPH-G	1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
Sulfate	<2.0	mg/L	SM 4500-SO4 E	1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
Arsenic	0.8	µg/L	SW846 6020A	1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
Chromium	< 0.5	µg/L	SW846 6020A	1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
Lead	< 0.5	µg/L	SW846 6020A	1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
PCB	<0.1	µg/L	SW846 8082A	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method	Surrogate	Recovery	Method
Dibromofluoromethane	125	SW846 8260C	Toluene-d8	110	NWTPH-G
p-Terphenyl	91	NWTPH-D	1,2-Dichloroethane-d4	124	SW846 8260C
Toluene-d8	92	SW846 8260C	4-Bromofluorobenzene	99	SW846 8260C
4-Bromofluorobenzene	127	NWTPH-G	Decachlorobiphenyl	89	SW846 8082A

SPECTRA LABORATORIES

for

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Field Blank #1-030916
Sample Matrix: Water
Date Sampled: 03/09/2016
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 12

Analyte	Result	Units	Method
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C

Analyte	Result	Units	Method
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Dibromofluoromethane	125	SW846 8260C
p-Terphenyl	91	NWTPH-D
Toluene-d8	92	SW846 8260C
4-Bromofluorobenzene	127	NWTPH-G

Surrogate	Recovery	Method
Toluene-d8	110	NWTPH-G
1,2-Dichloroethane-d4	124	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Decachlorobiphenyl	89	SW846 8082A

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #1-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 13

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	107	NWTPH-G
4-Bromofluorobenzene	122	NWTPH-G
Dibromofluoromethane	129	SW846 8260C
1,2-Dichloroethane-d4	127	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	90	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #1-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 13

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	107	NWTPH-G
4-Bromofluorobenzene	122	NWTPH-G
Dibromofluoromethane	129	SW846 8260C
1,2-Dichloroethane-d4	127	SW846 8260C

Surrogate	Recovery	Method
Toluene-d8	90	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #2-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 14

Analyte	Result	Units	Method	Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G	2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Butanone (MEK)	<10	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C	2-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C	2-Hexanone (MBK)	<10	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C	4-Chlorotoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C	4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C	4-methyl-2-pentanone	<10	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acetone	<10	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C	Acetonitrile	<10	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C	Acrolein	<10	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Acrylonitrile	<10	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C	Benzene	<1.0	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C	Bromobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Bromochloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C	Bromodichloromethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C	Bromoform	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C	Bromomethane	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Carbon Disulfide	<10	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C	Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C	Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Dibromofluoromethane	128	SW846 8260C
Toluene-d8	91	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	127	NWTPH-G
Toluene-d8	108	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #2-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 14

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	99	SW846 8260C
Dibromofluoromethane	128	SW846 8260C
Toluene-d8	91	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	127	NWTPH-G
Toluene-d8	108	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #3-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 15

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Dibromofluoromethane	127	SW846 8260C
Toluene-d8	90	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	119	NWTPH-G
Toluene-d8	107	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #3-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 15

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	98	SW846 8260C
Dibromofluoromethane	127	SW846 8260C
Toluene-d8	90	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	119	NWTPH-G
Toluene-d8	107	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

03/22/2016

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #4-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Analyte	Result	Units	Method
Gasoline	<50	µg/L	NWTPH-G
1,1,1,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,1-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1,2,2-Tetrachloroethane	<1.0	µg/L	SW846 8260C
1,1,2-Trichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethane	<1.0	µg/L	SW846 8260C
1,1-Dichloroethene	<1.0	µg/L	SW846 8260C
1,1-Dichloropropene	<1.0	µg/L	SW846 8260C
1,2,3-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,3-Trichloropropane	<1.0	µg/L	SW846 8260C
1,2,4-Trichlorobenzene	<1.0	µg/L	SW846 8260C
1,2,4-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,2-Dibromo3Chloropropane	<10	µg/L	SW846 8260C
1,2-Dibromoethane (EDB)	<1.0	µg/L	SW846 8260C
1,2-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,2-Dichloroethane	<1.0	µg/L	SW846 8260C
1,2-Dichloropropane	<1.0	µg/L	SW846 8260C
1,3,5-Trimethylbenzene	<1.0	µg/L	SW846 8260C
1,3-Dichlorobenzene	<1.0	µg/L	SW846 8260C
1,3-Dichloropropane	<1.0	µg/L	SW846 8260C
1,4-Dichlorobenzene	<1.0	µg/L	SW846 8260C
2,2-Dichloropropane	<1.0	µg/L	SW846 8260C
2-Butanone (MEK)	<10	µg/L	SW846 8260C
2-Chloroethylvinyl Ether	<10	µg/L	SW846 8260C
2-Chlorotoluene	<1.0	µg/L	SW846 8260C
2-Hexanone (MBK)	<10	µg/L	SW846 8260C
4-Chlorotoluene	<1.0	µg/L	SW846 8260C
4-Isopropyltoluene	<1.0	µg/L	SW846 8260C
4-methyl-2-pentanone	<10	µg/L	SW846 8260C
Acetone	<10	µg/L	SW846 8260C
Acetonitrile	<10	µg/L	SW846 8260C
Acrolein	<10	µg/L	SW846 8260C
Acrylonitrile	<10	µg/L	SW846 8260C
Benzene	<1.0	µg/L	SW846 8260C
Bromobenzene	<1.0	µg/L	SW846 8260C
Bromochloromethane	<1.0	µg/L	SW846 8260C
Bromodichloromethane	<1.0	µg/L	SW846 8260C
Bromoform	<1.0	µg/L	SW846 8260C
Bromomethane	<1.0	µg/L	SW846 8260C
Carbon Disulfide	<10	µg/L	SW846 8260C
Carbon Tetrachloride	<1.0	µg/L	SW846 8260C
Chlorobenzene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	96	SW846 8260C
Dibromofluoromethane	125	SW846 8260C
Toluene-d8	92	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	118	NWTPH-G
Toluene-d8	109	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/22/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Project: 19482-002-00 Ground Water
Client ID: Trip Blank #4-030916
Sample Matrix: Water
Date Sampled:
Date Received: 03/09/2016
Spectra Project: 2016030273
Spectra Number: 16

Analyte	Result	Units	Method
Chlorodibromomethane	<1.0	µg/L	SW846 8260C
Chloroethane	<2.0	µg/L	SW846 8260C
Chloroform	<1.0	µg/L	SW846 8260C
Chloromethane	<2.0	µg/L	SW846 8260C
Dibromomethane	<1.0	µg/L	SW846 8260C
Dichlorodifluoromethane	<1.0	µg/L	SW846 8260C
Ethylbenzene	<1.0	µg/L	SW846 8260C
Hexachlorobutadiene	<1.0	µg/L	SW846 8260C
Iodomethane	<10	µg/L	SW846 8260C
Isopropylbenzene	<1.0	µg/L	SW846 8260C
Methyl-tert-Butyl Ether	<1.0	µg/L	SW846 8260C
Methylene chloride	<5.0	µg/L	SW846 8260C
Naphthalene	<1.0	µg/L	SW846 8260C
Styrene	<1.0	µg/L	SW846 8260C
Tetrachloroethene	<1.0	µg/L	SW846 8260C
Toluene	<1.0	µg/L	SW846 8260C
Total Xylenes	<2.0	µg/L	SW846 8260C
Trichloroethene	<1.0	µg/L	SW846 8260C
Trichlorofluoromethane	<1.0	µg/L	SW846 8260C
Vinyl Acetate	<10	µg/L	SW846 8260C
Vinyl chloride	<0.20	µg/L	SW846 8260C

Analyte	Result	Units	Method
cis-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
cis-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C
n-Butylbenzene	<1.0	µg/L	SW846 8260C
n-Propylbenzene	<1.0	µg/L	SW846 8260C
sec-Butylbenzene	<1.0	µg/L	SW846 8260C
tert-Butylbenzene	<1.0	µg/L	SW846 8260C
trans-1,2-Dichloroethene	<1.0	µg/L	SW846 8260C
trans-1,3-Dichloropropene	<1.0	µg/L	SW846 8260C

Surrogate	Recovery	Method
1,2-Dichloroethane-d4	128	SW846 8260C
4-Bromofluorobenzene	96	SW846 8260C
Dibromofluoromethane	125	SW846 8260C
Toluene-d8	92	SW846 8260C

Surrogate	Recovery	Method
4-Bromofluorobenzene	118	NWTPH-G
Toluene-d8	109	NWTPH-G

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager
a14/jjb

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

3/21/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2016030273
Applies to Spectra Samples: 1-16

QUALITY CONTROL RESULTS
NWTPH-Gx

Initial Calibration Verification

Date Analyzed: 3/13/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	252	250	100.8%	85-115%

Continuing Calibration Verification 1

Date Analyzed: 3/13/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	253	250	101.2%	85-115%

Continuing Calibration Verification 2

Date Analyzed: 3/14/2016
Units: ug/L

Analyte	Standard Value	Conc.	%Rec	QC Limit
Gasoline	263	250	105.2%	85-115%

Spectra Laboratories

for

Steven G. Hibbs
Laboratory Manager

for

Jesse J. Bynum
QA Officer

SPECTRA Laboratories
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

3/21/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2016030273
Applies to Spectra Samples: 1-12

QUALITY CONTROL RESULTS
NWTPH-Dx

Initial Calibration Verification

Date Analyzed: 3/16/2016
Units: ug/L

Analyte	Value	Standard Conc.	%Rec	QC Limit
Diesel	2787	2500	111.5%	85-115%
Oil	5676	5000	113.5%	85-115%

Continuing Calibration Verification 1

Date Analyzed: 3/16/2016
Units: ug/L

Analyte	Value	Standard Conc.	%Rec	QC Limit
Diesel	2752	2500	110.1%	85-115%
Oil	4843	5000	96.9%	85-115%

Continuing Calibration Verification 2

Date Analyzed: 3/17/2016
Units: ug/L

Analyte	Value	Standard Conc.	%Rec	QC Limit
Diesel	2686	2500	107.4%	85-115%
Oil	4787	5000	95.7%	85-115%

Spectra Laboratories

for

Steven G. Hibbs
Laboratory Manager

for

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2016030273
Applies to Spectra Samples: 4, 8-12

QUALITY CONTROL RESULTS
Polychlorinated Biphenyls (PCBs) - EPA Method SW846-8082A

Initial Calibration Verification

Date Analyzed: 3/21/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	104.0	100	104.0%	80-120%
Arochlor 1260	108.6	100	108.6%	80-120%

Continuing Calibration Verification 1

Date Analyzed: 3/21/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	104.0	100	104.0%	80-120%
Arochlor 1260	106.9	100	106.9%	80-120%

Continuing Calibration Verification 2

Date Analyzed: 3/22/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	105.0	100	105.0%	80-120%
Arochlor 1260	108.3	100	108.3%	80-120%

Spectra Laboratories

for

Steven G. Hibbs
Laboratory Manager

for

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

02/05/16

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Spectra Project: 2016030273
Applies to Spectra Samples: 1-3, 5-7

QUALITY CONTROL RESULTS
Polychlorinated Biphenyls (PCBs) - EPA Method SW846-8082A

Initial Calibration Verification

Date Analyzed: 3/20/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	101.3	100	101.3%	80-120%
Arochlor 1260	105.3	100	105.3%	80-120%

Continuing Calibration Verification 1

Date Analyzed: 3/20/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	102.8	100	102.8%	80-120%
Arochlor 1260	105.1	100	105.1%	80-120%

Continuing Calibration Verification 2

Date Analyzed: 3/21/2016
Units: ng/mL

Analyte	Standard Value	Conc.	%Rec	QC Limit
Arochlor 1016	102.8	100	102.8%	80-120%
Arochlor 1260	107.1	100	107.1%	80-120%

Spectra Laboratories

for

Steven G. Hibbs
Laboratory Manager

for

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

3/11/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	ug/L
Spectra Project:	2016030273
Applies to Spectra #'s	1-12
Analyst:	SCJ

QUALITY CONTROL RESULTS

ICP-MS Metals - SW846 6020A - Water

Initial Quality Control Standard/Blank Results

Date Analyzed: 3/11/2016

Element	Standard Value	Conc.	%Rec	QC Limit	Blank Result
Arsenic	100	93.48	93.5	90-110%	< 0.5
Chromium	100	92.86	92.9	90-110%	< 0.5
Lead	100	92.21	92.2	90-110%	< 0.5

Continuing Calibration Verfication/Blank Results

Date Analyzed: 3/11/2016

Element	Standard Value	Conc.	%Rec	QC Limit	Blank Result
Arsenic	100	98.61	98.6	90-110%	< 0.5
Chromium	100	90.49	90.5	90-110%	< 0.5
Lead	100	98.23	98.2	90-110%	< 0.5

Spectra Laboratories

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

3/11/2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	ug/L
Spectra Project:	2016030273
Applies to Spectra #'s	1-12
Analyst:	SCJ

QUALITY CONTROL RESULTS
ICP-MS Metals - SW846 6020A - Water

Laboratory Reagent Blank (LRB)

Date Digested: 3/11/2016 Date Analyzed: 3/11/2016

Element	CAS #	Result
Arsenic	7440-38-2	< 0.5
Chromium	7440-47-3	< 0.5
Lead	7439-92-1	< 0.5

Laboratory Fortified Blank (LFB)

Date Digested: 3/11/2016 Date Analyzed: 3/11/2016

Element	Spike Added	LCS Conc.	LCS %Rec
Arsenic	100.0	94.70	94.7
Chromium	100.0	95.76	95.8
Lead	100.0	95.39	95.4

LCS Recovery limits 85-115%

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Digested: 3/11/2016 Date Analyzed: 3/11/2016
Sample Spiked: 2016030273-5

Element	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Arsenic	10.01	100.0	101.70	91.7	102.50	92.5	0.9
Chromium	0.85	100.0	91.19	90.3	90.67	89.8	0.6
Lead	0.00	100.0	97.01	97.0	97.80	97.8	0.8

Recovery Limits 70-130%
RPD Limit 20

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

Jesse J. Bynum
QA Officer

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	mg/L
Spectra Project:	2016030273
Applies to Samples:	1-12

QUALITY CONTROL RESULTS

Nitrate Method Colorimetric Easy 1-Reagent

Method Blank

Date Analyzed: 3/10/16

	Result	
Nitrate as N	<0.01	mg/L

Blank Spike (LCS)

Date Analyzed: 3/10/16

	Spike Added	LCS Conc.	LCS %Rec
Nitrate as N	0.50	0.465	93.0

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Analyzed: 3/10/16

Sample Spiked: 2016030273-5

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Nitrate as N	0.060	0.250	0.274	85.6	0.273	85.2	0.47

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Units:	mg/L
Spectra Project:	2016030273
Applies to Samples:	1-12

QUALITY CONTROL RESULTS

Sulfate Method AASHTO T290/375.4/SM 4500E

Method Blank

Date Analyzed: 3/10/16

	Result	
Sulfate	<2.0	mg/L

Blank Spike (LCS)

Date Analyzed: 3/10/16

	Spike Added	LCS Conc.	LCS %Rec
Sulfate	25.0	24.8	99.2

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Date Analyzed: 3/10/16

Sample Spiked: 2016030273-5

	Sample Conc.	Spike Conc.	MS Conc.	MS %Rec	MSD Conc	MSD %Rec	RPD
Sulfate	10.7	25	36.1	100.4	34.9	95.5	5.0

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2016030273
Applies to Spectra # 1-3, 5-7

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2016030273-5

Date Extracted: 3/19/2016
Date Analyzed: 3/21/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.42	83%	0.44	88%	6.3

BLANK SPIKE (LCS)

Date Extracted: 3/18/2016
Date Analyzed: 3/20/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.355	71%

METHOD BLANK

Date Extracted: 3/18/2016
Date Analyzed: 3/20/2016

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 91%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2016030273
Applies to Spectra # 4

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2016030273-5

Date Extracted: 3/19/2016
Date Analyzed: 3/21/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.42	83%	0.44	88%	6.3

BLANK SPIKE (LCS)

Date Extracted: 3/20/2016
Date Analyzed: 3/21/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.443	89%

METHOD BLANK

Date Extracted: 3/20/2016
Date Analyzed: 3/21/2016

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 90%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: EPA Method 8082A
Sample Matrix: Water
Units: ug/L
Spectra Project: 2016030273
Applies to Spectra # 8-12

PCB ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2016030273-5

Date Extracted: 3/19/2016
Date Analyzed: 3/21/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	RPD
AR1260	<0.1	0.50	0.42	83%	0.44	88%	6.3

BLANK SPIKE (LCS)

Date Extracted: 3/19/2016
Date Analyzed: 3/21/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
AR1260	<0.1	0.50	0.419	84%

METHOD BLANK

Date Extracted: 3/19/2016
Date Analyzed: 3/21/2016

PCB's <0.1

Surrogate Recovery:
Decachlorobiphenyl 90%

SPECTRA LABORATORIES

[signature] for

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method:	NWTPH-Dx
Sample Matrix:	Water
Spectra Project:	2016030273
Applies to Spectra #:	1-7
Units:	ug/L

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2016030273-5

Date Extracted: 3/11/2016
Date Analyzed: 3/16/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	% RPD
Diesel	<100	2500	1803	72	2165	87	18.2

BLANK SPIKE (LCS)

Date Extracted: 3/11/2016
Date Analyzed: 3/16/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	1958	78

Surrogate Percent Recoveries:

p-terphenyl	86%

METHOD BLANK

Date Extracted: 3/11/2016
Date Analyzed: 3/16/2016

WTPH-D	<100
Heavy Oils	<500

Surrogate Percent Recoveries:

p-terphenyl	86%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-Dx
Sample Matrix: Water
Spectra Project: 2016030273
Applies to Spectra #: 8-12
Units: ug/L

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

MS/MSD

Spiked Sample: 2016030273-5

Date Extracted: 3/11/2016
Date Analyzed: 3/16/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery	Dup. Spike Amount Found	Percent Recovery	% RPD
Diesel	<100	2500	1803	72	2165	87	18.2

BLANK SPIKE (LCS)

Date Extracted: 3/12/2016
Date Analyzed: 3/16/2016

Compound	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
Diesel	<100	2500	1838	74

Surrogate Percent Recoveries:

p-terphenyl 86%

METHOD BLANK

Date Extracted: 3/12/2016
Date Analyzed: 3/16/2016

WTPH-D <100

Heavy Oils <500

Surrogate Percent Recoveries:

p-terphenyl 69%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 15, 2016

Petroleum Reclaiming Services, Inc.
3003 Taylor Way
Tacoma, WA 98421

Method: NWTPH-G
Sample Matrix: Water
Units: ug/L
Spectra Project: 2016030273
Applies to Spectra # 1 - 16

HYDROCARBON ANALYSIS
QUALITY CONTROL RESULTS

DUPLICATE

Duplicate Sample # 2016030273-5
Date Analyzed: 3/13/2016

Compound	Sample Result	Duplicate Result	RPD
Gasoline	<50	<50	0

BLANK SPIKE (LCS)

Date Analyzed 3/13/2016

	Sample Result	Spike Amount Added	Spike Amount Found	Percent Recovery
LCS	<50	250	252	100.8

Surrogate Recoveries:

Toluene-d8	106%
BFB	117%

METHOD BLANK

Date Analyzed 3/13/2016

WTPH-G <50

Surrogate Recoveries:

Toluene-d8	106%
BFB	119%

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 15, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Spectra Project:
Spectra #
Applies to Sample #1-16

Date Received: 3/9/2016
Date Analyzed: 3/13/2016
Dilution: 1
< = less than
2016030273
Method Blank
5ml Sparge

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10.00	trans-1,2,-Dichloroethene	< 1.00
Acetonitrile	< 10.00	1,2-Dichloropropane	< 1.00
Acrolein	< 10.00	1,3-Dichloropropane	< 1.00
Acrylonitrile	< 10.00	cis-1,3-Dichloropropene	< 1.00
Benzene	< 1.00	trans-1,3-Dichloropropene	< 1.00
Bromobenzene	< 1.00	2,2-Dichloropropane	< 1.00
Bromochloromethane	< 1.00	1,1-Dichloropropene	< 1.00
Bromodichloromethane	< 1.00	Ethylbenzene	< 1.00
Bromoform	< 1.00	2-Hexanone (MBK)	< 10.00
Bromomethane	< 1.00	Hexachlorobutadiene	1.02
2-Butanone (MEK)	< 10.00	Iodomethane	< 10.00
n-Butylbenzene	< 1.00	Isopropylbenzene	< 1.00
sec-Butylbenzene	< 1.00	p-Isopropyltoluene	< 1.00
tert-Butylbenzene	< 1.00	Methylene chloride	< 5.00
Carbon Disulfide	< 10.00	4-Methyl-2-pentanone (MIBK)	< 10.00
Carbon tetrachloride	< 1.00	MTBE	< 1.00
Chlorobenzene	< 1.00	Naphthalene	< 1.00
Chlorodibromomethane	< 1.00	n-Propylbenzene	< 1.00
Chloroethane	< 2.00	Styrene	< 1.00
2-Chloroethyl Vinyl ether	< 10.00	1,1,1,2-Tetrachloroethane	< 1.00
Chloroform	< 1.00	1,1,2,2-Tetrachloroethane	< 1.00
Chloromethane	< 2.00	Tetrachloroethene	< 1.00
2-Chlorotoluene	< 1.00	Toluene	< 1.00
4-Chlorotoluene	< 1.00	Total Xylenes	< 2.00
1,2-Dibromo-3-Chloropropane (DBCP)	< 10.00	1,2,3-Trichlorobenzene	< 1.00
1,2-Dibromoethane (EDB)	< 1.00	1,2,4-Trichlorobenzene	1.24
Dibromomethane	< 1.00	1,1,1-Trichloroethane	< 1.00
1,2-Dichlorobenzene	< 1.00	1,1,2-Trichloroethane	< 1.00
1,3-Dichlorobenzene	< 1.00	Trichloroethene	< 1.00
1,4-Dichlorobenzene	< 1.00	Trichlorofluoromethane	< 1.00
Dichlorodifluoromethane	< 1.00	1,2,3-Trichloropropane	< 1.00
1,1-Dichloroethane	< 1.00	1,2,4-Trimethylbenzene	< 1.00
1,2-Dichloroethane	< 1.00	1,3,5-Trimethylbenzene	< 1.00
1,1-Dichloroethene	< 1.00	Vinyl Acetate	< 10.00
cis-1,2-Dichloroethene	< 1.00	Vinyl chloride	< 1.00

SURROGATE RECOVERIES

Dibromofluoromethane	113	%
1,2-Dichloroethane-d4	114	%
Toluene-d8	89	%
4-Bromofluorobenzene	95	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories

...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 15, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/ 8260C
Spectra Project: 2016030273
Date Analyzed: 3/13/2016
Units: ug/L
Applies to Spectra #'s: #1-16

GCMS VOLATILE ORGANIC ANALYSIS
Laboratory Control Sample (LCS) Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	SPIKE RESULT	LCS %REC
1,1-Dichloroethene	<1	10.00	9.38	94
Benzene	<1	10.00	9.16	92
Trichloroethene	<1	10.00	9.27	93
Toluene	<1	10.00	9.17	92
Chlorobenzene	<1	10.00	9.28	93

Surrogate Recoveries (%)	LCS
Dibromofluoromethane	102
1,2-Dichloroethane-d4	102
Toluene-d8	101
4-Bromofluorobenzene	105

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories
...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample Matrix: Water
EPA Method: 624/8260C
Spectra Project: 2016030273
Date Analyzed: 3/13/2016
Units: ug/L
Applies to Spectra #'s: #1-16
Spiked Sample 2016030273-5

GCMS VOLATILE ORGANIC ANALYSIS
Matrix Spike/ Matrix Spike Duplicate Results

COMPOUND	SAMPLE RESULT	SPIKE AMOUNT	MS RESULT	MS %REC	MSD RESULT	MSD %REC	RPD
1,1-Dichloroethene	<1	10.0	8.38	84	8.71	87	3.9
Benzene	<1	10.0	9.28	93	9.54	95	2.8
Trichloroethene	<1	10.0	8.59	86	9.04	90	5.1
Toluene	<1	10.0	8.80	88	9.06	91	2.9
Chlorobenzene	<1	10.0	9.06	91	9.49	95	4.6
(Results after dilution)							

Surrogates	MS	MSD
Dibromofluoromethane	109	106
1,2-Dichloroethane-d4	108	104
Toluene-d8	101	100
4-Bromofluorobenzene	91	92

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

October 30, 2015

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Project: GW Monitoring, March 2016
Sample matrix: Water

Spectra Project:
Sample #: 2016030273-5
Applies to Sample #1-16

Date Received: 03/09/16
Date Analyzed: 03/13/16
Dilution: 1
< = less than
2015090231
Duplicate Analysis
5ml Sparge

VOLATILE ORGANIC ANALYSIS

METHOD 624/8260

Compound	ug/L	Compound	ug/L
Acetone	< 10	trans-1,2,-Dichloroethene	< 1
Acetonitrile	< 10	1,2-Dichloropropane	< 1
Acrolein	< 10	1,3-Dichloropropane	< 1
Acrylonitrile	< 10	cis-1,3-Dichloropropene	< 1
Benzene	< 1	trans-1,3-Dichloropropene	< 1
Bromobenzene	< 1	2,2-Dichloropropane	< 1
Bromochloromethane	< 1	1,1-Dichloropropene	< 1
Bromodichloromethane	< 1	Ethylbenzene	< 1
Bromoform	< 1	2-Hexanone (MBK)	< 10
Bromomethane	< 1	Hexachlorobutadiene	< 1
2-Butanone (MEK)	< 10	Iodomethane	< 10
n-Butylbenzene	< 1	Isopropylbenzene	< 1
sec-Butylbenzene	< 1	p-Isopropyltoluene	< 1
tert-Butylbenzene	< 1	Methylene chloride	< 5
Carbon Disulfide	< 10	4-Methyl-2-pentanone (MIBK)	< 10
Carbon tetrachloride	< 1	MTBE	< 1
Chlorobenzene	< 1	Naphthalene	< 1
Chlorodibromomethane	< 1	n-Propylbenzene	< 1
Chloroethane	< 2	Styrene	< 1
2-Chloroethyl Vinyl ether	< 10	1,1,1,2-Tetrachloroethane	< 1
Chloroform	< 1	1,1,2,2-Tetrachloroethane	< 1
Chloromethane	< 2	Tetrachloroethene	< 1
2-Chlorotoluene	< 1	Toluene	< 1
4-Chlorotoluene	< 1	Total Xylenes	< 2
1,2-Dibromo-3-Chloropropane (DBCP)	< 10	1,2,3-Trichlorobenzene	< 1
1,2-Dibromoethane (EDB)	< 1	1,2,4-Trichlorobenzene	< 1
Dibromomethane	< 1	1,1,1-Trichloroethane	< 1
1,2-Dichlorobenzene	< 1	1,1,2-Trichloroethane	< 1
1,3-Dichlorobenzene	< 1	Trichloroethene	< 1
1,4-Dichlorobenzene	< 1	Trichlorofluoromethane	< 1
Dichlorodifluoromethane	< 1	1,2,3-Trichloropropane	< 1
1,1-Dichloroethane	< 1	1,2,4-Trimethylbenzene	< 1
1,2-Dichloroethane	< 1	1,3,5-Trimethylbenzene	< 1
1,1-Dichloroethene	< 1	Vinyl Acetate	< 10
cis-1,2-Dichloroethene	< 1	Vinyl chloride	< 1

SURROGATE RECOVERIES

Dibromofluoromethane	124 %
1,2-Dichloroethane-d4	124 %
Toluene-d8	89 %
4-Bromofluorobenzene	102 %

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 14, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Spectra Project: **2016030273**
Spectra # **Method Blank**
Applies to Sample #1-16 **25ml Sparge--Vinyl Chloride**

Date Received:	3/9/2016
Date Analyzed:	3/12/2016
Dilution:	1
< = less than	

VOLATILE ORGANIC ANALYSIS

Compound	ug/L	**METHOD 624/8260** 25 ml Sparge
Vinyl Chloride	< 0.20	

SURROGATE RECOVERIES

Dibromofluoromethane	112	%
1,2-Dichloroethane-d4	108	%
Toluene-d8	98	%
4-Bromofluorobenzene	94	%

Steven G. Hibbs
Laboratory Manager

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

March 22, 2016

Petroleum Reclaiming Service, Inc.
3003 Taylor Way
Tacoma, WA 98421
Attn: Jay

Sample matrix: Water

Spectra Project:
Spectra #10
Client ID: SO-4B-030816
Applies to Sample #1-16

Date Received:	3/9/2016
Date Analyzed:	3/12/2016
Dilution:	1

< = less than
2016030273
Duplicate Analysis
25ml Sparge--Vinyl Chloride
ug/L

VOLATILE ORGANIC ANALYSIS **METHOD 624/8260**

Compound	Initial Result	Duplicate Result	RPD %
Vinyl Chloride	<0.20	<0.20	0.00

for

Steven G. Hibbs
Laboratory Manager

Spectra Laboratories
Sample Receiving Checklist
FRONT DESK ATTN **(If Receiving Fecal Samples, Fill Out Entire Sheet)**

Client: PRS Group — Spectra Project # 2016 030273

Project Name: 19482-002-00 Groundwater

Received Date: 3-9-16 Received Time: 4:20 By: [illegible]

Shipped via: Client Courier UPS USPS FEDEX Other ______

Tracking Number ______

Papers/Cooler:

Type of shipping container: Cooler Box None Other ______

Cooler Temperature 0.7 °C Sample Temperature 2.9 °C

Custody papers included?...Yes No

Were custody papers properly filled out (ink, signed, etc)?...........Yes No N/A

Were Papers/Bottle labels legible?...Yes No N/A

Did all bottle labels and tags agree with custody papers?..............Yes No N/A

Custody Seals:

Were custody seals on outside of samples/containers?..................Yes No

Intact?..Yes No N/A

Custody seal info (date/name/label) ______

LOGIN:

Did all sample containers arrive in good condition (unbroken, etc)...Yes No

Was sufficient amount of sample sent for the tests indicated?.......Yes No N/A

Were the bottles provided correct for the analyses requested?.......Yes No

Were VOA vials free of air bubbles?..Yes No N/A

Was correct preservation added to samples?..............................Yes No N/A

If no, Sample Control added preservative to the following:

Sample Number	Reagent	Analyte

Explain any discrepancies: ______

Initials: MH **Date:** 3-9-16 J:UserShares/sample management/sample management/sample check in

SPECTRA Laboratories
2221 Ross Way, Tacoma, WA 98421
(253) 272-4850 Fax (253) 572-9838
www.spectra-lab.com info@spectra-lab.com

SPECIAL INSTRUCTIONS/COMMENTS:
* TOTAL METALS BY 6020 ✓
(Cr, AS, Pb)
* GEOENGINEERS JOB# 19482-002-00

CHAIN OF CUSTODY

SPECTRA PROJECT # 20160302773

Return Samples: Y N X Page 1 of 2 STANDARD X RUSH ☐

CLIENT: PRS GROUP ADDRESS: ADDRESS CHANGE ☐

PROJECT: 19482-002-00 GROUND WATER

CONTACT: JAY @ PRS, NICK @ GEOENGINEERS

SAMPLED BY: BRIAN ANDERSON

PHONE: 253-383-4175 FAX:

e-MAIL: JAY@PRSPLANT.NET, NROHRBACH@GEOENGINEERS.COM Prefer FAX ☐ or e-MAIL ☐

PURCHASE ORDER #

#	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	HYDROCARBONS: NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-Gx	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)	ORGANICS: 8260/624 VOA VOC 8260B	8260 CHLOR SOLVENTS	8270-625 SEMI VOA	8270 PAH/PNA	8082/608 PCB	METALS: TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) SEE NOTE	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)	OTHER: PH 9040/9045	TX/TOX/EOX	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	NITRATE BY EPA 353.2	SULFATE BY EPA 375.4	MS/MSD VOLUME
1	MW-1A-030916	3-9-16	1459	W	7				X	X			X				X		X									X	X	
2	MW-1B-030916	3-9-16	1412	W	7				X	X			X				X		X									X	X	
3	MW-2A-030916	3-9-16	1049	W	7				X	X			X				X		X									X	X	
4	MW-3A-030916	3-9-16	0959	W	7				X	X			X				X		X									X	X	
5	CO-3A-030816	3-8-16	1442	W	21				X	X			X				X		X									X	X	X
6	CO-3B-030816	3-8-16	1617	W	7				X	X			X				X		X									X	X	
7	CO-3B-9-030816	3-8-16	1630	W	7				X	X			X				X		X									X	X	
8	SO-2A-030816	3-8-16	1358	W	7				X	X			X				X		X									X	X	
9	SO-4A-030816	3-8-16	1059	W	7				X	X			X				X		X									X	X	
10	SO-4B-030816	3-8-16	1306	W	7				X	X			X				X		X									X	X	

LAB USE ONLY
Shipped Via: US Mail UPS Fed Ex Courier Client
Shipping Container: Cooler Box Envelope None
Tracking #
Custody Seals: Y N Intact: Y N
Cooler Temp 0.7 Sample Temp 2.9

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	Brian Anderson	BRIAN ANDERSON	GEOENGINEERS	3-9-16	
RECEIVED BY	Lori Hamilton	Lori Hamilton	Spectra	3-9-16	4:20
RELINQUISHED BY					
RECEIVED BY					

SPECTRA Laboratories
2221 Ross Way, Tacoma, WA 98421
(253) 272-4850 Fax (253) 572-9838
www.spectra-lab.com info@spectra-lab.com

SPECIAL INSTRUCTIONS/COMMENTS:
* TOTAL METALS BY 6020 (CR, AS, PB)
* GEOENGINEERS JOB# 19482-002-00

Return Samples: Y N ~~Y~~

Page 2 of 2

CHAIN OF CUSTODY

SPECTRA PROJECT # W1L0302773

STANDARD ☒ RUSH ☐

CLIENT: PRS GROUP
ADDRESS:
ADDRESS CHANGE ☐

PROJECT: 19482-002-00 GROUND WATER
CONTACT: JAY@PRS NICK@GEOENGINEERS
SAMPLED BY: BRIAN ANDERSON
PHONE: 253-383-4175 FAX:
e-MAIL: JAY@PRSPLANT.NET NROHRBACH@GEOENGINEERS.COM Prefer FAX ☐ Prefer E-MAIL ☐
PURCHASE ORDER #

	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	HYDROCARBONS: NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-Gx	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)	ORGANICS: 8260/624 VOA VOC 8260 B	8260 CHLOR SOLVENTS	8270-625 SEMI VOA	8270 PAH/PNA	8082/608 PCB	METALS: TOTAL METALS RCRA 8	TOTAL METALS (SPECIFY) SEE ABOVE	TCLP METALS RCRA 8	TCLP METALS (SPECIFY)	OTHER: PH 9040/9045	TX/TOX/EOX	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	NITRATE (BY EPA 353.2)	SULFATE (BY EPA 375.2)
1	RINSATE BLANK #1-030916	3-9-16	1300	W	7				X	X			X				X		X									X	X
2																													
3	FIELD BLANK #1-030916	3-9-16	1315	W	7				X	X			X				X		X									X	X
4																													
5	TRIP BLANK #1-030916	—	—	W	1				X				X																
6	TRIP BLANK #2-030916	—	—	W	1				X				X																
7	TRIP BLANK #3-030916	—	—	W	1				X				X																
8	TRIP BLANK #4-030916	—	—	W	1				X				X																
9																													
10																													

LAB USE ONLY
Shipped Via: US Mail UPS Fed Ex Courier Client
Shipping Container: Cooler Box Envelope None
Tracking #
Custody Seals: Y N Intact: Y N
Cooler Temp. 0.7 Sample Temp. 2.9

	SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME
RELINQUISHED BY	[signature]	BRIAN ANDERSON	GEOENGINEERS	3-9-16	
RECEIVED BY	[signature]	Lori Hamilton	Spectra	3-9-16	4:20
RELINQUISHED BY					
RECEIVED BY					

APPENDIX B
Laboratory Data Validation Reports

Date: September 1, 2015

File: 19482-002-00

Subject: PRS Hazardous Waste Disposal Facility Groundwater Monitoring, First Quarter (June) 2015 Groundwater Samples

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2B data validation (EPA Document 540-R-08-005; EPA 2009) of analytical data from the analyses of groundwater samples collected as part of the June 2015 first quarter sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the PRS Group, Inc. (PRS) facility located at 3003 Taylor Way in Tacoma, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and Inorganic Superfund Data Review (EPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

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

In accordance with the Quality Assurance Project Plan (QAPP) (Appendix B of Exhibit C, Groundwater Monitoring Plan [PRS 2015]), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method, Trip, and Field Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Laboratory/Field Duplicates
- Instrument Tuning
- Initial Calibrations
- Continuing Calibrations
- Reporting Limits
- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery groups (SDGs) listed below in Table 1.

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
2015060363	MW1A-0615, MW-1B-0615, MW-3A-0615, CO-3A-0615, CO-3B-0615, SO-2A-0615, SO-4A-0615, SO-4A-9-0615, SO-4B-0615, TP1-0615
2015060364	MW-2A-0615, TB2-0615

CHEMICAL ANALYSIS PERFORMED

Spectra Laboratories, Inc. (Spectra), located in Tacoma, Washington, performed laboratory analyses on the groundwater samples using the following methods:

- Petroleum Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Volatile Organic Compounds (VOCs) by Method SW8260C;
- Polychlorinated biphenyls (PCBs) by Method SW8082A;
- Total Metals by Method EPA 6020A;
- Nitrate by Method Systea Easy (1-Reagent); and
- Sulfate by Method SM4500-SO4 E.

