February 10, 2012
Project 101.00173.00010

Mr. Tom Middleton
Washington Department of Ecology
P.O. Box 47775
Olympia, Washington 98504-7775

Re: 2011 Deep Groundwater Remediation System Performance Report, Former Arco Service Station #0855, Longview, Washington

Dear Mr. Middleton:

On behalf of Wakefield Family LLC (Wakefield), SLR International Corp. (SLR) has prepared this report to present the results of the deep groundwater recovery/treatment system operations at the above-referenced property during 2011. The former Arco Service Station #0855 property is located at 4603 Ocean Beach Highway, near the western end of Longview, Washington (see Figure 1).

BACKGROUND

On June 26, 2007, Wakefield (the property owner) entered into the Washington Department of Ecology's (Ecology's) Voluntary Cleanup Program (VCP) to obtain Ecology's opinions regarding the results of the previous investigation activities at the site and the recommended remedial alternative. The recommended remedial alternative was presented in a Feasibility Study Report (SLR, 2007), and consisted of soil excavation, shallow groundwater and free product extraction, and natural attenuation of the remaining contamination with a contingency to potentially implement deeper groundwater extraction. On October 11, 2007, Ecology notified Wakefield that they agreed that the recommended alternative was the most feasible option for addressing the contamination at the site (Ecology, 2007).

Primary Phase of Remedial Action

During September, November, and December 2007, and March 2008, the primary phase of the site remedial action, consistent with the recommended remedial alternative, was completed. The objectives of the work were: 1) to remediate the soil that contained petroleum hydrocarbon concentrations greater than Model Toxics Control Act (MTCA)

Method A cleanup levels[1], 2) to remove the source of the impacted shallow groundwater, 3) to remove the primary source of the impacted deep groundwater, and 4) to extract the accessible impacted shallow groundwater. The remedial action consisted of demolishing all of the property structures, excavating the petroleum hydrocarbon-impacted soil that occurred at depths above 15 feet below ground surface (bgs), extracting hydrocarbon-impacted shallow groundwater from the open excavation, installing replacement shallow and deep groundwater monitoring wells within the areas of excavation, and conducting two groundwater sampling events.

Based on the analytical results from the final excavation floor and sidewall confirmation samples, the excavation activities effectively removed all of the soil that contained petroleum hydrocarbon concentrations greater than the MTCA Method A cleanup levels, except at three locations (SLR, 2008). The final floor samples from sample grid cells A3, B3, and C2, at 15 feet bgs, contained benzene, ethylbenzene, total xylenes, and/or gasoline-range organics (GRO) concentrations that exceeded the Method A cleanup levels. The excavation was not extended below 15 feet bgs at those three locations to ensure that a semi-confining unit (clayey silt) was not breached. The results of the two subsequent groundwater sampling events indicated that the shallow groundwater extraction activities removed the impacted groundwater within the excavation area and the soil excavation effectively eliminated the source of any additional shallow groundwater contamination. The groundwater sampling results also showed that the excavation and shallow groundwater extraction activities had limited short-term affects on the petroleum hydrocarbon concentrations in the deeper semi-confined groundwater zone (SLR, 2008).

Secondary Phase of Remedial Action

The secondary phase of the site remedial action consists of long-term groundwater monitoring to assess the natural attenuation of the remaining petroleum hydrocarbon concentrations in the shallow and deep groundwater zones. Since the primary phase of the remedial action had limited short-term affects on the deep groundwater concentrations, the secondary phase of the remedial action also includes the installation and operation of a deep groundwater recovery/treatment system. The purpose of the recovery/treatment system is to reduce the petroleum hydrocarbon concentrations in the deep groundwater zone to levels that will naturally attenuate to below the MTCA Method A cleanup levels within a reasonable period of time.

To extract petroleum hydrocarbon-impacted deep groundwater, a groundwater recovery well (designated RW-1) was installed at the area of the highest petroleum hydrocarbon

[1] Chapter 173-340 WAC, Model Toxics Control Act Cleanup Regulation, Method A Cleanup Levels. Revised November 2007.

concentrations in the deep groundwater zone, near the western end of the former gasoline dispenser island (see Figure 2). The top of the 5-foot-long well screen was installed at a depth of approximately 24 feet bgs [approximately 6 inches below the top of the primary water-producing unit (fine- to coarse-grained sand) of the upper part of the deep groundwater zone].

In June 2009, the deep groundwater recovery/treatment system was installed at the property. An electronic submersible pump was installed in RW-1, and the bottom of the pump (the intake) was set near the bottom of the screen. Two float switches were installed within the well to activate and deactivate the pump. The groundwater extracted by the pump is plumbed, via hose and underground piping, to a groundwater treatment system located in the southeastern corner of the property (see Figure 3). The treatment system consists of two canisters in series that are each filled with 1,000 pounds of activated carbon. A totalizing flow meter is located after the second carbon canister to record the pumping rate and the total volume of extracted groundwater. After the flow meter, the effluent line is plumbed into a 50-gallon equalization tank and the effluent from the tank discharges into the City of Longview sanitary sewer system. A plan view of the treatment system is shown on Figure 3.

Operation of Deep Groundwater Recovery/Treatment System During 2009 and 2010

On June 17, 2009, the deep groundwater recovery/treatment system was activated. By December 30, 2010, a total of 3,563,206 gallons of water were recovered and treated by the system. The groundwater pumping rates ranged from approximately 3.4 to 5.3 gallons per minute (SLR, 2009; and SLR, 2011b).

During the operations, SLR personnel monitored system performance in accordance with the requirements of a treated water discharge permit (Permit for Utility Service) from the City of Longview. At system activation, on a weekly basis for the first month of operation, on an every other week basis for the next two months of operation, and then on a monthly basis, treatment system samples were collected after the first carbon canister to monitor contaminant breakthrough and after the second carbon unit to monitor the system discharge concentrations. At system activation and then on a monthly basis, an influent sample to the first carbon canister was also collected to monitor contaminant loading. All of the samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and GRO. On June 18, 2009 (the system activation sample), the influent sample to the first carbon canister contained benzene and total xylenes concentrations of 500 and 2.6 micrograms per liter (µg/L), respectively. Toluene, ethylbenzene, and GRO were not detected at concentrations above the method reporting limits (MRLs). By December 13, 2010, the benzene concentration in the system influent sample had decreased to 22 µg/L.

From June 18, 2009 through December 13, 2010, none of the effluent samples from either carbon canister contained BTEX or GRO concentrations above the MRLs (SLR, 2009; and SLR, 2011b). The previous groundwater treatment system sample analytical results are presented in Table 1.

On June 17, 2009, immediately prior to activating the recovery/treatment system, SLR personnel measured the depths to groundwater in all of the shallow and deep groundwater monitoring wells and in deep groundwater recovery well RW-1. On a monthly basis through September 2009 and then on a quarterly basis (a couple of weeks after each groundwater sampling event) through December 2010, SLR measured the depths to groundwater in all of the wells while the system was operating to evaluate the radius of pumping influence. The groundwater monitoring data showed that the most consistent and greatest decreases in groundwater elevations in the deep monitoring wells were in the well (DMW-9) located nearest to the recovery well. Except for DMW-9, there was no evidence of consistent groundwater drawdown in any of the deep monitoring wells. There was also no evidence of consistent groundwater drawdown in any of the shallow monitoring wells (SLR, 2011b). The previous groundwater monitoring data are presented in Table 2.

After activating the deep groundwater recovery/treatment system, the groundwater sampling program has consisted of conducting annual groundwater sampling events (collect samples from all of the shallow and deep monitoring wells) and quarterly groundwater sampling events [collect samples from only the remaining wells that contain petroleum hydrocarbon concentrations greater than MTCA Method A cleanup levels (shallow well MW-10 and deep wells DMW-5, DMW-9, and DMW-10)]. The objectives of the groundwater sampling program are to evaluate the affects of the deep groundwater recovery system and to monitor the natural attenuation of the remaining petroleum hydrocarbon concentrations in the shallow and deep groundwater.

Quarterly groundwater sampling events were conducted in December 2009 and in March, June, and December 2010, and an annual sampling event was conducted in September 2010. The results of the groundwater sampling showed that samples from deep wells DMW-5, DMW-9, and DMW-10 contained benzene concentrations (up to 13, 980, and 41 µg/L, respectively) that exceeded the MTCA Method A cleanup level (5 µg/L) (SLR, 2010a; SLR, 2010b; SLR, 2010c; SLR, 2010d; and SLR, 2011a); however, the benzene concentrations in these wells were significantly lower than the benzene concentrations (42, 3,300, and 90 µg/L, respectively) in those wells in October 2008 (the last sampling event conducted prior to activation of the deep groundwater recovery system). From December 2009 through December 2010, at least one of the samples from DMW-9 contained total xylenes and GRO concentrations (up to 1,100 and 5,300 µg/L, respectively) that exceeded the Method A cleanup levels (1,000 and 800 µg/L, respectively). The samples from

DMW-5 and DMW-10 did not contain toluene, ethylbenzene, total xylenes, or GRO concentrations that exceeded the Method A cleanup levels.

From December 2009 through September 2010, the groundwater samples from shallow well MW-10 did not contain BTEX or GRO concentrations greater than the Method A cleanup levels. Since the samples from MW-10 contained petroleum hydrocarbon concentrations below the cleanup levels for four consecutive quarters, MW-10 was eliminated from the quarterly sampling program in December 2010 (SLR, 2011a). The previous groundwater sample analytical results for petroleum hydrocarbons are presented in Table 3.

In September 2010, the groundwater samples were analyzed in the field or by a laboratory for parameters [dissolved manganese, alkalinity, dissolved methane, sulfate, nitrate, dissolved ferrous iron, dissolved oxygen, oxygen-reduction (redox) potential] to evaluate the natural attenuation of the remaining petroleum hydrocarbons. The sample analytical results showed that the greatest dissolved methane concentrations [2.2 and 3.7 milligrams per liter (mg/L)] were at the remaining area of elevated petroleum hydrocarbon concentrations in the deep groundwater (at DMW-9 and DMW-10) (SLR, 2010d). The relatively higher dissolved methane concentrations in the remaining area of deep groundwater contamination are consistent with the previous sampling results, and indicate that the impacted deep groundwater occurs in a reducing (little or no oxygen) environment and that there is more anaerobic biological activity where petroleum hydrocarbons are present. The previous groundwater sample analytical results for the natural attenuation parameters are presented in Table 4.

2011 SYSTEM OPERATIONS

During 2011, the deep groundwater recovery/treatment system operated from January 1 through July 22, 2011. The groundwater recovery/treatment system was permanently deactivated on July 22nd because, as discussed below, the petroleum hydrocarbon concentrations in the deep groundwater samples collected in March and June 2011 were near or below the MTCA Method A cleanup levels and the treatment system influent concentrations had reached asymptotic levels. In 2011, a total of 1,386,917 gallons of groundwater were extracted and treated by the deep groundwater recovery/treatment system. The groundwater pumping rates ranged from approximately 4 to 6 gallons per minute. From system activation through July 22, 2011, a total of 4,950,123 gallons of groundwater were extracted and treated by the system.

2011 Treatment System Sample Analytical Results

From January through July 2011, treatment system samples were collected on a monthly basis from the influent to the first carbon canister, the effluent from the first carbon canister, and the effluent from the second carbon canister. All of the samples were submitted to Columbia Analytical Services, Inc. (CAS) in Kelso, Washington, for analysis of BTEX by EPA Method 8021B and GRO by Ecology Method NWTPH-Gx. From January through July 2011, the influent samples to the first carbon canister contained benzene concentrations that ranged from 11 to 16 µg/L. Toluene, ethylbenzene, and total xylenes and GRO were not detected in any of the samples at concentrations above the MRLs. None of the effluent samples from either carbon canister contained BTEX or GRO concentrations above the MRLs. All of the treatment system sample analytical results are presented in Table 1, and copies of the laboratory reports from the January through July 2011 system sampling events are presented in Appendix A.

2011 Groundwater Monitoring Data

During 2011, quarterly groundwater sampling events were conducted in March, June, and December, and an annual groundwater sampling event was conducted in September. For the March and June sampling events, the deep groundwater recovery/treatment system was deactivated for at least 18 hours in order to collect the deep groundwater samples under static groundwater conditions. Since the system was deactivated in July 2011, the September and December sampling events were also conducted under static groundwater conditions. Immediately prior to each groundwater sampling event, SLR personnel measured the depths to groundwater in all of the shallow and deep monitoring wells and in the deep recovery well. Approximately two weeks after the March and June sampling events, SLR measured the depths to groundwater in all of the shallow and deep wells, including the recovery well, while the system was operating. The purpose of these groundwater level measurements was to evaluate the radius of pumping influence over time. The depth to groundwater measurements were converted to groundwater elevations by using the results of previous well elevation surveys. The groundwater monitoring data from 2011, as well as from the previous monitoring events, are presented in Table 2.