DATA VALIDATION SUMMARY

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

Data Package Completeness

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

Chain-of-Custody Documentation

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

SDG 2015060363: The laboratory noted that for Samples SO-4A-0615, SO-4A-9-0615, and SO-4B-0615 Method SGT-HEM (TPH) was selected on the COC, whereas Method NWTPH-Dx was selected for the other samples. It was determined that Method NWTPH-Dx should have been the method selected on the COC for these samples.

Holding Times and Sample Preservation

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

SDG 2015060364: The sample cooler temperature was not recorded at the laboratory; however, the sample temperature was recorded at 8.2 degrees Celsius. It was determined through professional judgment that since the samples were received by the laboratory the same day they were collected, this temperature should not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the control limits specified on Table B-2 of the QAPP.

Method, Trip, and Field Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For the sample batches, method blanks were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in the method blanks.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. Two trip blanks were collected (one for each cooler): TP1-0615 and TB2-0615. None of the analytes of interest were detected above the reporting limits in the trip blanks.

Field Blanks

Field blanks are analyzed to provide indication of cross-contamination that may occur from the sampling environment. One field blank should be analyzed at a frequency of 1 per 20 field samples collected. There were no field blank samples collected during this sampling event.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in Table B-2 of the QAPP, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery and RPD values were within the proper control limits, with the following exceptions:

SDGs 2015060363 and 2015060364: (PCBs) The laboratory performed a MS/MSD sample set on Sample MW-1A-0615. The percent recovery for Aroclor 1260 was greater than the control limits in both the MS and MSD extracted on June 30, 2015. There were no positive results for this target analyte in the associated field sample; therefore, no action was required for these outliers.

Laboratory Control Samples

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS control limits for accuracy are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS analyses would apply to each sample in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS analyses are specified in Table B-2 of the QAPP.

One LCS analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery values were within the proper control limits, with the following exception:

SDGs 2015060363 and 2015060364: (PCBs) The percent recovery for Aroclor 1260 was greater than the control limits in the LCS extracted on June 26, 2015. There were no positive results for this target analyte in the associated field samples; therefore, no action was required for this outlier.

Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP.

SDG 2015060363: One field duplicate sample pair, SO-4A-0615 and SO-4A-9-0615, was submitted with this SDG. The precision criteria for the target analytes were met for this sample pair, with the exception of nitrate and sulfate. The positive results for these target analytes were qualified as estimated (J) in these samples.

Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) are completed to ensure that mass resolution, identification, and sensitivity of the analyses are acceptable. Instrument tuning should be performed at the beginning of each 12-hour period during which samples or standards are analyzed. The frequency and specified acceptance criteria were met for each applicable analysis.

Initial Calibrations

The initial calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent relative standard deviation (%RSD) and relative response factors (RRF) values were within the control limits stated in either the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDGs 2015060363 and 2015060364: (VOCs) The %RSD values for 1,2,4-Trimethylbenzene, 2-Chloroethyl vinyl Ether, 4-Isopropyltoluene, cis-1,3-Dichloropropene, n-butylbenzene, naphthalene, styrene, tert-butylbenzene, and total xylenes were outside the control limits in the initial calibration verification performed on May 29, 2015. The reporting limits for these target analytes were qualified as estimated (UJ) in Samples MW1A-0615, MW-1B-0615, MW-2A-0615, MW-3A-0615, CO-3A-0615, CO-3B-0615, SO-2A-0615, SO-4A-0615, SO-4A-9-0615, SO-4B-0615, TP1-0615, and TB2-0615.

Continuing Calibrations

The continuing calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent difference (%D) and relative response factors (RRF) values were within the control limits in either the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDGs 2015060363 and 2015060364: (VOCs) The %D values for 1,2,3-Trichlorobenzene, 2,2-Dichloropropane, 2-Chlorotoluene, acrolein, bromomethane, iodomethane, and naphthalene were outside the control limits in the continuing calibration verification performed on June 15, 2015. The reporting limits for these target analytes were qualified as estimated (UJ) in Samples MW1A-0615, MW-1B-0615, MW-2A-0615, MW-3A-0615, CO-3A-0615, CO-3B-0615, SO-2A-0615, SO-4A-0615, SO-4A-9-0615, SO-4B-0615, TP1-0615, and TB2-0615.

The %D for vinyl chloride was outside the control limits in the continuing calibration verification performed on June 23, 2015. The positive results and reporting limits for this target analyte were qualified as estimated (J/UJ) in Samples MW1A-0615, MW-1B-0615, MW-2A-0615, MW-3A-0615, CO-3A-0615, CO-3B-0615, SO-2A-0615, SO-4A-0615, SO-4A-9-0615, SO-4B-0615, TP1-0615, and TB2-0615.

Reporting Limits

The contract required quantitation limits (CRQL) were met by the laboratory for each target analyte throughout this sampling event as specified in Table B-3 of the QAPP.

Miscellaneous

Table B-2 of the QAPP: The recovery limits and RPDs listed in Table B-2 are from 2009 (see footnote 2 in QAPP). Table 2 below lists the current recovery limits and RPDs obtained from Spectra on August 11, 2015.

TABLE 2. CURRENT RECOVERY LIMITS AND RPDS

Analyte	Analytical Method	LCS %Recovery Limits	MS %Recovery Limits	Sample Surrogate %Recovery Limits	MS/MSD, or Laboratory Duplicate RPD Limits (%)	Field Duplicate RPD Limits
Total Metals	EPA 6020A	80-120	75-125	NA	≤20	≤30
TPH – Diesel	NWTPH-Dx	71-125	71-125	50-150	≤20	≤30
TPH – Gasoline	NWTPH-Gx	68-124	68-124	50-150	≤30	≤30
PCBs	SW8082A	42-130	42-130	51-118	≤30	≤30
VOCs	SW8260C	49-155	50-165	92-142	≤25	≤30
1,1-Dichloroethene	SW8260C	49-155	50-165	--	≤25	≤30
Benzene	SW8260C	88-120	80-126	--	≤25	≤30
Trichloroethene	SW8260C	81-117	75-126	--	≤25	≤30
Toluene	SW8260C	93-122	74-123	--	≤25	≤30
Chlorobenzene	SW8260C	96-129	76-130	--	≤25	≤30
Dibromofluoromethane (Surr)	SW8260C	--	--	104-142	--	--
1,4-Difluorobenzene d-4 (Surr)	SW8260C	--	--	92-131	--	--
Toluene d-8 (Surr)	SW8260C	--	--	92-120	--	--
4-Bromofluorobenzene (Surr)	SW8260C	--	--	110-128	--	--

SDGs 2015060363 and 2015060364: (NWTPH-Dx) The laboratory performed a MS/MSD analyses instead of a laboratory duplicate as stated in Table B-5 of the QAPP and in Analytical Methods for Petroleum Hydrocarbons (Ecology 1997). See lab report case narrative for details.

SDGs 2015060363 and 2015060364: (Nitrate and Sulfate) The requested analysis methods in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for nitrate and sulfate were Methods EPA 353.3 and 375.4, respectively. These methods are outdated. The Method Systea Easy (1-Reagent) was used for nitrate and the Method SM4500-SO4 E was used for sulfate per the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants. These methods supersede the requested analysis methods.

OVERALL ASSESSMENT

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

The data are acceptable for the intended use, with the following qualifications listed below in Table 3.

TABLE 3. SUMMARY OF QUALIFIED SAMPLES

Analyte	Sample ID												Reason		
	MW-1A-0615	MW-1B-0615	MW-2A-0615	MW-3A-0615	CO-3A-0615	CO-3B-0615	SO-2A-0615	SO-4A-0615	SO-4A-9-0615	SO-4B-0615	TP1-0615	TB2-0615	ICAL %RSD	CCAL %D	FD Precision
1,2,3-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
1,2,4-Trimethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
2,2-Dichloropropane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
2-Chlorotoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
2-Chloroethyl vinyl Ether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
4-Isopropyltoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Acrolein	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
Bromomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
cis-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Iodomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X	
n-butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Naphthalene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X	
Nitrate	--	--	--	--	--	--	--	J	J	--	--	--			X
Sulfate	--	--	--	--	--	--	--	J	J	--	--	--			X
Styrene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Tert-butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Total Xylenes	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X		
Vinyl chloride	UJ	UJ	UJ	UJ	UJ	UJ	UJ	J	J	UJ	UJ	UJ		X	

Notes:
ICAL – Initial Calibration; CCAL – Continuing Calibration; FD – Field Duplicate

REFERENCES

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

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.

PRS Group, Inc., "Exhibit C, Groundwater Monitoring Plan." May 20, 2015.

Washington State Department of Ecology (Ecology). "Analytical Method for Petroleum Hydrocarbons." Publication No. ECY 97-602. June 1997.

GeoEngineers

1101 Fawcett Avenue, Suite 200, Tacoma, Washington 98402, Telephone: 253.383.4940, Fax: 253.383.4923 www.geoengineers.com

Data Validation Report

Date:	November 21, 2015
File:	19482-002-00
Subject:	PRS Hazardous Waste Disposal Facility Groundwater Monitoring, Second Quarter (September) 2015 Groundwater Samples

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2B data validation (EPA Document 540-R-08-005; EPA 2009) of analytical data from the analyses of groundwater samples collected as part of the September 2015 second quarter sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the PRS Group, Inc. (PRS) facility located at 3003 Taylor Way in Tacoma, Washington

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and Inorganic Superfund Data Review (EPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

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

In accordance with the Quality Assurance Project Plan (QAPP) (Appendix B of Exhibit C, Groundwater Monitoring Plan [PRS 2015]), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method, Trip, and Field Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Laboratory/Field Duplicates
- Instrument Tuning
- Initial Calibrations
- Continuing Calibrations
- Reporting Limits
- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

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

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
2015090231	MW-1A-150908, MW-1B-150908, MW-2A-150908, MW-3A-150909, CO-3A-150909, CO-3B-150909, SO-2A-150909, SO-4A-150908, SO-4B-150908, TB-1-150909

CHEMICAL ANALYSIS PERFORMED

Spectra Laboratories, Inc. (Spectra), located in Tacoma, Washington, performed laboratory analyses on the groundwater samples using the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Diesel- and Heavy Oil-Range Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Volatile Organic Compounds (VOCs) by Method SW8260C;
- Polychlorinated biphenyls (PCBs) by Method SW8082A;
- Total Metals by Method EPA 6020A;
- Nitrate by Method Systea Easy (1-Reagent); and
- Sulfate by Method SM4500-SO4 E.

DATA VALIDATION SUMMARY

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

Data Package Completeness

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

Chain-of-Custody Documentation

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

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for each analysis. The sample cooler arrived at the laboratory outside the appropriate temperatures of between two and six degrees Celsius. The out-of-compliance temperature is detailed below.

SDG 2015090231: The sample cooler temperature recorded at the laboratory was 10.4 degrees Celsius. The samples collected on September 8, 2015 were preserved on ice during sample collection and then stored in the GeoEngineers field refrigerator overnight. After sample collection was completed on September 9, 2015, all samples were placed in the sample cooler, preserved on ice, and delivered to the laboratory. It was determined through professional judgment that since the samples collected on September 8, 2015 were properly preserved and the samples collected on September 9, 2015 were received by the laboratory the same day they were collected, this temperature should not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the control limits specified on Table B-2 of the QAPP.

Method, Trip, and Field Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For the sample batches, method blanks were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in the method blanks.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. One trip blank was collected: TB-1-150909. None of the analytes of interest were detected above the reporting limits in the trip blank.

Field Blanks

Field blanks are analyzed to provide indication of cross-contamination that may occur from the sampling environment. One field blank should be analyzed at a frequency of 1 per 20 field samples collected. There were no field blank samples collected during this sampling event.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in Table B-2 of the QAPP, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery and RPD values were within the proper control limits, with the following exception:

SDG 2015090231: (NWTPH-Dx) The laboratory performed an MS/MSD sample set on Sample MW-1A-150908. The RPD value for diesel-range hydrocarbons was greater than the control limit in the MS/MSD extracted on September 11, 2015. There were no positive results for this target analyte in the associated field sample; therefore, no action was required for this outlier.

Laboratory Control Samples

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS control limits for accuracy are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS analyses would apply to each sample in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS analyses are specified in Table B-2 of the QAPP.

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

Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP.

There were no field duplicate samples collected during this sampling event.

Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) are completed to ensure that mass resolution, identification, and sensitivity of the analyses are acceptable. Instrument tuning should be performed at the beginning of each 12-hour period during which samples or standards are analyzed. The frequency and specified acceptance criteria were met for each applicable analysis.

Initial Calibrations

The initial calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent relative standard deviation (%RSD) and relative response factors

(RRF) values were within the control limits stated in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2015090231: (VOCs) The %RSD values for 1,1,2,2-Tetrachloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Chloroethyl vinyl Ether, 4-Isopropyltoluene, ethylbenzene, iodomethane, n-Butylbenzene, naphthalene, sec-Butylbenzene, styrene, tert-Butylbenzene, total xylenes, and vinyl acetate were outside the control limits in the initial calibration verification performed on September 22, 2015. The reporting limits for these target analytes were qualified as estimated (UJ) in Samples MW-1A-150908, MW-1B-150908, MW-2A-150908, MW-3A-150909, CO-3A-150909, CO-3B-150909, SO-2A-150909, SO-4A-150908, SO-4B-150908, and TB-1-150909.

Continuing Calibrations

The continuing calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent difference (%D) and relative response factors (RRF) values were within the control limits in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2015090231: (VOCs) The %D values for 4-Isopropyltoluene, bromomethane, hexachlorobutadiene, naphthalene, styrene, tert-Butylbenzene, total xylenes, and vinyl acetate were outside the control limits in the continuing calibration verification performed on September 23, 2015. The reporting limits for these target analytes were qualified as estimated (UJ) in Samples MW-1A-150908, MW-1B-150908, MW-2A-150908, MW-3A-150909, CO-3A-150909, CO-3B-150909, SO-2A-150909, SO-4A-150908, SO-4B-150908, and TB-1-150909.

Reporting Limits

The contract required quantitation limits (CRQL) were met by the laboratory for each target analyte throughout this sampling event as specified in Table B-3 of the QAPP.

Miscellaneous

Table B-2 of the QAPP: The recovery limits and RPDs listed in Table B-2 are from 2009 (see footnote 2 in QAPP). Table 2 below lists the current recovery limits and RPDs obtained from Spectra on November 19, 2015.

TABLE 2. CURRENT RECOVERY LIMITS AND RPDS

Analyte	Analytical Method	LCS %Recovery Limits	MS %Recovery Limits	Sample Surrogate %Recovery Limits	MS/MSD, or Laboratory Duplicate RPD Limits (%)	Field Duplicate RPD Limits
Total Metals	EPA 6020A	80-120	75-125	NA	≤20	≤30
TPH – Diesel	NWTPH-Dx	43-122	43-122	50-150	≤20	≤30
TPH – Gasoline	NWTPH-Gx	70-124	70-124	50-150	≤30	≤30
PCBs	SW8082A	45-130	45-130	44-110	≤30	≤30
VOCs	SW8260C	56-153	39-159	65-154	≤25	≤30
1,1-Dichloroethene	SW8260C	56-153	39-155	--	≤25	≤30
Benzene	SW8260C	66-150	66-159	–	≤25	≤30

Analyte	Analytical Method	LCS %Recovery Limits	MS %Recovery Limits	Sample Surrogate %Recovery Limits	MS/MSD, or Laboratory Duplicate RPD Limits (%)	Field Duplicate RPD Limits
Trichloroethene	SW8260C	77-121	60-139	--	≤25	≤30
Toluene	SW8260C	71-125	63-129	--	≤25	≤30
Chlorobenzene	SW8260C	81-127	72-127	--	≤25	≤30
Dibromofluoromethane (Surr)	SW8260C	--	--	95-154	--	--
1,2-Dichloroethane d-4 (Surr)	SW8260C	--	--	69-151	--	--
Toluene d-8 (Surr)	SW8260C	--	--	65-111	--	--
4-Bromofluorobenzene (Surr)	SW8260C	--	--	77-117	--	--

SDG 2015090231: (NWTPH-Dx) The laboratory performed a MS/MSD analyses instead of a laboratory duplicate as stated in Table B-5 of the QAPP and in Analytical Methods for Petroleum Hydrocarbons (Ecology 1997). See lab report case narrative for details.

SDG 2015090231: (VOCs) The requested analysis method in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for VOCs is Method SW8260B. This method is outdated. The Method SW8260C was used for VOC analysis. This is the most current revision to the method and approved by EPA.

SDG 2015090231: (Nitrate and Sulfate) The requested analysis methods in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for nitrate and sulfate were Methods EPA 353.3 and 375.4, respectively. These methods are outdated. The Method Systea Easy (1-Reagent) was used for nitrate and the Method SM4500-SO4 E was used for sulfate per the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants. These methods supersede the requested analysis methods.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD percent recovery values. Precision was acceptable, as demonstrated by the MS/MSD and laboratory duplicate RPD values, with the exception noted above.

The data are acceptable for the intended use, with the following qualifications listed below in Table 3.

TABLE 3. SUMMARY OF QUALIFIED SAMPLES

Analyte	Sample ID										Reason	
	MW-1A-150908	MW-1B-150908	MW-2A-150908	MW-3A-150909	CO 3A 150909	CO-3B-150909	SO-2A-150909	SO-4A-150908	SO-4B-150908	TB-1-150909	ICAL %RSD	CCAL %D
1,1,2,2-Tetrachloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
1,2,3-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
1,2,4-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
1,2,4-Trimethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
1,3,5-Trimethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
2-Chloroethyl vinyl Ether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
4-Isopropyltoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X
Bromomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X
Ethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
Hexachlorobutadiene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		X
Iodomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
n-Butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
Naphthalene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X
sec-Butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	
Styrene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X
tert-Butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X
Total xylenes	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	X	X
Vinyl acetate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	J	UJ	UJ	X	X

Notes:
ICAL – Initial Calibration; CCAL – Continuing Calibration

REFERENCES

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

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.

PRS Group, Inc., "Exhibit C, Groundwater Monitoring Plan." May 20, 2015.

Washington State Department of Ecology (Ecology). "Analytical Method for Petroleum Hydrocarbons." Publication No. ECY 97-602. June 1997.

GeoEngineers
1101 Fawcett Avenue, Suite 200, Tacoma, Washington 98402, Telephone: 253.383.4940, Fax: 253.383.4923 www.geoengineers.com

Data Validation Report

Date: February 22, 2016

File: 19482-002-00

Subject: PRS Hazardous Waste Disposal Facility Groundwater Monitoring, Third Quarter (December) 2015 Groundwater Samples

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2B data validation (EPA Document 540-R-08-005; EPA 2009) of analytical data from the analyses of groundwater samples collected as part of the December 2015 third quarter sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the PRS Group, Inc. (PRS) facility located at 3003 Taylor Way in Tacoma, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and Inorganic Superfund Data Review (EPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

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

In accordance with the Quality Assurance Project Plan (QAPP) (Appendix B of Exhibit C, Groundwater Monitoring Plan [PRS 2015]), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method, Trip, Field, and Rinsate Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Laboratory/Field Duplicates
- Instrument Tuning
- Initial Calibrations
- Continuing Calibrations
- Reporting Limits
- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

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

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
2015120354	MW-1A-121115, MW-1B-121115, MW-2A-121115, MW-3A-121115, CO-3A-121015, CO-3B-121015, SO-2A-121015, SO-4A-121015, SO-4A-9-121015, SO-4B-121015, Field Blank #1-121115, Rinsate Blank #1-121115, Trip Blank #1-121115, Trip Blank #2-121115, Trip Blank #3-121115, Trip Blank #4-121115, Trip Blank #5-121115

CHEMICAL ANALYSIS PERFORMED

Spectra Laboratories, Inc. (Spectra), located in Tacoma, Washington, performed laboratory analyses on the groundwater samples using the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Diesel- and Heavy Oil-Range Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Volatile Organic Compounds (VOCs) by Method SW8260C;
- Polychlorinated biphenyls (PCBs) by Method SW8082A;
- Total Metals by Method EPA 6020A;
- Nitrate by Method Systea Easy (1-Reagent); and
- Sulfate by Method SM4500-SO4 E.

DATA VALIDATION SUMMARY

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

Data Package Completeness

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

Chain-of-Custody Documentation

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

Holding Times and Sample Preservation

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

SDG 2015120354: The sample cooler temperature recorded at the laboratory was 1.9 degrees Celsius. It was determined through professional judgment that since the samples were not frozen, this temperature should not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the control limits specified on Table B-2 of the QAPP.

Method, Trip, Field, and Rinsate Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For the sample batches, method blanks were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in the method blanks.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. Five (5) trip blanks were collected: Trip Blank #1-121115, Trip Blank #2-121115, Trip Blank #3-121115, Trip Blank #4 121115, and Trip Blank #5-121115. None of the analytes of interest were detected above the reporting limits in the trip blanks.

Field Blanks

Field blanks are analyzed to provide indication of cross-contamination that may occur from the sampling environment. One field blank should be analyzed at a frequency of 1 per 20 field samples collected. One field blank was collected: Field Blank #1-121115. None of the analytes of interest were detected above the reporting limits in the field blank.

Rinsate Blanks

Equipment rinsate blanks are analyzed to provide an indication as to whether field decontamination and sampling procedures effectively prevent cross-contamination in field activities. One rinsate blank should be analyzed at a frequency of 1 per 20 field samples collected. One rinsate blank was collected: Rinsate Blank #1-121115. None of the analytes of interest were detected above the reporting limits in the rinsate blank.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in Table B-2 of the QAPP, as are the RPD control limits for MS/MSD sample sets.

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

Laboratory Control Samples

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS control limits for accuracy are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS analyses would apply to each sample in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS analyses are specified in Table B-2 of the QAPP.

One LCS analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery values were within the proper control limits, with the following exception:

SDG 2015120354: (NWTPH-Dx) The laboratory performed an LCS extracted on December 19, 2015. There was an equipment malfunction that caused the percent recovery for diesel-range hydrocarbons to fall outside the control limits. The malfunction was isolated to the LCS alone. Since the LCS analysis does not provide useful information in determining accuracy in the associated field samples, no qualification of the data was required.

Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP.

One field duplicate should be collected and analyzed for every 20 field samples or one per sampling event, whichever is greater. Field duplicates were analyzed at the proper frequency and the precision assessment is detailed below.

SDG 2015120354: One field duplicate sample pair, SO-4A-121015 and SO-4A-9-121015, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair.

Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) are completed to ensure that mass resolution, identification, and sensitivity of the analyses are acceptable. Instrument tuning should be performed at the beginning of each 12-hour period during which samples or standards are analyzed. The frequency and specified acceptance criteria were met for each applicable analysis.

Initial Calibrations

The initial calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90% and 110%. For organic analyses, the percent relative standard deviation (%RSD) and relative response factors (RRF) values were within the control limits stated in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2015120354: (VOCs) The %RSD for 2-Chloroethyl vinyl Ether was outside the control limits in the initial calibration verification performed on December 22, 2015. The reporting limits for this target analyte were qualified as estimated (UJ) in Samples MW-1A-121115, MW-1B-121115, MW-2A-121115, MW-3A-121115, CO-3A-121015, CO-3B-121015, SO-2A-121015, SO-4A-121015, SO-4A-9-121015, SO-4B-121015, Field Blank #1-121115, Rinsate Blank #1-121115, Trip Blank #1-121115, Trip Blank #2-121115, Trip Blank #3-121115, Trip Blank #4 121115, and Trip Blank #5-121115.

Continuing Calibrations

The continuing calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent difference (%D) and relative response factors (RRF) values were within the control limits in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2015120354: (VOCs) The %D for hexachlorobutadiene was outside the control limits in the continuing calibration verification performed on December 22, 2015. The reporting limits for this target analyte were qualified as estimated (UJ) in Samples MW-1A-121115, MW-1B-121115, MW-2A-121115, MW-3A-121115, CO-3A-121015, CO-3B-121015, SO-2A-121015, SO-4A-121015, SO-4A-9-121015, SO-4B-121015, Field Blank #1-121115, Rinsate Blank #1-121115, Trip Blank #1-121115, Trip Blank #2-121115, Trip Blank #3-121115, Trip Blank #4 121115, and Trip Blank #5-121115.

Reporting Limits

The contract required quantitation limits (CRQL) were met by the laboratory for each target analyte throughout this sampling event as specified in Table B-3 of the QAPP.

Miscellaneous

Table B-2 of the QAPP: The recovery limits and RPDs listed in Table B-2 are from 2009 (see Footnote 2 in QAPP). Table 2 below lists the current recovery limits and RPDs obtained from Spectra on November 19, 2015.

TABLE 2. CURRENT RECOVERY LIMITS AND RPDS

Analyte	Analytical Method	LCS %Recovery Limits	MS %Recovery Limits	Sample Surrogate %Recovery Limits	MS/MSD, or Laboratory Duplicate RPD Limits (%)	Field Duplicate RPD Limits
Total Metals	EPA 6020A	80-120	75-125	NA	≤20	≤30
TPH – Diesel	NWTPH-Dx	43-122	43-122	50-150	≤20	≤30
TPH – Gasoline	NWTPH-Gx	70-124	70-124	50-150	≤30	≤30
PCBs	SW8082A	45-130	45-130	44-110	≤30	≤30
VOCs	SW8260C	56-153	39-159	65-154	≤25	≤30
1,1-Dichloroethene	SW8260C	56-153	39-155	--	≤25	≤30
Benzene	SW8260C	66-150	66-159	--	≤25	≤30
Trichloroethene	SW8260C	77-121	60-139	--	≤25	≤30
Toluene	SW8260C	71-125	63-129	--	≤25	≤30
Chlorobenzene	SW8260C	81-127	72-127	--	≤25	≤30
Dibromofluoromethane (Surr)	SW8260C	--	--	95-154	--	--
1,2-Dichloroethane d-4 (Surr)	SW8260C	--	--	69-151	--	--
Toluene d-8 (Surr)	SW8260C	--	--	65-111	--	--
4-Bromofluorobenzene (Surr)	SW8260C	--	--	77-117	--	--

SDG 2015120354: (NWTPH-Dx) The laboratory performed a MS/MSD analyses instead of a laboratory duplicate as stated in Table B-5 of the QAPP and in Analytical Methods for Petroleum Hydrocarbons (Ecology 1997). See lab report case narrative for details.

SDG 2015120354: (VOCs) The requested analysis method in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for VOCs is Method SW8260B. This method is outdated. The Method SW8260C was used for VOC analysis. This is the most current revision to the method and approved by the EPA.

SDG 2015120354: (Nitrate and Sulfate) The requested analysis methods in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for nitrate and sulfate were Methods EPA 353.3 and 375.4, respectively. These methods are outdated. The Method Systea Easy (1-Reagent) was used for nitrate and the Method SM4500-SO4 E was used for sulfate per the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants. These methods supersede the requested analysis methods.

OVERALL ASSESSMENT

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

The data are acceptable for the intended use, with the following qualifications listed below in Table 3.

TABLE 3. SUMMARY OF QUALIFIED SAMPLES

Sample ID	Analyte	Qualifier	Reason
MW-1A-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
MW-1B-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
MW-2A-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
MW-3A-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
CO-3A-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
CO-3B-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
SO-2A-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
SO-4A-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
SO-4A-9-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
SO-4B-121015	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Field Blank #1-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Rinsate Blank #1-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Trip Blank #1-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Trip Blank #2-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Trip Blank #3-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Trip Blank #4 121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery
Trip Blank #5-121115	2-Chloroethyl vinyl Ether Hexachlorobutadiene	UJ UJ	Initial Calibration %RSD Recovery Continuing Calibration %D Recovery

REFERENCES

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

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.

PRS Group, Inc., "Exhibit C, Groundwater Monitoring Plan." May 20, 2015.

Washington State Department of Ecology (Ecology). "Analytical Method for Petroleum Hydrocarbons." Publication No. ECY 97-602. June 1997.

1101 Fawcett Avenue, Suite 200, Tacoma, Washington 98402, Telephone: 253.383.4940, Fax: 253.383.4923 www.geoengineers.com

Date: April 1, 2016

File: 19482-002-00

Subject: PRS Hazardous Waste Disposal Facility Groundwater Monitoring, Fourth Quarter (March) 2016 Groundwater Samples

This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2B data validation (EPA Document 540-R-08-005; EPA 2009) of analytical data from the analyses of groundwater samples collected as part of the March 2016 fourth quarter sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the PRS Group, Inc. (PRS) facility located at 3003 Taylor Way in Tacoma, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and Inorganic Superfund Data Review (EPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

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

In accordance with the Quality Assurance Project Plan (QAPP) (Appendix B of Exhibit C, Groundwater Monitoring Plan [PRS 2015]), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method, Trip, Field, and Rinsate Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Laboratory/Field Duplicates
- Instrument Tuning
- Initial Calibrations
- Continuing Calibrations
- Reporting Limits
- Miscellaneous

VALIDATED SAMPLE DELIVERY GROUPS

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

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
2016030273	MW-1A-030916, MW-1B-030916, MW-2A-030916, MW-3A-030916, CO-3A-030816, CO-3B-030816, CO-3B-9-030816, SO-2A-030816, SO-4A-030816, SO-4B-030816, Field Blank #1-030916, Rinsate Blank #1-030916, Trip Blank #1-030916, Trip Blank #2-030916, Trip Blank #3-030916, Trip Blank #4-030916

CHEMICAL ANALYSIS PERFORMED

Spectra Laboratories, Inc. (Spectra), located in Tacoma, Washington, performed laboratory analyses on the groundwater samples using the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Diesel- and Heavy Oil-Range Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Volatile Organic Compounds (VOCs) by Method SW8260C;
- Polychlorinated biphenyls (PCBs) by Method SW8082A;
- Total Metals by Method EPA6020A;
- Nitrate by Method Systea Easy (1-Reagent); and
- Sulfate by Method SM4500-SO4 E.

DATA VALIDATION SUMMARY

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

Data Package Completeness

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

Chain-of-Custody Documentation

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

Holding Times and Sample Preservation

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

SDG 2016030273: The sample cooler temperature recorded at the laboratory was 0.7 degrees Celsius. It was determined through professional judgment that since the samples were not frozen, this temperature should not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the control limits specified on Table B-2 of the QAPP, with the following exceptions:

SDG 2016030273: (NWTPH-Gx) The percent recovery for 4-Bromofluorobenzene was greater than the control limits in Samples SO-4A-030816 and SO-4B-030816. The positive result for gasoline-range hydrocarbons was qualified as estimated (J) in Sample SO-4A-030816. There were no positive results for gasoline-range hydrocarbons in Sample SO-4B-030816; therefore, no qualification was required.

SDG 2016030273: (VOCs) The percent recovery for 4-Bromofluorobenzene was greater than the control limits in Samples SO-4A-030816 and SO-4B-030816; however, the samples were spiked with three additional surrogates, each within their respective control limits. For this reason, no action was required.

Method, Trip, Field, and Rinsate Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For the sample batches, method blanks were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in the method blanks, with the following exceptions:

SDG 2016030273: (VOCs) There were positive results for 1,2,4-Trichlorobenzene and hexachlorobutadiene detected in the method blank extracted on March 13, 2016. There were no positive results for these target analytes in the associated field samples; therefore, no qualification was required.

Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. Four (4) trip blanks were collected: Trip Blank #1-030916, Trip Blank #2-030916, Trip Blank #3-030916, and Trip Blank #4-030916. None of the analytes of interest were detected above the reporting limits in the trip blanks.

Field Blanks

Field blanks are analyzed to provide indication of cross-contamination that may occur from the sampling environment. One field blank should be analyzed at a frequency of 1 per 20 field samples collected. One field blank was collected: Field Blank #1-030916. None of the analytes of interest were detected above the reporting limits in the field blank, with the following exception:

SDG 2016030273: (Metals) There was a positive result for arsenic detected in the field blank collected on March 9, 2016. The positive results for arsenic were qualified as non-detected (U) in Samples MW-1B-030916, SO-2A-030816, and Rinsate Blank #1-030916. The positive results in Samples MW-1A-030916, MW-2A-030916, MW-3A-030916, CO-3A-030816, CO-3B-030816, CO-3B-9-030816, SO-4A-030816, and SO-4B-030816 were greater than 10X the concentration in the field blank for this target analyte; therefore, no qualification was required.

In cases were target analytes are qualified as non-detected because of blank contamination, the new reporting limit is elevated to the level of the former concentration reported in the sample.

Rinsate Blanks

Equipment rinsate blanks are analyzed to provide an indication as to whether field decontamination and sampling procedures effectively prevent cross-contamination in field activities. One rinsate blank should be analyzed at a frequency of 1 per 20 field samples collected. One rinsate blank was collected: Rinsate Blank #1-030916. None of the analytes of interest were detected above the reporting limits in the rinsate blank, with the following exception:

SDG 2016030273: (Metals) There was a positive result for arsenic detected in the rinsate blank collected on March 9, 2016. The positive result for arsenic was qualified as non-detected due to field blank contamination (see ‘Field Blanks’ section).

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in Table B-2 of the QAPP, as are the RPD control limits for MS/MSD sample sets.

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

Laboratory Control Samples

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS control limits for accuracy are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS analyses would apply to each sample in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS analyses are specified in Table B-2 of the QAPP.

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

Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limits are specified in Table B-2 of the QAPP.

One field duplicate should be collected and analyzed for every 20 field samples or one per sampling event, whichever is greater. Field duplicates were analyzed at the proper frequency and the precision assessment is detailed below.

SDG 2016030273: One field duplicate sample pair, CO-3B-030816 and CO-3B-9-030816, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair.

Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) are completed to ensure that mass resolution, identification, and sensitivity of the analyses are acceptable. Instrument tuning should be performed at the beginning of each 12-hour period during which samples or standards are analyzed. The frequency and specified acceptance criteria were met for each applicable analysis.

Initial Calibrations

The initial calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent relative standard deviation (%RSD) and relative response factors

(RRF) values were within the control limits stated in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2016030273: (VOCs) The %RSD for vinyl chloride was outside the control limits in the initial calibration verification performed on March 12, 2016. The reporting limits for this target analyte were qualified as estimated (UJ) in Samples MW-1A-030916, MW-1B-030916, MW-2A-030916, MW-3A-030916, CO-3A-030816, CO-3B-030816, CO-3B-9-030816, SO-2A-030816, SO-4A-030816, SO-4B-030816, Field Blank #1-030916, Rinsate Blank #1-030916, Trip Blank #1-030916, Trip Blank #2-030916, Trip Blank #3-030916, and Trip Blank #4-030916.

The %RSD values for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 2-Chloroethyl vinyl ether, 4-Isopropyltoluene, bromomethane, hexachlorobutadiene, iodomethane, naphthalene, styrene, tert-butylbenzene, and total xylenes were outside the control limits in the initial calibration verification performed on March 13, 2016. The reporting limits for these target analytes were qualified as estimated (UJ) in Samples MW-1A-030916, MW-1B-030916, MW-2A-030916, MW-3A-030916, CO-3A-030816, CO-3B-030816, CO-3B-9-030816, SO-2A-030816, SO-4A-030816, SO-4B-030816, Field Blank #1-030916, Rinsate Blank #1-030916, Trip Blank #1-030916, Trip Blank #2-030916, Trip Blank #3-030916, and Trip Blank #4-030916.

Continuing Calibrations

The continuing calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For inorganic analyses, the percent recoveries were within the control limits of 90 and 110 percent. For organic analyses, the percent difference (%D) and relative response factors (RRF) values were within the control limits in the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 2008), with the following exceptions:

SDG 2016030273: (VOCs) The %D for acetonitrile was outside the control limits in the continuing calibration verification performed on March 13, 2016. The reporting limits for this target analyte were qualified as estimated (UJ) in Samples MW-1A-030916, MW-1B-030916, MW-2A-030916, MW-3A-030916, CO-3A-030816, CO-3B-030816, CO-3B-9-030816, SO-2A-030816, SO-4A-030816, SO-4B-030816, Field Blank #1-030916, Rinsate Blank #1-030916, Trip Blank #1-030916, Trip Blank #2-030916, Trip Blank #3-030916, and Trip Blank #4-030916.

Reporting Limits

The contract required quantitation limits (CRQL) were met by the laboratory for each target analyte throughout this sampling event as specified in Table B-3 of the QAPP.

Miscellaneous

Table B-2 of the QAPP: The recovery limits and RPDs listed in Table B-2 are from 2009 (see footnote 2 in QAPP). Table 2 below lists the current recovery limits and RPDs obtained from Spectra on November 19, 2015.

TABLE 2. CURRENT RECOVERY LIMITS AND RPDS

Analyte	Analytical Method	LCS %Recovery Limits	MS %Recovery Limits	Sample Surrogate %Recovery Limits	MS/MSD, or Laboratory Duplicate RPD Limits (%)	Field Duplicate RPD Limits
Total Metals	EPA 6020A	80-120	75-125	NA	≤20	≤30
TPH – Diesel	NWTPH-Dx	43-122	43-122	50-150	≤20	≤30
TPH – Gasoline	NWTPH-Gx	70-124	70-124	50-150	≤30	≤30
PCBs	SW8082A	45-130	45-130	44-110	≤30	≤30
VOCs	SW8260C	56-153	39-159	65-154	≤25	≤30
1,1-Dichloroethene	SW8260C	56-153	39-155	--	≤25	≤30
Benzene	SW8260C	66-150	66-159	--	≤25	≤30
Trichloroethene	SW8260C	77-121	60-139	--	≤25	≤30
Toluene	SW8260C	71-125	63-129	--	≤25	≤30
Chlorobenzene	SW8260C	81-127	72-127	--	≤25	≤30
Dibromofluoromethane (Surr)	SW8260C	--	--	95-154	--	--
1,2-Dichloroethane d-4 (Surr)	SW8260C	--	--	69-151	--	--
Toluene d-8 (Surr)	SW8260C	--	--	65-111	--	--
4-Bromofluorobenzene (Surr)	SW8260C	--	--	77-117	--	--

SDG 2016030273: (NWTPH-Dx) The laboratory performed a MS/MSD analyses instead of a laboratory duplicate as stated in Table B-5 of the QAPP and in Analytical Methods for Petroleum Hydrocarbons (Ecology 1997). See lab report case narrative for details.

SDG 2016030273: (VOCs) The requested analysis method in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for VOCs is Method SW8260B. This method is outdated. The Method SW8260C was used for VOC analysis. This is the most current revision to the method and approved by the EPA.

SDG 2016030273: (Nitrate and Sulfate) The requested analysis methods in Table 1 of the Groundwater Monitoring Plan (PRS 2015) for nitrate and sulfate were Methods EPA 353.3 and 375.4, respectively. These methods are outdated. The Method Systea Easy (1-Reagent) was used for nitrate and the Method SM4500-SO4 E was used for sulfate per the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants. These methods supersede the requested analysis methods.

OVERALL ASSESSMENT

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

The data are acceptable for the intended use, with the following qualifications listed below in Table 3.

TABLE 3. SUMMARY OF QUALIFIED SAMPLES

Analytes	Samples																Reason			
	MW-1A-030916	MW-1B-030916	MW-2A-030916	MW-3A-030916	CO-3A-030816	CO-3B-030816	CO-3B-9-030816	SO-2A-030816	SO-4A-030816	SO-4B-030816	Field Blank #1-030916	Rinsate Blank #1-	Trip Blank #1-030916	Trip Blank #2-030916	Trip Blank #3-030916	Trip Blank #4-030916	Surrogate Recovery	Blank Contamination	ICAL %RSD	CCAL %D
1,2,3-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
1,2,4-Trichlorobenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
1,2,4-Trimethylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
2-Chloroethyl vinyl Ether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Acetonitrile	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				X
Arsenic	--	U	--	--	--	--	--	U	--	--	--	U	--	--	--	--		X		
4-Isopropyltoluene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Bromomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Gasoline-range Hydrocarbons	--	--	--	--	--	--	--	--	J	--	--	--	--	--	--	--	X			
Hexachlorobutadiene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Iodomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Naphthalene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Styrene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
tert-Butylbenzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Total xylenes	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	
Vinyl chloride	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ			X	

REFERENCES

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

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.

PRS Group, Inc., "Exhibit C, Groundwater Monitoring Plan." May 20, 2015.

Washington State Department of Ecology (Ecology). "Analytical Method for Petroleum Hydrocarbons." Publication No. ECY 97-602. June 1997.

APPENDIX C
Agreed Order and Groundwater Monitoring Plan

RECEIVED

OCT 26 2015

WA State Department
of Ecology (SWRO)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-8641

September 23, 2015

Mr. Tom Smith, President
PRS Group Inc.
3003 Taylor Way
Tacoma, WA 98421

Dear Mr. Smith:

The enclosed Agreed Order DE112357 is presented to you for your signature. Please sign Agreed Order and return it to me for Ava's signature and date. Once all have signed this Agreed Order, a copy of the final document will be provided to you.

If you have any questions, you may contact Charles Hoffman at (360) 407-6344 or by email at Chuck.Hoffman@ecy.wa.gov.

Sincerely,

Lorna Gadwa

Lorna Gadwa, Administrative Assistant
Hazardous Waste and Toxics Reduction Program
Southwest Regional Office

Enclosure: Agreed Order DE11357

RECEIVED

OCT 26 2015

WA State Department
of Ecology (SWRO)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: PRS Group, Inc. 3003 Taylor Way Tacoma, Washington	AGREED ORDER No. DE 11357

TO: The Potentially Liable Persons (PLPs) at 3003 Taylor Way, Tacoma, Washington

PRS Group, Inc.
c/o Mr. Tom Smith, President

Petroleum Reclaiming Service, Inc. (PRSI)
c/o Mr. Tom Smith, President

Mr. Tom Smith
PRS Group, Inc.

Mr. Gary Smith
PRS Group, Inc.

TABLE OF CONTENTS

I. INTRODUCTION

The mutual objective of the State of Washington, Department of Ecology (Ecology) and PRS Group, Inc., Petroleum Reclaiming Services Inc. (PRSI), Mr. Tom Smith, and Mr. Gary Smith (the PLPs) under this Agreed Order (Order) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Order requires the PLPs to prepare a final remedial investigation (RI) report, a feasibility study (FS) report, and a draft cleanup action plan (CAP) for the PRS Group, Inc. Facility located at 3003 Taylor Way, Tacoma, Washington. Ecology believes the actions required by this Order are in the public interest.

II. JURISDICTION

This Agreed Order is issued pursuant to the authority of the Model Toxics Control Act (MTCA), RCW 70.105D.050(1). This Order rescinds and supersedes Agreed Order No. DE 95HS-S349, signed April 2, 1997, by Ecology, Petroleum Reclaiming Service, Inc. (PRSI), Mr. Tom Smith, and Mr. Gary Smith. This Order also satisfies the requirements of WAC 173-303-646 through -64630.

III. PARTIES BOUND

This Order shall apply to and be binding upon the Parties to this Order, their successors and assigns. The undersigned representative of each Party hereby certifies that he or she is fully authorized to enter into this Order and to execute and legally bind such Party to comply with the Order. The PLPs agree to undertake all actions required by the terms and conditions of this Order. No change in ownership or corporate status shall alter the PLPs' responsibility under this Order. The PLPs shall provide a copy of this Order to all agents, contractors, and subcontractors retained to perform work required by this Order, and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Order.

IV. DEFINITIONS

Unless otherwise specified herein, the definitions set forth in RCW 70.105D and WAC 173-340 shall control the meanings of the terms used in this Order.

A. Agreed Order or Order: Refers to this Order and each of the exhibits to this Order. All exhibits are integral and enforceable parts of this Order. The terms "Agreed Order" or "Order" shall include all exhibits to this Order.

B. Area of Concern (AOC): Refers to any area of the Facility where a release of dangerous constituents (including dangerous waste and hazardous substances) has occurred, is occurring, is suspected to have occurred, or threatens to occur.

C. Cleanup Action Plan (CAP): Refers to the document issued by Ecology under WAC 173-340-380 which selects Facility-specific corrective measures and specifies cleanup standards (cleanup levels, points of compliance, and other requirements for the corrective measures).

D. Cleanup Standards: Refers to the standards promulgated under RCW 70.105D.030(2)(e) and include (1) hazardous substance concentrations (cleanup levels) that protect human health and the environment, (2) the location at the Facility where those cleanup levels must be attained (points of compliance), and (3) additional regulatory requirements that apply to a cleanup because of the type of action and/or the location of the Facility.

E. Corrective Action: Refers to any activities including investigations, studies, characterizations, and corrective measures, including actions taken pursuant to RCW 70.105D and WAC 173-340, undertaken in whole or in part to fulfill the requirements of WAC 173-303-64620.

F. Corrective Measure: Refers to any measure or action to control, prevent, or mitigate release(s) and/or potential release(s) of dangerous constituents (including dangerous waste and hazardous substances) reviewed and approved by Ecology for the Facility and set forth

in a Facility-specific CAP prepared in compliance with the requirements of WAC 173-340, including WAC 173-340-360. Corrective measures may include interim actions as defined by WAC 173-340. Interim actions will not necessarily be set forth in a Facility-specific CAP.

G. Dangerous Constituent or Dangerous Waste Constituent: Refers to any constituent identified in WAC 173-303-9905 or 40 C.F.R. part 264, appendix IX; any constituent that caused a waste to be listed or designated as dangerous under the provisions of WAC 173-303; and any constituent defined as a hazardous substance under RCW 70.105D.020(13).

H. Dangerous Waste: Refers to any solid waste designated in WAC 173-303-070 through -100 as dangerous or extremely hazardous or mixed waste. Dangerous wastes are considered hazardous substances under RCW 70.105D.020(13).

I. Dangerous Waste Management Facility: Used interchangeably in this document with the term "Facility."

J. Dangerous Waste Management Unit (DWMU): Refers to a contiguous area of land on or in which dangerous waste is placed, or the largest area in which there is a significant likelihood of mixing dangerous waste constituents in the same area, as defined in WAC 173-303-040.

K. Facility: Refers to the DWMU controlled by the PLPs located at 3003 Taylor Way, Tacoma, WA 98421; all property contiguous to the DWMU also controlled by the PLPs; and all property, regardless of control, affected by release(s) or threatened release(s) of hazardous substances, including dangerous wastes and dangerous constituents, at and from these areas. "Facility" also includes the definition found in RCW 70.105D.020(8).

L. Feasibility Study (FS): Refers to the investigation and evaluation of potential corrective measures performed in accordance with the FS requirements of WAC 173-340-350, and the RI/FS Scope of Work attached to this order as Exhibit D, which includes the substantive requirements for a Resource Conservation and Recovery Act Corrective Measures Study, and

which is undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

M. Parties: Refers to the State of Washington, Department of Ecology, PRS Group, Inc., Petroleum Reclaiming Service, Inc. (PRSI), Mr. Gary Smith, and Mr. Tom Smith.

N. Polychlorinated biphenyls or PCB mixtures refers to those aromatic compounds containing two benzene nuclei with two or more substituted chlorine atoms. PCB includes those congeners which are identified using the appropriate analytical methods as specified in WAC 173-340-810.

O. Potentially Liable Persons (PLPs): Refers to PRS Group, Inc., PRSI, Mr. Gary Smith, and Mr. Tom Smith.

P. Permit or Permitting Requirement: Unless otherwise specified, refers to the requirements of WAC 173-303 for applying for, obtaining, maintaining, modifying, and terminating Dangerous Waste Management Facility permits.

Q. RCRA: Refers to the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901–6992k.

R. RCRA Facility Assessment (RFA): Refers to the United States Environmental Protection Agency (EPA) conducted investigation of release(s) and potential release(s) at the Dangerous Waste Management Facility and the information contained in the report entitled *Final RCRA Facility Assessment Report, Petroleum Reclaiming Service, Inc., Tacoma, Washington, EPA I.D. WAD 980511729* (RFA Report), dated July 1996. The RFA Report is incorporated into this Order by reference as if fully set forth herein.

S. Release: Refers to any intentional or unintentional spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of dangerous waste or dangerous constituents into the environment. It also includes the abandonment or discarding of barrels, containers, and other receptacles containing dangerous

waste or dangerous constituents, and includes the definition of "release" in RCW 70.105D.020(32).

T. Remedial Investigation (RI): Refers to a facility-wide investigation and characterization performed in accordance with the requirements of WAC 173-340, and the RI/FS Scope of Work attached to this Order as Exhibit D, which includes the substantive requirements for a RCRA facility investigation, undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

U. Solid Waste Management Unit (SWMU): Refers to any discernible location at the Dangerous Waste Management Facility where solid wastes have been placed at any time, irrespective of whether the location was intended for the management of solid or dangerous waste. Such locations include any area at the Dangerous Waste Management Facility at which solid wastes, including spills, have been routinely and systematically released, and include regulated units as defined by WAC 173-303.

V. FINDINGS OF FACT

Ecology makes the following Findings of Fact, without any express or implied admissions of such facts by the PLPs

A. PRSI owned and operated the Facility as a Dangerous Waste Management Facility on or after November 19, 1980, the date which subjects facilities to RCRA permitting requirements, including interim status requirements pursuant to RCRA, 42 U.S.C. § 6925, and implementing regulations thereunder, and including authorized state regulations promulgated in WAC 173-303.

B. On November 29, 1983, PRSI submitted a Notification of Dangerous Waste Activities (NDWA) Form 2 to Ecology for the Facility. The NDWA Form 2 included the following waste codes:

Waste Code	Description	Volume
K049	Slop oil emulsions from the petroleum refining industry	3 tons
K051	American Petroleum Institute (API) separator sludge from the petroleum refining industry	25 tons

C. On January 10, 1984, pursuant to the November 29, 1983 notification, EPA issued identification number WAD980511729 to PRSI.

D. In November 1987, Mr. Gary Smith and Mr. Tom Smith purchased PRSI.

E. In November 2003, PRSI underwent corporate restructuring and created PRS Group, Inc. PRSI maintained ownership of the Facility. PRS Group, Inc. is the operator of the Facility and responsible for day-to-day operations at the Facility.

F. On March 15, 2013, the PLPs submitted a Dangerous Waste Management Facility Permit application (Part A and Part B) for the Facility.

G. In a letter to the PLPs dated October 3, 2013, Ecology expressed concerns regarding the adequacy of the permit application.

H. In a letter to Ecology dated February 18, 2014, the PLPs withdrew the permit application submitted on March 15, 2013.

I. In a letter to the PLPs dated February 27, 2014, Ecology acknowledged receipt of the permit application withdrawal letter and declared the permitting process closed.

J. A public comment period on termination of interim status was held October 27 to December 11, 2014. In a letter dated January 23, 2015, Ecology notified the PLPs of Ecology's decision to terminate interim status at the Facility.

K. The PLPs currently operate the Facility as a used oil recycling facility under the requirements of WAC 173-303-515 (Standards for the management of used oil).

Findings of Facts Regarding Wastes Proposed and Approved for Management at the Facility

L. On August 8, 1985, PRSI submitted a Dangerous Waste Permit General Information Form (Part A). In the Part A application, PRSI identified itself as managing K049 (slop oil emulsions), K051 (API separator sludge), K052 (leaded tank bottoms), and W001 (wastes generated from the salvaging, rebuilding, or discarding of transformers, bushings, or capacitors which contain PCBs). The Part A identified tank storage (S02) of 149,625 gallons and tank treatment (T01) of 40,000 gallons per day.

M. Between 1985 and 1993, the PLP's submitted six (6) amended Part A applications proposing the management of dangerous wastes at the Facility. Oftentimes the applications were for wastes the PLPs were not actually managing and the PLPs did not receive approval from Ecology for managing those wastes.

N. In a letter dated November 20, 1991, Ecology granted PRSI approval to manage WT02 and W001 waste.

Findings of Facts Regarding Releases and/or Potential Releases

O. In July 1996, EPA performed a RFA at the Facility. The purpose of a RFA is to identify those areas at the Facility where release(s) of hazardous substances, as defined in RCW 70.105D.020(13), may have occurred or may be occurring.

P. Pursuant to the RFA Report and other information, Ecology has identified the following SWMUs and AOCs at the Facility:

SWMU/AOC Number	**Description**
SWMUs 1 and 2	Tanks 1A and 2A
SWMUs 3 and 4	Tanks 3A and 4A
SWMU 5	Tank 5A
SWMU 6	Tank 6A
SWMU 7	Tank 7A
SWMUs 8 and 9	Tanks 8A and 9A
SWMU 10	Tank 10A
SWMU 11	Tank 11A
SWMU 12	Tank 12A
SWMU 13	Tank 20A
SWMU 14	Tank 30A
SWMU 15	Tank SL
SWMU 16	Tank VO
SWMU 17	Tank 1B
SWMU 18	Tank 2B
SWMU 19	Tank 3B
SWMU 20	Tank 4B
SWMU 21	Tank 5B
SWMU 22	Water Treatment Plant
SWMU 23	Antifreeze Drum Storage Area
SWMU 24	Sludge Tank
SWMU 25	Sanitary Sewer
AOC 1	Soil and Groundwater Contamination

Q. Release(s) and/or potential release(s) of hazardous substances from SWMUs and AOCs at the Facility include, but are not limited to total petroleum hydrocarbons (TPH), benzene, tetrachloroethene, trichloroethylene, vinyl chloride, xylenes, arsenic, cadmium, and mercury from SWMUs and AOCs at the Facility are documented in the RFA Report and by investigations and sampling done by the PLPs' consultants: Environmental Engineering & Consulting, Inc. and SECOR International in 1992, 1993 and 1996. Ecology documented groundwater contamination at the Facility in 2001. Additional groundwater monitoring wells were installed at the Facility in 2008 and 2010.

1. On September 14, 1989, Ecology issued an Administrative Order to PLP-PRSI for violations of facility performance standards (WAC 173-303-283) and spills to the interior of the diked secondary containment area found during inspections by Ecology on May 16, May 24, and June 17, 1989. Equipment used at the Facility routinely tracked oil around the facility on and off of containment pads, and personnel at the Facility routinely tracked waste oils into the laboratory and the office, which should be considered clean.

2. Extensive tracking of waste oil throughout the floor of the diked secondary containment area was observed by Ecology during inspections of the Facility on October 19, 1989, and May 3, 1990. In addition, none of the joints in the diked secondary containment area had been sealed, and no sealant appeared to coat the concrete base or walls of the secondary containment area. Staining on the outside of the containment walls indicated possible spillage over the top of the containment walls. During the May 1990 inspection, Ecology observed evidence of leakage at a joint in the south wall on the southeast corner of the containment area and from a large crack in the south wall. A void was noted in a trough running the west-east length of the containment

area at its west end where concrete at the bottom of the void could not be found when the void was probed with a pen.

3. On December 21, 1989, during an inspection, Ecology observed the diked secondary containment area surrounding three large vertical tanks partially full of a black viscous liquid. Of the 20 inches of liquid in the containment area, 18.6 inches was petroleum-based material. A discharge of liquid (via a crack or joint) from the containment area to the ground on the east side of the containment area was also observed. The liquid found in the containment was primarily composed of #2 diesel oil along with some type of heavier hydrocarbon mixture, probably a lubricating oil.

4. On October 30, 1990, Ecology and the PLPs signed PCHB No. 90-30 Stipulation and Agreed Order of Dismissal. The Stipulation and Agreed Order of Dismissal required PRSI to evaluate potential soil and groundwater contamination at the Facility, and define the type, and vertical and horizontal extent of soil and groundwater contamination beneath the Facility.

5. On April 2, 1997, Ecology and the PLPs signed Agreed Order No. DE 95HS-S349. Agreed Order No. DE 95HS-S349 rescinded PCHB No. 90-30 Stipulation and Agreed Order of Dismissal, except for an outstanding portion of a $5,000 penalty credit. Agreed Order No. DE 95HS-S349 required the PLPs to conduct an interim action after closure of the existing tank farm and before construction of a new tank farm.

6. Holes in the bottom of the sewer discharge sump at the Facility were discovered when the sump was cleaned out on December 14, 1990.

7. According to a December 31, 1990 report, holes were again found in the Facility's oil-water separator during cleaning. The holes were "about 6 inches in diameter – and there were two holes."

8. A strong hydrocarbon odor was noted in soils at a depth of 3.0 feet and visible hydrocarbon sheen was observed on soil at a depth of 5.0 to 5.5 feet during installation of monitoring well (MW) C-03A at the Facility on August 23, 1991.

9. Soil and groundwater contamination at the Facility was identified in 1991 and 1992 during a Phase 1 site investigation. Specific analytes in soil included: total petroleum hydrocarbons or TPH (88,000 milligrams per kilogram or mg/kg), arsenic (218 mg/kg), cadmium (30 mg/kg), and mercury (1.7 mg/kg). Specific analytes found in the shallow groundwater included: arsenic (190 micrograms per liter or μg/l), trichloroethylene (32 μg/l), vinyl chloride (150 μg/l), total xylenes (34 μg/l), and TPH (3,200 μg/l).

10. Soil and groundwater contamination at the Facility was identified in Phase 2 of a site investigation in 1992 and 1993. Specific analytes found in soil included: arsenic (210 mg/kg), PCB mixtures (Aroclor 1260 at 15 mg/kg), TPH (47,000 mg/kg), and mercury (1.1 mg/kg). Specific analytes found in the shallow groundwater included: arsenic (690 μg/l), cadmium (7 μg/l), vinyl chloride (190 μg/l), and TPH (1,200 μg/l).

11. Groundwater contamination at the Facility was again identified in 1996 during additional data collection of two additional groundwater monitoring wells, which were installed to collect data on the shallow aquifer. Specific analytes found in the groundwater included: TPH (3.62 mg/l), dissolved arsenic (0.179 mg/l), benzene (8.59 μg/l), tetrachloroethene (11.7 μg/l), and vinyl chloride (5.75 μg/l).

12. On behalf of PRSI, SECOR International Incorporated submitted a compilation report to Ecology in 1996. The report reformatted and revised the 1992 and 1993 report regarding the Phase 2 investigation conducted at the Facility.

13. Ecology identified groundwater contamination during groundwater sampling at the Facility in May 2001. Specific analytes in the groundwater included:

benzene (1.3 μg/l), trichloroethene (5.9 μg/l), tetrachloroethene (23 μg/l), arsenic (85 μg/l), and gasoline (100 μg/l).

14. During an inspection on February 19, 2004, Ecology noted cracks and gaps in the secondary containment system, which was a violation of WAC 173-303-515(9) ["Failure to maintain a tank and secondary containment system and/or repair cracks and gaps that can provide a pathway to soil and groundwater contamination."] This violation was detailed in a letter to the PLPs on March 2, 2004.

15. Groundwater contamination at the Facility was again identified in 2008 during groundwater sampling. Specific analytes found in the groundwater included: cis-1,2-dichloroethane (28 μg/l), vinyl chloride (5 μg/l), and arsenic (1.3 mg/L).

16. During an inspection on June 11, 2009, Ecology noted that the containment system in Tank Farm A and Tank Farm B could not be inspected due to the accumulation of residual material, dirt, and soil coating the surface. Conditions around stored drums of PCB-contaminated materials were deemed "unacceptable," with leaking hoses and containers leaking oily waste onto the concrete pad at the back of the property.

17. During an inspection on July 13, 2011, Ecology noted the poor condition of the containment system in Tank Farm A and Tank Farm B and poor housekeeping with the surfaces of the tank farms dirty – coated with oil and standing puddles. The inspection report stated lack of compliance with WAC 173-303-515(9) and 40 CFR Part 279.54 (c, d, and e) ["Secondary containment is required for used oil being managed in containers and tanks."] and WAC 173-303-515(9) and 40 CFR Part 279.52(a)(1) ["Facilities must be maintained and operated to minimize the possibility of a non-sudden release of used oil to soil."].

18. In a letter dated July 22, 2011, to the PLPs, Ecology stated "Due to on-going releases of oil to the floor, it was difficult to fully assess the integrity of the system. However, I was able to see in at least two places that the joint sealant was gone, and in

many areas the coating has worn off revealing exposed concrete aggregate. These conditions present a significant deviation from performance standards."

R. Hazardous substances may have been and might continue to be released from the PRS Group, Inc. Facility into the environment including surface water drainage areas; groundwater beneath and beyond the Facility; air; human work areas; and floral and faunal habitats.

VI. ECOLOGY DETERMINATIONS

Ecology makes the following determinations, without any express or implied admissions of such determinations (and underlying facts) by the PLPs.

A. The PLPs are persons within the meaning of RCW 70.105D.020(24).

B. The PLPs are the owners and operators of the Facility that has operated, is operating, or should have been operating under interim status or a final facility permit, subject to RCRA, 42 U.S.C. §§ 6924 and 6925, and regulations promulgated thereunder, including authorized state regulations in WAC 173-303. The PLPs are also an "owner or operator" as defined by RCW 70.105D.020(22) of a "facility" as defined by RCW 70.105D.020(8).

C. The Facility is no longer operating under interim status, which was terminated pursuant to loss of interim status (LOIS) provisions. Despite LOIS, the Facility is still subject to corrective action under WAC 173-303-646 through 64620.

D. Certain waste and constituents found at the Facility are dangerous wastes and/or dangerous constituents as defined by WAC 173-303 and in Section IV (Definitions) of this Order.

E. These dangerous wastes and dangerous constituents are considered hazardous substances within the meaning of RCW 70.105D.020(13).

F. Based on the Findings of Fact and the administrative record, Ecology has determined that release(s) and potential release(s) of hazardous substances at and/or from the

Facility have occurred and present a threat or potential threat to human health and the environment.

G. Based on credible evidence, Ecology issued PLP status letters to Mr. Gary Smith, Mr. Tom Smith and to PRSI dated October 28, 1994, and to PRS Group, Inc. on March 5, 2015, pursuant to RCW 70.105D.040, .020(26), and WAC 173-340-500. After providing for notice and opportunity for comment, reviewing any comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued a determination that Mr. Gary Smith and Mr. Tom Smith and PRSI, and PRS Group, Inc. are PLPs under RCW 70.105D.040. Ecology notified Mr. Gary Smith and Mr. Tom Smith of this determination by letter dated December 5, 1994. Ecology notified PRSI and PRS Group, Inc. of this determination by separate letters dated December 13, 1994 and March 5, 2015, respectively.

H. Pursuant to RCW 70.105D.030(l) and .050(1), Ecology may require the PLPs to investigate or conduct other remedial actions with respect to any release or threatened release of hazardous substances, whenever it believes such action to be in the public interest. Based on the foregoing facts, Ecology believes the remedial actions required by this Order are in the public interest.

I. Under WAC 173-340-430, an interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study, or design of a cleanup action plan. Either party may propose an interim action under this Order. If the Parties are in agreement concerning the interim action, the Parties will follow the process in Section VII.E. If the Parties are not in agreement, Ecology reserves its authority to require interim action(s) under a separate order or other enforcement action under RCW 70.105D, or to undertake the interim action itself.

VII. WORK TO BE PERFORMED

Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that the PLPs take the following remedial action(s) at the Facility and that this (these) action(s) be conducted in accordance with WAC 173-340 unless otherwise specifically provided for herein.

A. The PLPs shall submit semiannual progress reports on the 15th of January and July. If Ecology agrees that such a change is appropriate, progress reports may be submitted at less frequent intervals. The semiannual progress reports shall include, at a minimum:

1. A description of work performed or completed in accordance with the approved work plan completed during the reporting period.

2. A description of work activities planned for the next reporting period.

3. A description of any problems and how problems were resolved, including any deviation from the approved work plan that Ecology and the PLPs have agreed to under Section VIII.L of this Order.

4. A summary of significant findings, changes in personnel, and significant contacts with all federal, state, and local governments, community, and public interest groups.

5. The results of all laboratory analyses (as copies of the original laboratory reporting data, in tabulated format).

6. All quality assurance results and associated data validation assessments.

7. All field measurements.

B. The PLPs shall conduct groundwater monitoring according to the schedule in the Groundwater Monitoring Plan, attached as Exhibit C. The PLPs shall also submit annual groundwater data analysis reports to Ecology according to the requirements in Exhibit C.

C. Within sixty (60) days of the effective date of this Order, data from previous investigations at the Facility shall be compiled and submitted in electronic format consistent with Section VIII.E to Ecology for review and comment. If the Parties agree, the PLPs shall prepare and submit an Agency Review Draft Work Plan for additional investigation, including a scope of work and schedule, by a date determined by Ecology. Upon review and approval by Ecology, the Public Review Work Plan for additional investigation becomes an integral and enforceable part of this Order, and the PLPs are required to implement the Work Plan in accordance with the schedule in the approved Work Plan.

D. The PLPs shall submit a final RI report, final FS report, and draft CAP according to the Scope of Work and Schedule, attached as Exhibit D.

E. Following Ecology approval of all deliverables, each deliverable, once approved by Ecology, becomes an integral and enforceable part of this Order.

F. If the Parties agree on an interim action under Section VI.H, the PLPs shall prepare and submit to Ecology an Interim Action Work Plan, including a scope of work and schedule, by the date determined by Ecology. Ecology will provide public notice and opportunity to comment on the Interim Action Work Plan in accordance with WAC 173-340-600(16). The PLPs shall not conduct the interim action until Ecology approves the Interim Action Work Plan. Upon approval by Ecology, the Interim Action Work Plan becomes an integral and enforceable part of this Order, and the PLPs are required to conduct the interim action in accordance with the approved Interim Action Work Plan.

G. The PLPs shall notify Ecology's project coordinator in writing of any newly-identified SWMU(s), newly-discovered release(s) from known SWMU(s), and newly-discovered AOCs at the Facility no later than thirty (30) days after discovery, and shall investigate and report on these areas as directed by Ecology's project coordinator. If required, the investigation (assessment) and reporting shall be done in accordance with Exhibit D (RI/FS Scope of Work).

H. If Ecology determines that the PLPs have failed to make sufficient progress or failed to implement the remedial action, in whole or in part, Ecology may, after notice to the PLPs, perform any or all portions of the remedial action or at Ecology's discretion allow the PLPs opportunity to correct. The PLPs shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.A (Remedial Action Costs). Ecology reserves the right to enforce requirements of this Order under Section X (Enforcement).

I. Except where necessary to abate an emergency situation, the PLPs shall not perform any remedial actions at the Facility outside those remedial actions required by this Order, unless Ecology concurs, in writing, with such additional remedial actions.

VIII. TERMS AND CONDITIONS

A. Remedial Action Costs

The PLPs shall pay to Ecology costs incurred by Ecology pursuant to this Order and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for, or on, the Facility under RCW 70.105D, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the issuance of this Order. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Ecology has accumulated $12,162.53 in remedial action costs related to this Facility as of June 17, 2015. Payment for this amount shall be submitted within thirty (30) days of the effective date of this Order. For all costs incurred subsequent to June 17, 2015, the PLPs shall pay the required amount within thirty (30) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within

ninety (90) days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

In addition to other available relief, pursuant to RCW 19.16.500, Ecology may utilize a collection agency and/or, pursuant to RCW 70.105D.055, file a lien against real property subject to the remedial actions to recover unreimbursed remedial action costs.

B. Designated Project Coordinators

The project coordinator for Ecology is:

Charles Hoffman
Department of Ecology
Hazardous Waste and Toxics Reduction Program
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775
Phone: 360/407-6344
Email: chof461@ecy.wa.gov

The project coordinator for the PLPs is:

Tom Smith
PRS Group, Inc.
3003 Taylor Way
Tacoma, WA 98421
Phone: 253/383-4175
Email: tom@prsplant.net

Each project coordinator shall be responsible for overseeing the implementation of this Order. Ecology's project coordinator will be Ecology's designated representative for the Facility. To the maximum extent possible, communications between Ecology and the PLPs, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Order.

Any party may change its respective project coordinator. Written notification shall be given to the other party at least ten (10) calendar days prior to the change.

C. Performance

All geologic and hydrogeologic work performed pursuant to this Order shall be under the supervision and direction of a geologist or hydrogeologist licensed by the state of Washington or under the direct supervision of an engineer registered by the state of Washington, except as otherwise provided for by RCW 18.43 and 18.220.

All engineering work performed pursuant to this Order shall be under the direct supervision of a professional engineer registered by the state of Washington, except as otherwise provided for by RCW 18.43.130.

All construction work performed pursuant to this Order shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered by the state of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrologic, or engineering work shall be under the seal of an appropriately licensed professional as required by RCW 18.43 and 18.220.

The PLPs shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Order, in advance of their involvement at the Facility.

In 2013, Ecology adopted NAVD88 as the agency's official vertical datum. Since then, Ecology's Environmental Information Management System (EIM) database has been modified to accept only NAVD88 referenced elevations, which in turn are used to calculate groundwater level elevations and depths below land surface from user input groundwater levels. Therefore, all new and existing groundwater monitoring wells shall be surveyed to the NAVD88 vertical datum.

D. Access

Ecology or any Ecology authorized representative shall have access to enter and freely move about all property at the Facility that the PLPs either own, control, or have access rights to

at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the PLPs' progress in carrying out the terms of this Order; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by the PLPs. The PLPs shall make all reasonable efforts to secure access rights for those properties within the Facility not owned or controlled by the PLPs where remedial activities or investigations will be performed pursuant to this Order. Ecology or any Ecology authorized representative shall give reasonable notice before entering any Facility property owned or controlled by the PLPs unless an emergency prevents such notice. All persons who access the Facility pursuant to this section shall comply with any applicable health and safety plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Facility property access.

E. Sampling, Data Submittal, and Availability

With respect to the implementation of this Order, the PLPs shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VII (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, the PLPs shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by the PLPs pursuant to implementation of this Order. The PLPs shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Facility. Ecology shall, upon request, allow the PLPs and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, provided that doing so does not interfere

with Ecology's sampling. Without limitation on Ecology's rights under Section VIII.D (Access), Ecology shall notify the PLPs prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under WAC 173-50 for the specific analyses to be conducted, unless otherwise approved by Ecology.

F. Public Participation

A Public Participation Plan is required for this Facility. The Public Participation Plan is found in Exhibit E to this Order. Ecology shall review the existing Public Participation Plan to determine its continued appropriateness and whether it requires amendment, or if no plan exists, Ecology shall develop a Public Participation Plan alone or in conjunction with the PLPs.

Ecology shall maintain the responsibility for public participation at the Facility. However, the PLPs shall cooperate with Ecology, and shall:

1. If agreed to by Ecology, develop appropriate mailing list, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

2. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, Ecology shall notify the PLPs prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by the PLPs that do not receive prior Ecology approval, the PLPs shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

3. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Facility. Participation may be through attendance at public meetings to assist in answering questions, or as a presenter.

4. When requested by Ecology, arrange and/or continue information repositories to be located at the following locations:

(a) Citizens for a Healthy Bay
535 Dock Street, Suite 213,
Tacoma, WA 98402 •
Phone: 253/383-2429

(b) Mary Rose Kobetich Library
212 Browns Point Blvd NE
Tacoma, WA 98422
Phone: 253/248-7265

(c) Ecology's Southwest Regional Office
300 Desmond Drive SE
Lacey, WA 98503
Phone: 360/407-6300

At a minimum, copies of all public notices, fact sheets, and documents relating to public comment periods shall be promptly placed in these repositories. A copy of all documents related to this Facility shall be maintained in the repository at Ecology's Southwest Regional Office in Lacey, Washington.

G. Retention of Records

During the pendency of this Order, and for ten (10) years from the date of completion of work performed pursuant to this Order, the PLPs shall preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, the PLPs shall make all records available to Ecology and allow access for review within a reasonable time.

Nothing in this Order is intended to waive any right the PLPs may have under applicable law to limit disclosure of documents protected by the attorney work-product privilege and/or the attorney-client privilege. If the PLPs withhold any requested records based on an assertion of privilege, the PLPs shall provide Ecology with a privilege log specifying the records withheld and the applicable privilege. No Facility-related data collected pursuant to this Order shall be considered privileged.

H. Resolution of Disputes

1. In the event that the PLPs elect to invoke dispute resolution the PLPs must utilize the procedure set forth below.

   a. Upon the triggering event (receipt of Ecology's project coordinator's written decision or an itemized billing statement), the PLPs have fourteen (14) calendar days within which to notify Ecology's project coordinator in writing of its dispute ("Informal Dispute Notice").

   b. The Parties' project coordinators shall then confer in an effort to resolve the dispute informally. The parties shall informally confer for up to fourteen (14) calendar days from receipt of the Informal Dispute Notice. If the project coordinators cannot resolve the dispute within those 14 calendar days, then within seven (7) calendar days Ecology's project coordinator shall issue a written decision ("Informal Dispute Decision") stating: the nature of the dispute; the PLPs' position with regards to the dispute; Ecology's position with regard to the dispute; and the extent of resolution reached by informal discussion.

   c. The PLPs may then request regional management review of the dispute. This request ("Formal Dispute Notice") must be submitted in writing to the Southwest Region's Hazardous Waste and Toxics Reduction Section Manager within seven (7) calendar days of receipt of Ecology's Informal Dispute Decision. The Formal Dispute Notice shall include a written statement of dispute setting forth: the nature of the dispute;

the disputing Party's position with respect to the dispute; and the information relied upon to support its position.

d. The Southwest Region's Hazardous Waste and Toxics Reduction Section Manager shall conduct a review of the dispute and shall issue a written decision regarding the dispute ("Decision on Dispute") within thirty (30) calendar days of receipt of the Formal Dispute Notice. The Decision on Dispute shall be Ecology's final decision on the disputed matter.

2. The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

3. Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension.

4. In case of a dispute, failure to either proceed with the work required by this Order or timely invoke dispute resolution may result in Ecology's determination that insufficient progress is being made in preparation of a deliverable, and may result in Ecology undertaking the work under Section VII (Work to be Performed) or initiating enforcement under Section X (Enforcement).

I. Extension of Schedule

1. An extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

a. The deadline that is sought to be extended;

b. The length of the extension sought;

c. The reason(s) for the extension; and

d. Any related deadline or schedule that would be affected if the extension were granted.

2. The burden shall be on the PLPs to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

a. Circumstances beyond the reasonable control and despite the due diligence of the PLPs including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by the PLPs;

b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or

c. Endangerment as described in Section VIII.K (Endangerment).

However, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of the PLPs.

3. Ecology shall act upon any written request for extension in a timely fashion. Ecology shall give the PLPs written notification of any extensions granted pursuant to this Order. A requested extension shall not be effective until approved by Ecology. Unless the extension is a substantial change, it shall not be necessary to amend this Order pursuant to Section VIII.J (Amendment of Order) when a schedule extension is granted.

4. An extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) days only as a result of:

a. Delays in the issuance of a necessary permit which was applied for in a timely manner;

b. Other circumstances deemed exceptional or extraordinary by Ecology; or

c. Endangerment as described in Section VIII.K (Endangerment).

J. Amendment of Order

The project coordinators may verbally agree to minor changes to the work to be performed without formally amending this Order. Minor changes will be documented in writing by Ecology within seven (7) days of verbal agreement.

Except as provided in Section VIII.L (Reservation of Rights), substantial changes to the work to be performed shall require formal amendment of this Order. This Order may only be formally amended by the written consent of both Ecology and the PLPs. The PLPs shall submit a written request for amendment to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request for amendment is received. If the amendment to this Order represents a substantial change, Ecology will provide public notice and opportunity to comment. Reasons for the disapproval of a proposed amendment to this Order shall be stated in writing. If Ecology does not agree to a proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section VIII.H (Resolution of Disputes).