During static (non-pumping) conditions in March, June, September and December 2011, the depths to groundwater in the deep wells (including the recovery well) ranged from 3.95 to 7.82 feet and the depths to groundwater in the shallow wells ranged from 1.41 to 8.17 feet. Free product was not observed in any of the wells. The groundwater elevations in the deep wells ranged from -0.86 to 3.02 feet above the NAVD 88 datum, and the groundwater elevations in the shallow wells ranged from -0.01 to 7.58 feet above the NAVD 88 datum. During each monitoring event, the groundwater elevations in the deep and shallow wells were inconsistent and could not be used to determine general deep or shallow groundwater

flow directions beneath the site area. The groundwater elevations in the deep wells and shallow wells on June 16, 2011, are shown on Figures 2 and 4, respectively.

During pumping conditions on April 1 and June 30, 2011, the depths to groundwater in the recovery well was 24.60 and 24.00 feet (elevations of -15.92 and -16.52 feet above the NAVD 88 datum), respectively, and the drawdown in the well was 19.52 and 18.39 feet, respecitively. On April 1 and June 30, 2011, the deep groundwater elevations were typically lower than the elevations under static conditions on March 16 and June 16, 2011, however, the decreases in elevations were fairly consistent and appeared to be due to natural conditions rather than to the pumping operations. Although it is difficult to estimate the radius of pumping influence in 2011 based on the limited data, previous monitoring data indicated that the radius of pumping influence was typically less than 50 feet in 2009 and 2010 (SLR, 2011b). Since the pumping rates in 2011 were similar to the previous pumping rates, it is likely that the radius of pumping influence in 2011 was also similar. The groundwater elevations in the deep wells and shallow wells on June 30, 2011, are shown on Figures 5 and 6, respectively.

2011 Groundwater Sampling Results

In 2011, quarterly groundwater sampling events were conducted in March, June, and December 2011, and included sample collection from deep wells DMW-5, DMW-9, and DMW-10. An annual sampling event was conducted in September that included sample collection from all of the deep and shallow groundwater monitoring wells at the site. The results of the 2011 sampling events showed that the benzene concentrations in the samples collected from DMW-5 decreased from 11 µg/L in March 2011 to below the MRL (<1.0 µg/L) in June, September, and December 2011 (SLR, 2011c; SLR, 2011d; SLR, 2011e; and SLR, 2012). The benzene concentrations in the samples from DMW-9 decreased from 14 µg/L in March and 87 µg/L in June to below the MRL in September and December 2011. The benzene concentrations in the March and June samples from DMW-10 were both 27 µg/L, and then decreased to 20 µg/L in September and below the MRL in December. The samples from DMW-5, DMW-9, and DMW-10 did not contain toluene, ethylbenzene, total xylenes, or GRO concentrations greater than the MTCA Method A cleanup levels. The results of the annual sampling event in September showed that the samples from all of the deep wells, except DMW-10, and from all of the shallow wells contained BTEX and GRO concentrations that were below the MTCA Method A cleanup levels. The groundwater sample analytical results (petroleum hydrocarbons only) from the 2011 sampling events, as well as from previous sampling events, are presented in Table 3.

The groundwater samples collected in September 2011 were also analyzed in the field or by a laboratory for the natural attenuation parameters described previously. The analytical

results showed that the greatest dissolved methane concentration (18.6 mg/L) was at the source area deep well (DMW-9), which is consistent with the previous results (SLR, 2011e) and indicates that the remaining impacted deep groundwater occurs in a reducing environment and that there is more anaerobic biological activity where petroleum hydrocarbons are present. The groundwater sample analytical results for the natural attenuation parameters in September 2011, as well as from the previous annual sampling events, are presented in Table 4.

CONCLUSIONS

During 2011, the deep groundwater recovery/treatment system operated from January 1 through July 22, 2011. The groundwater recovery/treatment system was permanently deactivated on July 22nd because the petroleum hydrocarbon concentrations in the deep groundwater samples collected in March and June 2011 were near or below the MTCA Method A cleanup levels and the treatment system influent concentrations had reached asymptotic levels. In 2011, a total of 1,386,917 gallons of groundwater were extracted and treated by the deep groundwater recovery/treatment system. The groundwater pumping rates ranged from approximately 4 to 6 gallons per minute.

After the deactivation of the deep groundwater recovery/treatment system, the groundwater sample analytical results in September and December 2011 showed that the remaining petroleum hydrocarbon concentrations in the deep groundwater have continued to decrease due to natural attenuation. In December 2011, the BTEX and GRO concentrations in all of the deep groundwater samples were below the MTCA Method A cleanup levels.

If you have any questions or comments about this report, please contact Mike Staton at (425) 471-0479.

Sincerely,

SLR International Corp

Michael D. Staton, L.G.
Principal Geologist

Attachments: Limitations
References
Tables 1 through 4
Figures 1 through 6
Appendix A – Laboratory Analytical Reports – Treatment System Samples

cc: Kurt Peterson, Cascadia Law Group PLLC (4 Copies)

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

REFERENCES

SLR International Corp. 2007. *Feasibility Study Report, Former Arco Service Station #0855, Longview, Washington.* February 22.

SLR International Corp. 2008. *Remedial Action Report, Former Arco Service Station #0855, 4603 Ocean Beach Highway, Longview, Washington.* July 21.

SLR International Corp. 2009. *Deep Groundwater Remediation System Installation and Performance Report, Former Arco Service Station #0855, Longview, Washington.* November 4.

SLR International Corp. 2010a. *Quarterly Groundwater Sampling Report – December 2009 Event, Former Arco Service Station #0855, Longview, Washington.* January 9.

SLR International Corp. 2010b. *Quarterly Groundwater Sampling Report – March 2010 Event, Former Arco Service Station #0855, Longview, Washington.* April 5.

SLR International Corp. 2010c. *Quarterly Groundwater Sampling Report – June 2010 Event, Former Arco Service Station #0855, Longview, Washington.* July 20.

SLR International Corp. 2010d. *Groundwater Sampling Report – September 2010 Event, Former Arco Service Station #0855, Longview, Washington.* October 25.

SLR International Corp. 2011a. *Quarterly Groundwater Sampling Report – December 2010 Event, Former Arco Service Station #0855, Longview, Washington.* January 4.

SLR International Corp. 2011b. *2010 Deep Groundwater Remediation System Performance Report, Former Arco Service Station #0855, Longview, Washington.* January 13.

SLR International Corp. 2011c. *Quarterly Groundwater Sampling Report – March 2011 Event, Former Arco Service Station #0855, Longview, Washington.* May 23.

SLR International Corp. 2011d. *Quarterly Groundwater Sampling Report – June 2011 Event, Former Arco Service Station #0855, Longview, Washington.* July 20.

SLR International Corp. 2011e. *Quarterly Groundwater Sampling Report – September 2011 Event, Former Arco Service Station #0855, Longview, Washington.* October 31.

SLR International Corp. 2012. *Quarterly Groundwater Sampling Report – December 2011 Event, Former Arco Service Station #0855, Longview, Washington.* January 9.

Washington Department of Ecology. 2001. *Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC.* Publication No. 94-06. Amended February 12.

Washington Department of Ecology. 2007. Letter to Wakefield Family LLC. October 11.

TABLES

Table 1
Groundwater Treatment System Sample Analytical Results
Former ARCO Service Station #0855
Longview, Washington

Date	Sample Location	Sample Name	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)
06/18/09	Influent - First Carbon	INF1-61809	500	<1.0	<1.0	2.6	<250
	Effluent - First Carbon	EFF1-61809	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-61809	<0.5	<0.5	<0.5	<0.5	<250
06/25/09	Effluent - First Carbon	EFF1-62509	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-62509	<0.5	<0.5	<0.5	<0.5	<250
07/01/09	Effluent - First Carbon	EFF1-7109	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-7109	<0.5	<0.5	<0.5	<0.5	<250
07/08/09	Effluent - First Carbon	EFF1-7809	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-7809	<0.5	<0.5	<0.5	<0.5	<250
07/15/09	Influent - First Carbon	INF1-71509	230	0.7	4.0	6.4	<250
	Effluent - First Carbon	EFF1-71509	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-71509	<0.5	<0.5	<0.5	<0.5	<250
07/29/09	Effluent - First Carbon	EFF1-72909	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-72909	<0.5	<0.5	<0.5	<0.5	<250
08/13/09	Influent - First Carbon	INF1-81309	140	0.5	3.0	5.0	<250
	Effluent - First Carbon	EFF1-81309	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-81309	<0.5	<0.5	<0.5	<0.5	<250
08/26/09	Effluent - First Carbon	EFF1-82609	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-82609	<0.5	<0.5	<0.5	<0.5	<250
09/09/09	Influent - First Carbon	INF1-9909	95	<0.5	1.9	3.8	<250
	Effluent - First Carbon	EFF1-9909	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-9909	<0.5	<0.5	<0.5	<0.5	<250
09/28/09	Effluent - First Carbon	EFF1-92809	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-92809	<0.5	<0.5	<0.5	<0.5	<250
10/15/09	Influent - First Carbon	INF-101509	65	<0.5	1.6	3.2	<250
	Effluent - First Carbon	EFF1-101509	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-101509	<0.5	<0.5	<0.5	<0.5	<250
11/17/09	Influent - First Carbon	INF1-111709	67	<0.5	1.4	3.2	<250
	Effluent - First Carbon	EFF1-111709	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-111709	<0.5	<0.5	<0.5	<0.5	<250
12/14/09	Influent - First Carbon	INF-121409	50	<0.5	0.72	1.7	<250
	Effluent - First Carbon	EFF1-121409	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-121409	<0.5	<0.5	<0.5	<0.5	<250
01/13/10	Influent - First Carbon	INF-11310	48	<0.5	0.80	2.4	<250
	Effluent - First Carbon	EFF1-11310	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-11310	<0.5	<0.5	<0.5	<0.5	<250
02/17/10	Influent - First Carbon	INF-21710	33	<0.5	<0.5	1.7	<250
	Effluent - First Carbon	EFF1-21710	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-21710	<0.5	<0.5	<0.5	<0.5	<250

Table 1
Groundwater Treatment System Sample Analytical Results
Former ARCO Service Station #0855
Longview, Washington

Date	Sample Location	Sample Name	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)
03/17/10	Influent - First Carbon	INF-31710	25	<0.5	<0.5	1.4	<250
	Effluent - First Carbon	EFF1-31710	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-31710	<0.5	<0.5	<0.5	<0.5	<250
04/15/10	Influent - First Carbon	INF-41510	32	<0.5	<0.5	1.4	<250
	Effluent - First Carbon	EFF1-41510	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-41510	<0.5	<0.5	<0.5	<0.5	<250
05/14/10	Influent - First Carbon	INF-51410	27	<0.5	<0.5	1.0	<250
	Effluent - First Carbon	EFF1-51410	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-51410	<0.5	<0.5	<0.5	<0.5	<250
06/14/10	Influent - First Carbon	INF-61410	31	<0.5	<0.5	0.86	<250
	Effluent - First Carbon	EFF1-61410	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-61410	<0.5	<0.5	<0.5	<0.5	<250
07/20/10	Influent - First Carbon	INF-72010	19	<0.5	<0.5	0.52	<250
	Effluent - First Carbon	EFF1-72010	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-72010	<0.5	<0.5	<0.5	<0.5	<250
08/13/10	Influent - First Carbon	INF-81310	27	<0.5	<0.5	0.56	<250
	Effluent - First Carbon	EFF1-81310	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-81310	<0.5	<0.5	<0.5	<0.5	<250
09/10/10	Influent - First Carbon	INF-91010	17	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-91010	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-91010	<0.5	<0.5	<0.5	<0.5	<250
10/08/10	Influent - First Carbon	INF-100810	26	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-100810	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-100810	<0.5	<0.5	<0.5	<0.5	<250
11/12/10	Influent - First Carbon	INF-111210	19	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-111210	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-111210	<0.5	<0.5	<0.5	<0.5	<250
12/13/10	Influent - First Carbon	INF-121310	22	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-121310	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-121310	<0.5	<0.5	<0.5	<0.5	<250
01/18/11	Influent - First Carbon	INF-11811	13	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-11811	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-11811	<0.5	<0.5	<0.5	<0.5	<250
02/15/11	Influent - First Carbon	INF-21511	15	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-21511	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-21511	<0.5	<0.5	<0.5	<0.5	<250
03/15/11	Influent - First Carbon	INF-31511	16	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-31511	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-31511	<0.5	<0.5	<0.5	<0.5	<250

Table 1
Groundwater Treatment System Sample Analytical Results
Former ARCO Service Station #0855
Longview, Washington

Date	Sample Location	Sample Name	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)
04/11/11	Influent - First Carbon	INF-41111	13	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-41111	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-41111	<0.5	<0.5	<0.5	<0.5	<250
05/17/11	Influent - First Carbon	INF-51711	14	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-51711	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-51711	<0.5	<0.5	<0.5	<0.5	<250
06/15/11	Influent - First Carbon	INF-61511	15	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-61511	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-61511	<0.5	<0.5	<0.5	<0.5	<250
07/14/11	Influent - First Carbon	INF-71411	11	<0.5	<0.5	<0.5	<250
	Effluent - First Carbon	EFF1-71411	<0.5	<0.5	<0.5	<0.5	<250
	Effluent - Second Carbon	EFF2-71411	<0.5	<0.5	<0.5	<0.5	<250

Notes:
The deep groundwater recovery/treatment system was activated on June 17, 2009.
µg/L = micrograms per liter (ppb).
[a]Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8260B.
[b]Gasoline-range organics (GRO) by Northwest Method NWTPH-Gx.

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells					
MW-1	8.34	03/27/00	4.36	NP	3.98
		05/23/00	5.20	NP	3.14
		07/20/00	5.55	NP	2.79
		10/18/00	5.41	NP	2.93
		01/18/01	4.81	NP	3.53
		04/18/01	4.58	NP	3.76
		07/17/01	5.54	NP	2.80
		10/18/01	5.26	NP	3.08
		01/16/02	4.45	NP	3.89
		07/09/03	5.80	NP	2.54
	8.25[c]	05/25/05	4.12	NP	4.13
		12/07/05	3.77	NP	4.48
		08/16/06	6.58	NP	1.67
		Well abandoned in September 2007.			
MW-2	8.76	03/27/00	3.61	NP	5.15
		05/23/00	4.64	NP	4.12
		07/20/00	5.06	NP	3.70
		10/18/00	5.19	NP	3.57
		01/18/00	3.96	NP	4.80
		04/18/01	3.83	NP	4.93
		07/17/01	5.08	NP	3.68
		10/18/01	4.83	NP	3.93
		01/16/02	3.71	NP	5.05
		07/09/03	5.36	NP	3.40
	8.89[c]	05/25/05	4.15	NP	4.74
		12/07/05	4.09	NP	4.80
		08/16/06	5.96	NP	2.93
		Well abandoned in September 2007.			
MW-3	8.78	03/27/00	5.61	NP	3.17
		05/23/00	6.46	NP	2.32
		07/20/00	7.05	NP	1.73
		10/18/00	6.84	NP	1.94
		01/18/01	6.37	NP	2.41
		04/18/01	5.46	NP	3.32
		07/17/01	6.93	NP	1.85
		10/18/01	6.47	NP	2.31
		01/16/01	4.83	NP	3.95
		07/09/03	6.72	0.02	2.08*
	8.58[c]	05/25/05	4.65	Film	3.93
		12/07/05	4.45	0.01	4.14*
		08/16/06	6.91	0.24	1.86*
		Well abandoned in September 2007.			

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells (continued)					
MW-4	8.78	11/15/00	6.88	NP	1.90
		01/18/01	6.78	NP	2.00
		04/18/01	6.90	NP	1.88
		07/17/01	7.50	NP	1.28
		10/18/01	6.92	NP	1.86
		01/16/02	6.15	NP	2.63
		07/09/03	7.04	NP	1.74
	8.69[c]	05/25/05	6.24	NP	2.45
		12/07/05	5.70	NP	2.99
		08/16/06	6.84	NP	1.85
		Well abandoned in September 2007.			
MW-5	8.78	11/15/00	6.54	NP	2.24
		01/18/01	6.07	NP	2.71
		04/18/01	5.46	NP	3.32
		07/17/01	6.79	NP	1.99
		10/18/01	6.50	NP	2.28
		01/16/02	5.49	NP	3.29
		07/09/03	6.86	NP	1.92
	8.67[c]	05/25/05	5.64	NP	3.03
		12/07/05	5.53	NP	3.14
		08/16/06	6.28	NP	2.39
		12/11/07	4.64	NP	4.03
		03/11/08	4.90	NP	3.77
		07/01/08	5.33	NP	3.34
		09/30/08	6.17	NP	2.50
		06/17/09	6.00	NP	2.67
		07/01/09	***6.25***	***NP***	***2.42***
		07/29/09	***6.80***	***NP***	***1.87***
		08/26/09	***6.98***	***NP***	***1.69***
		09/02/09	7.08	NP	1.59
		09/28/09	***7.03***	***NP***	***1.64***
		12/15/09	4.63	NP	4.04
		01/29/10	***4.81***	***NP***	***3.86***
		03/18/10	4.85	NP	3.82
		03/31/10	***3.85***	***NP***	***4.82***
		06/15/10	4.84	NP	3.83
		06/30/10	***5.68***	***NP***	***2.99***
		09/14/10	6.87	NP	1.80
		09/30/10	***5.96***	***NP***	***2.71***
		12/14/10	3.03	NP	5.64
		12/30/10	***3.41***	***NP***	***5.26***
		03/16/11	2.80	NP	5.87
		04/01/11	***3.23***	***NP***	***5.44***
		06/16/11	5.66	NP	3.01
		06/30/11	***5.97***	***NP***	***2.70***
		09/14/11	7.12	NP	1.55
		12/08/11	5.57	NP	3.10

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells (continued)					
MW-6	8.21	11/15/00	6.15	NP	2.06
		01/18/01	5.85	NP	2.36
		04/18/01	5.70	NP	2.51
		07/17/01	6.02	NP	2.19
		10/18/01	6.03	NP	2.18
		01/16/02	5.80	NP	2.41
		07/09/03	6.16	NP	2.05
	8.11[c]	05/25/05	4.00	NP	4.11
		12/07/05	5.70	NP	2.41
		08/16/06	6.40	NP	1.71
		Well destroyed in November 2007.			
MW-7	8.45	11/15/00	6.52	NP	1.93
		01/18/01	6.24	NP	2.21
		04/18/01	5.98	NP	2.47
		07/17/01	6.44	NP	2.01
		10/18/01	6.39	NP	2.06
		01/16/02	6.31	NP	2.14
		07/09/03	7.00	NP	1.45
	8.26[c]	05/25/05	5.61	NP	2.65
		12/07/05	6.36[d]	NP	1.90
		08/16/06	6.40	NP	1.86
		Well abandoned in September 2007.			
MW-8	6.45	05/25/05	4.50	NP	1.95
		12/07/05	3.69	NP	2.76
		08/16/06	4.67	NP	1.78
		12/11/07	3.55	NP	2.90
		03/11/08	3.51	NP	2.94
		07/01/08	4.03	NP	2.42
		09/30/08	4.19	NP	2.26
		06/17/09	3.91	NP	2.54
		07/01/09	***3.89***	***NP***	***2.56***
		07/29/09	***4.12***	***NP***	***2.33***
		08/26/09	***4.47***	***NP***	***1.98***
		09/02/09	4.55	NP	1.90
		09/28/09	***4.51***	***NP***	***1.94***
		12/15/09	3.31	NP	3.14
		01/29/10	***3.21***	***NP***	***3.24***
		03/18/10	3.05	NP	3.40
		03/31/10	***3.04***	***NP***	***3.41***
		06/15/10	2.48	NP	3.97
		06/30/10	***3.41***	***NP***	***3.04***
		09/14/10	4.32	NP	2.13
		09/30/10	***4.26***	***NP***	***2.19***
		12/14/10	2.70	NP	3.75
		12/30/10	***2.04***	***NP***	***4.41***
		03/16/11	2.15	NP	4.30
		04/01/11	***2.13***	***NP***	***4.32***
		06/16/11	2.37	NP	4.08
		06/30/11	***2.65***	***NP***	***3.80***
		09/14/11	4.79	NP	1.66
		12/08/11	3.52	NP	2.93

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells (continued)					
MW-9	9.43	05/25/05	4.66	NP	4.77
		12/07/05	4.59	NP	4.84
		08/16/06	5.23	NP	4.20
		12/11/07	4.52	NP	4.91
		03/11/08	4.65	NP	4.78
		07/01/08	5.06	NP	4.37
		09/30/08	5.08	NP	4.35
		06/17/09	5.05	NP	4.38
		07/01/09	***5.01***	***NP***	***4.42***
		07/29/09	***5.20***	***NP***	***4.23***
		08/26/09	***5.05***	***NP***	***4.38***
		09/02/09	5.20	NP	4.23
		09/28/09	***4.97***	***NP***	***4.46***
		12/15/09	4.51	NP	4.92
		01/29/10	***4.67***	***NP***	***4.76***
		03/18/10	4.64	NP	4.79
		03/31/10	***4.45***	***NP***	***4.98***
		06/15/10	4.72	NP	4.71
		06/30/10	***4.93***	***NP***	***4.50***
		09/14/10	4.94	NP	4.49
		09/30/10	***4.71***	***NP***	***4.72***
		12/14/10	4.66	NP	4.77
		12/30/10	***4.09***	***NP***	***5.34***
		03/16/11	3.91	NP	5.52
		04/01/11	***4.36***	***NP***	***5.07***
		06/16/11	4.83	NP	4.60
		06/30/11	***4.76***	***NP***	***4.67***
		09/14/11	5.35	NP	4.08
		12/08/11	4.78	NP	4.65
MW-10	9.52	05/25/05	10.30	NP	-0.78
		12/07/05	5.90	NP	3.62
		08/16/06	7.18	NP	2.34
		12/11/07	4.22	NP	5.30
		03/11/08	6.02	NP	3.50
		07/01/08	6.53	NP	2.99
		09/30/08	4.51	NP	5.01
		06/17/09	6.61	NP	2.91
		07/01/09	***6.89***	***NP***	***2.63***
		07/29/09	***7.35***	***NP***	***2.17***
		08/26/09	***7.34***	***NP***	***2.18***
		09/02/09	7.76	NP	1.76
		09/28/09	***7.51***	***NP***	***2.01***
		12/15/09	5.97	NP	3.55
		01/29/10	***5.21***	***NP***	***4.31***
		03/18/10	8.14	NP	1.38
		06/15/10	5.15	NP	4.37
		06/30/10	***6.33***	***NP***	***3.19***
		09/14/10	7.88	NP	1.64
		09/30/10	***6.96***	***NP***	***2.56***
		12/14/10	3.42	NP	6.10
		12/30/10	***3.99***	***NP***	***5.53***
		03/16/11	3.54	NP	5.98
		04/01/11	***3.97***	***NP***	***5.55***
		06/16/11	6.40	NP	3.12
		06/30/11	***6.66***	***NP***	***2.86***
		09/14/11	8.01	NP	1.51
		12/08/11	5.36	NP	4.16

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells (continued)					
MW-11	8.16	12/07/05	3.87	NP	4.29
		08/16/06	6.10	NP	2.06
		12/11/07	3.51	NP	4.65
		03/11/08	4.86	NP	3.30
		07/01/08	5.61	NP	2.55
		09/30/08	6.56	NP	1.60
		06/17/09	5.70	NP	2.46
		07/01/09	***6.02***	***NP***	***2.14***
		07/29/09	***6.72***	***NP***	***1.44***
		08/26/09	***7.37***	***NP***	***0.79***
		09/02/09	7.52	NP	0.64
		09/28/09	***7.01***	***NP***	***1.15***
		12/15/09	4.35	NP	3.81
		01/29/10	***4.10***	***NP***	***4.06***
		03/18/10	4.17	NP	3.99
		03/31/10	***3.68***	***NP***	***4.48***
		06/15/10	4.22	NP	3.94
		06/30/10	***5.28***	***NP***	***2.88***
		09/14/10	6.28	NP	1.88
		09/30/10	***5.61***	***NP***	***2.55***
		12/14/10	1.86	NP	6.30
		12/30/10	***2.61***	***NP***	***5.55***
		03/16/11	2.59	NP	5.57
		04/01/11	***3.25***	***NP***	***4.91***
		06/16/11	5.43	NP	2.73
		06/30/11	***5.62***	***NP***	***2.54***
		09/14/11	8.17	NP	-0.01
		12/08/11	4.18	NP	3.98
MW-12	8.21	12/11/07	2.69	NP	5.52
		03/11/08	4.25	NP	3.96
		07/01/08	5.20	NP	3.01
		09/30/08	5.85	NP	2.36
		06/17/09	5.41	NP	2.80
		07/01/09	***5.57***	***NP***	***2.64***
		07/29/09	***6.11***	***NP***	***2.10***
		08/26/09	***6.21***	***NP***	***2.00***
		09/02/09	6.33	NP	1.88
		09/28/09	***5.76***	***NP***	***2.45***
		12/15/09	3.09	NP	5.12
		01/29/10	***3.60***	***NP***	***4.61***
		03/18/10	3.46	NP	4.75
		03/31/10	***2.54***	***NP***	***5.67***
		06/15/10	3.65	NP	4.56
		06/30/10	***4.78***	***NP***	***3.43***
		09/14/10	5.65	NP	2.56
		09/30/10	***4.85***	***NP***	***3.36***
		12/14/10	1.45	NP	6.76
		12/30/10	***2.40***	***NP***	***5.81***
		03/16/11	1.90	NP	6.31
		04/01/11	***2.37***	***NP***	***5.84***
		06/16/11	4.77	NP	3.44
		06/30/11	***5.22***	***NP***	***2.99***
		09/14/11	5.35	NP	2.86
		12/08/11	3.89	NP	4.32