K. Endangerment

In the event Ecology determines that any activity being performed at the Facility is creating or has the potential to create a danger to human health or the environment on or surrounding the Facility, Ecology may direct the PLPs to cease such activities for such period of time as it deems necessary to abate the danger. The PLPs shall immediately comply with such direction.

In the event the PLPs determine that any activity being performed at the Facility is creating or has the potential to create a danger to human health or the environment, the PLPs may cease such activities. The PLPs shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction the PLPs shall provide Ecology with documentation of

the basis for the determination or cessation of such activities. If Ecology disagrees with the PLPs' cessation of activities, it may direct the PLPs to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this section, the PLPs' obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section VIII.I (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

L. Reservation of Rights

This Order is not a settlement under RCW 70.105D. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any of Ecology's rights or authority. Ecology will not, however, bring an action against the PLPs to recover remedial action costs paid to and received by Ecology under this Order. In addition, Ecology will not take additional enforcement actions against the PLPs regarding remedial actions required by this Order, provided the PLPs comply with this Order.

Ecology nevertheless reserves its rights under RCW 70.105D, including the right to require additional or different remedial actions at the Facility should it deem such actions necessary to protect human health and the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Facility.

By entering into this Order, the PLPs do not admit to any liability for the Facility. Although the PLPs are committing to conducting the work required by this Order under the terms of this Order, the PLPs expressly reserve all rights available under law, including but not

limited to the right to seek cost recovery or contribution against third parties, and the right to assert any defenses to liability in the event of enforcement.

M. Transfer of Interest in Property

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Facility shall be consummated by the PLPs without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to the PLPs' transfer of any interest in all or any portion of the Facility, and during the effective period of this Order, the PLPs shall provide a copy of this Order to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least thirty (30) days prior to any transfer, the PLPs shall notify Ecology of said transfer. Upon transfer of any interest, the PLPs shall notify all transferees of the restrictions on the activities and uses of the property under this Order and incorporate any such use restrictions into the transfer documents.

O. Compliance with Applicable Laws

1. All actions carried out by the PLPs pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090. At this time, no federal, state, or local requirements have been identified as being applicable to the actions required by this Order.

2. Pursuant to RCW 70.105D.090(1), the PLPs are exempt from the procedural requirements of RCW 70.94, 70.95, 77.55, 90.48, and 90.58 and of any laws requiring or authorizing local government permits or approvals. However, the PLPs shall comply with the substantive requirements of such permits or approvals. At this time, no state or local permits or approvals have been identified as being applicable but procedurally exempt under this section.

The PLPs have a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial

action under this Order. In the event either Ecology or the PLPs determine that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify the other party of its determination. Ecology shall determine whether Ecology or the PLPs shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, the PLPs shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by the PLPs and on how the PLPs must meet those requirements. Ecology shall inform the PLPs in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. The PLPs shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

3. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the state to administer any federal law, the exemption shall not apply and the PLPs shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

P. Financial Assurance

1. Financial assurance for corrective action is required by WAC 173-303-64620. Ecology's Financial Assurance Officer shall determine when the PLPs' actions and submissions meet the requirements of WAC 173-303-64620.

2. Ecology's Financial Assurance Officer is:

Kimberly Goetz
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
Phone: (360) 407-6754
Fax: (360) 407-6715
Email: kgoe461@ecy.wa.gov

Q. Indemnification

The PLPs agree to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action (1) for death or injuries to persons, or (2) for loss or damage to property to the extent arising from or on account of acts or omissions of the PLPs, its officers, employees, agents, or contractors in entering into and implementing this Order. However, the PLPs shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Order.

IX. SATISFACTION OF ORDER

The provisions of this Order shall be deemed satisfied upon the PLPs' receipt of written notification from Ecology that the PLPs have completed the corrective actions required by this Order, as amended by any modifications, and that the PLPs have complied with all other provisions of this Order.

X. ENFORCEMENT

Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Facility.

C. A liable party who refuses, without sufficient cause, to comply with any term of this Order will be liable for:

1. Up to three (3) times the amount of any costs incurred by the State of Washington as a result of its refusal to comply; and

2. Civil penalties of up to twenty-five thousand dollars ($25,000) per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: 10-27-15

PRS GROUP, INC.

Tom P. Smith

Tom Smith
President
PRS Group, Inc.
Telephone: 206/255-7509

PETROLEUM RECLAIMING SERVICE, INC.

Tom P. Smith

Tom Smith
President
Petroleum Reclaiming Service, Inc.
Telephone: 206/255-7509

TOM SMITH

Tom P. Smith

Tom Smith
PRS Group, Inc.
Telephone: 206/255-7509

GARY SMITH

Tom Smith
Gary Smith
PRS Group, Inc.
Telephone: 253/383-4175

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Ava Edmonson

Ava Edmonson
Section Manager
Hazardous Waste and Toxics Reduction Program
Southwest Regional Office
Telephone: 360/407-6337

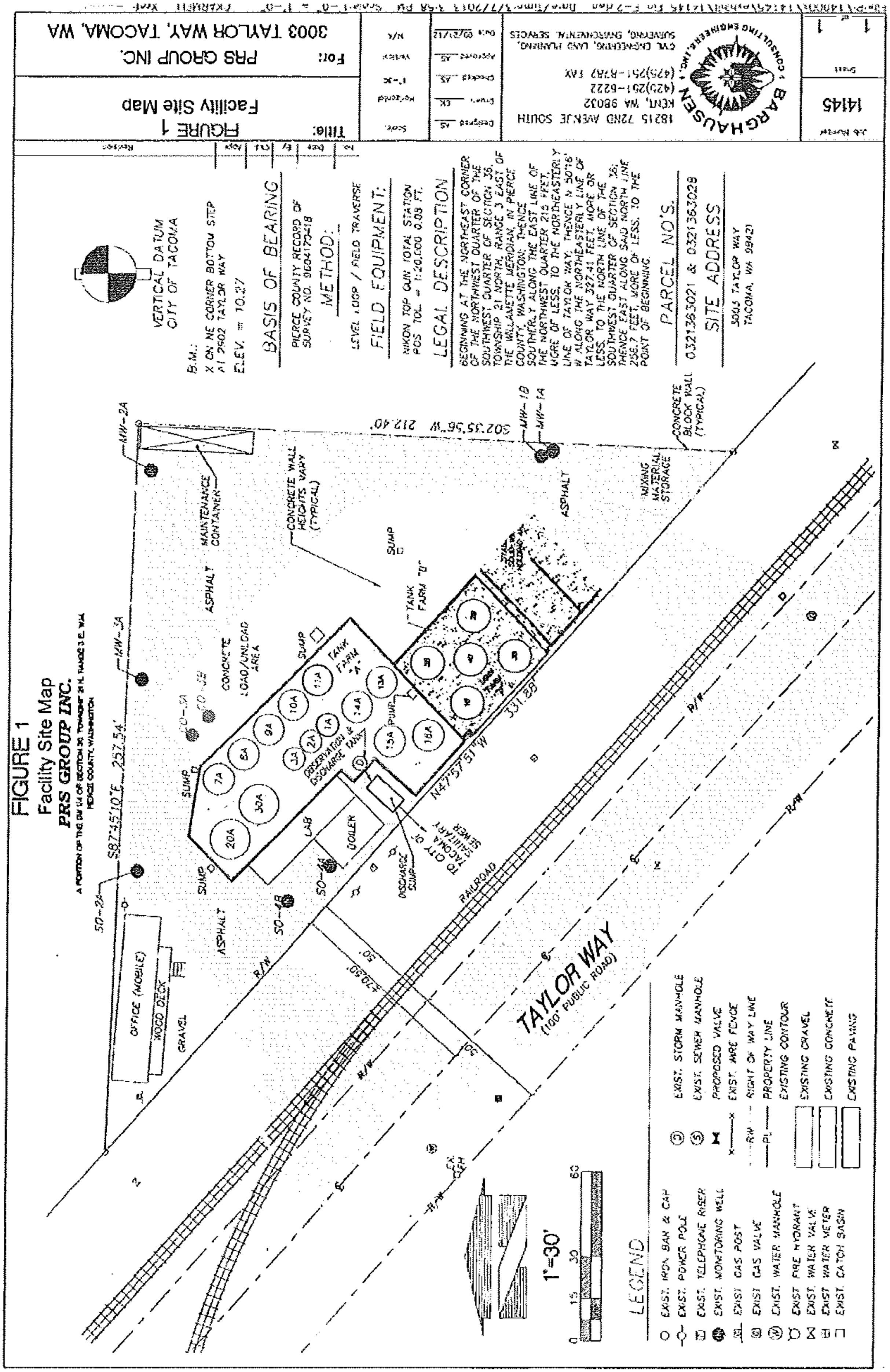


EXHIBIT A: Facility Diagram

EXHIBIT B: **List of documents submitted for PRS Group, Inc. Facility**

Site Inspection Report, Petroleum Reclaiming Services, Inc., Tacoma, Washington, dated March 13, 1987, prepared by Ecology and Environment, Inc. for the US Environmental Protection Agency, Region X

Phase 1 Report, Soil & Ground Water Investigation of Petroleum Reclaiming Services Inc., 3003 Taylor Way, Tacoma, Washington, dated February 6, 1992, prepared by Environmental Engineering & Consulting, Inc.

Phase 2 Report, Soil and Ground Water Investigation of Petroleum Reclaiming Service, Inc., Tacoma, Washington, prepared by Environmental Engineering & Consulting, Inc., and submitted by PRSI to Ecology on March 19, 1993

Remedial Investigation Report, Petroleum Reclaiming Services, Inc., 3003 Taylor Way, Tacoma, Washington, dated October 2, 1996, submitted by SECOR International Incorporated on behalf of Petroleum Reclaiming Services, Inc.

Remedial Investigation Addendum, Petroleum Reclaiming Service, Inc., dated December 19, 1996, prepared by SECOR International Incorporated

EXHIBIT C
Groundwater Monitoring Plan

PRS Group, Inc.
5/20/2015

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

GROUNDWATER MONITORING PLAN
PRS GROUP, INC.
TACOMA, WA 98421

1.0 INTRODUCTION

PRS Group, Inc. (PRS) manages wastes from off-site generators from their location at 3003 Taylor Way in Tacoma, Washington, as shown in Figure E-1 Facility Site Map. PRS operates under the requirements of WAC-173-303-515 (Standards for the management of used oil).

PRS stores and treats used oil for resale and treats wastewater suitable for discharge to the local sewer utility. Waste streams managed include used engine oil, non-PCB transformer oils, lubricating oils, oily wastewaters, bilge and ballast wastes, and drilling fluids. PRS also manages non-dangerous waste sludge for offsite disposal at a Subtitle D landfill.

This Groundwater Monitoring Plan (GWMP) was prepared in compliance with the requirements of the Dangerous Waste Regulations (WAC 173-303) and the Washington State Department of Ecology (Ecology).

1.1 BACKGROUND

The GWMP is designed to monitor the groundwater emanating from the facility. It utilizes nine existing groundwater monitoring wells installed at the facility. The monitoring wells, the analyses conducted, and the frequency of sampling are included in Table 1 **Groundwater Monitoring Schedule**. The monitoring wells are located to provide adequate information on (1) groundwater flowing onto the site from off-site, (2) groundwater underlying the site; and (3) groundwater leaving the site and flowing to off-site, downgradient locations. The monitoring wells were installed on site from 1991 through 2010. Groundwater samples will be analyzed for the chemicals of potential concern (COPCs) reviewed during past groundwater investigations on the site, including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), and select heavy metals.

The site or sections of the site have historically been owned by the city of Tacoma, Ohio Ferro-Alloys, Pacific Northwest Processing (a rendering plant), Pierce County, Port of Tacoma, several private individuals, and a prior PRSI owner. The site was an electrical power substation beginning in 1942 until 1976; from 1976 to present the site has been used for waste oil and water recycling prior to use as a rendering plant known as Pacific Northwest Processing.

The groundwater monitoring program outlined in this GWMP is designed to address all of the regulated areas at the facility and areas with releases of dangerous wastes and dangerous constituents.

1.2 GROUNDWATER MONITORING OBJECTIVES

This GWMP addresses the following major elements:

- Description of the current GWMP monitoring network;

- Procedures for completing water-level surveys, groundwater sampling, well evacuation, field decontamination, sample storage and transportation, sample analysis, and quality assurance/quality control;
- Procedures and requirements for well construction, maintenance, and decommissioning;
- Requirements for annual reporting and notification;
- Personnel functions and responsibilities;
- Worker health and safety planning
- How the GWMP's objectives will be met; and
- Field and laboratory quality assurance.

2.0 SITE HYDROGEOLOGICAL CHARACTERISTICS

PRS has collected geological and hydrological data for the site in previous environmental investigations. A detailed description of the site geological and hydrogeological characteristics is presented in the Comprehensive Remedial Investigation (RI) Report, dated October 2, 1996 and Addendum, dated December 19, 1996. The information presented in this section is based on the findings of the RI. The boring logs for all monitoring wells included in the GWMP are provided in Appendix A. A summary of the geological and hydrogeological characteristics is provided below.

2.1 SITE SETTING

The facility lies in a relatively flat area surrounded by developed and undeveloped industrial properties. The elevation of the facility is approximately 10 feet above sea level. The site occupies approximately .66 acres.

2.2 SITE GEOLOGY

The local geological units underlying the facility include:

- Fill material, consisting of silt and sand, dredged from the Blair and Hylebos Waterways in the 1950s and 1960s as well as from gravel borrow sources. Wastes reportedly dumped in the area around the facility from the late 1960s include slag from Asarco. The fill material ranges in thickness from a few feet to approximately 25 feet.
- Deltaic-alluvial sediments deposited by the Puyallup River, which flowed out of the Cascade Mountain Range to discharge into Commencement Bay of Puget Sound. A delta formed at the mouth of the Puyallup River in the Commencement Bay area, depositing alternating layers of sands and silts which can be over 100 feet in thickness.

2.3 SITE HYDROGEOLOGY

The hydrogeological units underlying the facility include:

- Shallow Aquifer – The shallow aquifer, which is unconfined, is present throughout the property and has also been encountered at borings on neighboring properties. The shallow aquifer is underlain by the silt aquitard.

- Silt Aquitard – The silt aquitard is present beneath all of the property and has been encountered in borings on neighboring properties as well. The silt aquitard is bounded above by the shallow aquifer and below by the deep aquifer.

- Deep Aquifer – The deep aquifer appears to be present throughout the property. The unit is fully saturated and is hydraulically confined by the overlying silt aquitard.

Water level measurements collected from the on-site monitoring wells vary from 1 to 15 feet below ground surface, depending on the aquifer, its location, and seasonal variations. The direction of groundwater flow seems to be dependent on seasonal variations.

South of the site along Taylor Way is a 24" sewer utility line bedded in porous sands/gravel providing an easy path for groundwater to flow toward. This area acts as a sink for groundwater during drier months allowing groundwater to flow southerly into the bedded area. Conversely during the wet season the utility line bedded area is saturated with groundwater and seems to push groundwater away, reversing the flow of groundwater towards the north.

3.0 MONITORING NETWORK

The groundwater monitoring well network and maintenance program for the facility are described in this section.

3.1 MONITORING WELL LOCATIONS

The locations of the full groundwater monitoring network are shown on Figure 2 **Monitoring Well Locations**. Figure 2 also shows the monitoring wells that will be monitored for both water levels and chemical constituents during the sampling events.

3.2 MONITORING WELL NUMBERING SYSTEM

Each well designation consists of four alphabetic characters ending in "A" for shallow wells and "B" for the deep aquifer.

3.3 MONITORING WELL CONSTRUCTION

For all wells in the groundwater monitoring network, well construction details are summarized in Table 2 **Well Construction Information**, and well construction logs are provided in Appendix A. More detailed installation descriptions are provided in the RI (1996), 2004 Monitoring and Drilling Summary Report, 2010 Monitoring and Drilling Summary Report and subsequent quarterly progress reports. Monitoring well construction is discussed further in Section 3.5.4.

3.4 MONITORING WELL SURVEY

In the Public Land Survey System, the facility is located in the SW1/4 of Section 36, Township 21 North, Range 3E, Willamette Meridian. The latitude/longitude coordinates are approximately 47°15'N/122°22'W. All survey data are recorded relative to this section, township, and range. All vertical survey data was based on the national Geodetic Vertical Datum (NGVD) of 1929 and converted to the North American Vertical Datum (1988). All horizontal data are provided relative to the Washington State Plane Coordinate System, South Zone (North American Datum, 1983/91). Table 3 provides Well Survey Data.

3.5 MONITORING WELL NETWORK INSPECTION, MAINTENANCE, AND REPLACEMENT

This section describes a program to provide regular inspection, and if necessary, maintenance of the monitoring wells and associated equipment. In addition, well construction and decommissioning procedures are presented in this section.

3.5.1 WELL INSPECTION

The integrity of monitoring wells within the monitoring network is inspected quarterly. The inspection involves an all-inclusive visual inspection of each well to determine if it has been damaged or tampered with, and verifies the physical condition of the well at the ground surface as well as the internal well casing. The physical condition of each well and problems discovered during the inspection will be recorded in a field inspection logbook and a Monitoring Well Inspection Form according to PRS SOP 400 **Documentation Procedures**. Both logbook and forms will be provided to the Senior Project Manager.

Problems that require immediate attention will be reported to the Senior Project Manager so as to remedy the condition prior to the next sampling event. Section 6.1 summarizes the duties and responsibilities of the Senior Project Manager. If a significant problem, such as a broken well head, bent casing, or other damage that compromises well access is discovered, it may be necessary to remedy the problem before sampling. A problem with the well integrity may require a modification of the sampling schedule or some other change in the sampling program. All decisions regarding such modifications will be addressed by the Senior Project Manager, who will notify and request approval from Ecology regarding such modifications. PRS will notify Ecology by telephone or in writing within 15 days of any visible damage to or deterioration of wells. Table B-1 **Project Personnel and Responsibilities** in Appendix A **Quality Assurance Project Plan** (QAPP) provides contacts and describes responsibilities for personnel.

3.5.2 MAINTENANCE

Borehole integrity will be maintained at each well. One of the following three methods will be consistently used to maintain borehole integrity:

- Annual comparisons of specific capacity. With this method, any well is redeveloped to within 5 percent of the original specific capacity if that well's annual capacity measurement is less than 80 percent of the original measured capacity.

- Annual sounding. With this method, any well that has an annually measured buildup of at least one foot of sediment must be redeveloped.

- Biennial comparisons of hydraulic conductivity. With this method, PRS must redevelop any well to within 5 percent of the original hydraulic conductivity if that well's biennial conductivity measurement is less than 80 percent of the original measured conductivity. Hydraulic conductivity must be determined by means of consistently performed slug tests.

All pumps and other sampling equipment used for groundwater monitoring will be calibrated regularly according to standard operating procedures (SOPs) and maintained regularly by the sampling team member(s) according to the equipment manuals and manufacturers' recommendations.

3.5.3 MONITORING WELL REPLACEMENT

If any monitoring well in the network must be replaced, PRS will make every effort to replace the well prior to the next sampling event. PRS will submit to Ecology a written explanation of the rationale for the well's replacement and the time frame and location for the replacement, at least 15 days prior to decommissioning. Ecology will approve the location of replacement wells prior to installation. The replacement will be completed upon approval of the agency and preferably prior to the next scheduled groundwater sampling event.

If it is agreed that the well should be replaced, the replacement well will be installed as close as possible to the well being replaced. A monitoring well construction form will be completed for the new well and a copy will be submitted to the agency. When necessary, wells will be decommissioned following the procedures specified in Section 3.5.5.

3.5.4 MONITORING WELL CONSTRUCTION

A qualified geologist will inspect the drilling and construction of all new or replacement monitoring wells. A detailed log of each well will be prepared. The logs and descriptions will include the following information:

- Date and time of construction;
- Drilling method and any drilling fluid used;
- Well location (surveyed to within 0.5 foot);
- Borehole diameter and well casing diameter;
- Well depth (to within 0.1 foot);
- Drilling logs and lithologic logs from the field, including a description of soil or rock types, color, weathering, texture, structure, and fractures;
- Casing materials;
- Screen material and design, including screen length and slot size, and depth interval of the well screens;
- Casing and screen joint type;
- Filter pack material, including size, placement method, and approximate volume, and depth interval of the filter pack material;
- Composition and approximate volume of sealant material and method of placement;
- Surface seal design and construction;
- Well development procedures;
- Ground surface elevation (to within 0.01 foot);
- Top-of-casing elevation (to within 0.01 foot) and
- Detailed drawing of well, including dimensions.

The logs and descriptions, as-built drawings, and location of the new well will be submitted to Ecology within 30 calendar days of well completion or according to the schedule approved by Ecology in specific

4.0 GROUNDWATER LEVEL MONITORING

Water level measurements are collected quarterly for a one-year period in March, June, September, and December. Water levels are collected from nine monitoring wells. The wells included in the water level monitoring events are presented in Table 1.

4.1.1 SCHEDULE

A water-level measurement event is conducted in accordance with the schedule presented in Table 1. Water level measurements are conducted prior to the corresponding groundwater sampling event, if applicable, and measurements are obtained within as short a time as possible prior to sampling, not to exceed one working day.

Figure E-2 shows the locations of the wells used for water level measurements.

4.1.2 PROCEDURES

The procedure for measuring water levels is described in PRS SOP-120 **Measuring Water Elevations and Total Depths**, presented in Appendix C **PRS Standard Operating Procedures**. Wells will be vented prior to measurement to allow water levels to stabilize before measurement. Water level measurements and well venting times are recorded in the field on a water level field form. An example of the water level field form is provided in Appendix D **Field Forms**.

4.1.3 EQUIPMENT

Equipment used for the water-level survey is listed in the PRS SOP-120, as provided in Appendix C. Depth-to-water measurements are made using an electronic water-level meter. The meter consists of a coaxial cable or plastic-coated flat wire permanently marked with increments of 0.01–foot, a detection probe, and electronic controls contained in a spool or reel used at a permanently marked reference point on the well casing. The water-level meter/sounder registers a response when the probe attached to the cable contacts an electrically conductive medium such as water, thereby completing the electrical circuit. The response is visible (e.g., red light), audible (e.g., alarm), or a combination of the two.

4.1.4 REPORTING

All water-level data are recorded in the field on water-level data forms. An example of the form format is provided in Appendix D. The water-level data forms facilitate transmission of data from the field to the office. The field form is provided to the PRS Senior Project Manager to file with the facility field forms. The water level data are used to create potentiometric contour maps and a summary table of the water-level measurements, which are included with the annual report.

4.2 WATER QUALITY MONITORING

PRS SOP-124 **Low-Flow Groundwater Sampling Procedure**, provided in Appendix C, describes the groundwater sampling methodology. This section of the GWMP describes the equipment used and the procedures for groundwater sampling, field decontamination, field records preparation, sample identification, and sample storage and transport for water quality testing.

work plans. Appendix A provides the log for each existing monitoring well in the groundwater monitoring well network.

3.5.5 MONITORING WELL DECOMMISSIONING

Wells will be decommissioned in accordance with the WAC 173-160-460 (Abandonment of Resource Protection Wells) and applicable updates. PRS' drilling contractor will file the appropriate notification of well abandonment with Ecology. The PRS Senior Project Manager will provide written rationale for the decision to decommission the well to Ecology at least 30 days prior to conducting the decommissioning. If the well being decommissioned is being replaced, it should be decommissioned no later than 90 days after installation of the replacement well.

Minor deviations from the decommissioning procedures that are deemed necessary due to unforeseen events in the field at the time of well abandonment will be noted in the operating record, along with an explanation of the need for the deviation. The PRS Senior Project Manager will notify Ecology in writing of any deviations within 15 days of well decommissioning.

4.2.1 SCHEDULE

Groundwater samples are collected in accordance with the schedule presented in Table 1 **Groundwater Monitoring Schedule**. After one year of quarterly sampling according to the requirements in this GWMP, sampling will happen once a year in June. Figure E-2 shows the locations of wells used for groundwater sampling.

4.2.2 GROUNDWATER SAMPLING PROCEDURE

Groundwater samples are collected following the procedures outlined in the PRS SOP-124, presented in Appendix C. This is a low-flow groundwater sampling methodology based on groundwater sampling guidance and comments from Ecology and the U.S. Environmental Protection Agency under RCRA. The groundwater sampling procedure involves purging groundwater from the monitoring well prior to sampling at a flow rate of 0.2 to 0.5 liter per minute slowly increasing the speed while maintaining a drawdown of less than 0.33 feet. During the purging, groundwater quality parameters, including temperature, pH, turbidity, dissolved oxygen, oxidation/reduction potential (ORP), and specific conductivity, are monitored approximately every three minutes, and purging is conducted until these parameters stabilize within criteria outlined in PRS SOP-124. Following the instructions in PRS SOP-124, if the dissolved oxygen measurement is less than 1 mg/L, a sample is collected and analyzed by the colorimetric procedures outlined in PRS SOP-300 **Dissolved Oxygen Measurement**. Once the water quality parameters have stabilized, groundwater samples are collected using a flow rate of less than 500 mL/min. Immediately following the collection of groundwater samples, a sample is collected and measured in the field for ferrous iron following the procedures outlined in PRS SOP-301 **Ferrous Iron Procedures**.

4.2.3 EQUIPMENT

The monitoring wells included in this GWMP are sampled with a nondedicated peristaltic pump using dedicated polyethylene tubing. The tubing intake is set at mid-screen for sampling or mid-water column if the top of the screen is above the water table. The depth to mid-screen is provided for all wells in Table 2 **Well Construction Information**. Other equipment to be used for well evacuation is listed in PRS SOP-124. This equipment includes a flow-through water quality meter, turbidity meter, water level meter, a digital titrator and colorimeter, and/or oil/water interface detector. A multiparameter, flow-through water quality meter that measures and records pH, temperature, dissolved oxygen, ORP, specific conductivity, turbidity, and time was selected for use in this monitoring program. All meters are calibrated according to instrument instructions. Calibration information and operating instructions can be found in PRS SOP 123 and PRS SOP 302 presented in Appendix C. The calibration results for each parameter are recorded in the field logbook. Refer to PRS SOP-400 **Documentation Procedures**.

4.2.4 FIELD DECONTAMINATION PROCEDURES

The decontamination procedures for all nondedicated field sampling equipment are outlined in PRS SOP 200 **Equipment Decontamination Procedure**. This equipment includes any instrument that is placed in a well or comes in contact with the groundwater sample, including the water-level indicator and any nondedicated pump. Refer to SOPs for field decontamination during sampling of monitoring equipment used for measuring water quality parameters.

The flow-through water quality meter requires decontamination with deionized water, but not with soaps or solvents, which may adversely affect the probes in the meter. The flow-through cell is disconnected prior to sample collection; therefore, groundwater collected for laboratory analysis at the laboratory does not contact the flow-through cell.

4.2.5 FIELD RECORDS

PRS SOP-400 describes field logbook documentation procedures required for field sampling events, as well as field forms required for specific tasks. Field observations for well evacuation and groundwater sampling are recorded in the field in the logbook and on monitoring well water sampling sheets similar to the one show in Appendix D. The monitoring well water sampling sheet is designed to help the sampling team determine when the water quality parameters are stable enough to collect a sample and also facilitates transmission of data from the field to the office. The following information is recorded on the sampling sheet during well evacuation; well identification, date, sampling personnel, beginning and ending water levels, sampling method, equipment used, and samples collected. Readings of water quality parameters (pH, specific conductivity, temperature, turbidity, dissolved oxygen, and ORP are recorded on the sheet approximately every 3 minutes, along with flow rate and pump speed. The ferrous iron measurements conducted in the field as well as any colorimetric dissolved oxygen measurements obtained in the field are also recorded on the field sheets.

4.2.6 SAMPLE LABEL AND IDENTIFICATION SYSTEM

A sample label is affixed to each sample bottle before sample collection. Each label includes the following information:

- Project Name
- Sample number (see below),
- Sampling event location,
- Date and time of sample collection (using 24-hour time clock),
- Preservatives added to the sample,
- Analytes for which the sample is to be analyzed.

Water samples are labeled with a unique sample number. The sample number consists of the appropriate monitoring well designation followed by, and separated by a hyphen from, a date identification code. The date identification code consists of a four-digit number that represents the month and year that the sample was collected. For instance, the sample number SO-2A-0614 denotes a sample collected in June 2014 from monitoring well SO-2A.

Quality control samples follow a similar nomenclature. Field duplicate samples are labeled the same as regular samples, except a '9' is added to the sample number preceding the well number and separated by hyphens on either side (e.gl, SO-2A-9-0614). Matrix spike and matrix spike duplicate (MS/MSD) samples are labeled the same as regular samples; but should be noted on the chain of custody form that extra volume was collected for MS/MSD. Field blank samples are labeled: Field Blank#1-0614" and trip blank samples are labeled "Trip Blank#1-0614". The location at which field blanks are collected should be noted in the field logbook and/or field form. Equipment blanks are not normally collected, but might be necessary if non-dedicated tubing or bailers are used during groundwater sampling. If they are collected, equipment blanks are labeled "Equipment blank#1-0614" and, if collected, the location should be noted in the field logbook and/or field form.

4.2.7 SAMPLE STORAGE AND TRANSPORTATION

Immediately after each sampling is obtained, samples are packed for shipping and placed in ice-cooled transport containers. The transport containers consist of sturdy, insulated, commercially produced coolers. All bottle caps are secured tightly, and all glass containers are secured into position within the shipping container to avoid breakage. Trip blanks are included in any transport container that carries water samples being analyzed for VOCs or TPH as gasoline. A custody seal is affixed to the container prior to laboratory pickup or delivery. The chain of custody form should be taped to the top of the cooler or shipping container in most circumstances.

An example chain of custody form is provided in Appendix D. During sample collection or at the end of the day and prior to shipping or storage, chain-of-custody forms will be completed for all samples by a designated field team member. The information on the sample labels will be rechecked and verified against field logbook entries and the chain of custody forms. The chain of custody form should include information such as sample name, sample time, sample date, type of medium, and analyses requested. Any necessary changes to chain of custody forms, sample container labels, or the field logbook will be made by striking out the error with one line and entering the correct information. The new entries will be initialed and dated. Samples with extra volume for laboratory quality control protocols (MS/MSD and laboratory duplicates) will be designated as such on the chain of custody form. The field team should ensure that analyte method numbers and analyte lists required for the project are either listed on the chain of custody form, attached to the chain of custody form, or referred to on the chain of custody form. Every person who takes possession of the samples while transporting the samples from the field to the laboratory must sign the chain of custody form.

For most samples, the field team either transports the samples to the laboratory or has a laboratory courier come to the site at the end of the sampling day to pick up samples for delivery to the laboratory. Upon receipt of the sample transport containers by the analytical laboratory, laboratory personnel open the containers and examine the contents for problems, such as damaged transport containers, broken custody seals, missing or broken sample bottles, chain of custody discrepancies, and documentation errors. Problems are reported to PRS. After the samples are analyzed by the analytical laboratory, laboratory personnel store the samples in a secure location at the laboratory for the remainder of their holding times. All notifications from the Laboratory will be provided to the Senior Project Manager or Sampling Team Leader.

4.2.8 ANALYTICAL PROCEDURES

The sampling and analysis schedule for this GWMP is included in Table 1. Typical detection limits and more detailed information about the analytical methods are provided in the QAPP (Appendix B). Groundwater monitoring analytical data will be analyzed and validated in accordance with the requirements in the QAPP.

The analytical laboratory purchase new and certified clean sample bottles for each sampling event. The recommended specifications for bottle types, volume of sample required for analysis, and types of sample preservative required for analyses are provided in Table1[1] and Table B-4 **Sample Containers, Preservation and Holding Times** in the QAPP. However, these recommendations may be modified by the laboratory as analytical methods are modified and improved.

[1] Under some circumstances, it may not be possible to collect the sample volumes recommended by the laboratory, as shown in Table 1. In such a case, the field team will fill bottles per the laboratory project manager's instructions.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

All work associated with the GWMP will be conducted in accordance with the QAPP (Appendix B).

6.0 PERSONNEL FUNCTIONS AND RESPONSIBILITIES

All fieldwork will be completed in accordance with the project-specific Health and Safety Plan (HASP), included as Appendix E of this plan. The specific tasks of key personnel involved in the groundwater monitoring program are summarized below.

6.1 PRS SENIOR PROJECT MANAGER

The function of the Senior Project Manager is to:

- Maintain correspondence between regulatory agencies and PRS.
- Maintain the groundwater monitoring network in good working condition.
- Maintain Field Log Book inventory. (See PRS SOP-400 Documentation Procedures)
- Notify Ecology seven days prior to conducting sampling events.
- Train staff on procedures in the GWMP and document the training.
- Maintain standard operating procedures (SOPs).

6.2 SAMPLING TEAM LEADER

The functions of the Sampling Team Leader are to:

- Learn and follow all of the procedures in this GWMP.
- Notify the Senior Project Manager of any unresolved problems or deviations from approved procedures. Problems or deviations will be documented in a log book according to PRS SOP-400 **Documentation Procedures**. Oversee field sampling activities and equipment repair to prevent sample and/or well contamination.
- Work to prevent sample and/or well contamination by sampling from least to most contaminated. Examine sample bottles, preservatives, and sample transport containers. Maintain lines of communication between those personnel involved in the field sampling activities, the Senior Project Manager, and the analytical laboratory.
- Maintain or service all dedicated sampling equipment.
  Schedule sample analysis services with the analytical laboratory and the Field Team Leader.

6.3 FIELD TEAM LEADER

The functions of the Field Team Leader are to:

- Learn and follow all of the procedures in this GWMP.
- Take neat and complete field notes in field logbook and necessary forms.
- Provide field technical guidance for sampling and maintenance procedures.
- Obtain, maintain, and inspect all equipment used to fulfill their responsibilities.
- Verify or arrange for shipment of sample bottles and sample transport containers, both from the analytical laboratory to the field and from the field to the laboratory.
- Conduct health and safety meetings, and implement safety requirements.
- Calibrate equipment.

- Assume responsibility for storage and provide security of sample transport containers and sample equipment.
- Take all field measurements.
- Check that samples are correctly identified and packed securely with ice in the sample transport container(s).
- Perform or supervise the water-level survey and well inspection.
- Purge monitoring wells.
- Collect and preserve samples.

6.4 PRS DATABASE ADMINISTRATOR

The function of the PRS Database Administrator is to update the monitoring well information tables.

7.0 SCHEDULE

Quarterly monitoring events occur four times in the first one-year period in the first quarter (March), the second quarter (June), the third quarter (September), and the fourth quarter (December). Well inspections also occur every quarter. After one year of quarterly monitoring events according to this GWMP, PRS shall submit an annual groundwater data analysis report. After reviewing this report, Ecology will determined if the monitoring schedule shall be revised to annual monitoring events in the second quarter and a semiannual water level monitoring event in the fourth quarter.

8.0 REPORTING

PRS shall submit a groundwater data analysis report to Ecology annually on April 15. The report shall summarize the data collected and activities performed with respect to the groundwater monitoring program since the previous annual report. Each report shall include the following information:

- A description of groundwater monitoring activities completed during the year;
- A description of groundwater monitoring activities planned for the next year;
- A summary of any problems, how problems were resolved, deviations from the GWMP, and a justification for all deviations;
- All laboratory analyses (in a mutually agreed-upon electronic data format and as hard copies of the original laboratory data) in tabulated data format for which quality assurance procedures were completed during the current time period;
- A summary of constituent concentrations which exceed MTCA cleanup levels;
- All field measurements; and
- A table with measured groundwater elevations for each well as well as groundwater level contour maps.
- A summary of significant findings, changes in personnel, and significant contacts with Federal, state, and local governments, community and public interest goals.

9.0 REFERENCES

PRS, 1996, Remedial Investigation Report prepared by SECOR.
2004 Monitoring and Drilling Summary
2010 Monitoring and Drilling Summary

TABLES

TABLE 1

GROUNDWATER MONITORING SCHEDULE
PRS GROUP, INC.
TACOMA, WA

	Required Analyses							
Analytical Method	**VOC by 8260B**	**TPH-Diesel by NWTPH-Dx**	**TPH-GASOLINE BY NWTPH-Gx**	**Total Metals by 6020[1]**	**PCBs by 8082**	**Nitrate by EPA 353.3**	**Sulfate by EPA 375.4**	**Water Levels**
Container Requirements	**2 x 40 mL Vial**	**1 x 1 liter Amber Glass**	**2 x 40mL Vial**	**1 x 250 mL poly**	**1 x 1 liter amber**	**250 mL poly**	**250mL poly**	
Preservative	**HCL**	**HCL**	**HCL**	**HNO3**	**none**	**none**	**none**	
Monitoring Location								
MW-1A	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
MW-1B	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
MW-2A	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
MW-3A	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
CO-3A	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
CO-3B	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
SO-2A	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
SO-4A	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
SO-4B	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
Field Blank	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4	1,2, 3, 4
Trip Blank	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
Total Samples	**44**	**44**	**44**	**44**	**44**	**44**	**44**	

Notes:

1. Metals: Cr, As, Pb
2. Collection Schedule as follows:
   - 1 = Second Week in March
   - 2 = Second Week in June
   - 3 = Second Week in September
   - 4 = Second Week in December

After one year of quarterly events, groundwater monitoring is conducted annually in June

Abbreviations

As = Arsenic
Cr = Chromium
HCL = Hydrochloric Acid
HNO3 = Nitric Acid
mL = Milliliter
Pb = Lead
Poly = Polyethylene
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compound

Table 2

Well Construction Information

PRS Group, Inc.