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Shallow Monitoring Wells (continued)					
MW-13	9.03	12/11/07	1.10	NP	7.93
		03/11/08	1.53	NP	7.50
		07/01/08	3.53	NP	5.50
		09/30/08	4.73	NP	4.30
		06/17/09	3.65	NP	5.38
		07/01/09	***4.68***	***NP***	***4.35***
		07/29/09	***6.07***	***NP***	***2.96***
		08/26/09	***6.97***	***NP***	***2.06***
		09/02/09	7.04	NP	1.99
		09/28/09	***7.75***	***NP***	***1.28***
		12/15/09	2.24	NP	6.79
		01/29/10	***1.91***	***NP***	***7.12***
		03/18/10	1.48	NP	7.55
		03/31/10	***1.41***	***NP***	***7.62***
		06/15/10	1.65	NP	7.38
		06/30/10	***2.91***	***NP***	***6.12***
		09/14/10	5.80	NP	3.23
		09/30/10	***2.11***	***NP***	***6.92***
		12/14/10	1.48	NP	7.55
		12/30/10	***1.42***	***NP***	***7.61***
		03/16/11	1.45	NP	7.58
		04/01/11	***1.46***	***NP***	***7.57***
		06/16/11	3.12	NP	5.91
		06/30/11	***4.25***	***NP***	***4.78***
		09/14/11	6.97	NP	2.06
		12/08/11	2.46	NP	6.57
MW-14	8.39	12/11/07	1.50	NP	6.89
		03/11/08	3.85	NP	4.54
		07/01/08	4.27	NP	4.12
		09/30/08	6.44	NP	1.95
		06/17/09	5.49	NP	2.90
		07/01/09	***6.00***	***NP***	***2.39***
		07/29/09	***6.52***	***NP***	***1.87***
		08/26/09	***6.85***	***NP***	***1.54***
		09/02/09	6.93	NP	1.46
		09/28/09	***6.90***	***NP***	***1.49***
		12/15/09	1.77	NP	6.62
		01/29/10	***1.68***	***NP***	***6.71***
		03/18/10	1.65	NP	6.74
		03/31/10	***1.47***	***NP***	***6.92***
		06/15/10	1.78	NP	6.61
		06/30/10	***4.05***	***NP***	***4.34***
		09/14/10	6.23	NP	2.16
		09/30/10	***2.10***	***NP***	***6.29***
		12/14/10	1.37	NP	7.02
		12/30/10	***1.47***	***NP***	***6.92***
		03/16/11	1.41	NP	6.98
		04/01/11	***1.46***	***NP***	***6.93***
		06/16/11	4.77	NP	3.62
		06/30/11	***5.51***	***NP***	***2.88***
		09/14/11	7.25	NP	1.14
		12/08/11	1.88	NP	6.51
Deep Monitoring Wells					
DMW-1	8.55	12/07/05	6.73	NP	1.82
		08/16/06	6.28	NP	2.27
		Well abandoned in September 2007.			

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Deep Monitoring Wells (continued)					
DMW-2	8.29	12/07/05	6.10	NP	2.19
		08/16/06	6.71	NP	1.58
		Well abandoned in September 2007.			
DMW-3	6.66	12/07/05	12.15[d]	NP	-5.49
		08/16/06	4.55	NP	2.11
		12/11/07	4.60	NP	2.06
		03/11/08	5.68	NP	0.98
		07/01/08	5.52	NP	1.14
		09/30/08	5.03	NP	1.63
		06/17/09	6.68	NP	-0.02
		07/01/09	***6.41***	***NP***	***0.25***
		07/29/09	***5.38***	***NP***	***1.28***
		08/26/09	***5.15***	***NP***	***1.51***
		09/02/09	5.19	NP	1.47
		09/28/09	***6.81***	***NP***	***-0.15***
		12/15/09	4.71	NP	1.95
		01/29/10	***4.71***	***NP***	***1.95***
		03/18/10	4.55	NP	2.11
		03/31/10	***4.60***	***NP***	***2.06***
		06/15/10	4.42	NP	2.24
		06/30/10	***4.45***	***NP***	***2.21***
		09/14/10	5.01	NP	1.65
		09/30/10	***5.02***	***NP***	***1.64***
		12/14/10	4.36	NP	2.30
		12/30/10	***4.05***	***NP***	***2.61***
		03/16/11	3.95	NP	2.71
		04/01/11	***3.98***	***NP***	***2.68***
		06/16/11	4.10	NP	2.56
		06/30/11	***4.24***	***NP***	***2.42***
		09/14/11	4.73	NP	1.93
		12/08/11	7.52	NP	-0.86
DMW-4	8.55	12/07/05	6.30	NP	2.25
		08/16/06	7.12	NP	1.43
		12/11/07	6.08	NP	2.47
		03/11/08	6.54	NP	2.01
		07/01/08	6.41	NP	2.14
		09/30/08	6.91	NP	1.64
		06/17/09	6.61	NP	1.94
		07/01/09	***6.76***	***NP***	***1.79***
		07/29/09	***7.00***	***NP***	***1.55***
		08/26/09	***7.05***	***NP***	***1.50***
		09/02/09	7.13	NP	1.42
		09/28/09	***7.20***	***NP***	***1.35***
		12/15/09	6.26	NP	2.29
		01/29/10	***6.40***	***NP***	***2.15***
		03/18/10	6.43	NP	2.12
		03/31/10	***6.10***	***NP***	***2.45***
		06/15/10	6.11	NP	2.44
		06/30/10	***6.31***	***NP***	***2.24***
		09/14/10	6.97	NP	1.58
		09/30/10	***6.91***	***NP***	***1.64***
		12/14/10	5.18	NP	3.37
		12/30/10	***5.71***	***NP***	***2.84***
		03/16/11	5.55	NP	3.00
		04/01/11	***5.81***	***NP***	***2.74***
		06/16/11	6.11	NP	2.44
		06/30/11	***6.36***	***NP***	***2.19***
		09/14/11	7.20	NP	1.35
		12/08/11	6.67	NP	1.88

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Deep Monitoring Wells (continued)					
DMW-5	8.14	12/07/05	5.88	NP	2.26
		08/16/06	6.57	NP	1.57
		12/11/07	5.75	NP	2.39
		03/11/08	6.14	NP	2.00
		07/01/08	5.01	NP	3.13
		09/30/08	6.52	NP	1.62
		06/17/09	6.23	NP	1.91
		07/01/09	*6.36*	*NP*	*1.78*
		07/29/09	*6.65*	*NP*	*1.49*
		08/26/09	*6.66*	*NP*	*1.48*
		09/02/09	6.75	NP	1.39
		09/28/09	*6.79*	*NP*	*1.35*
		12/15/09	5.87	NP	2.27
		01/29/10	*5.97*	*NP*	*2.17*
		03/18/10	6.03	NP	2.11
		03/31/10	*5.67*	*NP*	*2.47*
		06/15/10	5.68	NP	2.46
		06/30/10	*5.89*	*NP*	*2.25*
		09/14/10	6.55	NP	1.59
		09/30/10	*6.52*	*NP*	*1.62*
		12/14/10	4.80	NP	3.34
		12/30/10	*5.31*	*NP*	*2.83*
		03/16/11	5.17	NP	2.97
		04/01/11	*5.41*	*NP*	*2.73*
		06/16/11	5.69	NP	2.45
		06/30/11	*5.95*	*NP*	*2.19*
		09/14/11	6.79	NP	1.35
		12/08/11	6.28	NP	1.86
DMW-6	9.15	08/16/06	7.74	NP	1.41
		12/11/07	6.68	NP	2.47
		03/11/08	7.15	NP	2.00
		07/01/08	7.04	NP	2.11
		09/30/08	7.53	NP	1.62
		06/17/09	7.25	NP	1.90
		07/01/09	*7.37*	*NP*	*1.78*
		07/29/09	*7.62*	*NP*	*1.53*
		08/26/09	*7.67*	*NP*	*1.48*
		09/02/09	7.79	NP	1.36
		09/28/09	*7.80*	*NP*	*1.35*
		12/15/09	6.89	NP	2.26
		01/29/10	*6.99*	*NP*	*2.16*
		03/18/10	7.06	NP	2.09
		03/31/10	*6.71*	*NP*	*2.44*
		06/15/10	6.74	NP	2.41
		06/30/10	*6.93*	*NP*	*2.22*
		09/14/10	7.59	NP	1.56
		09/30/10	*7.53*	*NP*	*1.62*
		12/14/10	5.79	NP	3.36
		12/30/10	*6.31*	*NP*	*2.84*
		03/16/11	6.18	NP	2.97
		04/01/11	*6.41*	*NP*	*2.74*
		06/16/11	6.75	NP	2.40
		06/30/11	*6.97*	*NP*	*2.18*
		09/14/11	7.82	NP	1.33
		12/08/11	7.31	NP	1.84

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Deep Monitoring Wells (continued)					
DMW-7	8.12	08/16/06	6.68	NP	1.44
		12/11/07	5.68	NP	2.44
		03/11/08	6.11	NP	2.01
		07/01/08	6.02	NP	2.10
		09/30/08	6.61	NP	1.51
		06/17/09	6.07	NP	2.05
		07/01/09	***6.20***	***NP***	***1.92***
		07/29/09	***6.51***	***NP***	***1.61***
		08/26/09	***6.51***	***NP***	***1.61***
		09/02/09	6.74	NP	1.38
		09/28/09	***6.80***	***NP***	***1.32***
		12/15/09	5.85	NP	2.27
		01/29/10	***5.96***	***NP***	***2.16***
		03/18/10	5.93	NP	2.19
		03/31/10	***5.92***	***NP***	***2.20***
		06/15/10	5.82	NP	2.30
		06/30/10	***5.87***	***NP***	***2.25***
		09/14/10	6.55	NP	1.57
		09/30/10	***7.11***	***NP***	***1.01***
		12/14/10	5.27	NP	2.85
		12/30/10	***5.21***	***NP***	***2.91***
		03/16/11	5.15	NP	2.97
		04/01/11	***5.37***	***NP***	***2.75***
		06/16/11	5.70	NP	2.42
		06/30/11	***5.77***	***NP***	***2.35***
		09/14/11	6.64	NP	1.48
		12/08/11	6.28	NP	1.84
DMW-8	9.09	08/16/06	7.65	NP	1.44
		12/11/07	6.60	NP	2.49
		03/11/08	7.06	NP	2.03
		07/01/08	6.97	NP	2.12
		09/30/08	7.48	NP	1.61
		06/17/09	7.01	NP	2.08
		07/01/09	***7.13***	***NP***	***1.96***
		07/29/09	***7.44***	***NP***	***1.65***
		08/26/09	***7.45***	***NP***	***1.64***
		09/02/09	7.69	NP	1.40
		09/28/09	***7.76***	***NP***	***1.33***
		12/15/09	6.80	NP	2.29
		01/29/10	***6.81***	***NP***	***2.28***
		03/18/10	6.81	NP	2.28
		03/31/10	***6.91***	***NP***	***2.18***
		06/15/10	6.55	NP	2.54
		06/30/10	***6.87***	***NP***	***2.22***
		09/14/10	7.50	NP	1.59
		09/30/10	***7.45***	***NP***	***1.64***
		12/14/10	6.52	NP	2.57
		12/30/10	***6.30***	***NP***	***2.79***
		03/16/11	6.26	NP	2.83
		04/01/11	***5.31***	***NP***	***3.78***
		06/16/11	6.60	NP	2.49
		06/30/11	***6.74***	***NP***	***2.35***
		09/14/11	7.23	NP	1.86
		12/08/11	7.19	NP	1.90