Tacoma, WA

Well ID	Installation Date	Contractor	Drilling Method	Total Borehole Depth	Initial Total Well Depth	Casing						Screen						Filter Pack			Seals				Information Source
						Depth Interval		Material	Nominal Diameter	Flush or Aboveground Monument	Type Of PVC Joint	Depth Interval		Screened Hydro-geologic Unit	Material	Nominal Diameter	Slot Size	Depth Interval		Material	Depth Interval		Material	Surface Seal	
						Upper	Lower					Upper	Lower					Upper	Lower		Upper	Lower			
CO3A	8/23/91	Holt Drilling	Hollow Stem Auger	11.5'	11.5'	0.0	5.0'	PVC	2"	Flush	PVC	5'	10'	Shallow Aquifer	PVC	2"	0.02	4'	10'	sand	0.0 2' 9.5'	2' 4' 10'	Concrete Bentonite	Concrete Flush Mount	Golder Associates
CO3B	8/26/91	Holt Drilling	Hollow Stem Auger	30'	29.5'	0.0	19.5'	PVC	2"	Flush	PVC	19.5'	29.5'	Deep Aquifer	PVC	2"	0.02	16.5'	29.5'	sand	0.0 2' 29.5'	2' 16.5' 30'	Concrete Bentonite	Concrete Flush Mount	———
SO2A	8/23/91	Holt Drilling	Hollow Stem Auger	12.5'	12.5'	0.0	5'	PVC	2"	Flush	PVC	5'	12'	Shallow Aquifer	PVC	2"	0.02	4'	12'	sand	0.0 2' 12'	2' 4' 12.5	Concrete Bentonite	Concrete Flush Mount	Golder Associates
SO4A	10/18/96	Cascade Drilling	Hollow Stem Auger	11.5'	10'	0.0	3'	PVC	2"	Flush	PVC	3.5'	11.5'	Shallow Aquifer	PVC	2"	.01	2.5'	12'	10/20 sand	0.0 1' 2'	1' 2' 11.5'	Concrete Bentonite Sand	Concrete Flush Mount	Secor
SO4B	1/2010	Pacific NW Probe	Direct Push	30'	28.5'	0.0	18.5'	PVC	1"	Flush	PVC	18.5'	28.5'	Deep Aquifer	PVC	1"	.01	16'	18.5'	Fine sand	.5 3' 16'	3' 16' 28.5"	Concrete Bentonite Grout	Concrete Flush Mount	RN
MW1A	3/22/08		Direct Push	12'	10'	0.0	5'			Flush	PVC			Shallow Aquifer										Concrete flush Mount	EMS
MW1B	1/2010	Pacific NW Probe	Direct Push	30'	29'	0.0	19'	PVC	1"	Flush	PVC	19'	29'	Deep Aquifer	PVC	1"	.01	19'	29	sand	0.5' 3' 16'	3' 16' 19'	Concrete Bentonite grout Bentonite	Concrete Flush Mount	RN
MW2A	3/22/08		Direct Push	12'	10'	0.0				Flush	PVC			Shallow Aquifer										Concrete Flush Mount	EMS
MW3A	3/22/08		Direct Push	12'	10'	0.0				Flush	PVC			Shallow Aquifer										Concrete flush Mount	EMS

Table 3

Well Survey Data
PRS Group, Inc.
Tacoma, WA

Well ID#	NORTHING	EASTING	ELEVATION (NAVD88)
MW-1A	709713.2652	1175727.8917	14.21'
MW-1B	709717.8682	1175726.3306	14.20'
MW-2A	709863.1699	1175714.5759	14.72'+/-
MW-3A	709868.2288	1175645.4877	13.91'
CO-3A	709849.1407	1175630.5507	13.10'
CO-3B	709843.1930	1175636.9974	12.92'
SO-4A	709800.9119	1175581.8993	14.61'
SO-4B	709817.2408	1175568.7243	14.10'
SO-2A	709868.5338	1175582.5228	14.21'

CONVERSION FORMULA USED TO CONVERT TO NAVD88 = NGVD29+3.501'

FIGURES

APPENDIX A

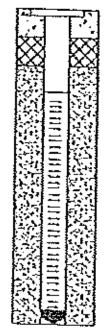
Groundwater Monitoring Well Logs

International Incorporated

FACILITY PETROLEUM RECLAIMING SERVICE INCORPORATED JOB # 00324-001-01 BORING/WELL SO4A
LOCATION 3003 TAYLOR WAY AVE., FIFE, WASHINGTON SURFACE ELEVATION
START 10/18/96 1415 FINISH 10/18/96 1500 CASING TOP ELEVATION
LOGGED BY P. JEWETT MONITORING DEVICE PID
SUBCONTRACTOR AND EQUIPMENT CASCADE DRILLING, INC.; LIMITED ACCESS HOLLOW STEM AUGER
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet
				5			5
				0	Silty Gravelly Sand (fill)		0
				∇			
8/3/3		* 0	NS	5	Sand, black, medium dense, medium to coarse grained, saturated	SP	5
55 for 6"		0			No recovery		
2/3/2		* 0	NS	10	Silty Clay, brown to gray, interbedded with peat/organics, very soft, plastic, saturated	CL-ML	10
					Boring terminated at 11.5 feet. Groundwater encountered at approximately 3 feet during drilling. Boring converted to a groundwater monitoring well on 10/18/96.		
				15			15
				20			20
				25			25

Well Construction Schematic



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

∇ Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: U32410R

PROJECT: PRSI/DRILLING/ TACOMA

RECORD OF BOREHOLE #C-03A

SHEET 1 OF 1

DATUM:

PROJECT NUMBER: 913-1215

BORING LOCATION:

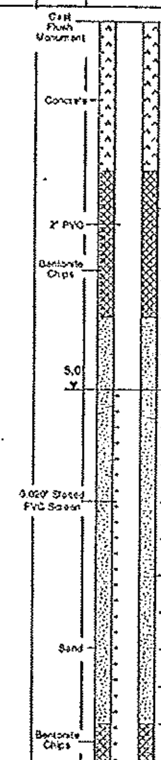
BORING DATE: 8/23/91

BORING METHOD: 4 inch Hollow-stem Auger

DEPTH FEET	SOIL PROFILE: DESCRIPTION	USCS	ELEV. / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 IN. (140 lb. hammer, 30 inch drop)	N	REC/ATT
0	0.0 Concrete							
	0.8 Loose, brownish-black (5YR2/1) silty, fine to medium sandy, fine to coarse GRAVEL and cobbles, dry	GP						
2.5	2.6 Compact, medium olive-brown (5Y4/4), fine to medium sandy, silty, fine to coarse GRAVEL and cobbles, dry			2.5	E	15-15-15	30	
	3.0 Loose, brownish-black (5YR2/1), fine to coarse SAND, trace silt, strong hydrocarbon odor, moist	SP						
5	5.0 Same material, hydrocarbon sheen visible on soil to 5.5'			5.0	E S	3-4-6	10	
7.5				7.5	E	4-3-1	4	
10				10.0	E	1-0-1	1	
	11.0 Very soft, olive-gray (5Y3/2), silty CLAY, some peat, moist	OL						
	End of hole							
12.5								
15								

PENETRATION RESISTANCE BLOWS/FT. (10, 20, 30, 40, 50); WATER CONTENT, PERCENT Wp — W — Wl (10, 20, 30, 40, 50)

PIEZOMETER GRAPHIC / WATER LEVEL



E = Environmental Sample
S = Stratigraphic Sample

DRILL RIG: Mobile B-57

DRILLING CONTRACTOR: HOLT DRILLING

DRILLER: SH

Golder Associates

LOGGED: D. Crawford

CHECKED: M. Lubrecht

DATE: 1/15/92

913-1215

RECORD OF BOREHOLE #C-03B

PROJECT: PRSI/DRILLING/ TACOMA

PROJECT NUMBER: 913-1215

BORING LOCATION:

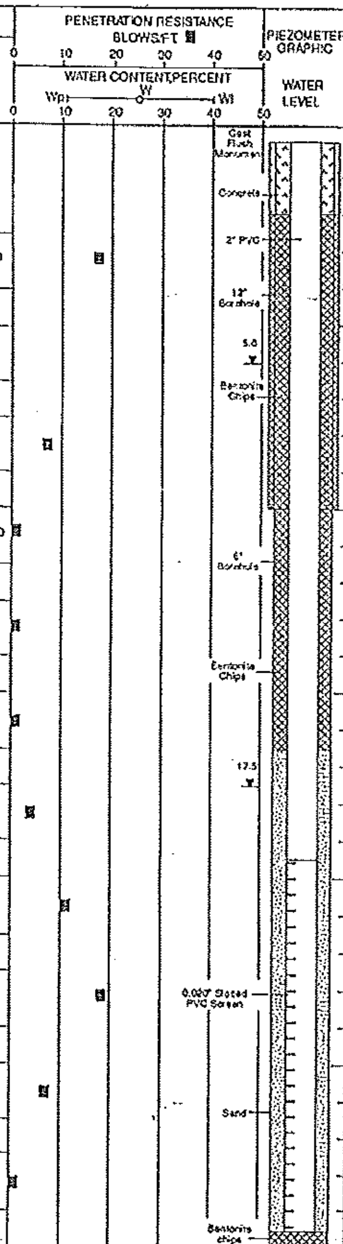
SHEET 1 OF 1

DATUM: -

BORING DATE: 8/26/91

DEPTH FEET	BORING METHOD	DESCRIPTION	USCS	ELEV. / DEPTH	NUMBER	TYPE	BLOWS / 6 IN. (140 lb. hammer, 30 inch drop)	N	REC/ATT
0	6 Inch Hollow-stem Augor	0.0 Concrete							
		0.8 Loose, brownish-black (5YR2/1) silty, fine to medium sandy GRAVEL, dry	GP						
		2.5 Compact, brownish-black (5YR2/1) fine to coarse SAND, little fine to coarse gravel, moist	SP		2.5	E	8-9-8	17	90
5					5.0	E			90
		8.0 Soft, dusky yellowish-brown (10YR2/2) PEAT and clay, moist	PT		7.5	E S	2-4-3	7	93
		8.5 Firm, medium olive-brown (5Y4/4) silty CLAY to CLAY, little organic material, moist	ML-CL						
10					10.0	E	1-0-1	1	100
					12.5	E	1-0-1	1	90
15		15.0 Graded to trace organic material			15.0	E	1-0-1	1	50
	4 Inch Hollow-stem Auger	17.5 Loose, brownish-black (5YR2/1) fine to coarse SAND, trace fine to coarse gravel, wet	SP		17.5	E	1-1-3	4	75
20		— Heaving Sand			20.0	E	4-4-7	11	90
					22.5	E	11-10-8	18	90
25		25.5 Soft, olive-gray (5Y3/2) silty CLAY, moist	CL		25.0	E	6-3-4	7	
		26.0 Loose, brownish-black (5YR2/1) fine to coarse SAND, wet							
					27.5	E	1-0-1		
		End of hole							
30									

E = Environmental Sample
S = Stratigraphic Sample



DRILL RIG: Mobile B-57

DRILLING CONTRACTOR: HOLT DRILLING

DRILLER: Bill

Golder Associates

LOGGED: O. Crawford

CHECKED: M. Lubrecht

DATE: 1/15/02

913-1215

RECORD OF BOREHOLE #S-02A

PROJECT: PRSI/DRILLING/TACOMA

PROJECT NUMBER: 913-1215

BORING LOCATION:

SHEET 1 OF 1

DATUM:

BORING DATE: 8/23/91

DEPTH FEET	BORING METHOD	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH	NUMBER	TYPE	BLOWS / 6 IN. 140 lb. hammer 30 inch drop	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT / WATER CONTENT PERCENT	PIEZOMETER GRAPHIC / WATER LEVEL
0	4 Inch Hollow-stem Auger	0.0 Crushed rock, compacted sand and gravel	GP									Cast Flush Monument
		0.3 Loose, medium olive-brown (5Y4/4) fine to coarse SAND, some fine to coarse gravel, little silt, dry (FILL)	SM									Concrete
2.5						2.5	E S	9-9-7	16	90		2" PVC; Bentonite Chips
5		5.0 Loose, brownish-black (5YR2/1) fine to medium SAND, trace fine gravel, trace silt, wet	SP			5.0	E	3-5-8	13	90		5.0
7.5						7.5	E	1-2-1	3	25		0.020" Slotted PVC Screen
		8.5 Loose, brownish-black (5YR2/1) fine to medium sandy SILT, wet	SM									Sand
10						10.0	NO SAMPLE	1-0-1	1	0		
12.5		12.5 Very soft, olive-gray (5Y3/2), silty CLAY, little organic material, wet	CL			12.5	E S	0-0-1	1	60		Bentonite Chips
15												

E = Environmental Sample
S = Stratigraphic Sample

DRILL RIG: Mobile B-57

DRILLING CONTRACTOR: HOLT DRILLING

DRILLER: Bill

Golder Associates

LOGGED: D. Crawford

CHECKED: M. Lubrecht

DATE: 8/23/91

913-1215.44473

Environmental Services
emsgroupllc.com

Boring Number: MW03A | Sheet Number: 3 of 3

Job Name: PRS Monitoring Well Installation | Date: 3/22/2008

Client: PRS Monitoring Well Installation

Location: 3003 Taylor Way Tacoma, WA center of north property line

Casing Depth: n/a	Casing Elevation: n/a	Drilling	
Well Screen Size: n/a	Water Level: 2.5 feet bgs	Start	Finish
Surface Conditions: Asphalt	Time:	9:55	10:05

Longitude:

Latitude:

Comments: Direct Push Probe used

Inches Driven	Inches Recovered	Sample Number	Sample Time & Interval	Depth to Water	Water Sampling Screen	Depth	Soil Description
						0 -	0-6" Asphalt
						-	6"-2'6": Gray medium to fine sand with silt and occasional gravel.
						1 -	
						-	
						2 -	2'6"-12': Wet brown medium to fine sand with silt and occasional gravel
						-	
						3 -	
						-	
48	36					4 -	
						-	
						5 -	5-5'6": Gray and brown medium to fine well sorted sand with silt
						-	5'6"-6': Gray and white medium to fine well sorted sand with silt, moist

			SMW3A3.5	10:00	6	-	6-8': Gray well sorted silt with some fine sand. wet
			SMW3A3.5	10:20		-	
					7	-	
						-	
	48	48			8	-	8-11'6": Gray poorly sorted silt with some clay, wet
						-	
					9	-	
						-	
					10	-	
						-	
					11	-	
						-	11'6"-16': Gray fine sorted sand with silt
	48	48			12	-	
						-	
					13	-	
						-	
					14	-	
						-	
					15	-	
						-	
					16	-	
						-	
					17	-	
						-	Well Developed @1255
					18	-	

ems Environmental Services
emsgroupllc.com

Boring Number: MW02A
Sheet Number: 2 of 3
Job Name: PRS Monitoring Well Installation
Date: 3/22/2008
Client: PRS
Location: 3003 Taylor Way Tacoma, WA northeast corner of property

Casing Depth:	n/a	Casing Elevation:	flush mount
Well Screen Size:	n/a	Water Level:	3 feet bgs
Surface Conditions:	Asphalt		

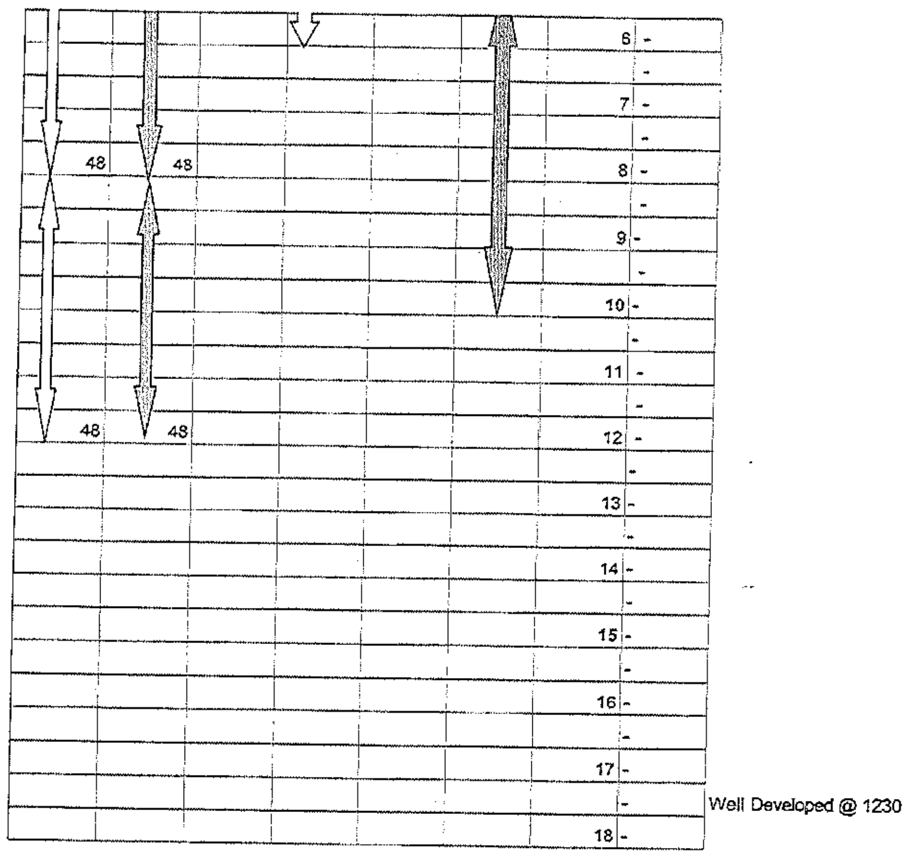
Drilling	Start	Finish
Time:	9:20	9:30

Longitude:

Latitude:

Comments: Direct Push Probe used

Inches Driven	Inches Recovered	Sample Number	Sample Time & Interval	Depth to Water	Water Sampling Screen		Soil Description
						0 -	0-6" Asphalt
						-	6"-3'6": Brown medium to fine sand with silt and occasional gravel
						1 -	
						-	
						2 -	
						-	
						3 -	
						-	4-12': Wet gray medium to fine sorted sand with silt
48	36					4 -	
						-	
		SMW2A4'	9:35			5 -	
						-	

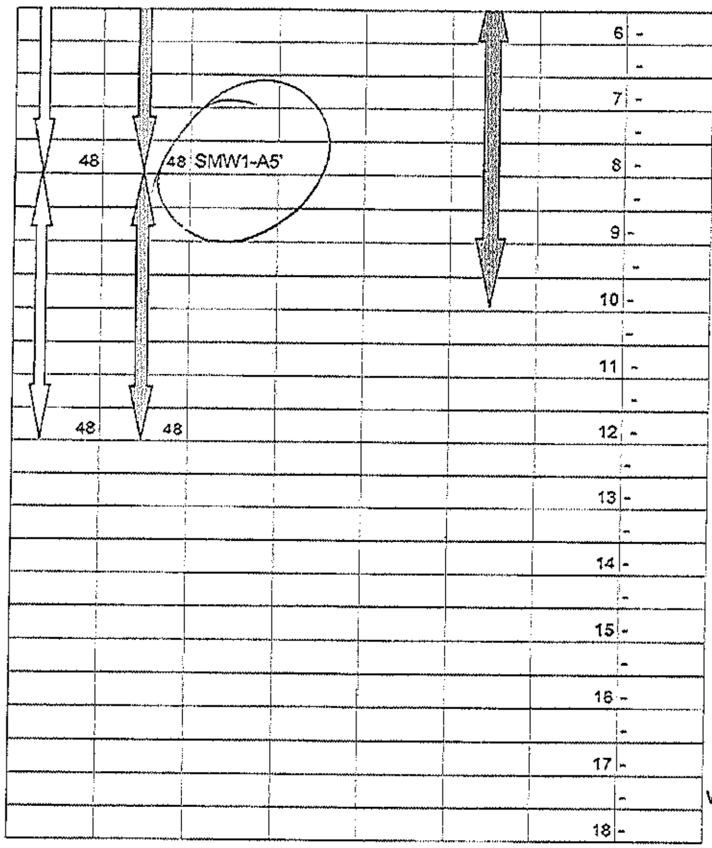


48
48
48
48
6
7
8
9
10
11
12
13
14
15
16
17
18
Well Developed @ 1230

ems Environmental Services
emsgroupllc.com

Boring Number:	MW-1A	Sheet Number:	1	of	3
Job Name:	PRS-Monitoring Well Installation	Date:	3/22/2008		
Client:	PRS				
Location:	3003 Taylor Way Tacoma, WA Southeast corner of property				
Casing Depth:	n/a	Casing Elevation:	flush mount	Drilling	
Well Screen Size:	n/a	Water Level:	3 feet bgs	Start	Finish
Surface Conditions:	Asphalt		Time:	8:27	8:55
Longitude:					
Latitude:					
Comments:	Direct Push Probe used				

Inches Driven	Inches Recovered	Sample Number	Sample Time & Interval	Depth to Water	Water Sampling Screen	Depth (ft)	Soil Description
						0 -	0-6" Asphalt
						-	6"-2'6": Brown medium to fine sand with silt and occasional gravel,
						1 -	resembling fill material
						-	
						2 -	2'6"-12': Wet brown medium to fine sand with silt and occasional gravel
						-	
						3 -	
						-	
48	36					4 -	
						-	
						5 -	
			9:00			-	



Well developed @ 1200

APPENDIX B

Quality Assurance Project Plan

QUALITY

ASSURANCE

PROJECT

PLAN

PRS Group, Inc.
Tacoma, WA

TABLE OF CONTENTS

TABLES

EXHIBITS

DISTRIBUTION LIST

This list identifies all individuals to receive a copy of the Approved Quality Assurance Project Plan, either in hard copy or electronic format, as well as any subsequent revisions.

Washington State Department of Ecology Project Manager:	Chuck Hoffman Washington State Department of Ecology Hazardous Waste and Toxics Reduction Southwest Regional Office PO Box 47775 Olympia, WA 98504-7775 360-407-6344 chof461@ecy.wa.gov
PRS Senior Project Manager	Tom Smith PRS Group, Inc. 3003 Taylor Way Tacoma, WA 98421 253-383-4175 tom@prsplant.net
PRS Sampling Team Leader:	Jay Johnson PRS Group, Inc. 3003 Taylor Way Tacoma, WA 98421 253-383-4175 jay@prsplant.net
PRS Database Administrator	Josh Simmons PRS Group, Inc. 3003 Taylor Way Tacoma, WA 98421 253-383-4175 josh@prsplant.net
Field Team Leader:	TBD Geo Engineers 1101 Fawcett Avenue; Suite 200 Tacoma, WA 98402 253-722-2415 @geoengineers.com
Spectra Laboratory Project Manager:	Steve Hibbs Spectra Laboratories 2221 Ross Way Tacoma, WA 98421

253-272-4850
steveH@spectra-lab.com

Spectra Laboratory QA Leader:

Jessie Bynum
Spectra Laboratories
2221 Ross Way
Tacoma, WA 98421
253-272-4850
@spectra-lab.com

Data Validator

Geo Engineers
1101 Fawcett Avenue; Suite 200
Tacoma, WA 98402
253-722-2415
@geoengineers.com

QUALITY ASSURANCE PROJECT PLAN
PRS GROUP, INC.
TACOMA, WA 98421

1.0 BACKGROUND

PRS Group, Inc. (PRS) manages wastes from off-site generators from their location at 3003 Taylor Way in Tacoma, Washington, as shown in Figure E-1 Facility Site Map. PRS operates under the requirements of WAC-173-303-515 (Standards for the management of used oil).

The project description, regulatory background, site history, site characterization, and site conditions are described in the Comprehensive RI Report, addendums and quarterly reports.

This QAPP outlines quality assurance (QA) and quality control (QC) protocols to be followed in implementing the GWMP.

2.0 PROJECT DESCRIPTION

This Quality Assurance Project Plan (QAPP) supports the groundwater monitoring and sampling activities at the facility. This QAPP addresses the type and quality of data needed to support environmental decisions and provides direction for collecting data during the groundwater monitoring and sampling activities and for assessing and reporting those data. This QAPP also outlines quality assurance (QA) and quality control (QC) protocols to be followed in implementing the GWMP.

3.0 ORGANIZATION

The individuals responsible for planning and implementing field and laboratory operations and QA/QC procedures for this project are identified in Table B-1 **Project Personnel and Responsibilities**, along with contact information and a summary of each individual's responsibilities for project management and QA procedures.

3.1 Management Responsibilities

Project management responsibilities are shown in Table B-1. Detailed descriptions of the management and QA responsibilities of laboratory personnel are described in the Spectra Laboratories QA Manual (Exhibit B-1).

3.2 Quality Assurance Responsibilities

The personnel responsible for review and approval of the QAPP and for data verification, validation, and data quality assessment are described in Table B-1.

3.3 Field Responsibilities

Field responsibilities for collection of the samples are provided in the GWMP and in Section 6 through 8 of this QAPP.

3.4 Laboratory Responsibilities

Spectra will provide analytical services for the groundwater monitoring program. The Laboratory QA Leader, as described in Table B-1, will ensure that appropriate procedures are followed during sample analysis and preparation of the data packages and electronic deliverables.

Spectra has provided their QA Manual (Exhibit B-1) for review and approval by the PRS Senior Project Manager. The QA manual includes descriptions of the laboratory organization, personnel, and responsibilities; facilities and equipment, analytical methods and QA/QC protocols; and routine procedures for sample custody and data handling.

4.0 QUALITY OBJECTIVES

The sampling design, field procedures, laboratory procedures, and QC procedures are set up to provide high-quality data for use in the groundwater monitoring program. Specific data quality factors that may affect data usability include quantitative factors (representativeness and comparability). The measurement quality objectives (MQOs) associated with these data quality factors are summarized in Table B-2 **Measurement Quality Objectives** and discussed below.

4.1 Precision

Precision is the agreement among a set of replicate measurements without assuming knowledge of the true value. Precision is measured for this project by calculating the relative percentage difference (RPD) for analytical results from field duplicate and lab duplicate samples. Precision is optimized by collecting data at multiple locations and adhering to strict procedural guidelines that minimize possible sample contamination. RPD results that are outside the control limits listed in Table B-2 for laboratory split samples will be qualified appropriately during data validation.

Field precision will be assessed through the collection and analytical testing of field duplicates at a rate of one duplicate per 20 samples, or a minimum of one per sampling event. These analyses measure both field and laboratory precision. The results, therefore, may have more variability than laboratory-generated duplicates.

Laboratory precision is assessed through analysis of duplicate spiked and/or unspiked samples, as specified by the analytical method. Specific discussion of the different types of laboratory duplicate samples is found in Section 8.1. The RPD value will be calculated according to the following formula:

$$\text{RPD (\%)} = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} \times 100$$

Where:

D_1 = Concentration of analyte in sample

D_2 = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates), and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision may also be expressed as the percent difference (%D) between replicate analyses. During data validation, the Data Validator will evaluate all RPD values and take action as described in U.S. Environmental Protection Agency (EPA) guidance (EPA, 2008, 2010).

4.2 Bias

Bias is systematic deviation of a measured value from the true value. Bias can be assessed by comparing a measured value to an accepted reference value in a sample of known concentration or by determining the recovery of a known amount of contaminated spiked into a sample. Bias is minimized for this project by standardizing field activity methodologies, including methods for equipment decontamination, sample collection, field observation and documentation, sample transport, and chain of custody control. Descriptions of these methodologies are included in the GWMP.

4.3 Accuracy

Accuracy is the degree of agreement between an observed value and an accepted reference value. When applied to a set of observed values, accuracy will depend on a combination of random error and of common systematic error (or bias). Accuracy will be evaluated for this project by evaluating laboratory spike sample recoveries that represent the difference between an observed value and an accepted reference value. Control limits for spike recoveries have been documented by the project laboratory and are found in Table B-2. Results showing noncompliant recoveries will be qualified appropriately during data validation. In general, if percent recoveries are consistently low, nondetect results may indicate that compounds of interest are not present when in fact these compounds are present. Detected compounds may be biased low or reported at a value less than actual environmental conditions. The reverse is true when recoveries are consistently high. In such case, results for detected analytes may be higher than the true value. Accuracy will be optimized for this project by using procedures designed to reduce potential error that might impact the accuracy of results. The laboratory QC procedures, described in Section 8.1, also reduce error to improve accuracy.

Accuracy will be assessed by the percent recovery (%R) of a surrogate compound (also known as "system monitoring compound"), a matrix spike result, and/or results from a laboratory control sample (also known as standard reference material or blank spikes) where:

$$\text{Recovery (\%)} = \frac{\text{Sample Result}}{\text{Spike Amount}} \times 100$$

The Data Validator will evaluate all %R values and take action as described in EPA guidance (EPA, 2008, 2010).

4.4 Representativeness

Representativeness is the measure of how well data reflect the actual environment and the conditions under which the data are collected. Representativeness will be optimized for this project by using general historical and investigative information to determine proper locations of new sampling points that represent the areas of concern. The methodologies used to collect samples and measurements, as detailed in the GWMP, are also designed to collect representativeness of the data will be performed by:

- Comparing actual sampling procedures to those prescribed in the GWMP and this QAPP;
- Comparing analytical results from field duplicates to determine variation in the analytical results; and
- Flagging nonrepresentative data as invalid or identifying data that are noncompliant with project specifications.

Only representative data will be used in subsequent data reduction, validation, and reporting activities.

4.5 Comparability

Comparability is how well multiple data sets can be used for a common interpretation. Comparability will be optimized for this project by using the same standards for data collection at each location, and the same analytical procedures and QA procedures during each sampling event.

Comparability expresses the confidence with which one set of data can be compared to another. Since numeric goals do not exist for comparability, a statement of comparability will be prepared to determine overall usefulness of data sets, following the determination of both precision and accuracy. This statement will be included in the Data Review Reports (see Section 10.2.3).

4.6 Completeness

Completeness is a measure of the amount of data collected that are found to be valid in relation to the total amount of data intended to be collected according to the sampling design. Completeness will be optimized for this project by having all analytical results validated or reviewed by a data validator to assess the validity of the data.

The number of samples and results expected establishes the comparative basis for completeness and is defined as a ratio of acceptable measurements (including estimated data) obtained to the total number of planned measurements for an activity. Completeness (C) can be calculated as follows:

$$\%C = \frac{\text{(number of acceptable data points)}}{\text{(total number of data points)}} \times 100$$

The data quality objective (DQO) for completeness for this project is 100 percent useable data for samples/analyses planned. If the completeness goal is not achieved, an evaluation will be made to determine if the data are adequate to meet study objectives. Completeness below 100 percent will require review of the sampling objectives to determine whether further sampling and analyses may be required.

4.7 Reporting Limits

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Although results reported near the MDL provide insight to actual field conditions, quality assurance requires that analytical methods achieve a consistently reliable level of quantitation known as the practical quantitation limit (PQL). The laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

Ideally, the laboratory's reporting limits (PQLs) should be low enough to compare to the applicable Model Toxics Control Act (MTCA) Method A or Method B screening levels. A reasonable level of effort will be exercised to achieve these goals. The current PQLs are shown in Table B-3 **Groundwater Practical Quantitation Limits.**

The PQLs listed in Table B-3 are considered "target" reporting limits, because several factors may influence laboratory practical quantitation limits and individual sample quantitation limits. Changes in laboratory protocols may change the applicable PQL that the laboratory can achieve. The most recent laboratory QA Manual will provide the current applicable PQL. Analytical procedures may also require dilution and/or cleanup of samples and subsequent reanalysis to accurately quantify a particular analyte at concentrations above the range of the instrument. The effect is that other analytes may be reported as undetected at a PQL much higher than a specified screening level. Data users must be aware that nondetected analytes with a high stated reporting limit, although correctly reported, can bias statistical summaries, and careful interpretation is required to correctly characterize site conditions. During data validation, evaluation will be made and the most appropriate result for each analyte will be reported.

5.0 SAMPLING PROCESS DESIGN

The sampling design, including figures showing field work locations, tables of samples to be collected, and the sample collection schedule, are included in the GWMP.

6.0 SAMPLING PROCEDURES

Procedures for all field activities are described in the Section 4.1.2 and Section 4.2.2 of the GWMP. All field personnel will have completed 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Site Operations (HAZWOPER) training, as specified in the Health and Safety Plan (HASP) (Appendix E of the GWMP).

All instruments used in collection of samples will be properly calibrated according to the manufacturer's recommendations and decontaminated between samples if the instrument is reusable and comes in contact with samples. All samples will be placed in iced coolers immediately following sample collection, and strict chain of custody control will be maintained at all times. Samples will be delivered or shipped to Spectra Laboratories in Tacoma, Washington.

All instruments used in measuring water quality parameters will be calibrated according to PRS' SOPs.

6.1 Sample Identification

Each sample will be assigned a unique alphanumeric identification code (identifier) that contains sufficient information to identify the sample location and date. The sample labeling procedure is described in Section 4.2.6 of the GWMP.

6.2 Sample Labeling

A label will be securely attached to every sample container. Each label will include the following information:

- Sample number;
- Sampling event location;
- Project name;
- Preservatives added to the sample;
- Date and time of collection (using 24-hour time clock to minimize potential confusion about a.m. and p.m.; e.g., "1300" vs. "1:00 p.m."); and
- Analytes for which the sample is to be analyzed.

6.3 Field Log Maintenance

All sample locations descriptions, sample identifiers, and analyte lists will be recorded in the field log. The field log will include, but not be limited to, the following information:

- All incidents observed during each sampling event;
- The names of all personnel present involved in the sampling event;

- The major events that occurred during the day;
- Details about field procedures conducted; and
- Details about samples collected or problems that occurred.

Procedures for maintaining the field log are described in Section 4.2.5 of the GWMP and PRS-SOP-400 **Documentation Procedures.**

6.4 Sample Containers and Preservatives

Table 1 **Groundwater Monitoring Schedule** in the GWMP specifies the sample containers required for each analytical method. Table B-4 **Sample Containers, Preservation, and Holding Times** also specifies the required containers as well as the sample size, preservation protocol, and holding times for the list of analyses to be performed. All sample containers will be provided by the laboratory and will include the appropriate preservatives.

Sample containers will be placed in opaque, insulated coolers packed with ice to minimize their exposure to light and to cool them approximately to the recommended temperature. The coolers will be packed with sufficient packing material to prevent sample container breakage and/or leakage during transport.

The Senior Project Manager and Field Team Leader will plan sampling activities and coordinate sample delivery with laboratory personnel so that the sample holding time limits and temperatures specified in Table B-4 are not exceeded.

6.5 Sample Storage and Transportation

The exteriors of all sample containers will be wiped clean after they have been closed. Blank (QC) samples will be packaged with the primary samples that they control. Any vacant space in the cooler will be filled with ice or packaging material. If the cooler has a drain, it will be taped shut. Then each cooler will be secured using a chain of custody tape that will remain intact and verified by the testing laboratory.

6.6 Sample Chain of Custody

Chain of custody procedures will be followed by all project personnel to document sample transfer, sample possession, and sample integrity, from the time of sample collection through the completion of sample analysis. A chain of custody form will be initiated at the time of sampling, and will accompany the samples at all times including upon receipt at the project laboratory. The project laboratory maintains an internal.custody protocol. The chain of custody form has blank fields for entering the sample identifier, the date and time of sample collection, the name of the person who collected the sample, and the requested laboratory analyses. Each chain of custody form will be signed by every person who handles the sample containers. Sample transfers will be noted on the chain of custody form for each sample.

The chain of custody form documents sample identifications, locations, sample times, and the analyses required for each sample. This is the principal document shared by the sample generator and the project laboratory. Therefore accuracy and completeness are extremely important. Personnel initiating the chain of custody form will refer to the field forms and the field log (described above in Section 6.3) to access the required information. This continuity will help make the various forms of documentation consistent and reduce the risk of error. The chain of custody form will accompany all samples during transport. The field sampler also will keep a copy of the chain of custody form for the project file.

All samples will be delivered directly to laboratory personnel authorized to receive samples (sample custodians). When the laboratory receives the samples, the sample custodian will inspect the exterior condition of the shipping container. Then the sample custodian will open and examine the interior of the shipping container. Next the sample custodian will examine the sample containers and check the contents of the shipping container against the chain of custody form. The sample custodian will record any inconsistencies or problems with the sample shipment (breakage or signs of leakage, and missing or extra samples) on the chain or custody record and notify the PRS Senior Project Manager or the Spectra Laboratories QA Leader for immediate resolution. Official acceptance of sample custody will be documented by the sample custodian's signature on the chain of custody form. The samples will then be tracked through the laboratory by the laboratory's internal custody procedures.

7.0 MEASUREMENT PROCEDURES

A list of analyses and target reporting limits for this project are provided in Table B-3. The analytical and QA/QC procedures used by the laboratory QA Manual and SOPs included as Exhibit B-1.

7.1 Laboratory Measurement Procedures

Groundwater samples will be analyzed for the list of analytes as identified in the GWMP. These analytes are listed in Table B-3. Chemical laboratory analyses will be performed using the following sets of standard laboratory methods:

- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition (EPA, 2007);
- Ecology method NWTPH (for total petroleum hydrocarbons)

Specific analytes, reference methods, and target reporting limits (i.e., the applicable PQL), are presented in Table B-3.

7.2 Field Measurement Procedures

Field equipment will be used and calibrated in general accordance with the manufacturer's recommendations. More details on field procedures are provided in the GWMP.

8.0 QUALITY CONTROL

This section outlines QC procedures to be followed by both field personnel and the analytical laboratory. Following these QC procedures will support the development of a complete and accurate data set following laboratory analysis and data validation. In this section, a sampling event is defined as consecutive days of sampling not separated by more than two days of inactivity.

8.1 Analytical Laboratory Quality Control

The project laboratories are required to adhere to specified criteria in the following areas to verify the validity of data being produced:

- Holding times;
- Instrument tuning;
- Initial calibrations and continuing calibration verification;
- Method blanks;
- Surrogate spike compounds;
- Matrix spike samples and matrix spike duplicates(MS/MSD)
- Laboratory control samples (LCS)
- Laboratory duplicates; and
- Internal standards.

8.1.1 Holding Times

Holding time constraints for each method will be met to ensure the validity of the results report. Holding times are outlined in Table B-4.

8.1.2 Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) will be completed to ensure that mass resolution, identification, and, to some degree, sensitivity of the analyses are acceptable. Instrument tuning will be completed each 12-hour period during which samples or standards are analyzed. In the event that an instrument tuning does not meet control limits, analyses of project samples will be suspended until the source of the control failure is either eliminated or reduced to within control specifications. Any project samples analyzed while the instrument is out of calibration will be reanalyzed.

8.1.3 Laboratory Instrument Calibration

Initial calibration of instruments, as applicable, will be performed at the start of the project and when any ongoing calibration does not meet control criteria. The number of points used in the initial calibration is defined in each analytical method. Continuing calibration verification will be performed as specified in the analytical methods to track instrument performance. In the event that continuing calibration verification does not meet control limits (as specified by the method requirements), analysis of project samples will be suspended until the source of the control failure is either eliminated or reduced to within control specifications. Any project samples analyzed while the instrument was out of calibration will be reanalyzed. Calibration documentation will be retained at the laboratory and readily available for review.

8.1.4 Laboratory Method Blanks

According to the EPA (2008, 2010), "the purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks, and equipment blanks)."

Method blanks are laboratory QC samples that consist of either a contaminant-free, soil-like material or deionized water. Method blanks are created in the laboratory during sample preparation and follow samples throughout the analysis process. The frequency of method blanks will be at least one per analytical batch for each matrix. No more than 20 non-QC field samples can be contained in one batch.

If a substance is found in the method blank then one (or more) of the following events occurred.

- The measurement apparatus or containers were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance (s) of interest.
- Contaminated analytical equipment was not properly cleaned.
- Volatile substances in the air contaminated the samples during preparation or analysis.

Give method blank results, validation guidelines aid in determining which substances in samples are considered "real" and which ones are inadvertent contaminants of the analytical process.

During data validation, the Data Validator will evaluate all method and field blank sample results and take action as described in EPA reference documents (EPA, 2008, 2010); professional judgment will be applied as necessary.

8.1.5 Surrogate Spikes

Surrogate spike compounds are used during analysis for organic analytes to verify the accuracy of the instrument being used and assess extraction efficiency. Surrogates are substances similar to, but not one of, the target analytes. A known concentration of surrogate compound is added to the sample and passed through the instrument, and the surrogate compound recovery is recorded. Each surrogate compound used has an established range of acceptable percent recoveries, as summarized in Table B-2. If a surrogate recovery is low, sample results may be biased low, and, depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified range of acceptance a possibility of false positives exists, although nondetected results are considered accurate.

8.1.6 Matrix Spike/Matrix Spike Duplicates

Laboratory precision will be determined by splitting spiked or unspiked samples. MS/MSD sample analyses are used to determine accuracy and precision and to assess interferences caused by the physical or chemical properties of the sample itself. The analyst uses this information to determine the precision of the preparation and analytical techniques used to analyze the duplicate sample.

MS samples are preselected by field personnel and labeled accordingly on the chain of custody (see Section 8.2.6). The laboratory divides the sample into equal aliquots, and then spikes each of the aliquots with a known concentration of target analytes. Matrix spike samples are prepared by spiking a known amount of one or more of the target analytes at a concentration of 5 to 10 times higher than the expected sample result. Matrix spikes will be prepared and analyzed at a minimum frequency of 5 percent or one for each batch of 20 or fewer samples for each matrix. Same analyses (such as total petroleum hydrocarbons) do not require MS/MSDs, as shown on Table B-5 **Quality Control Sample Types and Frequency**. In addition, some analyses only require an MS sample and not an MSD.

MS/MSD data are reviewed in combination with other data quality indicators (e.g., LCS/LCS duplicate [LCSD]) to determine matrix effects. In some cases, matrix effects cannot be determined due to dilution and/or high levels of related substances in the sample.

8.1.7 Laboratory Control Spikes/Laboratory Control Spike Duplicates

The purpose of the laboratory control spike samples (also known as blank spikes) is to aid in assessment of overall accuracy and precision of the entire analytical process (e.g., sample preparation, instrument performance, and analyst performance). An LCS will be prepared and analyzed at a minimum of one LCS with each batch of 20 samples or fewer for each matrix. LCS are similar to matrix spikes; however, the LCS spike medium is "clean" or contaminant free.

8.1.8 Laboratory Replicates/Duplicates

Precision for inorganic analytes is monitored by analysis of [nonspiked] sample replicates/duplicates. Laboratory duplicate sample analysis, for inorganic analytes, will be prepared and analyzed at a minimum frequency of 3 percent or one laboratory duplicate with each batch of 20 samples or fewer for each matrix.

8.1.9 Internal Standards

Internal standards are added to all field and QC samples immediately prior to analysis for analyses completed by GC/MS. The internal standards are used to quantify target compounds and to ensure that the instrument is stable and functioning as calibrated.

No special QC procedures will be required for this project. Ranges of laboratory-established control limits for surrogates, MS/MSD recoveries, LCS recoveries, and laboratory duplicate RFDs, as applicable, are provided in Table B-2. The most current laboratory control limits will be used to evaluate results during data review and may be obtained directly from the Laboratory Project Manager.

8.2 Field Quality Control

Field QC samples are collected and analyzed to assess sample collection techniques, possible sources of contamination, interferences that may be attributed to the sample matrix, and, to some degree, the bias and precision of the reported results. Field QC will be evaluated, along with laboratory QC, by the Data Validator during data review and validation. Affected data will be qualified in accordance with EPA (2008, 2010) guidelines. A description of each type of QC sample is described below. For the purpose of this discussion, the term "primary sample" is defined to be a field sample of environmental medium (e.g., soil) other than a field QC sample.

8.2.1 Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards in accordance with manufacturer's recommended schedules and procedures for each instrument. Calibration (or drift) checks of the vapor measurement equipment will be conducted daily, and the instruments will be recalibrated as required. Calibration measurements will be recorded in the daily field logs. If field equipment becomes inoperable, it will be replaced with a properly calibrated instrument.

8.2.2 Equipment (Rinsate) Blanks

Equipment Rinsate blanks will be collected whenever nondedicated or nondisposable sampling equipment will be used. Equipment Rinsate blanks will be used to identify possible contamination from the sampling environment or from sampling equipment. These blanks will be collected by pouring deionized and distilled water over (or through) the decontaminated sampling equipment and into a sample jar. One equipment Rinsate blank will be collected for each type of sampling equipment used during the sampling event and will be analyzed for all analytes except convention analytes. The frequency of collection will be 1 per 20 samples collected. These are typically not required during routine sampling since PRS uses dedicated or disposable equipment for sampling all wells, but would be required if that were ever not the case.

8.2.3 Field Blanks

Sampling personnel will collect field blanks and submit the blanks to the laboratory as natural samples. Field blanks will be used to identify possible contamination occurring from the sampling environment. These blanks will consist of deionized and distilled water from the analytical laboratory in clean and preserved sampling containers. In the field, this water will be transferred to an empty sampling container at a specified sampling location. The sample will be preserved for the applicable analysis to be completed. The frequency of collection will be 1 per 20 samples collected. Field blanks will be analyzed for all analytes.

8.2.4 Trip Blanks

Trip blank samples, consisting of organic-free water poured into 40-milliliter (ml) sample vials at the laboratory under contaminant-free conditions, will be provided by the laboratory for each sampling event that includes analysis of volatile organic compounds (VOCs). Trip blanks remain sealed during sampling and are kept in the sample transport container at all times. Trip blank samples are analyzed for VOCs and gasoline-range organics and will provide a measure of potential cross-contamination with VOCs during shipment and handling.

Trip blanks will be included at a rate of one per cooler for analyses of all volatile constituents (e.g., VOCs, and gasoline-range organics). Results of trip blank samples are used to assess potential contamination that may impact groundwater samples during transport.

8.2.5 Field Duplicates

Field duplicates are used to assess the homogeneity of samples collected in the field and the precision of sampling methods. Field duplicates are prepared by collecting two aliquots (i.e., splits) of sample from the same sampling location using the same sampling equipment and technique, then submitting them for analysis as separate samples. Results from the analysis of field duplicates are used to evaluate the precision and consistency of laboratory analytical procedures and methods, and the consistency of the sampling techniques used by field personnel. Groundwater field duplicates will be collected at a rate of 1 per 20 samples per sampling event. Field duplicates will be collected at locations with suspected contamination. Any well and COC detections the previous sampling round would be eligible to be a field duplicate location the following round and no location will be sampled as a field duplicate location two rounds in a row. The field duplicate RPD should be less than 30 percent for groundwater samples.

8.2.6 Matrix Spike/Matrix Spike Duplicate

Extra sample volume must be collected by field staff to enable the lab to run MS/MSD analyses for the designated analyses listed in Table B-5. MS/MSD sample volume should be submitted at a rate of 1 per 20 samples collected, or one per field mobilization (lab batch) at a minimum. All MS/MSD samples should be noted on the chain of custody form. MS samples should be collected at relatively "clean" locations and are analyzed to assess the effects of the sample matrix on the accuracy of analytical measurements. Any well without COC detections the previous sampling round would be eligible to be a field duplicate location the following round and no location will be sampled as an MS/MSD location two rounds in a row. MSD samples are used to assess both accuracy and precision.

8.3 Corrective Action

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or QC performance outside established criteria. Corrective action can occur during field activities, laboratory analyses, data validation, or data assessment.

Corrective actions should be designed to correct the problem and to minimize the possibility of recurrence. Examples of corrective actions include modifying nonconforming procedures, forms, or worksheets; instituting a quality check; and the like. Proposed corrective actions should be reviewed and approved by the QA Leader prior to implementation. Significant noncompliance and corrective actions will be discussed in QA reports to the Project Manager and Washington State Department of Ecology (Ecology), as appropriate.

8.3.1 Field Corrective Action

Project personnel will be responsible for reporting technical or QA nonconformances or deficiencies of any activity or issued document to the Field Team Leader. The Field Team Leader will consult with the QA Leader to determine whether the situation warrants a reportable nonconformance and subsequent corrective action. If so, a Corrective Action Report (CAR) will be initiated by the QA Leader.

Corrective actions will be implemented and documented in the field record log. No staff member will initiate corrective action without prior communication of findings using the process described above.

8.3.2 Laboratory Corrective Action

Corrective action by the laboratory may occur prior to or during initial analyses. Conditions such as broken sample containers, multiple phases, low/high pH readings, and potentially high-concentration samples may be identified during sample log-in or prior to analysis.

Laboratory corrective action procedures are often handled at the bench level by the analyst, who reviews the preparation or extraction procedure for possible errors, and who checks potential sources of error, such as instrument calibration, spike and calibration mixes, and instrument sensitivity. If the problem persists, or cannot be identified, the problem should be referred to the supervisor, manager, and/or Laboratory Project Manager for further investigation and possible formal corrective action.

The contracted laboratory's QA manual (Exhibit B-1) includes specific procedures for identification and documentation of nonconformance and implementation and reporting of corrective action.

8.3.3 Corrective Actions Resulting From Data Validation

If necessary, the Data Validator will contact the laboratory for further information, clarification, or needed resubmissions and/or corrective actions. All communications will be documented and included with the data validation report as an appendix.

In cases where a deficiency or problem is recurring nonconformance requiring more extensive corrective action, it should be documented on a formal CAR. The CAR will be sent to the organization responsible for the corrective action, and a copy routed to the QA Leader. When the corrective action is complete, the Data Validator will complete the CAR.

9.0 DATA MANAGEMENT PROCEDURES

Computerized systems will be used to record, store, and sort the technical data that will support the site investigation. The data record will include a unique sample code, station ID, sample type (matrix), analyte, analyte concentration, and concentration units. Automated data handling increases the data integrity by reducing errors, omissions, and ambiguities that can be introduced by manual procedures. In addition, automated procedures will generally be used by the laboratories to capture and summarize analytical results. In this case, electronic data files can be imported directly from the laboratory to PRS's database, minimizing both data entry effort and opportunities for error. Sampling location coordinates will be entered into the database to enable the generation of maps and figures using GISKey© and AutoCad© software.

Field logbooks, station/sample forms, and chain of custody/sample analysis request forms are prepared by the field team while sample collection activities are in progress. Sample information from the field, such as water elevation data, is entered manually. Data from the laboratories are entered directly from the electronic data deliverables (EDDS). A small portion of the laboratory data may be entered manually if electronic data cannot be supplied. Data qualifiers are entered into the database when data validation is completed and verified, and the data set is approved as final. All manual and electronic entries are verified by the data manager or validation personnel.

Project tables and reports are prepared using customized retrievals that filter and sort the data according to criteria specified by the user. The data are automatically formatted for direct use with statistics software packages and various geographic information systems (GIS) software.

9.1 Laboratory Data Reports

The project laboratory will complete all analyses as described in the GWMP and present the following, at a minimum, in a report to the QA Leader within approximately 30 days of the receipt of samples, unless a shorter turnaround time is requested.

- Case narrative: the case narrative will describe the analytical methods used and discuss any irregularities encountered during sample analyses and any resulting data qualification.

- Analyte concentrations: A summary of analytical results will be presented for each sample.

- Method reporting limits: Method reporting limits achieved by the laboratory will be presented with analyte concentrations.

- Laboratory data qualifier codes and a summary of code definition: Data qualifiers will appear next to analyte concentrations, and associated definitions will be summarized in the report.

- Lab QC results: Results for method blanks, MS/MSD, LSC/LSCD, lab duplicates, and surrogate recoveries will be provided with final results.

- EDD version of results: A full set of results will be provided in database format.

9.2 Project Database

Data validation will be performed on specified analytical data for this project (see Sections 10 and 11), and the data validator will enter validation qualifiers and comments into the data set as necessary. The QA Leader will then transmit the validated EDD along with the validation report to the database uploader, who will upload it into the project database. Tables from the database will then be backchecked against hard copy results. Any corrections will be made to the database based on backcheck findings. The data will then be considered final, and EDDs or tables will be created from the database as necessary for use in data analysis and reporting.

9.3 Records Management

The QA Leader will inventory and store all analytical data, including all resubmissions collected during data validation efforts, worksheets, and original data validation reports.

10.0 AUDITS AND REPORTS

10.1 Technical Systems Audits

Technical systems audits will not be performed. Any deviations from the GWMP that occur during the reporting period will be included in the annual reports provided to Ecology.

10.2 Reports

Procedures, observations, and test results will be documented for all sample collection, laboratory analysis and reporting, and data validation activities. In addition to data reports provided by the laboratories, reports will be prepared that address data quality and usability and that provide tabulated laboratory and field data. Internal and external reporting procedures for this project are described in this section.

Upon receipt of the chemical data from the laboratories, the data will be subjected to a QA review (e.g., data validation). The QA reviews are anticipated to be completed within 30 days of receipt of the last data package from the laboratory. The results of the validated data will then be reported according to the schedule in the GWMP. Details regarding the validation of data are presented in Section 11.0 of this QAPP. In the event of unscheduled delays in the project schedule, the PRS Senior Project Manager will inform the Ecology Project Manager.

10.2.1 Field Records

Field records will be maintained during all stages of sample collection and preparation for shipment to the laboratories. Field records will include the following items:

- Field logbook to record daily sampling activities, conditions, and field measurements.
- Combined station/sample log to document station locations and date and time of collection;
- Sample labels and tags;
- Combined chain of custody/sample analysis request (COC/SAR) forms;
- Custody seals to monitor cooler security during shipment; and
- Photographic documentation (if taken).

Descriptions of the information that will be reported on each field record form are provided in SOP-400, contained in Appendix D of the GWMP. In addition to the routine field records, the following reports will be completed if a deviation from the GWMP or QAPP is encountered:

- Corrective action reports documenting any problems encountered during field activities and corrective actions taken,
- A summary of any changes made to documented procedures and the rational for the changes.

10.2.2 Laboratory Data Reports

The laboratories will perform data reduction as described in each test method for this project and submit complete data packages, as appropriate, with full documentation for all analyses or other determinations. The laboratory QA managers or their designees are responsible for reviewing their respective laboratory data packages, verifying

- Identification of cases where control limits or measurement performance criteria were not met and summary of the significance of these deviations; and

- Description of analyte identification and quantification.

All data and any qualifiers applied to the data as a result of the QA review will be reported in the final data report.

10.2.4 Location of Records and Reports

The records generated during sample collection and analysis document the validity and authenticity of the project data. During the pendency of the agreed order for corrective action and for ten years from the date of completion of work, PRS will be required to preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of the order. PRS will be required to insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, PRS shall make all records available to Ecology and allow access for review within a reasonable time.

all method-specific QA/QC protocols were completed and are acceptable, and checking data reduction so that a QA review has been completed and are acceptable, and checking data reduction so that a QA review has been completed for all data reported prior to submittal to PRS. Any transcription or computation errors identified during this review will be corrected by the laboratory.

The analytical laboratories will provide all information required to complete an abbreviated QA review (i.e., summary review) on 100 percent of the data.

To complete an abbreviated QA review, the information to be reported (as applicable to the analytical method) will include, at a minimum, the following:

- A cover letter discussing analytical procedures and any difficulties that were encountered;
- A summary of analyte concentrations and method reporting limits;
- Laboratory data qualifier codes appended to analyte concentrations, as appropriate, and a summary of code definitions;
- Results for method and calibration blanks;
- Results for all QA/QC checks, including SMCs, surrogate compounds, MS samples, LCSs, MSD samples, and laboratory duplicate or triplicate samples.

10.2.3 Data Review Report

A data review report will be prepared upon completion of the data review. The data review reports will summarize the results of the data validation and data quality review and will describe any significant QA problems that were encountered. The data review reports for the chemical analyses may include all or a portion (depending on the type of data validation that maybe completed) of the following items:

- Executive summary of overall data quality and recommendations for data use and limitations;
- Description of sample collection and shipping, including chain of custody and holding time documentation;
- Description of analytical methods and detection limits;
- Description of data reporting;
- Description of completeness relative to QAPP objectives;
- Description of instrument tuning and initial and continuing calibration results;
- Description of any contamination in field and laboratory blanks and implications for bias of the data;
- Description of accuracy relative to QAPP objectives, including results of SMC, surrogate, MS, and LCS recoveries;
- Description of precision relative to QAPP objectives, including results for field and laboratory replicate analyses;

11.0 DATA REVIEW, VERIFICATION, AND VALIDATION

Data review, verification, and validation are conducted to establish the data quality and usability for the project. These procedures are described below.

Data verification is the process of determining whether data have been collected or generated according to the GWMP, QAPP, and the respective SOPs or method descriptions.

Data validation is the process of evaluating the technical usability of the verified data with respect to the planned objectives of the project.

11.1 Sample Design and Sample Collection Procedures

The conformance of the field activities to requirements in the GWMP will be evaluated by the Field Team Leader and/or QA Leader on an ongoing basis while field activities are in progress. The review process will include immediate evaluation of any change to the sampling plan so that an alternate field procedure may be established.

Additional verification procedures may be completed for information generated in the field. A final verification review of field activities will be made when the field effort is complete. The verification results will be included in the data quality and usability report. Specifically, field forms will be reviewed for:

- Correct documentation of sample location;
- Complete and accurate procedures for sample collection or measurement and proper documentation;
- Proper chain of custody methodology, including sample shipment and preservation during transport; and
- Evaluation of field QC results; field QC sample contamination could result in data qualification.

The analytical laboratories will complete a data review and verification prior to producing results. This verification will include checking that QC procedures were included at the required frequencies and that the QC results meet the control limits specified by the laboratory at the time of analysis. Any QA issues identified by the laboratory will be described in the case narrative and may result in qualification of some of the results by the laboratory.

11.2 Verification and Validation of Chemical Data

Verification of chemical data will be completed at the laboratories and by the QA Leader. The laboratory will be responsible for the review and verification of all bench sheets; manual entry or transcriptions of data; review of any professional judgments made by a chemist during sample preparation, analysis, and calculation; and reporting of the final concentrations. The laboratory will also be responsible for the review of QC results to determine whether data are of usable quality or reanalyses are required. Any nonconformance issues identified during the laboratory's QA checks will be corrected and noted by the laboratory. Any data quality deviations will be discussed in the laboratory case narrative, including the direction and magnitude of any bias to the data, if possible.

Data validation and verification will be completed by the QA Leader prior to finalizing the data and release of the data set for interpretation. All data will be verified and validated in accordance with U.S. EPA National Functional guidelines (EPA, 2008, 2010), method-specific QC requirements, and laboratory-established control limits. Data will be qualified when QC procedures are not completed as required, when measurement performance criteria established in the applicable method are not met, or when specific data quality objectives established for this project are not achieved.

External data verification and validation will include an abbreviated QA review (summary data review) on 100 percent of the data. The laboratory information that will be reviewed, as applicable to the analyses completed, for each of these validation efforts is described below.

11.2.1 Abbreviated QA Review

Completion of an abbreviated QA review (i.e., a summary review data validation effort) assumes that all field results reported by the laboratory are correct. For this level of effort, summaries of applicable calibration and QC measurements are reviewed. Calculations and transcriptions are not verified or confirmed, and original instrument printouts are not reviewed. The following laboratory information will be reviewed, as applicable to each analysis:

- Chain of custody documentation to verify completeness of the data set;
- Case narratives discussing analytical problems (if any) and procedures;
- Sample preparation logs or laboratory summary result forms to verify analytical holding time constraints were met
- Instrument tuning, initial calibration, and continuing calibration results to assess instrument performance;
- Method blank, trip blank, equipment rinsate blank, and other field blank results;
- Surrogate or system monitoring compound recoveries to assess preparation and analyses;
- MS and LCS recoveries; and
- Laboratory duplicate, field duplicate, and MSD results.

12.0 DATA ASSESSMENT

The goal of data verification and validation is to determine the quality of each data point and to identify data pints that do not meet measurement performance criteria and other project DQOs. Nonconforming data may be qualified as estimated (J) or rejected (R) as usable during data validation if criteria for data quality are not met. Rejected data ® will be flagged as unreportable in the project database and will be excluded from all data retrievals. These data will not be used for any purpose. An explanation of the rejected data will be included in a data validation report. If the rejected data are needed to make a decision, then it may be necessary to resample. Any decision to resample would be based on discussions among the project management team.

Data qualified as estimated (J) will be appropriately qualified in the final project database. Although estimated data are less precise or less accurate than unqualified data, estimated results may still be used to evaluate and interpret site conditions provided that consideration of these data does not compromise the project objectives. The data review report will include all available pertinent information regarding the direction or magnitude of bias or the degree of imprecision for qualified data to facilitate the assessment of data usability.

The effect of estimated sample results in interpretation of site conditions depends on several factors.

- The nature and magnitude of the data quality problem: for example, a small positive bias in sample(s) concentration near a screening level may result in a conservative conclusion but a large negative bias may render the screening-level comparison meaningless.

- The nature and location of the affected samples(s): for example, a data deficiency in a result for a reference area may have a much greater impact on data interpretation than a similar deficiency in one of many results for a study site.

- The context of the sample results within the data set: for example, a questionable result for an analyte that is detected at high concentrations and important for site interpretation is likely to have a much greater impact on data interpretation than a questionable result for an analyte that is present at only low concentrations.

- The assessment of any data deficiencies on interpretive activities will be completed on a case-by-case basis. The data users are responsible for assessing the effect of the inaccuracy or imprecision of the qualified data on comparisons to screening criteria, statistical procedures, risk assessments, and other data uses. The effect of any data deficiencies on risk assessment and other interpretive activities and conclusions will be described in the final report.

13.0 REFERENCES

EPA (U.S. Environmental Protection Agency), 2007, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition, February.

EPA, 2008, USEPA Contract Laboratory Program, National Functional Guidelines for Superfund Organic Methods Review, EPA-540-R-0801, June

EPA, 2010, USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Superfund Data Review, EPA-540-R-10-011, January

TABLES

TABLE B-1

PROJECT PERSONNEL AND RESPONSIBILITIES
PRS Facility
Tacoma, Washington

Personnel	Responsibilities	Contact Information
Chuck Hoffman Washington State Department of Ecology Project Manager	Oversee all program activities to ensure compliance; perform technical oversight and consultation on major quality assurance problems; provide final approval of all necessary actions and adjustments for activities to accomplish project objectives. Provide final approval of the GWMP and QAPP.	Washington State Department of Ecology SWRO PO Box 47775 Olympia, WA 98504-7775 (360) 407-6344
Tom Smith PRS Group, Inc. Senior Project Manager	Overall responsibility for PRS Activities. Oversee all program activities to ensure compliance' provide technical oversight and consultation on major quality assurance problems; implement final approval of all necessary actions and adjustments for activities to accomplish project objectives.	3003 Taylor Way Tacoma, WA 98421 (253) 383-4175
Jay Johnson PRS Group, Inc. Sampling Team Leader	Coordinate with PRS Project Manager, Field Team members, and project laboratories for bottle and equipment shipments to the site and sample shipments to the laboratories; track submittal and receipt of samples to the laboratory, and initiate COC/SAR forms. Ensure field procedures are completed in accordance with GWMP and QAPP; authorize and document minor adjustments to the sampling plan in response to field conditions, as necessary, notify Project Manager.	3003 Taylor Way Tacoma, WA 98421 (253) 383-4175
Josh Simmons PRS Group, Inc. Database Administrator	Organize and maintain project database. Ensure that the data are stored in accordance with the GWMP and QAPP; supervise data management personnel.	3003 Taylor Way Tacoma, WA 98421 (253) 383-4175
Steve Hibbs Spectra Laboratories Laboratory Project Manager	Ensure that sample receipt and custody records are properly handled and data are reported within specified turnaround times; calibrate and maintain instruments as specified, perform internal quality control measures and analytical methods as required; tank appropriate corrective action as necessary; notify the QA/QC Leader when problems occur; report data and supporting quality assurance information as specified in the QAPP.	Spectra Laboratories 2221 Ross Way Tacoma, WA 98421 (253) 272-4850
TBD Field Team Leader Geo Engineers	Coordinate with the Sampling Team Leader, review QAPP and learn GWMP, take field notes, obtain field measurements, provide technical guidance, maintain all field equipment, conduct Health and Safety meetings, supervise field activities, verify shipment of sample bottles to and from locations; provide sampling report to PRS.	Geo Engineers 1101 Fawcett Avenue; Suite 200 Tacoma, WA 98402 253-722-2415
Jessie Bynum QA Leader Spectra Laboratories	Provide technical quality assurance assistance; review QAPP; oversee quality assurance activities to ensure compliance with QAPP; coordinate and supervise data validation and data quality report preparation; review and submit quality assurance reports.	Spectra Laboratories 2221 Ross Way Tacoma, WA 98421 (253) 272-4850
TBD Data Validator GeoEngineers		Geo Engineers 1101 Fawcett Avenue; Suite 200 Tacoma, WA 98402 253-722-2415

Abbreviations
COC = Chain of Custody   PRS = PRS Group, Inc.   QA/QC = quality assurance and quality control
GWMP = groundwater monitoring plan   QAPP = quality assurance project plan   SAR = sampling analysis request

TABLE B-2

MEASUREMENT QUALITY OBJECTIVES
PRS Facility
Tacoma, Washington

Analyte	Analytical Method[1]	LCS %Recovery Limits[2]	MS %Recovery Limits[2]	Sample Surrogate %Recovery Limits[2,3]	MS/MSD, or Laboratory Duplicate RPD Limits[4] (%)	Field Duplicate RPD Limits[4]
Total Metals	EPA 6020	80-120	75-125	NA	≤20	≤30
TPH – Diesel	NWTPH-Dx	45-159	45-140	50-150	≤20	≤30
TPH – Gasoline	NWTPH-Gx	77-122	71-128	50-150	≤30	≤30
PCBs	EPA 8082	53-118	53-118	54-170	≤30	≤30
VOCs	EPA 8260B	61-183	50-165	45-163	≤25	≤30

Notes

1. Method numbers refer to EPA SW-846 Analytical Methods or Washington State Department of Ecology (Ecology) recommended analytical methods.
2. Recovery limits are lowest and highest acceptable values based on 2009 Spectra Laboratories. For actual compound-specific ranges refer to current laboratory control limits.
3. Individual surrogate recoveries are compound specific.
4. RPD control limits are applicable only if the concentration is greater than 5 times the method reporting limit (MRL). For results less than S times the MRL, the difference between the sample and duplicate must be less than 2 times the MRL for soil and 1 times the MRL for water.

Abbreviations

EPA = U.S. Environmental Protection Agency
LCS = laboratory control sample
LCSD = laboratory control sample duplicate
MS/MSD = matrix spike/matrix spike duplicate
NA = not applicable
RPD = relative percent difference
VOCs = volatile organic compounds

TABLE B-3
GROUNDWATER PRACTICAL QUANTITATION LIIMITS
PRS Group, Inc. Facility
Tacoma, Washington

Constituent	CAS #	Analytical Method[1]	Lab MDL[2] (ug/l)	Lab MRL (Reporting Limit)[3] (ug/l)
Arsenic	7440-38-2	6020	0.09	0.50
Chromium	7440-47-3	6020	0.04	0.50
Lead	7439-92-1	6020	0.09	0.50
Diesel Range Hydrocarbons	n/a	NWTPH-Dx	32	100
Gasoline Range Hydrocarbons	n/a	NWTHP-Gx	33	50
1,1,1,2-Tetrachloroethane	630-20-6	8260	0.12	1.0
1,1,1-Trichloroethane	71-55-6	8260	0.54	1.0
1,1,2-Trichloroethane	79-00-5	8260	0.48	1.0
1,1-Dichloro-ethane	75-34-3	8260	0.44	1.0
1,2,3-Trichloropropane	96-18-4	8260	0.49	1.0
1,2-Dichloropropane	78-87-5	8260	0.57	1.0
2-Butanone	78-93-3	8260	3.96	10
2-chloroethylvinylether	110-75-8	8260	1.19	10
2-Hexanone	591-78-6	8260	1.7	10
4-Methyl-2-pentanone	108-10-1	8260	1.9	10
Acetone	67-64-1	8260	2.24	10
Acetonitrile	75-05-8	8260	4.1	10
Acrolein	107-02-8	8260	7.7	10
Acrylonitrile	107-13-1	8260	2.2	10
Benzene	71-43-2	8260	0.40	1.0
Bromodichloromethane	75-27-4	8260	0.45	1.0
Bromoform	75-25-2	8260	0.46	1.0
Bromomethane	74-83-9	8260	0.89	1.0
Carbon disulfide	75-15-0	8260	3.2	10
Chlorobenzene	108-90-7	8260	0.26	1.0
Chloroethane	75-00-3	8260	1.17	2.0
Chloroform	67-66-3	8260	0.38	1.0
Chloromethane	74-87-3	8260	1.47	2.0
cis-1,2-Dichloroethylene	156-59-2	8260	0.57	1.0
cis-1,3-Dichloropropene	10061-01-5	8260	0.24	1.0
Dibromochloromethane	124-48-1	8260	0.56	1.0
Dichloro-difluoro-methane	75-71-8	8260	1.0	1.0
Ethylbenzene	100-41-4	8260	0.28	1.0
m,p-Xylenes	108-38-3; 106-42-3	8260	0.76	2.0
Methylene chloride	75-09-2	8260	2.4	5.0
o-Xylene	95-47-6	8260	1.1	2.0
Tetrachloro-ethene	127-18-4	8260	0.39	1.0
Toluene	108-88-3	8260	0.39	1.0
trans-1,2-Dichloroethene	156-60-5	8260	0.41	1.0
trans-1,3-Dichloropropene	10061-02-6	8260	0.18	1.0
Trichloro-ethene	n/a	8260	0.54	1.0
Trichlorofluoromethane	75-69-4	8260	0.53	1.0
Vinyl acetate	108-05-4	8260	1.44	10
Carbon tetrachloride	56-23-5	8260	0.41	1.0
Vinyl chloride	75-01-4	8260	1.12	0.2

Notes

1. Methods are U.S. Environmental Protection Agency (EPA, 2007a) methods unless indicated otherwise; SIM Methods are standard methods of American Public Health Association (EPA, 2007); NWTPH Methods are methods approved by the Washington State Department of Ecology.
2. MDL = Method detection limit in micrograms per liter (ug/L) as reported by Spectra Laboratories, Tacoma, Washington (Project Laboratory).
3. MRL = Method reporting limit in micrograms per liter (ug/L) as reported by Spectra Laboratories, Tacoma, Washington (Project Laboratory).

Abbreviations
ug/L = micrograms per liter
SIM = selective ion monitoring

Table B-4
SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES
PRS Group, Inc. Facility
Tacoma, Washington

Analyte	Analytical Method[1]	Sample Container	Preservation / Temperature	Holding Time[2]
Total Metals	EPA 6020	500 mL HDPE	HNO3 to pH< 2	6 months
TPH-Diesel	Ecology NWTPH-Dx	2 x 500 mL Amber Glass	≤6°C	7 days
TPH – Gasoline	Ecology NWTPH-Gx	2 x 40mL VOA	HCL to pH<2, ≤6°C	14 days
VOCs	EPA 8260B	3 x 40 mL vial	HCL to pH<2, ≤6°C	14 days
PCBs	EPA 8082	1 liter Amber Glass	≤6°C	7 days

Notes
1. Method numbers refer to SW-846 EPA Analytical Methods (EPA, 1986), or Washington State Department of ecology analytical methods, or Standard Methods (SM) for the Examination of Water and Wastewater.
2. Holding times are based on the elapsed time from date and time of collection.

Abbreviations
°C = degree Celsius
EPA = U.S. Environmental Protection Agency
HCl = hydrochloric acid
HDPE = high density polypropylene
HNO_3 = nitric acid
L = liter
mL = milliliter
SIM = selective ion monitoring
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis
VOCs = volatile organic compounds

Table B-5

QUALITY CONTROL SAMPLE TYPES AND FREQUENCY

PRS Group, Inc. Facility
Tacoma, Washington

Parameter	Field QC1			Laboratory QC2			
	Field Duplicates	Field Blank	Trip Blanks	Method Blanks	LCS	MS/MSD	Lab Duplicates
Total Metals	1/20 samples per sampling event	1/20 samples per sampling event	NR	1/batch	1/batch	1 set/batch	NR
TPH- Diesel	1/20 samples per sampling event	1/20 samples per sampling event	NR	1/batch	1/batch	NR	1/batch
TPH- Gasoline	1/20 samples per sampling event	1/20 samples per sampling event	1/cooler	1/batch	1/batch	NR	1/batch
VOC's	1/20 samples per sampling event	1/20 samples per sampling event	1/cooler	1/batch	1/batch	1 set/batch	NR
PCBs	1/20 samples per sampling event	1/20 samples per sampling event	NR	1/batch	1/batch	1 set/batch	NR

Notes

1. A sampling event is defined as consecutive days of sampling not separated by more than two days of inactivity.
2. A batch is defined as a group of samples taken through a preparation procedure and sharing a method blank, LCS.
3. Field duplicates will be collected only for events with more than five samples.

Abbreviations

LCS = laboratory control sample
MS = matrix spike sample
MSD = matrix spike duplicate sample
NR = not required
QC = quality control
VOCs = volatile organic compounds

EXHIBIT B-1

Spectra Laboratories Quality Assurance Manual

APPENDIX C

PRS Standard Operating Procedures

Measuring Water Elevations and Total Depths
PRS SOP – 120

1.0 Purpose

The purpose of this Standard Operating Procedure (SOP) is to provide personnel with an outline of the specific information needed to measure water elevations and total well depths. This SOP provides a step-by-step guideline to be followed by personnel to assure consistent and representative water elevation and well depth measurements.

2.0 Application

This SOP provides a step-by-step guideline to be followed by the field sampling crew for measuring water elevations and total well depths.

3.0 References

Not applicable.

4.0 Associated SOPs

SOP – 121 – Monitoring Well Development
SOP – 124 – Low-Flow Groundwater Sampling Procedure
SOP – 200 – Equipment Decontamination Procedure
SOP – 302 – Photoionization Detector Calibration & Operation Procedure
SOP – 400 – Documentation Procedures

5.0 Equipment

The following equipment is necessary to measure water elevations and total well depths:

- A well key, hand drill, socket set, Allen wrench, pad lock key, or other well access equipment specific to the well monument cover plate.
- An electric water level meter calibrated to 0.01 foot with sufficient tape length to reach the bottom of the well, and narrow enough to fit in the well.
- Plastic or aluminum foil if required for providing a protective barrier.
- Required documentation materials including field books and field forms.
- Personal protective equipment (PPE) as described in the Site Health and Safety Plan.
- Decontamination equipment as described in SOP – 200 – Equipment Decontamination Procedure.
- A photoionization detector (PID) or similar instrument to monitor well head space for volatile organic compounds.

6.0 Procedures

The following procedures shall be followed when measuring water elevations and total well depths:

- Complete the measurements for all wells within one work day.
- Don the appropriate PPE as described in the Site Health and Safety Plan.
- Remove any soil or vegetation from the well cap and monument.
- Open the wellhead enclosure and remove any standing water inside the well monument prior to opening the well cap.
- Open the well cap. Immediately after removing the well cap, monitor the head space in the well using the photoionization detector. Record readings in the field notebook.
- Remove any down-hole equipment and allow water level to equilibrate for approximately 10 minutes prior to measuring the water elevation in the well or total well depth. Slowly lower a pre-decontaminated water level meter probe into the well casing until it reaches the water table. When the probe reaches the water table, it will alarm. Record the depth to water. Lower the water level probe to the bottom of the well to measure the total depth of the well. Gently bounce the probe on the well bottom and pull the slack on the tape to record to total well depth.
- Duplicate each water level and total depth measurement in the field to ensure that the readings are accurate. Record all results.
- Close and secure the well.