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Deep Monitoring Wells (continued)					
DMW-9	8.86	12/11/07	5.39	NP	3.47
		03/11/08	6.84	NP	2.02
		07/01/08	6.85	NP	2.01
		09/30/08	7.20	NP	1.66
		06/17/09	6.55	NP	2.31
		07/01/09	***6.80***	***NP***	***2.06***
		07/29/09	***7.36***	***NP***	***1.50***
		08/26/09	***7.41***	***NP***	***1.45***
		09/02/09	7.44	NP	1.42
		09/28/09	***7.52***	***NP***	***1.34***
		12/15/09	6.54	NP	2.32
		01/29/10	***6.87***	***NP***	***1.99***
		03/18/10	6.69	NP	2.17
		03/31/10	***6.59***	***NP***	***2.27***
		06/15/10	6.39	NP	2.47
		06/30/10	***6.77***	***NP***	***2.09***
		09/14/10	7.23	NP	1.63
		09/30/10	***7.52***	***NP***	***1.34***
		12/14/10	5.66	NP	3.20
		12/30/10	***6.11***	***NP***	***2.75***
		03/16/11	5.87	NP	2.99
		04/01/11	***6.31***	***NP***	***2.55***
		06/16/11	6.39	NP	2.47
		06/30/11	***6.65***	***NP***	***2.21***
		09/14/11	7.46	NP	1.40
		12/08/11	6.95	NP	1.91
DMW-10	8.38	12/11/07	4.91	NP	3.47
		03/11/08	6.35	NP	2.03
		07/01/08	6.24	NP	2.14
		09/30/08	6.75	NP	1.63
		06/17/09	6.44	NP	1.94
		07/01/09	***6.61***	***NP***	***1.77***
		07/29/09	***6.83***	***NP***	***1.55***
		08/26/09	***6.89***	***NP***	***1.49***
		09/02/09	6.99	NP	1.39
		09/28/09	***7.03***	***NP***	***1.35***
		12/15/09	6.09	NP	2.29
		01/29/10	***6.19***	***NP***	***2.19***
		03/18/10	6.25	NP	2.13
		03/31/10	***5.91***	***NP***	***2.47***
		06/15/10	5.91	NP	2.47
		06/30/10	***6.13***	***NP***	***2.25***
		09/14/10	6.77	NP	1.61
		09/30/10	***6.75***	***NP***	***1.63***
		12/14/10	5.02	NP	3.36
		12/30/10	***5.55***	***NP***	***2.83***
		03/16/11	5.38	NP	3.00
		04/01/11	***5.62***	***NP***	***2.76***
		06/16/11	5.92	NP	2.46
		06/30/11	***6.18***	***NP***	***2.20***
		09/14/11	7.02	NP	1.36
		12/08/11	6.51	NP	1.87

Table 2
Groundwater Monitoring Data
Former Arco Service Station #0855
Longview Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Free Product Thickness (feet)	Groundwater Elevation (feet)
Deep Recovery Well					
RW-1	8.08	06/17/09	6.13	NP	1.95
		07/01/09	***21.20***	***NP***	***-13.12***
		07/29/09	***21.85***	***NP***	***-13.77***
		08/26/09	***20.05***	***NP***	***-11.97***
		09/02/09	6.69	NP	1.39
		09/28/09	***23.20***	***NP***	***-15.12***
		10/28/09	***23.23***	***NP***	***-15.15***
		11/30/09	***21.20***	***NP***	***-13.12***
		12/15/09	5.78	NP	2.30
		01/29/10	***23.20***	***NP***	***-15.12***
		03/01/10	***23.55***	***NP***	***-15.47***
		03/18/10	5.96	NP	2.12
		03/31/10	***21.90***	***NP***	***-13.82***
		04/30/10	***21.75***	***NP***	***-13.67***
		06/01/10	***23.10***	***NP***	***-15.02***
		06/15/10	5.60	NP	2.48
		06/30/10	***23.25***	***NP***	***-15.17***
		07/20/10	***24.50***	***NP***	***-16.42***
		08/31/10	***21.45***	***NP***	***-13.37***
		09/30/10	***24.50***	***NP***	***-16.42***
		11/01/10	***24.60***	***NP***	***-16.52***
		12/14/10	4.70	NP	3.38
		03/16/11	5.06	NP	3.02
		04/01/11	***24.60***	***NP***	***-16.52***
		06/16/11	5.61	NP	2.47
		06/30/11	***24.00***	***NP***	***-15.92***
		09/14/11	6.95	NP	1.13
		12/08/11	5.83	NP	2.25

NOTES:

NP = Free prroduct was not present.

The deep groundwater recovery/treatment system was activated on June 17, 2009, after measuring the depths to groundwater in the wells.

Values in bold and italics were measured when the deep groundwater recovery system was operating.

[a] Top of well casing elevations were surveyed relative to NAVD 88 datum.

[b] Measurements in feet below top of well casing.

[c] Top of casing (TOC) elevation was re-surveyed in May 2005.

[d] Water in well was under pressure and rising when the cap was removed. The water level was recorded after the well cap was off for over 2 hours.

* Groundwater elevation corrected for product thickness by using the equation: Groundwater elevation = TOC elevation - depth to groundwater + (product thickness x 0.80).

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Shallow Monitoring Wells							
MW-1	03/27/00	ND	ND	ND	ND	ND	ND
	05/23/00	ND	ND	ND	ND	ND	NA
	07/20/00	ND	ND	ND	ND	ND	NA
	10/18/00	ND	ND	1.61	ND	404	NA
	01/18/01	ND	ND	ND	ND	95.6	NA
	04/18/01	ND	ND	ND	ND	NA	NA
	07/17/01	ND	2.63	1.46	ND	386	NA
	10/18/01	ND	ND	ND	ND	ND	NA
	01/16/02	ND	ND	ND	ND	104	NA
	07/09/03	<0.50	<0.50	<0.50	<1.0	<50	<250
	05/25/05	<1.0	<1.0	<1.0	<2.0	<100	<50
	11/30/05	<1.0	<1.0	<1.0	<3.0	<100	<50
	Well abandoned in September 2007.						
MW-2	03/27/00	**6.89**	49.5	599	**2,490**	**17,100**	ND
	05/23/00	**26.2**	16.2	614	**1,770**	**13,200**	NA
	07/20/00	**11.9**	11.8	304	330	**7,220**	NA
	10/18/00	3.67	1.23	13.9	7.55	743	NA
	01/18/00	ND	ND	41.1	5.62	691	NA
	04/18/01	ND	ND	8.73	ND	NA	NA
	07/17/01	ND	1.26	14	ND	430	NA
	10/18/01	2.11	ND	3.64	ND	304	NA
	01/16/02	1.16	0.81	37.1	6.71	370	NA
	07/09/03	0.86	<0.50	6.43	1.28	131	<250
	05/30/05	<1.0	<1.0	<1.0	<2.0	<100	52
	12/01/05	<1.0	<1.0	<1.0	<3.0	120	<50
	Well abandoned in September 2007.						
MW-3	03/07/00	**7,520**	**12,900**	**2,780**	**14,500**	**93,700**	ND
	05/23/00	**4,710**	**8,330**	**2,280**	**11,200**	**65,200**	NA
	07/20/00	**10,700**	**22,600**	**3,160**	**17,400**	**145,000**	NA
	10/18/00	**12,900**	**33,000**	**4,890**	**26,700**	**179,000**	NA
	01/18/01	**9,380**	**17,200**	**3,940**	**20,230**	**121,000**	NA
	04/18/01	**7,700**	**15,300**	**3,430**	**16,990**	NA	NA
	07/17/01	**10,100**	**21,400**	**4,120**	**20,900**	**940,000**	NA
	10/18/01	**7,200**	**19,700**	**3,340**	**17,300**	**139,000**	NA
	01/16/02	**13,600**	**26,600**	**3,920**	**20,800**	**177,000**	NA
	07/09/03	**11,800**	**20,100**	**4,560**	**21,200**	**124,000**	**3,750**
	05/25/05	Not sampled due to presence of free product.					
	11/28/05	Not sampled due to presence of free product.					
	Well abandoned in September 2007.						

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Shallow Monitoring Wells (continued)							
MW-4	11/15/00	**1,310**	53.6	**2,430**	**7,250**	**45,500**	NA
	01/18/01	**1,130**	ND	**2,030**	**2,764**	**29,400**	NA
	04/18/01	**1,280**	ND	**1,700**	**2,591**	NA	NA
	07/17/01	**1,610**	35	**2,870**	**1,870**	**34,900**	NA
	10/18/01	**1,040**	ND	**2,300**	**1,320**	**33,000**	NA
	01/16/02	**733**	ND	**920**	948	**19,300**	NA
	07/09/03	**906**	39.1	**1,350**	156	**14,100**	**798**
	05/24/05	**310**	2.90	410	185[e]	**9,600**	**2,300**
	12/01/05	**990**	140	**1,100**	**1,353[e]**	**11,000**	**2,900[f]**
	Well abandoned in September 2007.						
MW-5	11/15/00	ND	ND	ND	ND	ND	NA
	01/18/01	ND	ND	ND	ND	786	NA
	04/18/01	**9.42**	ND	6.76	10.1	NA	NA
	07/17/01	1.83	1.16	1.90	3.28	694	NA
	10/18/01	3.05	1.39	1.48	1.45	647	NA
	01/16/02	**52.3**	3.82	48	24.9	**2,800**	NA
	07/09/03	1.26	0.99	1.54	4.64	615	<250
	05/24/05	<1.0	<1.0	<1.0	<2.0	460	120
	11/28/05	<1.0	<1.0	<1.0	<3.0	420	230[f]
	12/11/07	<1.0	<1.0	<1.0	<3.0	140	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
MW-6	11/15/00	ND	ND	ND	ND	131	NA
	01/18/01	ND	ND	ND	ND	732	NA
	04/18/01	ND	ND	ND	ND	NA	NA
	07/17/01	ND	1.35	1.33	5.79	**892**	NA
	10/18/01	ND	ND	2.60	5.48	**1,000**	NA
	01/16/02	ND	0.72	1.58	2.78	**810**	NA
	07/09/03	<0.50	0.53	1.15	4.84	462	**958**
	05/25/05	<1.0	<1.0	<1.0	<2.0	370	270
	11/28/05	<1.0	<1.0	<1.0	<1.0	NA	<1.0
	Well destroyed in November 2007.						
MW-7	11/15/00	ND	ND	ND	1.35	113	NA
	01/18/01	ND	ND	ND	ND	242	NA
	04/18/01	ND	ND	ND	ND	NA	NA
	07/17/01	ND	ND	ND	ND	275	NA
	10/18/01	ND	ND	ND	ND	286	NA
	01/16/02	ND	ND	ND	ND	362	NA
	07/09/03	<0.50	<0.50	<0.50	1.48	232	**2,050**
	05/25/05	<1.0	<1.0	<1.0	<2.0	<100	220
	11/30/05	<1.0	<1.0	<1.0	<3.0	<100	140
	Well abandoned in September 2007.						