7.0 Decontamination Procedures

The electronic water level indicator probe/steel tape will be washed with phosphate free detergent and a scrubber, then thoroughly rinsed with distilled water. Decontamination procedures will be performed prior to arrival on site, relocation on site, and site exit.

8.0 Documentation

Water level and well depth measurements shall be documented in a detailed field notebook as described in PRS SOP – 400. The following documentation shall be recorded at each well location, as appropriate:

- Well Identification.
- Depth to water.
- Depth to bottom of the well.
- Date the water elevation or total well depth was measured.
- Time the water elevation or total well depth was measured.
- Pressure or vacuum observed in the well casing.
- Comments regarding well integrity.
- Visual and olfactory observations of the water.

9.0 Measure of Proficiency

Field staff will demonstrate proficiency on this SOP by successfully competing Sections 6.0, 7.0, and 8.0 of this SOP a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Monitoring Well Development
PRS SOP – 121

1.0 PURPOSE

The purpose of this SOP is to provide field personnel with a set of guidelines to assure proper monitoring well development. According to EPA all monitoring wells should be developed to create and effective filter pack around the well screen, to rectify damage to the formation caused by drilling, to remove fine particulates from the formation near the borehole, and to assist in restoring the natural water quality of the aquifer in the vicinity of the well.

2.0 APPLICATION

This SOP provides a step-by-step guideline to be followed by the field sampling crew for performing or overseeing monitoring well development.

3.0 REFERENCES

RCRA Groundwater Monitoring Draft Technical Guidance (Nov. 1992) EPA/530-R-93-001

4.0 ASSOCIATED SOPS

SOP – 200 – Equipment Decontamination Procedure
SOP – 302 – Photoionization Detector Calibration & Operation Procedure
SOP – 400 – Documentation Procedures

S.0 EQUIPMENT

The following equipment is necessary to properly develop a groundwater monitoring well:

- A well key, hand drill, socket set, pad lock key, or other well access equipment.
- A calibrated photo-ionization detector (PID) to monitor and record the well headspace.
- An electric water meter and oil/water interface probe calibrated to a hundredth of a foot, and sufficiently long to reach the bottom of the well.
- Well purging equipment (e.g. bailer, silicone line, PVC pipe, plug, pump, tubing, power supply, and extension cord), as needed.
- A solid PVC surge block.
- A sufficient number of 55-gallon drums (including lids, gaskets, and fasteners) to contain all purge water, unless other water handling arrangements have been made.
- A calibrated water quality meter that measures temperature, pH, specific conductivity, dissolved oxygen, redox potential, and turbidity.
- All required documentation including sample labels, field books, sampling forms, and chains of custody.

- Personal protective equipment as described in the Site Health and Safety Plan.
- Decontamination equipment as specified in the Work Plan.

6.0 DECONTAMINATION

All equipment that will come in contact with the well water will be decontaminated prior to arrival on site, relocation on site, and site exit. PRS – SOP – 200 shall be followed.

7.0 WELL DEVELOPMENT PROCEDURES

Upon arrival at each well, the following procedures shall be followed:

- Suit up in appropriate personal protective equipment as described in the Site Health and Safety Plan.
- Pump any standing water away from the well opening.
- Remove any soil or vegetation from around the well opening.
- Lay plastic sheeting around well to place equipment on and keep cords, tubing and pumps from touching the ground.
- Open the well cap.
- Monitor the headspace within the well using the PID. This is done by placing the instrument probe at the opening of the well, and recording the reading in the field book and on the appropriate field forms.
- Measure and record the depth to water and total depth of the well using a decontaminated water level indicator.
- Compute the unit purge volume using the following formula and the input values on the attached Well Volumes Sheet.

  1 well volume (including annular space) = [x(total well depth – water level)] + [(y x 0.40)(total well depth – bottom of seal)] where "x" is the Casing/Riser Volume per Unit Length, Internal (gal/ft), "y" is the Annular Volume per Unit length (gal/ft), and 0.40 is a conservative estimate of the porosity of the sand pack.

7.1 New Well Development Procedure

- If a submersible pump is to be used for well development, gently lower the pump to the well bottom. If a non-submersible pump is used, lower the tubing to the bottom of the well.
- Begin to purge the well at a rate sufficient to remove fines, slowly run the pump up and down the well over the length of the screen, and initiate physical water quality testing at least every 20% water removed for temperature, pH, conductivity, dissolved oxygen, and turbidity.
- A minimum of three and maximum of five well volumes (including annular space) will be removed. If this is the first time the well has been developed and water was used in the drilling process, the volume of water introduced into the formation during well formation must also be removed during development. *Purging is completed once the following has occurred:*
  - the minimum purge volume has been removed and the water quality parameters have stabilized by the following screening requirements for three consecutive readings: turbidity <

5 NTU, specific conductivity within 10% of each other, and pH within 0.5 units; OR
  - the well runs dry; OR
  - five purge volumes and drilling process water volumes have been removed.

- Measure total depth of well after development.
- Containerize all purge water in 55-gallon drums, unless other handling arrangements have been made.
- Record additional information such as unique odors or water color, and a description of the suspended particle content in the field notes and on appropriate field forms.
- Upon completion of development, both the well and the purge drums are to be properly sealed and secured.
- All drums are to be permanently labeled as follows:
  - Well ID
  - Facility Name
  - Drum Contents
  - Date
  - Drum Number
- Close the well appropriately and record any well integrity concerns in the field book and on the sampling form.

7.2 Existing Well Development Procedure

- Remove pump from well.
- Attach one length of twine to the surge block or use a drill rig or tripod and lower it to the bottom of the well.
- Vigorously begin moving the surge block up and down in the well creating a surging action across the screened interval. This action will bring the finer grained materials into suspension.
- Remove the surge block.
- Begin to purge the well at a sufficient rate to remove fines and initiate physical water quality testing at a minimum of every 20% water removed for turbidity.
- Repeat surging and purging to reduce silt presence in water and keep checking total depth measurements.
- A minimum of three and maximum of five well volumes (including annual space) will be removed.

Purging is completed once the following hos occurred:

- the minimum purge volume has been removed and the water quality parameters have stabilized by the following screening requirements for three consecutive readings: turbidity < 5 NTU, specific conductivity within 10% of each other, and pH within 0.5 units; OR
- the well runs dry; OR
- five purge volumes and drilling process water volumes have been removed.

- Measure total depth of well after development.

- Containerize all purge water in 55-gallon drums, unless other handling arrangements have been made.

- Record additional information such as unique odors or water color, and a description of the suspended particle content in the field notes and on appropriate field forms.

- Upon completion of development, both the well and the purge drums are to be properly sealed and secured.

- All drums are to be permanently labeled as follows:
    - Well ID
    - Facility Name
    - Drum Contents
    - Date
    - Drum Number

- Close the well appropriately and record any well integrity concerns in the field book and on the sampling form.

8.0 DOCUMENTATION

Documentation of all decontamination procedures associated with monitoring well activities including all field forms and the maintenance of a detailed field notebook as described in PRS SOP – 400.

9.0 MEASURE OF PROFICIENCY

Field staff will demonstrate proficiency on this SOP by successfully competing sections 6.0, 7.0, and 8.0 a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Multi-Parameter Meter Calibration and Operation Procedure

PRS SOP – 123

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide field personnel with an outline of the procedure for operating a Multi-Parameter Meter (MPM) during groundwater sampling activities. The MPM is used for the measurement of a variety of water quality parameter combinations such as dissolved oxygen, conductivity, specific conductance, salinity, resistivity, total dissolved solids (TDS), pH, ORP, pH/ORP combination, ammonium (ammonia), nitrate, chloride and temperature. Typical uses include surface water monitoring and groundwater monitoring documentation.

2.0 APPLICATION

This SOP provides a step-by-step guideline to be followed by the field sampling crew for operating a Multi-Parameter Meter.

3.0 REFERENCES

YSI Incorporated. YSI Professional Plus User Manual. http://www.ysi.com/media/pdfs/605596-YSI-ProPlus-User-Manual-RevD.pdf

YSI Incorporated. YSI Professional Plus Calibration Tips. http://www.ysi.com/media/pdfs/YSI-Professional-Plus-Calibration-Tips.pdf

4.0 ASSOCIATED SOPS

SOP – 124 – Low-Flow Groundwater Sampling Procedure
SOP – 400 – Documentation Procedures

5.0 EQUIPMENT

The following equipment is necessary to use and operate a MPM:

- A MPM instrument, including the meter's handheld readout screen and cable, such as the YSI Professionla Plus or equivalent instrument.
- The calibration solution liquids recommended by the manufacturer.
- Batteries for the specific MPM.
- Appropriate tubing to connect the well pump to the MPM.
- Required documentation including sample labels, field books and sampling forms.
- Personal protective equipment as described in the Site Health and Safety Plan.

6.0 CALIBRATION PROCEDURES

The following procedures shall be followed when calibrating a MPM:

- Don the appropriate personal protective equipment (PPE) as described in the Site Health and Safety Plan.
- Turn on the MPM and allow it to warm up as recommended by the manufacturer.
- Calibrate the MPM according to the manufacturer's instructions.
- Record calibration information and procedures in accordance with SOP – 400 – Documentation Procedures.
- The MPM shall be calibrated daily or as recommended by the manufacturer.

7.0 OPERATION PROCEDURES

The following procedures shall be followed when operating a MPM:

- Complete calibration procedures identified in Section 6.
- Attach/install the sensor guard to protect the sensor and membrane following calibration procedures.
- Place the probe in the flow-through container to measure water quality paramters and give the probe a quick shake to release any air bubbles.
- Collect water quality parameters, complete required documentation and complete decontamination procedures as identified in SOP-124.

8.0 DOCUMENTATION

Documentation of all calibration, operation and maintenance procedures and field measurements associated with Multi-Parameter Meter operation shall be maintained in a detailed field notebook as described in PRS SOP – 400.

9.0 MEASURE OF PROFICIENCY

Field staff will demonstrate proficiency on this SOP by successfully competing Sections 6.0, 7.0, and 8.0 of this SOP a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Low-Flow Groundwater Sampling Procedure
PRS SOP – 124

INTRODUCTION

The collection of "representative" water samples from wells is neither straightforward nor easily accomplished. Ground-water sample collection can be a source of variability through differences in sample personnel and their individual sampling procedures, the equipment used, and ambient temporal variability in subsurface and environmental conditions. Many site inspections and remedial investigations require the sampling at ground-water monitoring wells within a defined criterion of data confidence or data quality, which necessitates that the personnel collecting the samples are trained and aware of proper sample collection procedures.

The purpose of this standard operating procedure (SOP) is to provide a method which minimizes the amount of impact the purging process has on the ground water chemistry during sample collection and to minimize the volume of water that is being purged and disposed. This will take place by placing the pump intake within the screen interval and by keeping the drawdown at a minimal level (0.33 feet) (Puls and Barcelona, 1996) until the water quality parameters have stabilized and sample collection is complete. The flow rate at which the pump will be operating will depend upon both hydraulic conductivity of the aquifer and the drawdown with the goal of minimizing the drawdown. The flow rate from the pump during purging and sampling will be at a rate that will not compromise the integrity of the analyte that is being sampled. This sampling procedure may or may not provide a discrete ground water sample at the location of the pump intake. The flow of ground-water to the pump intake will be dependent on the distribution of the hydraulic conductivity (K) of the aquifer within the screen interval. In order to minimize the drawdown in the monitoring well a low-flow rate must be utilized.

Low-flow refers to the velocity with which water enters the pump intake from the surrounding formation in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface, which can be affected by flow regulators or restrictions (Puls and Barcelona, 1996). This SOP was developed by the Superfund/RCRA Ground Water Forum and draws from an USEPA's Ground Water Issue Paper, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedure, by Robert W. Puls and Michael J. Barcelona. Also, available USEPA Regional SOPs regarding Low-Stress (Low Flow) Purging and Sampling were used for this SOP.

SCOPE AND APPLICATION

This SOP should be used primarily at monitoring wells which have a screen or an open interval with a length of ten feet or less and can accept a sampling device which minimizes the disturbance to the aquifer or the water column in the well casing. The screen or open interval should have been optimally located to intercept an existing contaminant plume(s) or along flowpaths of potential contaminant releases. Knowledge of the contaminant distribution within the screen interval is highly recommended and is essential for the success of this sampling procedure. The ground-water samples which are collected using this procedure are acceptable for the analyses of ground-water contaminants which may be found at Superfund and RCRA contamination sites. The analytes may be volatile, semi-volatile organic compounds, pesticides, PCBs, metals and other inorganic compounds. The screened interval should be located within the contaminant plume(s) and the pump intake should be placed at or near the known source of the contamination within the screened interval. It is critical to place the pump intake in the exact location or depth for each sampling event. This argues for the use of dedicated, permanently installed sampling devices whenever possible. If this is not possible then the placement of the pump intake should be positioned with a calibrated sampling pump hose sounded with a weighted-tape or using a pre-measured hose. The pump intake should not be placed near the bottom of the screened interval to avoid disturbing any sediment that may have settled at the bottom of the well.

Water-quality indicator parameters and water levels must be measured during purging, prior to sample collection. Stabilization of the water quality parameters as well as monitoring water levels are a prerequisite to sample collection. The water-quality indicator parameters which are recommended include the following: specific electrical conductance, dissolved oxygen, turbidity, oxidation-reduction potential, pH, and temperature. The latter two parameters are useful data, but are generally insensitive as purging parameters. Oxidation-reduction potential may not always be appropriate stabilization parameter, and will depend on site-specific conditions. However, readings should be recorded because of its value as a double check for oxidation conditions, and for fate and transport issues. Also, when samples are collected for metals, semi-volatile organic compounds, and pesticides every effort must be made to reduce turbidity to 10 NTUs or less (not just the stabilization of turbidity) prior to the collection of the water sample. In addition to the measurement of the above parameters, depth to water must be measured during purging (U.S. Environmental Protection Agency, 1995).

Proper well construction, development and maintenance are essential for any ground-water sampling procedure. Prior to conducting the field work, information on the construction of the well and well development should be obtained and that information factored into the site specific sampling procedure. The attached Sampling Checklist is an example of the type of information that is useful.

Stabilization of the water-quality indicator parameters is the criterion for sample collection. But if stabilization is not occurring and the procedure has been strictly followed, then sample collection can take place once three (minimum) to six (maximum) casing volumes have been removed (Schuller et al., 1981 and U.S. Environmental Protection Agency., 1986; Wilde et al., 1998; Gibs and Imbrigiotta., 1990). The specific information on what took place during purging must be recorded in the field notebook or in the ground-water sampling log.

This SOP is not to be used where non-aqueous phase liquids (immiscible fluids) are present in the monitoring well.

EQUIPMENT

- Depth-to-water measuring device - An electronic water-level indicator or steel tape and chalk, with marked intervals of 0.01 foot. Interface probe for determination of liquid products (NAPL) presence, if needed.
- Steel tape and weight - Used for measuring total depth of well. Lead weight should not be used.
- Sampling pump - Submersible or bladder pumps with adjustable rate controls are preferred. Pumps are to be constructed of inert materials, such as stainless steel and Teflon®. Pump types that are acceptable include gear and helical driven, centrifugal (low-flow type) and air-activated piston. Adjustable rate, peristaltic pump can be used when the depth to water is 20 feet or less.
- Tubing - Teflon® or Teflon® lined polyethylene tubing is preferred when sampling for organic compounds. Polyethylene tubing can be used when sampling inorganics.
- Power Source - If a combustion type (gasoline or diesel-driven) generator is used, it must be placed downwind of the sampling area.
- Flow measurement supplies - flow meter, graduated cylinder and a stop watch.
- Multi-Parameter meter with flow-through-cell - This can be one instrument or more contained in a flow- through cell. The water-quality indicator parameters which must be monitored are pH, ORP/EH, dissolved oxygen (DO), turbidity, specific conductance, and temperature. Turbidity readings must be collected before the flow cell because of the potential for sediment buildup which can bias the turbidity measurements. Calibration fluids for all instruments should be NIST-traceable and there should be enough for daily calibration through-out the sampling event. The inlet of the flow cell must be located near the bottom of the flow cell and the outlet near the top. The size of the flow cell should be kept to a minimum and a closed cell is preferred. The flow cell must not contain any air or gas bubbles when monitoring for the water-quality indicator parameters.
- Decontamination Supplies - Including a reliable and documented source of distilled water and any solvents (if used). Pressure sprayers, buckets or decontamination tubes for pumps, brushes and non-

phosphate soap will also be needed.

- Sample bottles, sample preservation supplies, sample tags or labels and chain of custody forms.
- Approved Field Sampling and Quality Assurance Project Plan.
- Well construction data, field and water quality data from the previous sampling event.
- Well keys and map of well locations.
- Field notebook, ground-water sampling logs and calculator. A suggested field data sheet (ground-water sampling record or ground-water sampling log) are provided in the attachment.
- Filtration equipment, if needed. An in-line disposable filter is recommended.
- Polyethylene sheeting which will be placed on ground around the well head.
- Personal protective equipment specified in the site Health and Safety Plan.
- Air monitoring equipment as specified in the Site Health and Safety Plan.
- Tool box - All needed tools for all site equipment used.
- A 55-gallon drum or container to contain the purged water.

Materials of construction of the sampling equipment (bladders, pumps, tubing, and other equipment that comes in contact with the sample) should be limited to stainless steel, Teflon®, glass and other inert material. This will reduce the chance of the sampling materials to alter the ground-water where concentrations of the site contaminants are expected to be near the detection limits. The sample tubing diameter thickness should be maximized and the tubing length should be minimized so that the loss of contaminants into and through the tubing walls may be reduced and the rate of stabilization of ground-water parameters is maximized. The tendency of organics to sorb into and out of material makes the appropriate selection of sample tubing material critical for trace analyses (Pohlmann and Alduino, 1992; Parker and Ranney, 1998).

PURGING AND SAMPLING PROCEDURES

The following describes the purging and sampling procedures for the Low-Stress (Low Flow)/ Minimal Drawdown method for the collection of ground-water samples. These procedures also describe steps for dedicated and non-dedicated systems.

Pre-Sampling Activities (Non-dedicated and dedicated system)

1. Sampling locations must begin at the monitoring well with the least contamination, generally up-gradient or furthest from the site or suspected source. Then proceed systematically to the monitoring wells with the most contaminated ground water.
2. Check and record the condition of the monitoring well for damage or evidence of tampering. Lay out polyethylene sheeting around the well to minimize the likelihood of contamination of sampling/purging equipment from the soil. Place monitoring, purging and sampling equipment on the sheeting.
3. Unlock well head. Record location, time, date and appropriate information in a field logbook or on the ground-water sampling log (See attached ground-water sampling record and ground-water sampling log as examples).
4. Remove inner casing cap.
5. Monitor the headspace of the monitoring well at the rim of the casing for volatile organic compounds (VOC) with a Photo- ionization detector (PID) or Flame ionization detector (FID), and record in the logbook. If the existing monitoring well has a history of positive readings of the headspace, then the sampling must be conducted in accordance with the Health and Safety Plan.

6. Measure the depth to water (water level must be measured to nearest 0.01 feet) relative to a reference measuring point on the well casing with an electronic water level indicator or steel tape and record in logbook or ground-water sampling log. If no reference point is found, measure relative to the top of the inner casing, then mark that reference point and note that location in the field logbook. Record information on depth to ground water in the field logbook or ground water sampling log. Measure the depth to water a second time to confirm initial measurement; measurement should agree within 0.01 feet or re- measure.
7. Check the available well information or field information for the total depth of the monitoring well. Use the information from the depth of water in step six and the total depth of the monitoring well to calculate the volume of the water in the monitoring well or the volume of one casing. Record information in field logbook or ground-water sampling log.

Purging and Sampling Activities

1. Non-dedicated system - Place the pump and support equipment at the wellhead and slowly lower the pump and tubing down into the monitoring well until the location of the pump intake is set at a pre-determined location within the screen interval. The placement of the pump intake should be positioned with a calibrated sampling pump hose, sounded with a weighted-tape, or using a pre-measured hose. Refer to the available monitoring well information to determine the depth and length of the screen interval. Measure the depth of the pump intake while lowering the pump into location. Record pump location in field logbook or groundwater sampling log.
2. Dedicated system - Pump has already been installed, refer to the available monitoring well information and record the depth of the pump intake in the field logbook or ground-water sampling log.
3. Non-dedicated system and dedicated system - Measure the water level (water level must be measured to nearest 0.01 feet) and record information on the ground-water sampling log, leave water level indicator probe in the monitoring well.
4. Non-dedicated and dedicated system - Connect the discharge line from the pump to a flow-through cell. A "T" connection is needed prior to the flow cell to allow for the collection of water for the turbidity measurements. The discharge line from the flow-through cell must be directed to a container to contain the purge water during the purging and sampling of the monitoring well.
5. Non-dedicated and dedicated system - Start pumping the well at a low flow rate (0.2 to 0.5 liter per minute) and slowly increase the speed. Check water level. Maintain a steady flow rate while maintaining a drawdown of less than 0.33 feet (Puls and Barcelona, 1996). If drawdown is greater than 0.33 feet lower the flow rate. 0.33 feet is a goal to help guide with the flow rate adjustment. It should be noted that this goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience (Puls and Barcelona, 1996).
6. Non-dedicated and dedicated system - Measure the discharge rate of the pump with a graduated cylinder and a stop watch. Also, measure the water level and record both flow rate and water level on the groundwater sampling log. Continue purging, monitor and record water level and pump rate every three to five minutes during purging. Pumping rates should be kept at minimal flow to ensure minimal drawdown in the monitoring well.
7. Non-dedicated and dedicated system - During the purging, a minimum of one tubing volume (including the volume of water in the pump and flow cell) must be purged prior to recording the water-quality indicator parameters. Then monitor and record the water-quality indicator parameters every three to five minutes. The water-quality indicator field parameters are turbidity, dissolved oxygen, specific electrical conductance, pH, redox potential and temperature. Oxidation-reduction potential may not always be an appropriate stabilization parameter, and will depend on site-specific conditions. However, readings should be recorded because of its value as a double check for oxidizing conditions. Also, for the final

dissolved oxygen measurement, if the readings are less than 1 milligram per liter, it should be collected and analyze with the spectrophotometric method (Wilde et al., 1998 Wilkin et al., 2001), colorimetric or Winkler titration (Wilkin et al., 2001). The stabilization criterion is based on three successive readings of the water quality field parameters; the following are the criteria which must be used:

Parameter	Stabilization Criteria	Reference
pH	± 0.1 pH units	Puls and Barcelona, 1996; Wilde et al.,
Turbidity	± 10 % NTUs (when turbidity is greater than 10 NTUs)	Puls and Barcelona, 1996 Wilde et al., 1998
Dissolved oxygen	± 0.3 milligrams per liter	Wilde et al., 1998

Once the criteria have been successfully met indicating that the water quality indicator parameters have stabilized, then sample collection can take place.

8. If a stabilized drawdown in the well can't be maintained at 0.33 feet and the water level is approaching the top of the screened interval, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. It should be noted whether or not the pump has a check valve. A check valve is required if the pump is shut off. Under no circumstances should the well be pumped dry. Begin pumping at a lower flow rate, if the water draws-down to the top of the screened interval again turn pump off and allow for recovery. If two tubing volumes (including the volume of water in the pump and flow cell) have been removed during purging then sampling can proceed next time the pump is turned on. This information should be noted in the field notebook or ground-water sampling log with a recommendation for a different purging and sampling procedure.

9. Non-dedicated and dedicated system - Maintain the same pumping rate or reduce slightly for sampling (0.2 to 0.5 liter per minute) in order to minimize disturbance of the water column. Samples should be collected directly from the discharge port of the pump tubing prior to passing through the flow-through cell. Disconnect the pump's tubing from the flow-through-cell so that the samples are collected from the pump's discharge tubing. For samples collected for dissolved gases or Volatile Organic Compounds (VOCs) analyses, the pump's tubing needs to be completely full of ground water to prevent the ground water from being aerated as the ground water flows through the tubing. The sequence of the samples is immaterial unless filtered (dissolved) samples are collected and they must be collected last (Puls and Barcelona, 1996). All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container. When filling the VOC samples a meniscus must be formed over the mouth of the vial to eliminate the formation of air bubbles and head space prior to capping. In the event that the ground water is turbid, (greater than 10 NTUs), a filtered metal (dissolved) sample also should be collected.

   If filtered metal sample is to be collected, then an in-line filter is fitted at the end of the discharge tubing and the sample is collected after the filter. The in-line filter must be pre-rinsed following manufacturer's recommendations and if there are no recommendations for rinsing, a minimum of 0.5 to 1 liter of ground water from the monitoring well must pass through the filter prior to sampling.

10. Non-dedicated system - Remove the pump from the monitoring well. Decontaminate the pump and dispose of the tubing if it is non-dedicated.

11. Dedicated system - Disconnect the tubing that extends from the plate at the wellhead (or cap) and discard

after use.

12. Non-dedicated system - Before locking the monitoring well, measure and record the well depth (to 0.1 feet).

    Measure the total depth a second time to confirm initial measurement; measurement should agree within0.01 feet or re- measure.

13. Non-dedicated and dedicated system - Close and lock the well.

DECONTAMINATION PROCEDURES

Decontamination procedures for the water level meter and the water quality field parameter sensors.

The electronic water level indicator probe/steel tape and the water-quality field parameter sensors will be decontaminated by the following procedures:

1. The water level meter will be hand washed with phosphate free detergent and a scrubber, then thoroughly rinsed with distilled water.
2. Water quality field parameter sensors and flow-through cell will be rinsed with distilled water between sampling locations. No other decontamination procedures are necessary or recommended for these probes since they are sensitive. After the sampling event, the flow cell and sensors must be cleaned and maintained per the manufacturer's requirements.

Decontamination Procedure for the Sampling Pump

Upon completion of the ground water sample collection the sampling pump must be properly decontaminated between monitoring wells. The pump and discharge line including support cable and electrical wires which were in contact with the ground water in the well casing must be decontaminated by the following procedure:

1. The outside of the pump, tubing, support cable and electrical wires must be pressured sprayed with soapy water, tap water and distilled water. Spray outside of tubing and pump until water is flowing off of tubing after each rinse. Use bristle brush to help remove visible dirt and contaminants.
2. Place the sampling pump in a bucket or in a short PVC casing (4-in. diameter) with one end capped. The pump placed in this device must be completely submerged in the water. A small amount of phosphate-free detergent must be added to the potable water (tap water).
3. Remove the pump from the bucket or 4-in. casing and scrub the outside of the pump housing and cable.
4. Place pump and discharge line back in the 4-in. casing or bucket, start pump and re-circulate this soapy water for 2 minutes (wash).
5. Re-direct discharge line to a 55-gallon drum, continue to add 5 gallons of potable water (tap water) or until soapy water is no longer visible.
6. Turn pump off and place pump into a second bucket or 4-in. Casing which contains tap water, continue to add 5-gallons of tap water (rinse).
7. Turn pump off and place pump into a third bucket or 4-in. casing which contains distilled/deionized water, continue to add three to five gallons of distilled/deionized water (final rinse).
8. If a hydrophobic contaminant is present (such as separate phase, high levels of PCB's, etc.) An additional decontamination step, or steps, may be added. For example, an organic solvent, such as reagent-grade isopropyl alcohol may be added as a first spraying/bucket prior to the soapy water rinse/bucket.

FIELD QUALITY CONTROL

Quality control (QC) samples must be collected to verify that sample collection and handling procedures were performed adequately and that they have not compromised the quality of the ground water samples.
The appropriate EPA program guidance must be consulted in preparing the field QC sample requirements for the

site- specific Quality Assurance Project Plan (QAPP).

There are five primary areas of concern for quality assurance (QA) in the collection of representative ground-water samples:

1. Obtaining a ground-water sample that is representative of the aquifer or zone of interest in the aquifer. Verification is based on the field log documenting that the field water-quality parameters stabilized during the purging of the well, prior to sample collection.

2. Ensuring that the purging and sampling devices are made of materials, and utilized in a manner, which will not interact with or alter the analyses.

3. Ensuring that results generated by these procedures are reproducible; therefore, the sampling scheme should incorporate co-located samples (duplicates).

4. Preventing cross-contamination. Sampling should proceed from least to most contaminated wells, if known.
   Field equipment blanks should be incorporated for all sampling and purging equipment, and decontamination of the equipment is therefore required.

5. Properly preserving, packaging, and shipping samples.

All field quality control samples must be prepared the same as regular investigation samples with regard to sample volume, containers, and preservation. The chain of custody procedures for the QC samples will be identical to the field ground water samples. The following are quality control samples which must be collected during the sampling event:

HEALTH AND SAFETY CONSIDERATIONS

Depending on the site-specific contaminants, various protective programs must be implemented prior to sampling the first well. The site Health and Safety Plan should be reviewed with specific emphasis placed on the protection program planned for the sampling tasks. Standard safe operating practices should be followed, such as minimizing contact with potential contaminants in both the liquid and vapor phase through the use of appropriate personal protective equipment.

Depending on the type of contaminants expected or determined in previous sampling efforts, the following safe work practices will be employed:

Particulate or metals contaminants

1. Avoid skin contact with, and incidental ingestion of, purge water.
2. Use protective gloves and splash protection.

Volatile organic contaminants

1. Avoid breathing constituents venting from well.
2. Pre-survey the well head space with an appropriate device as specified in the Site Health and Safety Plan.
3. If monitoring results indicate elevated organic constituents, sampling activities may be conducted in level C protection. At a minimum, skin protection will be afforded by disposable protective clothing, such as Tyvek®.

General, common practices should include avoiding skin contact with water from preserved sample bottles, as this water will have pH less than 2 or greater than 10. Also, when filling pre- acidified VOA bottles, hydrochloric acid fumes may be released and should not be inhaled.

POST-SAMPLING ACTIVITIES

Several activities need to be completed and documented once ground-water sampling has been completed. These activities include, but are not limited to:

1. Ensure that all field equipment has been decontaminated and returned to proper storage location. Once the individual field equipment has been decontaminated, tag it with date of cleaning, site name, and name of individual responsible.
2. All sample paperwork should be processed, including copies provided to the Regional Laboratory, Sample Management Office, or other appropriate sample handling and tracking facility.
3. All field data should be complied for site records.
4. All analytical data when processed by the analytical laboratory, should be verified against field sheets to ensure all data has been returned to sampler.

REFERENCES

Gibs, J. and T.E. Imbrigiotta, 1990, Well-Purging Criteria for Sampling Purgeable Organic Compounds; Ground Water, Vol. 28, No. 1, pp 68-78.

Pohlmann, K.F. and A.J. Alduino, 1992, Ground-Water Issue Paper: Potential Sources of Error in Ground-Water Sampling at Hazardous Waste Sites, EPA/540/S-92/019.

Puls, R.W. and M.J. Barcelona, 1996, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedure, EPA/540/S-95/504, 12 pp.

Schuller, R.M., J.P. Gibb and R.A Griffin, 1981, Recommended Sampling Procedures for Monitoring Wells; Ground Water Monitoring Review, Spring 1981, pp. 42-46.

Parker, L.V. and T.A. Ranney, 1998, Sampling Trace-Level Organic Solutes with Polymeric Tubing: Part 2, Dynamic Studies; Ground Water Monitoring and Remediation, Vol. 18, No. 1, pp. 148-155.

U.S. Environmental Protection Agency, 1986, RCRA Ground-Water Monitoring Technical Enforcement Guidance Document; OSWER-9950.1, U.S. Government Printing Office, Washington, D.C., 208 pp., appendices.

U.S. Environmental Protection Agency, 1995, Ground Water Sampling - A Workshop Summary, Texas, November 30-December 2, 1993, EPA/600/R-94/205, 146 pp.

U.S. Environmental Protection Agency Region 1, 1996, Low Stress (low flow) Purging and Sampling Procedure For the collection of Ground water Samples From Monitoring Wells, SOP#: GW 0001, July 30, 1996.

U.S. Environmental Protection Agency Region 2, 1998, Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling, GW Sampling SOP Final, March 16, 1998.

Wilde, F.D., D.B. Radtke, J.Gibs and R.T. Iwatsubo, eds., 1998, National Field Manual for the Collection of Water-Quality Data;
U.S. Geological Survey Techniques of Water-Resources Investigations, Book 9, Handbooks for Water-Resources

Investigations, variously paginated.

Wilkin, R.T., M.S. McNeil, C.J. Adair and J.T. Wilson, 2001, Field Measurement of Dissolved Oxygen: A Comparison of Methods, Ground Water Monitoring and Remediation, Vol. 21, No. 4, pp. 124 132.

Equipment Decontamination Procedure
PRS SOP – 200

1.0 PURPOSE

The purpose of this SOP is to provide field personnel with an outline of the procedure and frequency of decontaminating equipment that has come into contact with monitoring well water.

2.0 APPLICATON

This SOP provides step-by-step guideline to be followed by the field sampling crew to prevent cross-contamination between monitoring wells and preserve well integrity.

3.0 REFERENCES

RCRA Groundwater Draft Technical Guidance (EPA, 1992)

4.0 ASSOCIATED SOPs

PRS – 120 – Measuring Water Elevations
PRS – 121 – Monitoring Well Development
PRS – 124 – Low Flow Groundwater Sampling Procedure
PRS – 400 – Documentation Procedures

5.0 EQUIPMENT

The following equipment is necessary to properly decontaminate equipment used with monitoring wells:

- De-ionized water and spray bottle.
- Alconox and spray bottle, hexane and spray bottle, and 10% nitric acid and spray bottle, paper towels/rags.
- PVC pipe capped on one end, 5 feet long, 3" diameter.
- A clean hose and tap water source.
- A labeled 55-gallon drum for wastewater and a bucket to use for smaller volume prior to containing in a drum.
- Personal protective equipment as described in the Site Health and Safety Plan.

6.0 GENERAL DECONTAMINATION PROCEDURES

All reusable equipment that will come in contact with the well and/or be used to acquire samples will be decontaminated prior to arrival on site, relocation on site, and site exit.

6.1 DECONTAMINATION WHEN ORGANIC CONSTITUENTS ARE OF INTEREST

- Wash the equipment with a solution of nonphosphate detergent (Alconox or equivalent) and water.

- Rinse the equipment with tap water.
- Rinse the equipment with Hexane.
- Rinse the equipment with DI water.

6.2 DECONTAMINATION WHEN INORGANIC CONSTITUENTS ARE OF INTEREST

- Wash the equipment with a solution of nonphosphate detergent (Alconox or equivalent) and water.
- Rinse the equipment with tap water.
- Rinse the equipment with 10% Nitric Acid Solution.
- Rinse the equipment with DI water.

6.3 DECONTAMINATION WHEN INORGANIC AND ORGANIC CONSTITUENTS ARE OF INTEREST

- Wash the equipment with a solution of nonphosphate detergent (Alconox or equivalent) and water.
- Rinse the equipment with tap water.
- Rinse the equipment with Hexane.
- Rinse the equipment with DI water.
- Rinse the equipment with 10% Nitric Acid Solution.
- Rinse the equipment with DI water.

7.0 SPECIFIC DECONTAMINATION PROCEDURES

7.1 NON-DEDICATED SUBMERSIBLE PUMP DECONTAMINATION

After sampling or developing a well using a non-dedicated submersible pump, decontaminate the pump as follows:

- Use hose to spray off pump with tap water.
- Place pump into a capped approximately 5' long, 3" diameter PVC pipe.
- Fill the PVC pipe with tap water and detergent.
- Run the pump until the pipe is empty, refilling it with tap water 3 times. The discharge decontamination water will be pumped into a 55-gallon drum.
- Remove the pump and wash out the pipe using tap water from the hose.
- Place the pump in the pipe again and fill with tap water.
- Repeat the process, running the pump until the pipe empties 3 times, when there is half a pipe of water left, add 2 liters of Hexane and continue pumping until the pipe is empty.
- Remove the pump and rinse out the pipe with tap water.
- Place the pump back in the pipe and fill with tap water.
- Repeat the process, running the pump until the pipe empties 3 times, when there is half a pipe of water left, add 2L of 10% Nitric Acid.
- Run the pump until it empties, then rinse it with water and refill the pipe with di-ionized water.
- Run the pump until the pipe empties three times with the deionized water.

8.0 DOCUMENTATION

Documentation of all decontamination procedures associated with monitoring well activities including all field forms and the maintenance of a detailed field notebook as described in PRS SOP – 400.

9.0 MEASURE OF PROFICIENCY

Field staff will demonstrate proficiency on this SOP by successfully competing sections 6.0, 7.0, and 8.0 a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Dissolved Oxygen Measurement
PRS-SOP – 300

1.0 Purpose

The purpose of this Standard Operating Procedure (SOP) is to provide field personnel with an outline of the procedure for performing a colorimetric field test for the analysis dissolved oxygen in groundwater. The concentration of dissolved oxygen in ground water strongly influences the fate and transport of organic and inorganic contaminants. Multi-parameter meters generally provide only a qualitative measurement of dissolved oxygen levels less than 1 milligram per liter (mg/L). If the final dissolved oxygen reading recorded with the multi-parameter meter prior to groundwater sample collection is less than 1 mg/L, a water sample shall be collected and analyzed for dissolved oxygen in the field using colorimetric methods.

Colorimetric reagents use oxidation-reduction indicators that transform from reduced, colorless forms to oxidized, colored forms upon reaction with dissolved oxygen in water; the extent of color formation is proportional to the concentration of dissolved oxygen and can be measured by visual comparison to sets of color standards.