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Shallow Monitoring Wells (continued)							
MW-8	05/25/05	<1.0	<1.0	<1.0	<3.0	<100	<70
	11/29/05	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/01/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/01/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
MW-9	05/25/05	<1.0	<1.0	<1.0	<3.0	<100	<50
	11/28/05	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
MW-10	05/25/05	**45**	<1.0	110	<2.0	**1,000**	**1,200**
	11/30/05	**31**	<1.0	110	<3.0	**1,400**	**1,000[f]**
	12/11/07	**9.0**	3.0	65	<3.0	**3,100**	**1,000[g]**
	03/11/08	**16**	2.0	40	<3.0	**3,000**	**1,200[g]**
	07/03/08	**18**	2.0	53	41	**2,500**	**1,100[g]**
	10/02/08	<1.0	<1.0	<1.0	<3.0	**1,300**	NA
	09/03/09	<1.0	<1.0	2.0	<3.0	200	NA
	12/15/09	3.0	<1.0	11	<3.0	310	NA
	03/18/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	06/15/10	<1.0	<1.0	<1.0	<3.0	170	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	180	NA
	09/14/11	1.5	<1.0	<1.0	<3.0	120	NA
MW-11	12/05/05	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Shallow Monitoring Wells (continued)							
MW-12	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
MW-13	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/03/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
MW-14	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/01/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
Deep Monitoring Wells							
DMW-1	12/07/05	**4,000**	160	**1,100**	**4,090[e]**	**22,000**	**2,900[f]**
	08/17/06	**4,100**	<1.0	**520**	**841[e]**	**16,000**	**930[f]**
	Well abandoned in September 2007.						
DMW-2	12/07/05	**11**	<1.0	40	46[f]	270	<50
	08/16/06	**10**	<1.0	5.6	<3.0	<100	<50
	Well abandoned in September 2007.						
DMW-3	12/07/05	<1.0	<1.0	<1.0	<3.0	<50	<50
	08/17/06	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/01/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
DMW-4	12/05/05	**56**	<1.0	<1.0	<3.0	230	<50
	08/17/06	**5.7**	<1.0	<1.0	<3.0	210	<50
	12/11/07	**27**	3.0	2.0	4.0	260	<50
	03/11/08	**6.0**	<1.0	<1.0	<3.0	230	68[g]
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	1.2	<1.0	3.3	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Deep Monitoring Wells (continued)							
DMW-5	12/05/05	**36**	<1.0	<1.0	<3.0	130	<50
	08/17/06	**74**	<1.0	<1.0	<3.0	170	<50
	12/11/07	**41**	<1.0	<1.0	<3.0	100	<50
	03/11/08	**10**	<1.0	<1.0	<3.0	<100	<50
	07/02/08	1.0	<1.0	<1.0	<3.0	<100	<50
	10/01/08	**42**	<1.0	<1.0	<3.0	110	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/15/09	1.0	<1.0	<1.0	<3.0	<100	NA
	03/18/10	**13**	<1.0	<1.0	<3.0	<100	NA
	06/15/10	**13**	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/14/10	**9.0**	<1.0	<1.0	<3.0	<100	NA
	03/16/11	**11**	<1.0	<1.0	<3.0	<100	NA
	06/16/11	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/08/11	<1.0	<1.0	<1.0	<3.0	<100	NA
DMW-6	08/16/06	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
DMW-7	08/16/06	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/01/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/01/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA
DMW-8	08/16/06	<1.0	<1.0	<1.0	<3.0	<100	<50
	12/11/07	<1.0	<1.0	<1.0	<3.0	<100	<50
	03/11/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	07/02/08	<1.0	<1.0	<1.0	<3.0	<100	<50
	10/02/08	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/03/09	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/10	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/14/11	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 3
Groundwater Sample Analytical Results - Petroleum Hydrocarbons
Former Arco Service Station #0855
Longview, Washington

Well Number	Sample Date	Benzene[a] (µg/L)	Toluene[a] (µg/L)	Ethylbenzene[a] (µg/L)	Total Xylenes[a] (µg/L)	GRO[b] (µg/L)	DRO[c] (µg/L)
MTCA Method A Cleanup Levels[d]		**5**	**1,000**	**700**	**1,000**	**800**	**500**
Deep Monitoring Wells (continued)							
DMW-9	12/11/07	**6,100**	**1,900**	**970**	**3,100**	**27,000**	**600[g]**
	03/11/08	**3,000**	150	380	880	**13,000**	450[g]
	07/03/08	**3,600**	3.0	320	610	**9,500**	**520[g]**
	10/02/08	**3,300**	4.0	140	270	**8,600**	NA
	09/03/09	**2,800**	4.0	320	**1,100**	**14,000**	NA
	12/15/09	**980**	2.0	<1.0	**1,100**	**5,300**	NA
	03/18/10	**190**	<1.0	10	200	**1,600**	NA
	06/15/10	**50**	<1.0	9.1	60	630	NA
	09/14/10	**210**	<1.0	5.2	120	**1,000**	NA
	12/14/10	3.3	<1.0	1.3	9.8	320	NA
	03/16/11	**14**	<1.0	2.0	3.7	310	NA
	06/16/11	**87**	<1.0	<1.0	33	700	NA
	09/14/11	<1.0	<1.0	<1.0	3.4	200	NA
	12/08/11	<1.0	<1.0	<1.0	<3.0	140	NA
DMW-10	12/11/07	**60**	4.0	88	130	750	53[g]
	03/11/08	**75**	4.0	140	120	**1,000**	74[g]
	07/02/08	**89**	6.0	160	130	**1,100**	68[g]
	10/01/08	**90**	5.0	120	25	**820**	NA
	09/03/09	**9.0**	<1.0	2.0	<3.0	<100	NA
	12/15/09	**20**	<1.0	13	7.0	150	NA
	03/18/10	**41**	<1.0	21	13	310	NA
	06/15/10	**34**	2.3	14	12	340	NA
	09/14/10	**12**	<1.0	<1.0	<3.0	<100	NA
	12/14/10	**32**	1.7	7.1	11	120	NA
	03/16/11	**27**	1.2	8.2	11	220	NA
	06/16/11	**27**	1.8	<1.0	9.9	130	NA
	09/14/11	**20**	<1.0	<1.0	3.9	140	NA
	12/08/11	<1.0	<1.0	<1.0	<3.0	<100	NA

NOTES: Values in bold exceed the MTCA Method A cleanup levels.

All concentrations in micrograms per liter (µg/L).

ND = Not detected above the laboratory method reporting limit (MRL).

NA = Not analyzed.

[a] Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B or EPA Method 8260B.

[b] Gasoline-range organics (GRO) by Ecology Method NWTPH-Gx.

[c] Diesel-range organics (DRO) by Ecology Method NWTPH-Dx.

[d] Chapter 173-340 WAC, Model Toxics Control Act (MTCA) Cleanup Regulation, Method A Cleanup Levels. Amended February 12, 2001.

[e] Total xylenes calculated by using the formula: total xylenes concentration = (m, p-xylene concentration) + (o-xylene concentration).

[f] The laboratory reported that the DRO concentration is due to overlap from the gasoline range.

[g] The laboratory reported that the pattern of chromatogram peaks from the sample were not indicative of diesel.

Table 4
Groundwater Sample Analytical Results - Natural Attenuation Parameters
Former Arco Service Station #0855
Longview, Washington

Sample Location	Sample Date	Nitrate[a] (mg/L)	Sulfate[a] (mg/L)	Dissolved Methane[b] (mg/L)	Dissolved Oxygen[c] (mg/L)	Dissolved Manganese[d] (mg/L)	Dissolved Ferrous Iron[e] (mg/L)	Alkalinity[f] (mg/L $CaCO^3$)	Redox Potential[g] (mV)
Shallow Wells									
MW-5	12/12/07	12.2	969	0.6	0.2	2.9	5.0	10.3	119
	03/13/08	2.3	341	<0.007	0.4	2.5	3.3	19.3	-123
	07/02/08	0.5	275	0.5	0.1	1.4	NM	80.8	10.0
	10/02/08	0.6	288	0.5	1.7	1.9	2.9	106	92.8
	09/03/09	<0.1	202	0.3	0.6	1.4	4.6	49.4	-67.4
	09/14/10	0.07	202	0.03	3.5	1.7	2.2	37.8	33.7
	09/14/11	<0.01	129	0.1	0.2	1.3	4.2	63.8	30.4
MW-8	12/12/07	<0.01	4.8	0.1	1.9	0.5	1.7	33.3	248
	03/13/08	<0.2	6.6	0.001	0.7	0.4	2.1	57.6	-140
	07/01/08	<0.1	14.0	2.0	0.2	0.4	NM	73.0	-78.9
	10/01/08	<0.1	15.9	1.1	1.3	0.5	3.6	74.1	-49.3
	09/03/09	<0.1	0.1	1.5	0.7	0.4	4.4	67.4	-110.3
	09/14/10	0.02	1.4	0.3	2.8	0.5	3.2	75.9	-70.6
	09/14/11	0.03	<1.0	1.5	0.2	0.4	4.2	80.0	-71.6
MW-9	12/12/07	0.5	5.0	0.0008	4.0	0.004	<0.1	40.1	237
	03/13/08	0.5	8.5	3.3	3.2	0.01	0.6	39.7	-33.5
	07/02/08	1.2	36.4	<0.0007	2.2	0.02	NM	80.2	85.6
	10/02/08	0.3	8.0	0.004	2.8	0.4	0.6	51.6	135
	09/03/09	0.3	9.3	0.010	1.9	0.5	0.4	52.9	-123
	09/14/10	1.8	25.2	0.02	4.1	0.01	<0.1	118	39.3
	09/14/11	0.09	6.1	0.01	0.4	1.6	<0.1	82.0	57.2
MW-10	12/12/07	0.04	74.9	6.5	3.0	2.4	2.0	174	294
	03/13/08	<0.2	186	1.8	2.1	2.2	3.1	160	-117
	07/02/08	<0.2	199	7.3	0.1	3.3	NM	232	15.2
	10/02/08	<0.1	69.0	1.7	1.3	2.1	3.0	181	111
	09/03/09	<0.1	34.3	7.9	1.3	1.4	3.0	180	111
	09/14/10	0.2	11.3	0.9	2.4	1.6	3.0	122	-24.6
	09/14/11	0.03	1.3	1.5	0.4	1.2	2.0	172	-81.6
MW-11	12/12/07	0.8	643	0.1	0.6	1.8	3.8	28.4	200
	03/13/08	0.4	199	<0.0007	0.6	2.5	1.4	45.1	-81.5
	07/02/08	0.04	162	0.2	0.2	1.0	NM	89.4	25.4
	10/02/08	<0.1	89.5	0.4	1.5	1.8	2.4	138	27.1
	09/03/09	<0.1	82.6	0.6	0.7	1.6	4.4	126	-88.1
	09/14/10	0.3	86.4	0.03	1.5	1.2	2.7	112	-67.4
	09/14/11	0.03	112	0.4	0.3	1.6	2.0	180	-48.4
MW-12	12/12/07	37.0	1,500	0.2	0.7	5.3	3.8	6.9	178
	03/13/08	27.5	1,060	0.0009	0.8	6.8	<0.1	58.8	-147
	07/02/08	<0.1	204	0.5	0.2	8.3	NM	52.3	83.7
	10/02/08	0.4	1,280	0.3	0.9	11.3	<0.1	91.8	141
	09/03/09	<0.1	882	0.8	1.7	11.5	1.2	146	-117
	09/14/10	0.02	547	0.03	2.8	6.6	<0.1	187	32.7
	09/14/11	<0.01	912	0.21	0.6	8.1	0.4	226	55.3
MW-13	12/12/07	31.7	1,590	0.04	NM	8.7	<0.1	70.7	236
	03/13/08	21.5	1,540	0.005	0.6	9.1	<0.1	218	-113
	07/03/08	4.5	1,420	0.007	0.1	9.8	NM	133	21.9
	10/02/08	1.9	1,800	0.02	1.3	16.3	<0.1	152	376
	09/03/09	<0.1	805	0.1	0.6	11.3	0.2	96	-66.8
	09/14/10	0.07	1,038	0.05	2.2	9.8	<0.1	74.2	64.8
	09/14/11	<0.01	775	0.01	0.5	6.0	<0.1	71.0	94.1

Table 4
Groundwater Sample Analytical Results - Natural Attenuation Parameters
Former Arco Service Station #0855
Longview, Washington