2.0 Application

This SOP describes procedures for performing a colorimetric field test for the analysis dissolved oxygen using the Hach Dissolved Oxygen AccuVac® field kit. The Hach Dissolved Oxygen AccuVac® field kit is commonly used in the environmental industry and is appropriate for analyzing dissolved oxygen concentrations ranging between 0.2 and 15 mg/L, at 0.2 mg/L increments. Other colorimetric or Winkler titration test kits may be used in accordance with manufacturer instructions, provided they are appropriate for analyzing dissolved oxygen concentrations less than 1 mg/L.

3.0 References

Wilkin, R.T., M.S. McNeil, C.J. Adair and J.T. Wilson, 2001, Field Measurement of Dissolved Oxygen: A Comparison of Methods, Ground Water Monitoring and Remediation, Vol. 21, No. 4, pp. 124 132.

Hach Company, 1994, Dissolved Oxygen AccuVac® Manual, Color Disc Kit 25150-50, Edition 1.

4.0 Associated SOPs

SOP – 124 – Low-Flow Groundwater Sampling Procedure
SOP – 400 – Documentation Procedures

5.0 Equipment

The following equipment is necessary to perform the dissolved oxygen colorimetric test procedure:

- Hach Dissolved Oxygen AccuVac® field kit. The test kit includes a sample beaker, zeroing vial, reagent ampoule, ampoule breaker, and color comparator with color disc.

- Required documentation including field books and sampling forms.

- Personal protective equipment as described in the Site Health and Safety Plan.

6.0 Colorimetric Test Procedures

The following procedures shall be followed when performing the dissolved oxygen colorimetric test procedure:

- Don the appropriate personal protective equipment (PPE) as described in the Site Health and Safety Plan.
- Collect 40 milliliter (mL) of sample in a clean beaker.
- Pour 10 mL of sample in to the zeroing vial. Place the zeroing vial in the left top opening of the color comparator.
- Use the ampoule breaker to break and fill the ampoule with sample from the beaker, or fill the ampoule by breaking the tip against the side of the beaker. Break the ampoule below the sample surface to prevent air from entering the ampoule.
- Without inverting the ampoule, immediately place the ampoule cap that has been filled with sample securely over the tip of the ampoule. The cap prevents contamination of the sample with atmospheric oxygen. Shake the ampoule for approximately 30 seconds. Allow 2 minutes for color development.
- Shake the ampoule again and place the ampoule in the right top opening of the color comparator.
- Hold the comparator up to a light source. Look through the openings in the front.
- Rotate the color disc in the comparator until the color matches in the zeroing vial and ampoule openings.
- Read the dissolved oxygen concentration in mg/L through the comparator scale window.
- Record the dissolved oxygen colorimetric test results in accordance with SOP – 400 – Documentation Procedures.

7.0 Documentation

Documentation of dissolved oxygen colorimetric test results and procedures shall be maintained on field sheets and in a detailed field notebook as described in PRS SOP – 400.

8.0 Measure of Proficiency

Field staff will demonstrate proficiency on this SOP by successfully competing Sections 6.0 and 7.0 of this SOP a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Ferrous Iron Procedures
PRS-SOP – 301

1.0 PURPOSE

The purpose of this SOP is to provide field personnel with an outline of the procedure for performing a colorimetric field test for the analysis ferrous iron in groundwater. The concentration of ferrous iron (Fe^{2+}) versus ferric iron (Fe^{3+}) in groundwater has important implications for electron donation/acceptance processes in oxidation-reduction reactions, and hence the natural attenuation (biodegradation) of contaminants. Exposure to oxygen can rapidly oxidize ferrous iron to ferric iron, making standard sample collection and laboratory analysis procedures impractical. Therefore, analysis of ferrous iron must be performed in the field immediately following collection of groundwater samples.

Ferrous iron shall be measured in the field using colorimetric methods. During the colorimetric test, a ferrous iron reagent reacts with ferrous iron in a groundwater sample to form an orange color in proportion to the ferrous iron concentration. The ferrous iron concentration can be measured by visual comparison to sets of color standards. Ferric iron does not react. If needed, the ferric iron concentration can be determined by subtracting the ferrous iron concentration from the results of a total iron test.

2.0 APPLICATION

This SOP describes procedures for performing a colorimetric field test for the analysis ferrous iron using the Hach Ferrous Iron Color Disc Test Kit (Model IR-18C). The Hach Ferrous Iron Color Disc Test Kit commonly used in the environmental industry and is appropriate for analyzing ferrous iron concentrations ranging between 0.2 and 7 mg/L, at 0.5 mg/L increments. Other colorimetric ferrous iron test kits may be used in accordance with manufacturer instructions.

3.0 REFERENCES

Hach Company, 1997, Iron (Ferrous) Test Kit Manual, Model IR-18C, Color Disc Kit 26672-00.

4.0 ASSOCIATED SOPS

SOP – 124 – Low-Flow Groundwater Sampling Procedure
SOP – 400 – Documentation Procedures

5.0 EQUIPMENT

The following equipment is necessary to perform the ferrous iron colorimetric test procedure:

- Hach Ferrous Iron Color Disc Test Kit. The test kit includes two plastic sample viewing tubes, ferrous iron reagent packets, a measuring vial, and color comparator with color disc.

- All required documentation including field books and sampling forms.

- Personal protective equipment as described in the Site Health and Safety Plan.

6.0 COLORIMETRIC TEST PROCEDURES

The following procedures shall be followed when performing the ferrous colorimetric test procedure:

- Don the appropriate PPE as described in the Site Health and Safety Plan.
- Fill a viewing tube with 5 mL of sample water. This is the blank.
- Place the blank tube in the top left opening of the color comparator.
- Fill a measuring vial with 25 mL of sample water.
- Add the contents of one ferrous iron reagent packet to the measuring vial.
- Swirl to mix the ferrous iron reagent and the water sample. An orange color will develop if ferrous iron is present. Allow three minutes for full color development.
- Fill a second viewing tube with 5 mL of the prepared sample from the measuring vial.
- Place the second tube in the top right opening of the color comparator.
- Hold the comparator up to a light source. Look through the openings in front of the blank and prepared sample tubes.
- Rotate the color disc until the color matches in the openings in front of the blank and prepared sample tubes.
- Read the ferrous iron concentration in mg/L through the scale window on the comparator.
- Record the ferrous iron colorimetric test results in accordance with SOP – 400 – Documentation Procedures.

7.0 DOCUMENTATION

Documentation of ferrous iron colorimetric test results and procedures shall be maintained on field sheets and in a detailed field notebook as described in PRS SOP – 400 – Documentation Procedures.

8.0 MEASURE OF PROFICIENCY

Field staff will demonstrate proficiency on this SOP by successfully competing sections 6.0 and 7.0 a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Photoionization Detector Procedure
PRS SOP – 302

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide field personnel with an outline of the procedure for operating a Photoionization Detector (PID) during groundwater sampling activities. The PID is used as a field screening instrument for the measurement of select volatile organic compounds (VOCs). A PID measures the concentration of organic vapors ionizable by a 10.6 electron volt lamp (standard) in parts per million (ppm) and quantifies organic vapor concentrations in the range between 0.1 ppm and 15,000 ppm (isobutylene-equivalent) with an accuracy of 1 ppm between 0 ppm and 100 ppm. Typical uses include groundwater screening for VOCs and breathing zone monitoring for health and safety documentation.

2.0 APPLICATION

This SOP provides a step-by-step guideline to be followed by the field sampling crew for operating a PID.

3.0 REFERENCES

RAE Systems. MiniRAE 3000 User's guide.
http://www.raesystems.com/sites/default/files/content/resources/Manual_MiniRAE-3000_059-4020-000_RevD.pdf

4.0 ASSOCIATED SOPS

SO – 121 – Monitoring Well Development
SOP – 124 – Low-Flow Groundwater Sampling Procedure
SOP – 400 – Documentation Procedures

5.0 EQUIPMENT

The following equipment is necessary to use and operate a PID:

- A PID instrument such as the RAE Systems- MiniRAE 3000 Hand-held VOC Monitor or equivalent instrument.
- Calibration gas with the appropriate concentration of calibration chemical as recommended by the manufacturer.
- The calibration gas regulator recommended by the manufacturer.
- Battery charger and batteries for the specific PID.
- Appropriate tubing to connect the calibration gas regulator to the PID.
- Required documentation including sample labels, field books and sampling forms.
- Personal protective equipment as described in the Site Health and Safety Plan.

6.0 CALIBRATION PROCEDURES

The following procedures shall be followed when calibrating a PID:

- Don the appropriate personal protective equipment (PPE) as described in the Site Health and Safety

Plan.

- Turn on the PID and allow it to warm up as recommended by the manufacturer.
- Calibrate the PID according to the manufacturer's instructions. PID calibration generally includes a 'fresh' (ambient) air calibration and a standard reference gas calibration.
- Record calibration information and procedures in accordance with SOP – 400 – Documentation Procedures.
- The PID shall be calibrated daily or as recommended by the manufacturer.

7.0 OPERATION PROCEDURES

The following procedures shall be followed when operating a PID:

- Complete calibration procedures identified in Section 6.
- Attach/install moisture filters to the instrument if available following calibration procedures.
- During operation, make sure the probe inlet and the gas outlet are free of obstructions. Obstructions can cause premature wear on the pump, false readings, or pump stalling.
- When screening the breathing zone for health and safety documentation, monitor the air quality at the breathing zone (chest or face level) and record the detected concentrations. Reference the Site Health and Safety documentation for applicable action levels, as appropriate.
- When screening for the headspace of a well, monitor the headspace directly after opening the well cap. Place the probe inlet directly above the well casing. Record the detected concentrations.
- If an increasing meter reading is indicated, monitor until the maximum meter reading is obtained.
- Do not allow water or soil to be introduced into the instrument.
- Humidity or moisture from rain can cause large fluctuations in PID readings. The PID should remain dry at all times while in operation.
- If fluctuating, erratic readings are observed, then it is possible that there is either moisture or dirt in the probe, in the moisture filter or on the lamp. If this occurs, follow the manufacturer's procedures to clean and dry the PID.

8.0 DOCUMENTATION

Documentation of all calibration, operation and maintenance procedures and field measurements associated with PID operation shall be maintained in a detailed field notebook as described in PRS SOP – 400.

9.0 MEASURE OF PROFICIENCY

Field staff will demonstrate proficiency on this SOP by successfully competing Sections 6.0, 7.0, and 8.0 of this SOP a minimum of twice under the direct supervision of the Corrective Actions Manager or her/his designee.

Documentation Procedure
PRS SOP – 400

1.0 PURPOSE

The purpose of the SOP is to outline, in detail, the required documentation needed to maintain accurate logs and files of all field procedures.

2.0 APPLICATION

This SOP provides documentation guidelines, including examples, required for all geotechnical exploratory and sampling procedures conducted or overseen by PRS.

3.0 REFERENCES

None.

4.0 ASSOCIATED SOPS

SOP – 120 – Measuring Water Elevations
SOP – 121 – Monitoring Well Development
SOP – 123 – Multi-parameter Meter Calibration & Operation Procedure
SOP – 124 – Micropurge Groundwater Sampling Procedure
SOP – 200 – Equipment Decontamination Procedure
SOP – 300 – Dissolved Oxygen Measurement
SOP – 301 – Ferrous Iron Measurement
SOP – 302 – Photoionization Detector Calibration & Operation Procedure

5.1 FIELD BOOKS

All field books should be pocket size "Rite in the Rain" or equivalent and should have non-removable pages. These field books are to be dedicated to a project, and the project manager is responsible for maintaining a field book inventory. This inventory should include a numbering and tracking mechanism for each field book assigned to a particular case.

Each field book is to be maintained as follows:

- Level the outside front cover with the following information: PRS Group, Inc., Dates Included, and Book Number. The inside cover should include: PRS Group, Inc., Project Manager's Name, 3003 Taylor Way, Tacoma, WA 98421. 253-383-4175, dates included, and Book Number.
- Inside the cover, list the full names and initials of each person working on the project that will be referred to in the field book.
- Maintain all field notes directly in the field books (i.e. notes are not to be taken then transferred to the field

book at a later time).

- Record all field notes in permanent ink (sharpie markers).
- Initial, date, and number each page upon completion.
- Correction of mistakes are made with a single line and initialing the correction.
- Avoid blank spaces within the notes. Unavoidable blank spaces are to be struck with a single line.

Examples of information required in the field book include:

- The date of entry.
- Time of entry for specific events (in military time).
- A meteorological description of daily changes.
- Personnel present including arrival and departure times and affiliations.
- Make, model and condition of equipment used.
- The time interval and reasons for delays including a detailed description of corrective actions taken by the field crew.
- A detailed description and rationale for any deviations from the Work Plan, Sampling Plan, or Health and Safety Plan.

6.0 FIELD FORMS

The field forms have been designed to detail all steps, actions, and readings associated with specific field procedures. These forms are to be completed in full. No sections are to be left blank, if a section is "not applicable", it is to be indicated as such. All forms, including locations diagrams, are to be completed in the field with permanent ink. Refer to Table 1 to see which forms are required for specific field procedures. Examples of each form are also attached.

7.0 MEASURE OF PROFICIENCY

Proficiency assessment for documentation is associated with specific procedural proficiency; therefore, no separate proficiency measures for documentation are needed.

APPENDIX D

Field Forms

SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

CHAIN of CUSTODY

PAGE ______ of ______

STANDARD ☐ RUSH ☐

CLIENT: PRS Group   ADDRESS: ADDRESS CHANGE ☐

PROJECT:

CONTACT:

PHONE: FAX:

e-MAIL: Prefer FAX ☐ or e-MAIL ☐ X

PURCHASE ORDER #

	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	NUMBER OF CONTAINERS	HYDROCARBONS: NWTPH-HCID	BTEX	BTEX/NWTPH-G	NWTPH-G	NWTPH-Dx	1664 SGT-HEM (TPH)	1664 HEM (FOG)		ORGANICS: 8260/624 VOA	8260 CHLOR SOLVENTS	8270/625 SEMI VOA	8270 PAH/PNA	8082/608 PCB		METALS: TOTAL METALS RCRA 8	TOTAL METALS(SPECIFY)	TCLP METALS RCRA 8	TCLP METALS(SPECIFY)	Cu, Zn, Ni	OTHER: PH 9040/9045	TX/TOX 9076	TURBIDITY	FLASH POINT	BOD	SOLIDS (SPECIFY)	Grain Size (Subcontract)	% solids
1																																
2																																
3																																
4																																
5																																
6																																
7																																
8																																

Directions | PAGE 1 | PAGE 2 | PAGE 3 | PAGE 4

Monitoring Well Sampling Results

PRS Group Facility, Tacoma, WA	Monitoring Well Sampling	Well #.
Date:	Sampling Personnel	Initial Well Headspace (ppm)
Sampling Method		Begin –Water Level (ft)
Equipment Used-	1 vol = [.17(Total well depth-water level)]	End – Water Level (ft)
		Pump Intake Depth (ft)

Water Quality Measurements

Time Military	Volume Removed (ml)	pH (0.1) (pH units)	Conductivity (3%)	Temperature (3%)	Turbidity (10%) (NTU)	Dissolved Oxygen (10%)	Redox Potential (± 10mV)

Signature ____________________ Date: ____________ No. of bottles ______

Page ______ of ____

PRS Facility

Monitoring Well Inspection Form

PRS Inspector ____________________ **Date:**______________

Well ID	Is well labeled?	Surrounding Impacts?	Well/pump condition	Internal condition (is cap secured)	Monument Condition	Well Accessible?	Recent construction in area that may have caused changes?	Other problems	Maintenance Performed

PRS Facility

Water Level Field Form

Field Event: ____________ Date (mm/dd/yyyy): ____________

Field Geologist(s): ____________ ____________ Organization: ____________

Well ID	Well Venting		Liquid- Level Measurement		Total Well Depth	Comments
	Time	Headspace PID Reading	Time	Depth to Water		
	(24-h Clock)	(ppm)	(24-h clock)	(Feet)	(Feet)	

APPENDIX E

Health and Safety Plan

HEALTH AND SAFETY PLAN

PRS Group Facility

Tacoma, WA 98421

Depending on the site-specific contaminants, various protective programs must be implemented prior to sampling the first well. The site Health and Safety Plan should be reviewed with specific emphasis placed on the protection program planned for the sampling tasks. Standard safe operating practices should be followed, such as minimizing contact with potential contaminants in both the liquid and vapor phase through the use of appropriate personal protective equipment.

1.0 Well Purging and Sampling

There are multiple well locations, generally around the perimeter and within the PRS facility Guidelines and expectations are as follows:

- Telephone communications will be available at the site at all times.
- All sampling equipment will be deployed and ready before opening the well.
- All well caps will remain closed until immediately before sampling. The time the wells will be open shall be minimized.
- All wellheads will be closed and secured immediately after sampling and investigation.
- Minimum level D Personal Protective Equipment within the restricted zone during sampling.
- All PPE, equipment or instruments will be decontaminated and calibrated prior to site arrival.
- Sampling will not be permitted during electrical storms, periods of high winds, or otherwise severely inclement weather.
- All removed or purged fluids will be immediately containerized. These containers shall be immediately sealed to prevent off gassing. Care shall be taken when opening these containers to prevent exposure from vapors, gases or dusts. If reopening of the containers becomes necessary, the worker shall open these while standing at a ninety-degree angle to the prevailing winds. All contaminated containers shall be placed sufficiently downwind of operations
- Drums/containers of purged fluids will be handled by PRS personnel according to Industry Standards.
- All equipment and tools will be decontaminated as described in PRS SOP – 400.
- Safety cones/barricades shall be placed near all sampling zones between traffic areas and workers and equipment.
- Facility managers shall be notified a minimum of seven days prior to sampling in order to properly notify facility workers of the sampling activities.

MONITORING

Personnel Monitoring: The need for personnel exposure monitoring will be determined by the Sampling Team Leader based upon site activities at the time.

Ambient Monitoring: Ambient monitoring will be conducted on a regular basis during operations may include direct reading instruments, specific compound indicators (as needed), or air sampling as determined by the Sampling Team Leader. A Photoionization Detector – PID will be used prior to beginning operations to determine background levels in the breathing space at the site. These readings will be entered on a Field Form.

During a sampling event any reading above initial recorded background levels is an action level where activities will cease until background levels in the breathing space are back to ambient levels.

CHEMICAL HAZARDS

Particulate or metals contaminants

1. Avoid skin contact with, and incidental ingestion of, purge water.
2. Use protective gloves and splash protection.

Volatile organic contaminants (VOCs)

VOCs may be present at the well openings especially immediately upon opening the well, within removed soils and liquids, inside containers of contaminated soils or liquids. Downwind of operations would present the highest likelihood of chemical contamination or exposures. Upwind should be relatively chemical hazard free depending on the wind velocity if not in the immediate vicinity of the contaminate source. Wellheads represent the most likely location for exposures. The well headspace can contain the highest concentration of VOCs available during these operations. These compounds have or may be volatilized from the groundwater into the headspace and are at equilibrium between the groundwater and the air. Disturbing this headspace can cause the VOCs to evacuate from the wells into the breathing zone of samplers.

1. Avoid breathing constituents venting from well.
2. Pre-survey the well head space with an appropriate device as specified in the Site Health and Safety Plan.

PPE Level D Required

Respirator: No respirator required. An air-purifying respirator may be worn for comfort based upon any existing odors. Dust masks may be worn while dusts are present.

Eye Protection: Safety glasses are worn at all times if not wearing a full-face respirator.

Hearing Protection: Earplugs or muffs are required during noisy facility operations.

Clothing: Full skin protection. Clothing must meet the needs for weather and climate conditions as well as protection from the chemical hazards present in the area. Safety vests are recommended while sampling.

Head Covering: A hardhat will be worn at all times.

Shoe Covers: Rubber disposable booties, deconnable rubber steel toed safety boots or chemical resistant safety boots.

Gloves: Cloth or leather work gloves while operating equipment. Latex or similar type while sampling or handling contaminated materials.

PHYSICAL HAZARDS

- Physical hazards exist near the off/loading pads. All efforts shall be made to only sample CO-3A and CO-3B when offloading or loading are not being conducted.
- PRS is a working facility with truck and forklift traffic.
- All wells are within high traffic areas including blind corners.
- Noise caused by heavy equipment on the site.
- Sparks from electrical connections or static discharge can ignite explosive atmospheres within the wellhead.
- Slippery areas may cause injurious falls.

EMERGENCY MEDICAL TREATMENT:

First aid, call 911, refer to Figure A for the emergency route to the hospital. For all emergencies, the following will be performed:

1. Survey scene, inform PRS Group.
2. Do primary survey of victim(s), check for unresponsiveness
3. Phone emergency medical services.
4. Secondary survey – interview, vital signs, head-to-to exam. Apply first aid as appropriate

EMERGENCY CONTACTS

Tom Smith	253-383-4175	206-255-7509
Jay Johnson	253-383-4175	253-405-7754

EMERGENCY 911 INFORMATION

Physical Address:

PRS Group, Inc.
3003 Taylor Way
Tacoma, WA 98421
253-383-4175

Hospital

St. Josephs Hospital

1717 South J Street
Tacoma, WA 98405
253-426-4101

APPENDIX F

Groundwater Monitoring Cost Estimate for Financial Assurance

Appendix F

Groundwater Monitoring Plan

Groundwater Monitoring Cost Estimate for Financial Assurance

PRS Group, Inc. Facility; Tacoma, Washington

The assumptions identified in the attached three tables, Tables F-1, F-1-1, F-2, F-2-1, and F-3 provide the basis for a 10 year Financial Assurance for the Facility's Groundwater Monitoring Plan (GWMP).

Table F-1 is the estimated cost of one year of groundwater monitoring based on the program outlined in this GWMP. It includes the costs for semi-annual sampling of nine existent groundwater monitoring wells every June and December.

Table F-1-1 is year three through ten; PRS will be conducting annual sampling of 9 existent groundwater monitoring wells every June, and another annual groundwater level measurement event that includes all the monitoring wells every December. The staff and level of effort identified are considered normal for the work defined in the GWMP. Additional other Direct Costs are also identified in Table F-1, including travel, laboratory costs, and equipment rental.

Table F-2 summarizes the analytical laboratory costs anticipated for the semi-annual sampling. The analytical costs are based on the current laboratory rates PRS has with Spectra Laboratories, per the analytical method required under the GWMP. A copy of PRS' contract with Spectra is attached. The costs identified in Table F-2 include field, duplicate, and trip blanks for quality assurance.

Table F-2-1 summarizes the analytical laboratory costs anticipated for the annual sampling. The analytical costs are based on the current laboratory rates PRS has with Spectra Laboratories, per the analytical method required under the GWMP. A copy of PRS' contract with Spectra is attached. The costs identified in Table F-2 include field, duplicate, and trip blanks for quality assurance.

Table F-3 presents the Financial Assurance Cost Estimate for 10 years of groundwater monitoring as defined in the GWMP.

As detailed in the attached four tables, the Financial Assurance Cost Estimate for 10 years of groundwater monitoring according to the GWMP is $.

Place holder for Groundwater Monitoring Costs for Financial Assurance to be submitted when available.

Table F-1. PRS Group, Inc. Facility; Groundwater Monitoring Plan – Estimated Annual Groundwater Monitoring Costs for Financial Assurance.

Task	Labor Category	Task	Rate	Units	Cost
Labor Costs			($/hour)		
Annual Groundwater Monitoring (June)					
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Annual Groundwater Monitoring (December)					
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Quarterly Monitoring Well Inspections	(2 events)				
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Annual Reporting (April)					
	Field Technician	Report Preparation			
	Senior Tech Review	Report Preparation			
Project Management					
	Project Manager	Oversight			
				Subtotal	
Other Direct Costs		Task			
Laboratory Costs		June Sampling			
		December Sampling			
				Subtotal	

				Total Cost per Year	

Table F-1-1. PRS Group, Inc. Facility; Groundwater Monitoring Plan – Estimated Annual Groundwater Monitoring Costs for Financial Assurance years three through ten.

Task	Labor Category	Task	Rate	Units	Cost
Labor Costs			($/hour)		
Annual Groundwater Monitoring (June)					
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Annual Groundwater Level Measurements (December)					
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Quarterly Monitoring Well Inspections	(4 events)				
	Field Technician	Mob/demob			
		Field Sampling			
		Field Form Completion			
Annual Reporting (April)					
	Field Technician	Report Preparation			
	Senior Tech Review	Report Preparation			
Project Management					
	Project Manager	Oversight			
				Subtotal	
Other Direct Costs		Task			
Laboratory Costs		June Sampling			
				Subtotal	
				Total Cost per Year	

EXHIBIT D: RI/FS Scope of Work and Schedule

Schedule	Deliverables/Tasks
Within 90 calendar days of submittal of the first annual groundwater data analysis report according to the schedule in Exhibit C Groundwater Monitoring Plan	Submit an Agency Review Draft RI report meeting the requirements of WAC 173-340-350 to Ecology for review and comment.
Within 60 calendar days of receipt of Ecology's written comments on the Agency Review Draft RI report	Submit a Public Review Draft RI report which addresses all of Ecology's comments on the Agency Review Draft RI report.
Within 60 calendar days of Ecology's written approval of the Public Review Draft RI report	Submit an Agency Review Draft FS work plan to Ecology for review and comment.
Within 30 calendar days of receipt of Ecology's written comments on the Agency Review Draft FS work plan	Submit a Public Review Draft FS work plan to Ecology which addresses all of Ecology's comments on the Agency Review Draft FS work plan.
Within 30 calendar days of receipt of Ecology's written approval of the Public Review Draft FS work plan	Implement the Public Review Draft FS work plan according to the approved schedule in the work plan.
In accordance with the schedule in the Public Review Draft FS work plan	Submit an Agency Review Draft FS report meeting the requirements of WAC 173-340-350 to Ecology for review and comment.
Within 30 calendar days of receipt of Ecology's written comments on the Agency Review Draft FS report	Submit a Public Review Draft FS report which addresses all of Ecology's written comments on the Agency Review Draft FS report.
Within 60 calendar days of receipt of Ecology's written review of the Public Review Draft FS report	Submit an Agency Review Draft CAP meeting the requirements of WAC 173-340-380 to Ecology for review and comment.
Within 60 calendar days of receipt of Ecology's written comments on the Agency Review Draft CAP	Submit a Public Review Draft CAP which addresses all of Ecology's written comments on the Agency Review Draft CAP.

DEPARTMENT OF ECOLOGY
State of Washington

Public Participation Plan

For:

PRS Group, Inc.
3003 Taylor Way
Tacoma, Washington 98421

August 2015
Publication no. 15-04-027

Publication and Contact Information

This report is available on the Department of Ecology's website at https://fortress.wa.gov/ecy/publications/SummaryPages/1504027.html

For more information contact:

Hazardous Waste and Toxics Reduction Program
P.O. Box 47600
Olympia, WA 98504-7600

Phone: 360-407-6700

Washington State Department of Ecology - www.ecy.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Yakima 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

To request ADA accommodation for disabilities, call the Hazardous Waste and Toxics Reduction Program at 360-407-6700. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

Public Participation Plan

For:
PRS Group, Inc.
3003 Taylor Way
Tacoma, Washington 98421

Prepared by:

Hazardous Waste and Toxics Reduction
Southwest Regional Office
Washington State Department of Ecology
Olympia, Washington

Table of Contents

Introduction

The Washington State Department of Ecology (Ecology) developed this public participation plan (Plan) in cooperation with PRS Group, Inc. (PRS). This plan is for PRS's former interim status hazardous waste treatment, storage, and disposal (TSD) facility located at 3003 Taylor Way, Tacoma, Washington, 98421.

The Plan describes the activities that Ecology will do to inform the public about contamination investigations, selection of cleanup activities, and throughout the corrective action process. Ecology encourages the public to learn about and get involved in decision-making opportunities at the PRS Site. The public can get involved during different stages of the investigation and cleanup of contamination at the Site.

The main objectives of public participation are to:

- Notify the public of opportunities to comment on and be involved in key decisions.
- Provide information and promote public understanding of the cleanup process.
- Open and maintain communication between the public, Ecology, other agencies, and PRS.
- Ensure the public's questions are answered and concerns are addressed.

Plan Contacts

For public participation questions or comments, please contact Ecology's Public Involvement Coordinator for the PRS facility, Bridgette Valdez-Kogle, at brva461@ecy.wa.gov or 360-407-7616. For questions about the proposed activities, please contact Ecology's corrective action project manager for the PRS:

Charles Hoffman
Washington Department of Ecology
PO Box 47775
Olympia, WA 98504-7775
Phone: 360-407-6344
Email: chof461@ecy.wa.gov

Public Participation Grants

Grants may be available to neighborhood committees, non-profits, and other groups near the site. These funds may be used to provide additional public involvement, to receive technical assistance, and/or enhance the public's understanding of the cleanup process. For more information, please contact Lynn Gooding at 360-407-6062 or lynn.gooding@ecy.wa.gov.

For more information about the public participation grants, visit:
http://www.ecy.wa.gov/programs/swfa/grants/ppg.html.

Citizens for a Healthy Bay (http://www.healthybay.org/) currently have a public participation grant to assist them on cleanup issues in the Commencement Bay area.

Regulatory Framework

There are federal and state regulations governing the management of hazardous wastes. Cleanup at PRS must satisfy federal and state "corrective action" requirements for facilities that manage, or have managed, hazardous wastes. Cleanup is also being completed in accordance with the Washington State's Model Toxics Control Act (MTCA) regulations.

Hazardous and Dangerous Waste Regulations

The Resource Conservation and Recovery Act (RCRA), an amendment to the Solid Waste Disposal Act, was enacted by the U.S. Congress in 1976 to ensure the safe management and disposal of municipal and industrial waste generated nationwide. RCRA has been amended several times, including in 1984 with the Hazardous and Solid Waste amendments that expanded the scope and requirements of RCRA.

The goals of RCRA are to protect human health and the environment, reduce waste, conserve energy and natural resources, and reduce or eliminate generation of hazardous waste. Subtitle C of RCRA established a program to handle wastes from "cradle to grave." Owners and operators of waste treatment, storage, and disposal facilities are required to submit a permit application. The permit covers all aspects of design, operation, maintenance and closure of the facility. RCRA requires owners and operators of these facilities to cleanup contamination resulting from past and present practices, including practices of previous owners of the facility. These cleanup activities are known as corrective actions.

The Washington State Dangerous Waste Regulations in WAC 173-303 cover the RCRA hazardous waste universe as well as other "State-only" defined wastes. Together, these wastes are referred to as dangerous wastes. State requirements for dangerous waste management must be at least as stringent as those established by the federal government.

MTCA

MTCA began as a grassroots citizen initiative in 1988 and started the process of cleaning up contaminated sites in Washington State. Under MTCA, a current or past owner or operator may be held responsible for the cleanup of contamination to standards that are safe for human health and the environment. Ecology was mandated with implementing MTCA and overseeing cleanups in Washington State, and has issued regulations and guidance governing those cleanups. These regulations can be found in WAC 173-340.

Public participation is an important part of cleanup under the MTCA process. Ecology assesses participation needs at each site according to the level of public interest and the degree of risk posed by contaminants. Individuals who live near the site, community groups, businesses, government, other organizations, and interested parties can provide comments on the cleanup process.

State Environmental Policy Act

Compliance with the State Environmental Policy Act (SEPA) will occur during review and development of the Cleanup Action Plan (CAP). Most often, Ecology will combine MTCA and SEPA public comment notices. Ecology will also post SEPA determinations in the SEPA register. The register is updated daily and is available on the SEPA website at www.ecy.wa.gov/programs/sea/sepa/e-review.html.

Facility Background and Site Contamination

The PRS facility was issued an interim status waste management permit for managing dangerous waste in November 20, 1991. After a public comment period, Ecology notified PRS on January 23, 2015, of Ecology's decision to terminate interim status at the PRS facility. Since PRS no longer treats or stores dangerous wastes at its facility, its permit does not allow the company to operate as a dangerous waste management facility at this location.

The PRS facility is located on 0.66 acres in the Port of Tacoma at 3003 Taylor Way. The PRS facility has 22 aboveground storage tanks with secondary containment and concrete pads for loading and unloading. PRS receives and manages wastes from off-site generators. Activities conducted on-site include storage and treatment of used oil for resale and treatment of wastewater suitable for discharge to the local sewer utility. PRS also manages non-dangerous waste sludge for disposal at a Subtitle D landfill.

The PRS facility previously operated as an interim status dangerous waste management facility for Washington "state-only" dangerous wastes. The facility received waste oils containing polychlorinated biphenyls (PCBs) and state toxic wastes.

A new Agreed Order, No. DE 11357, requires PRS to:

- Sample and test groundwater quarterly from nine monitoring wells for one year.
- Submit a data report to Ecology after the year of sampling.
- Compile groundwater data from past sampling events into one report for submittal to Ecology.

- Complete a remedial investigation/feasibility study (RI/FS) report.
- Draft a cleanup action plan (CAP).

Site Community

Because of the small size and industrial nature of the Site, we will use a ¼-mile radius for mailing our public comment notice. There are only industrial properties within this ¼-mile radius.

Public Participation Activities

The public may ask Ecology questions about cleanup at PRS at any time. In addition, the public may review Site documents and send comments to Ecology at any time. This is the most direct way to learn more about the Site and be involved in the cleanup's decision-making.

Public participation activities are coordinated among Ecology and PRS. Ecology maintains overall responsibility and approval authority in accordance with the requirements of the Dangerous Waste Regulations and the MTCA Cleanup Regulation. Ecology will, with participation from PRS, conduct public comment periods and other forms of public involvement when necessary.

The next formal public comment period for the Site will be August 5-September 4, 2015. At that time, the public may comment on a New Agreed Order.

All key Site documents are available for review and the public may read these plans, technical memoranda, and reports at any time.

Public Comment Notices, Fact Sheets, and Other Notices

During specific stages of the cleanup, Ecology will create and mail public comment notices to addresses within the Site's affected area. In general, we will send notice to all addresses within a 1/4-mile radius of the facility, agencies with jurisdiction and to interested organizations and individuals. These notices will provide general information about the Site, the status of the Site, contact information for submitting comments, and times and locations of public meetings or hearings.

Ecology may also develop fact sheets explaining what is happening at the Site, the Site background, and next-steps in the process. The fact sheets also provide contact information for the public if they want to comment. These fact sheets will be available online and in the document repositories.

Public Comment Periods

Formal **30-day comment periods** allow interested members of the public an opportunity to comment on draft Site documents, amended Orders or newly proposed cleanup actions. In these cases, we ask the public to comment on a draft document or proposal. If there is significant interest, Ecology may extend the public comment period to 60 days.

Public Meetings

We will hold public meetings, workshops, open houses, and public hearings based on community interest. These meetings are held at locations close to the Site that meet *Americans with Disabilities Act* standards. Public meetings, workshops, open houses, and hearings are always announced in advance, using a variety of methods.

Site Register

Information from the Public Comment Notices and Fact Sheets will be on the Statewide Site Register. The Site Register is available on Ecology's website: www.ecy.wa.gov/programs/tcp/pub_inv/pub_inv2.html.

It is also sent to those on its mailing list. Persons interested in receiving the Site Register should contact Seth Preston at Ecology at 360-407-6848 or e-mail seth.preston@ecy.wa.gov.

Display Ads or Legal Notices

These will announce public comment periods, public meetings, workshops, open houses, and public hearings. We will publish these ads or notices in *The Tacoma News Tribune*. We will also place notice on the Ecology Public Events Calendar at http://apps.ecy.wa.gov/pubcalendar/calendar.asp. These notices may be placed in more localized or culturally relevant newspapers in addition to *The Tacoma News Tribune.*

Email Listservs

Ecology will also post public comment period information on our Dangerous Waste Listserv. To subscribe to this listserv, go to:

http://listserv.wa.gov/cgi-bin/wa?SUBED1=DWFACILITIES-PUBLIC-NOTICE&A=1

Ecology may also provide updated information to community listservs. It will be up to the administrators of these listservs to identify what Site information is of most interest and how often Ecology should provide updates. The administrators will then post the updates that Ecology provides.

Mailing List

Ecology developed a mailing list that includes individuals interested in Site activities and those with property addresses in the Site area. These persons will receive (via first class mail) public comment notices at different stages of the cleanup. We will add additional individuals, organizations, other interested parties, and local, state, and federal governments to the mailing list as requested. If you would like to be added to the mailing list for this Site, contact Bridgette Valdez-Kogle, the Site's Public Involvement Coordinator, at 360-407-7616 or brva461@ecy.wa.gov.

Site Repositories

During public comment periods, you can find important documents at the following locations:

Department of Ecology
Southwest Regional Office
300 Desmond Drive SW
Lacey, WA 98502
360-407-6300

Citizens for a Healthy Bay
917 Pacific Avenue, Suite 100
Tacoma, Washington 98402
253-383-2429

Mary Rose Kobetich Library
212 Browns Point Blvd NE
Tacoma, WA 98422
253-248-7265

Please call to confirm office hours for each location.

If you would like to view documents outside of a formal public comment period, contact Charles Hoffman at chof461@ecy.wa.gov or 360-407-6344.

Ecology will also provide many of the relevant documents online at Ecology's website for PRS at https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=3255. Click on "View Electronic Documents" on the right side of the screen to access the important documents.

Plan Amendments

This plan was developed by Ecology, and complies with MTCA regulations (WAC 173-340-600). It will be reviewed as cleanup progresses, and amended if necessary. Ecology provides final approval of the Plan and amendments.

This Plan includes information for the public regarding opportunities for public involvement and comment. The outreach activities discussed in this section reflect Ecology's current plans for keeping the public informed and providing ways for those interested in the Site to communicate their concerns and questions to us. If members of the public feel the planned outreach activities and mechanisms described in this Plan are insufficient, or should otherwise be modified, we will work with those members of the public to find solutions. New outreach activities or outreach mechanisms established as a result can be implemented right away, with or without amendment of the Plan.