Sample Location	Sample Date	Nitrate[a] (mg/L)	Sulfate[a] (mg/L)	Dissolved Methane[b] (mg/L)	Dissolved Oxygen[c] (mg/L)	Dissolved Manganese[d] (mg/L)	Dissolved Ferrous Iron[e] (mg/L)	Alkalinity[f] (mg/L $CaCO^3$)	Redox Potential[g] (mV)
Shallow Wells (continued)									
MW-14	12/12/07	16.7	1,190	0.07	2.5	9.4	0.2	16.0	215
	03/13/08	5.7	945	0.0009	2.4	7.1	1.2	57.8	-164
	07/02/08	1.0	891	<0.0007	0.3	2.4	NM	43.4	28.7
	10/01/08	0.3	879	<0.0007	1.6	1.9	<0.1	80.7	547
	09/03/09	<0.1	444	0.10	0.7	1.1	<0.1	45.4	-108
	09/14/10	0.05	294	<0.005	2.7	0.02	<0.1	24.8	91.9
	09/14/11	0.01	154	<0.005	0.4	0.004	<0.1	23.7	128.9
Deep Wells									
DMW-3	12/12/07	<0.05	31.8	1.6	3.8	2.8	1.0	220	256
	03/13/08	<0.2	23.4	2.5	2.0	2.6	3.0	197	-129
	07/02/08	<0.1	43.9	1.6	0.2	2.3	NM	214	-96.2
	10/01/08	<0.1	22.2	2.2	1.3	2.8	3.5	210	276
	09/03/09	<0.1	8.8	1.4	1.3	2.3	3.5	220	276
	09/14/10	0.04	<1.0	0.2	3.0	1.9	2.5	155	-114
	09/14/11	0.01	5.5	0.8	0.5	1.6	2.8	191	-65.7
DMW-4	12/12/07	<0.01	22.4	10.1	0.1	2.2	3.6	174	105
	03/13/08	<0.2	297	0.0009	0.2	15.5	4.6	22.2	-137
	07/02/08	3.4	1,040	1.6	0.1	2.3	NM	65.8	-86.8
	10/02/08	<0.2	309	0.9	1.1	3.4	3.0	72.7	-18.4
	09/03/09	<0.1	24.4	4.2	1.5	1.7	4.4	178	-93.0
	09/14/10	0.03	50.6	0.4	3.4	2.1	2.2	133	-75.3
	09/14/11	0.03	106	2.1	0.3	1.2	3.0	111	-57.1
DMW-5	12/12/07	<0.01	13.0	13.7	0.1	2.3	3.4	177	102
	03/13/08	<0.2	10.3	8.2	0.2	2.9	3.6	180	-128
	07/02/08	<0.1	42.6	8.8	0.4	2.5	NM	221	-101
	10/01/08	<0.1	7.7	5.9	1.4	2.4	NM	166	48.6
	09/03/09	<0.05	33.6	4.2	1.7	1.6	2.8	126	-318
	09/14/10	0.01	<1.0	0.3	1.5	1.7	3.0	109	-82.7
	09/14/11	0.02	32.1	2.1	0.5	1.3	2.0	118	-74.7
DMW-6	12/12/07	<0.01	8.0	11.7	0.2	1.7	2.2	104	121
	03/13/08	<0.2	7.5	9.5	0.2	4.3	2.2	112	-137
	07/02/08	<0.1	54.0	7.6	0.1	2.0	NM	149	-86.1
	10/02/08	<0.1	39.0	6.4	1.1	2.0	2.6	154	-25.6
	09/03/09	<0.1	<0.1	9.5	0.5	1.7	4.2	146	-117.0
	09/14/10	0.02	1.3	0.9	1.9	1.9	5.1	124	-73.1
	09/14/11	0.02	6.3	6.8	0.5	1.9	3.0	150	-78.2
DMW-7	12/12/07	<0.01	23.3	9.1	0.3	3.7	3.1	158	93.6
	03/13/08	<0.2	29.6	8.3	0.4	12.4	3.0	155	-172
	07/01/08	<0.1	53.3	5.6	0.2	5.6	NM	195	-88.1
	10/01/08	<0.2	34.7	5.2	1.5	6.4	3.0	203	6.9
	09/03/09	<0.05	18.0	5.9	2.2	3.5	4.2	174	-261.0
	09/14/10	0.03	2.5	0.8	3.4	4.4	3.8	169	-93.5
	09/14/11	0.02	<1.0	6.1	0.7	4.3	5.2	236	-74.7
DMW-8	12/12/07	0.01	6.2	3.8	0.2	1.9	4.4	133	109
	03/13/08	<0.2	17.6	2.0	0.3	2.1	3.1	107	-160
	07/02/08	<0.1	37.0	1.6	0.2	1.8	NM	109	-5.9
	10/02/08	<0.1	26.8	2.0	1.2	2.0	2.6	151	1,103
	09/03/09	<0.05	23.2	3.1	1.7	1.9	3.6	142	-290
	09/14/10	0.03	1.3	0.4	1.4	2.0	3.1	127	-64.6
	09/14/11	0.02	34.5	2.6	0.3	1.7	2.6	128	-79.8

Table 4
Groundwater Sample Analytical Results - Natural Attenuation Parameters
Former Arco Service Station #0855
Longview, Washington

Sample Location	Sample Date	Nitrate[a] (mg/L)	Sulfate[a] (mg/L)	Dissolved Methane[b] (mg/L)	Dissolved Oxygen[c] (mg/L)	Dissolved Manganese[d] (mg/L)	Dissolved Ferrous Iron[e] (mg/L)	Alkalinity[f] (mg/L $CaCO^3$)	Redox Potential[g] (mV)
Deep Wells (continued)									
DMW-9	12/12/07	<0.01	55.7	27.4	0.2	1.9	5.7	270	113
	03/13/08	<0.5	32.2	19.8	0.2	3.4	3.7	355	-128
	07/03/08	<0.1	38.9	21.1	0.2	2.6	NM	406	-83.8
	10/02/08	<0.1	20.0	21.0	1.2	2.8	2.7	451	4.0
	09/03/09	<0.1	<0.1	20.6	0.7	2.1	4.2	330	-120.0
	09/14/10	0.03	<1.0	2.2	3.6	2.1	5.3	311	-89.2
	09/14/11	0.04	52.4	18.6	0.5	2.1	2.4	342	-71.8
DMW-10	12/12/07	<0.01	24.2	11.3	0.09	3.0	3.6	191	92.5
	03/13/08	<0.2	7.7	8.1	0.1	5.4	3.1	227	-94.2
	07/02/08	<0.1	27.9	11.0	0.3	4.0	NM	266	-113
	10/01/08	<0.2	5.3	11.5	1.5	4.5	4.4	271	-0.6
	09/03/09	<0.05	32.7	2.9	1.1	2.1	2.8	117	-343.0
	09/14/10	0.02	<1.0	3.7	1.2	1.7	3.9	93	-96.4
	09/14/11	0.03	59.9	3.2	0.3	1.8	3.4	132	-77.4

NOTES:

NM = Not measured.

mg/L = milligrams per liter (ppm).

[a] Nitrate by EPA Method 353.2.

[a] Sulfate by EPA Method 375.2.

[b] Dissolved methane by EPA Method RSK 175 Modified.

[c] Dissolved oxygen by EPA Method 360.1 (field instrument reading).

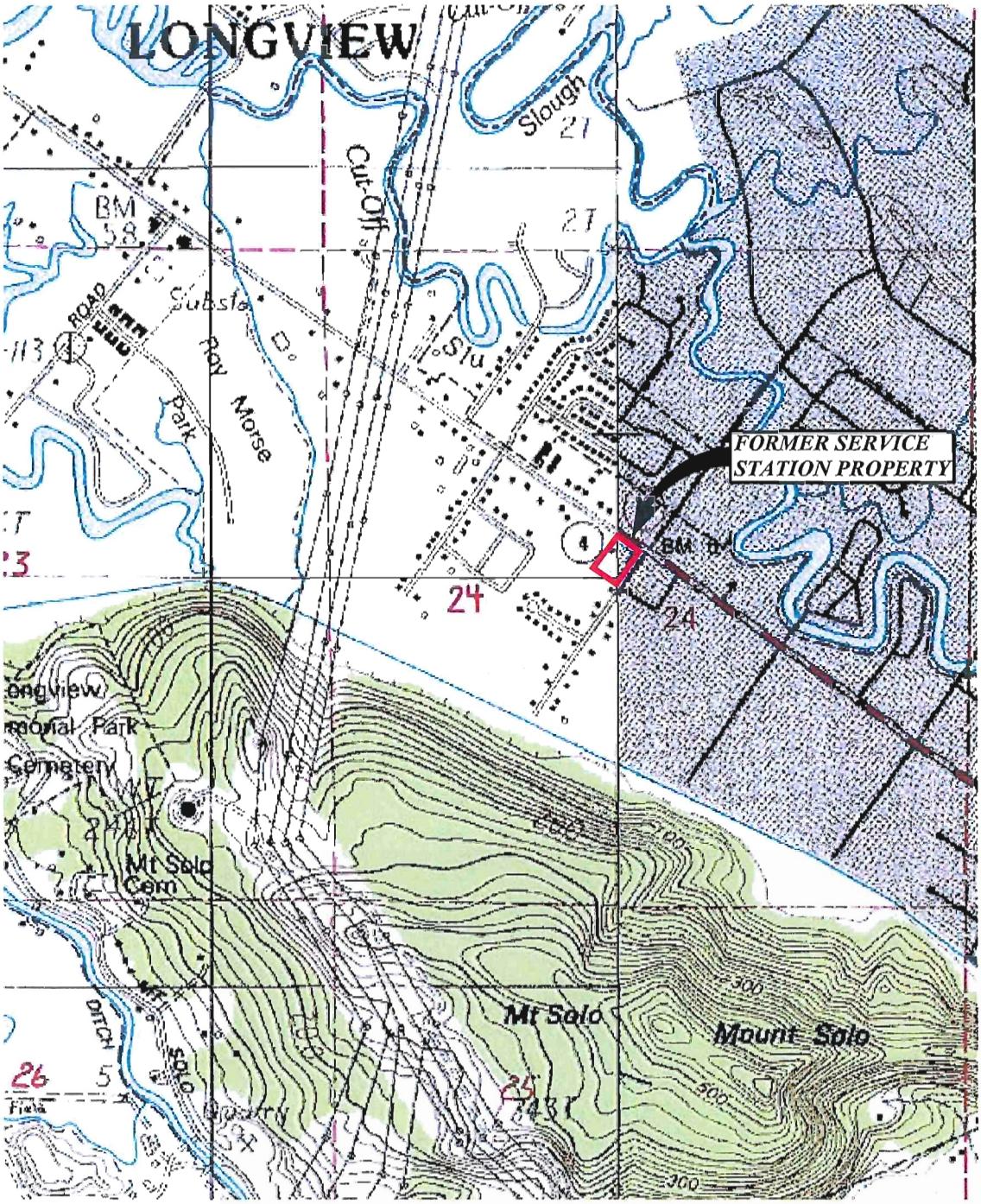
[d] Dissolved manganese by EPA Method 200.8.

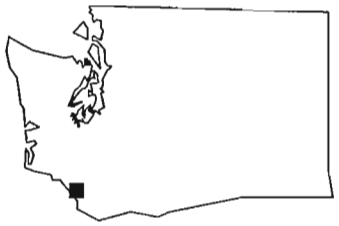
[e] Dissolved ferrous iron by Standard Method SM 3500 (field test kit).

[f] Alkalinity by Standard Method SM 2320.

[g] Oxidation-reduction (redox) potential by EPA Method D1498-76 (field instrument reading).

FIGURES





WASHINGTON

0 1500 3000

SCALE IN FEET

SOURCE: USGS 7.5 Minute Quadrangles Kelso, 1970 Contour Interval 20 Feet and Abernathy Mtn., 1986 Contour Interval 20 Feet.

SLR

22118 20th AVE SE
BUILDING G, SUITE 202
BOTHELL, WA 98021

T: 425-402-8800
F: 425-402-8488

DATE	01/10
DWN.	BDT
APPR.	MJS
REVIS.	
PROJECT NO.	101.00173.00010

FIGURE 1
FORMER ARCO SERVICE STATION #0855
LONGVIEW, WASHINGTON

PROPERTY LOCATION MAP

BOON DOX TAVERN

BOON DOX MARKET

DMW-7 (2.42)

TEXACO SERVICE STATION

LEGEND

DMW-5 — DEEP GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

RW-1 — DEEP GROUNDWATER RECOVERY WELL LOCATION AND DESIGNATION

(2.47) — DEEP GROUNDWATER ELEVATION (IN FEET ABOVE THE NAVD 88 DATUM)

OCEAN BEACH HIGHWAY

SIDEWALK

DMW-8 (2.49)

SIDEWALK

DMW-6 (2.40)

BUS LANE

DMW-4 (2.44)

PLANTER

DMW-5 (2.45)

DMW-9 (2.47)

FORMER UNDERGROUND DISPENSER LINES

FORMER DISPENSER ISLAND

RW-1 (2.47)

UNDEVELOPED MARSHY LAND

FORMER GASOLINE USTs

FORMER SERVICE STATION BUILDING

DMW-10 (2.46)

PROPERTY LINE

FORMER HEATING OIL UST

FORMER USED OIL UST

DMW-3 (2.56)

DRAINAGE DITCH

FORMER SERVICE STATION PARCEL (SITE) BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

46TH AVENUE

HENRI'S RESTAURANT

0 30 60

SCALE IN FEET

SLR
22118 20th AVE SE
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BOTHELL, WA 98021
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F: 425-402-8488

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DWN. PDT
APPR. MJS
REVIS.
PROJECT NO. 101.00173.00010

FIGURE 2
FORMER ARCO SERVICE STATION #0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON
DEEP GROUNDWATER ELEVATIONS - JUNE 16, 2011 (NON-PUMPING CONDITIONS)

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BOON DOX MARKET

BOON DOX TAVERN

TEXACO SERVICE STATION

DMW-7

SS

M.H.

OCEAN BEACH HIGHWAY

SIDEWALK

MW-10

MW-5

DMW-4

PLANTER

MW-11

DMW-5

DMW-9

MW-13

RW-1

MW-12

VACANT PROPERTY

DMW-10

MW-14

UNDERGROUND TREATMENT SYSTEM INFLUENT LINE

GROUNDWATER TREATMENT SYSTEM LOCATION

DMW-3

SYSTEM EFFLUENT LINE

SANITARY SEWER LATERAL

FORMER SERVICE STATION PARCEL (SITE) BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

DRAINAGE DITCH

46TH AVENUE

MW-9

DMW-6

BUS LANE

MW-8

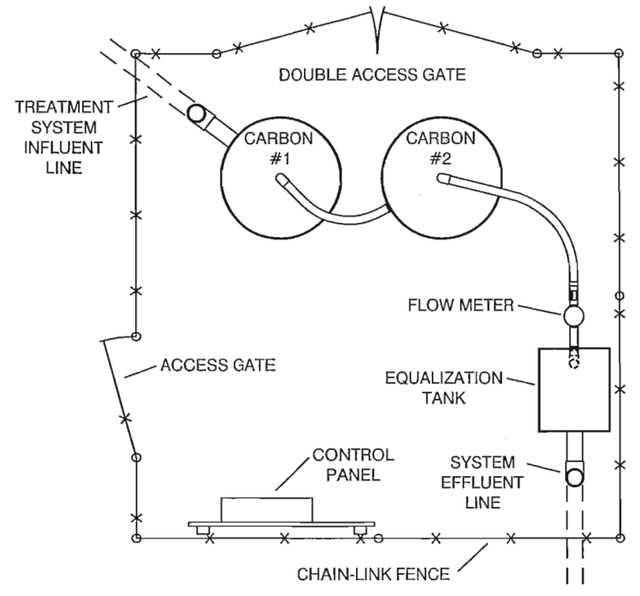
HENRI'S RESTAURANT

0 30 60

SCALE IN FEET

LEGEND

- RW-1 — DEEP GROUNDWATER RECOVERY WELL LOCATION
- MW-5 — SHALLOW GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- DMW-5 — DEEP GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- SS — UNDERGROUND SANITARY SEWER LINE
- M.H. — SANITARY SEWER MANHOLE



1/2 GROUNDWATER TREATMENT SYSTEM

NOT TO SCALE

SLR

22118 20th AVE SE
BLDG. G, SUITE 202
BOTHELL, WA 98021

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DATE	01/11
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APPR.	MDS
REVIS.	
PROJECT NO.	101.00173.00010

FIGURE 3
FORMER ARCO SERVICE STATION #0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON

SITE PLAN AND SYSTEM LAYOUT

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BOON DOX TAVERN

BOON DOX MARKET

TEXACO SERVICE STATION

LEGEND

- **MW-5** SHALLOW GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- **RW-1** DEEP GROUNDWATER RECOVERY WELL LOCATION AND LOCATION
- (3.01) SHALLOW GROUNDWATER ELEVATION (IN FEET ABOVE THE NAVD 88 DATUM)

OCEAN BEACH HIGHWAY

SIDEWALK

SIDEWALK

MW-10 (3.12)

MW-9 (4.60)

BUS LANE

MW-5 (3.01)

PLANTER

MW-11 (2.73)

MW-13 (5.91)

FORMER UNDERGROUND DISPENSER LINES

FORMER DISPENSER ISLAND

RW-1

UNDEVELOPED MARSHY LAND

MW-12 (3.44)

FORMER SERVICE STATION BUILDING

FORMER GASOLINE USTs

PROPERTY LINE

MW-14 (3.62)

FORMER HEATING OIL UST

FORMER USED OIL UST

DRAINAGE DITCH

FORMER SERVICE STATION PARCEL (SITE) BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

46TH AVENUE

MW-8 (4.08)

HENRI'S RESTAURANT

0 30 60

SCALE IN FEET.

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22118 20th AVE SE
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APPR. MDS
REVIS.
PROJECT NO. 101.00173.00010

FIGURE 4
FORMER ARCO SERVICE STATION #0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON
SHALLOW GROUNDWATER ELEVATIONS - JUNE 16, 2011 (NON-PUMPING CONDITIONS)

BOON DOX TAVERN

BOON DOX MARKET

DMW-7 (2.35)

TEXACO SERVICE STATION

LEGEND

DMW-5 — DEEP GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

RW-1 — DEEP GROUNDWATER RECOVERY WELL LOCATION AND DESIGNATION

(2.21) — DEEP GROUNDWATER ELEVATION (IN FEET ABOVE THE NAVD 88 DATUM)

OCEAN BEACH HIGHWAY

SIDEWALK

DMW-8 (2.35)

SIDEWALK

DMW-6 (2.18)

BUS LANE

DMW-4 (2.19)

PLANTER

DMW-5 (2.19)

DMW-9 (2.21)

FORMER UNDERGROUND DISPENSER LINES

FORMER DISPENSER ISLAND

RW-1 (-15.92)

UNDEVELOPED MARSHY LAND

FORMER GASOLINE USTs

DMW-10 (2.20)

FORMER SERVICE STATION BUILDING

PROPERTY LINE

FORMER HEATING OIL UST

FORMER USED OIL UST

DRAINAGE DITCH

DMW-3 (2.42)

FORMER SERVICE STATION PARCEL (SITE) BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

46TH AVENUE

HENRI'S RESTAURANT

0 30 60

SCALE IN FEET

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SLR
22118 20th AVE SE
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BOTHELL, WA 98021
T: 425-402-8800
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DATE 02/12
DWN. BDT
APPR. MDS
REVIS.
PROJECT NO. 101.00173.00010

FIGURE 5
FORMER ARCO SERVICE STATION #0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON
DEEP GROUNDWATER ELEVATIONS - JUNE 30, 2011 (SYSTEM OPERATING)

BOON DOX TAVERN

BOON DOX MARKET

TEXACO SERVICE STATION

LEGEND

MW-5 ⊕ SHALLOW GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

RW-1 ⊙ DEEP GROUNDWATER RECOVERY WELL LOCATION AND LOCATION

(2.70) SHALLOW GROUNDWATER ELEVATION (IN FEET ABOVE THE NAVD 88 DATUM)

NOTE: AT THE TIME OF THE SHALLOW GROUNDWATER LEVEL MEASUREMENTS, THE GROUNDWATER ELEVATION IN THE DEEP GROUNDWATER RECOVERY WELL WAS -15.92 FEET ABOVE THE NAVD 88 DATUM.

OCEAN BEACH HIGHWAY

SIDEWALK

SIDEWALK

MW-10 (2.86)

MW-9 (4.67)

BUS LANE

MW-5 (2.70)

PLANTER

MW-11 (2.54)

MW-13 (4.78)

FORMER UNDERGROUND DISPENSER LINES

FORMER DISPENSER ISLAND

RW-1

UNDEVELOPED MARSHY LAND

MW-12 (2.99)

FORMER SERVICE STATION BUILDING

FORMER GASOLINE USTs

PROPERTY LINE

MW-14 (2.88)

FORMER HEATING OIL UST

FORMER USED OIL UST

DRAINAGE DITCH

FORMER SERVICE STATION PARCEL (SITE) BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

46TH AVENUE

MW-8 (3.80)

HENRI'S RESTAURANT

0 30 60

SCALE IN FEET

SLR
22118 20th AVE SE
BLDG. G, SUITE 202
BOTHELL, WA 98021
T: 425-402-8800
F: 425-402-8488

DATE 02/12
DWN. BDT
APPR. MDS
REVIS.
PROJECT NO. 101.00173.00010

FIGURE 6
FORMER ARCO SERVICE STATION #0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON
SHALLOW GROUNDWATER ELEVATIONS - JUNE 30, 2011 (SYSTEM OPERATING)

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APPENDIX A

LABORATORY ANALYTICAL REPORTS – TREATMENT SYSTEM SAMPLES

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 | 360.577.7222 | 360.636.1068 (fax) | www.caslab.com

January 25, 2011 Analytical Report for Service Request No: K1100469

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview Former Arco/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on January 18, 2011. For your reference, these analyses have been assigned our service request number K1100469.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

For Mike Shelton
Project Chemist

MS/dlm

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value that was detected outside the quantitation range.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	01/18/2011
Sample Matrix:	Water	**Date Received:**	01/18/2011

Gasoline Range Organics

Sample Name:	Inf - 11811	**Units:**	ug/L
Lab Code:	K1100469-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	01/19/11	01/19/11	KWG1100717	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	50-150	01/19/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	01/18/2011
Sample Matrix:	Water	**Date Received:**	01/18/2011

Gasoline Range Organics

Sample Name:	Eff1 - 11811	**Units:**	ug/L
Lab Code:	K1100469-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	01/19/11	01/19/11	KWG1100717	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	50-150	01/19/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	01/18/2011
Sample Matrix:	Water	**Date Received:**	01/18/2011

Gasoline Range Organics

Sample Name:	Eff2 - 11811	**Units:**	ug/L
Lab Code:	K1100469-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	01/19/11	01/19/11	KWG1100717	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	50-150	01/19/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1100717-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	01/19/11	01/19/11	KWG1100717	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	103	50-150	01/19/11	Acceptable

Comments:

Client: SLR International
Project: Longview Former Arco/101.00173.00010
Sample Matrix: Water

Service Request: K1100469

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Inf - 11811	K1100469-001	103
Eff1 - 11811	K1100469-002	103
Eff2 - 11811	K1100469-003	103
Inf - 11811DUP	KWG1100717-1	103
Method Blank	KWG1100717-3	103
Lab Control Sample	KWG1100717-2	106

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Extracted:**	01/19/2011
Sample Matrix:	Water	**Date Analyzed:**	01/19/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	Inf - 11811	**Units:**	ug/L
Lab Code:	K1100469-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1100717

Analyte Name	MRL	Sample Result	Inf - 11811DUP KWG1100717-1 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Gasoline Range Organics-NWTPH	250	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Extracted:**	01/19/2011
Sample Matrix:	Water	**Date Analyzed:**	01/19/2011

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1100717

	Lab Control Sample KWG1100717-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics-NWTPH	483	500	97	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	Service Request:	K1100469
Project:	Longview Former Arco/101.00173.00010	Date Collected:	01/18/2011
Sample Matrix:	Water	Date Received:	01/18/2011

Volatile Organic Compounds

Sample Name:	Inf - 11811	Units:	ug/L
Lab Code:	K1100469-001	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	13		0.50	1	01/19/11	01/19/11	KWG1100668	
Toluene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Ethylbenzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
m,p-Xylenes	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
o-Xylene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	85	73-122	01/19/11	Acceptable
Toluene-d8	92	78-129	01/19/11	Acceptable
4-Bromofluorobenzene	86	68-117	01/19/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	01/18/2011
Sample Matrix:	Water	**Date Received:**	01/18/2011

Volatile Organic Compounds

Sample Name:	Eff1 - 11811	**Units:**	ug/L
Lab Code:	K1100469-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Toluene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Ethylbenzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
m,p-Xylenes	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
o-Xylene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	85	73-122	01/19/11	Acceptable
Toluene-d8	92	78-129	01/19/11	Acceptable
4-Bromofluorobenzene	86	68-117	01/19/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	01/18/2011
Sample Matrix:	Water	**Date Received:**	01/18/2011

Volatile Organic Compounds

Sample Name:	Eff2 - 11811	**Units:**	ug/L
Lab Code:	K1100469-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Toluene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Ethylbenzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
m,p-Xylenes	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
o-Xylene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	83	73-122	01/19/11	Acceptable
Toluene-d8	91	78-129	01/19/11	Acceptable
4-Bromofluorobenzene	85	68-117	01/19/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1100668-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Toluene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
Ethylbenzene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
m,p-Xylenes	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	
o-Xylene	ND	U	0.50	1	01/19/11	01/19/11	KWG1100668	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	83	73-122	01/19/11	Acceptable
Toluene-d8	92	78-129	01/19/11	Acceptable
4-Bromofluorobenzene	86	68-117	01/19/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient: SLR International **Service Request:** K1100469
:oject: Longview Former Arco/101.00173.00010
ımple Matrix: Water

Surrogate Recovery Summary
Volatile Organic Compounds

ıtraction Method: EPA 5030B **Units:** PERCENT
ıalysis Method: 8260B **Level:** Low

ımple Name	Lab Code	Sur1	Sur2	Sur3
ıtch QC	K1100379-001	86	92	86
f - 11811	K1100469-001	85	92	86
ff1 - 11811	K1100469-002	85	92	86
ff2 - 11811	K1100469-003	83	91	85
ethod Blank	KWG1100668-4	83	92	86
ıtch QCMS	KWG1100668-1	91	96	90
ıtch QCDMS	KWG1100668-2	89	97	91
ıb Control Sample	KWG1100668-3	90	97	90

ırrogate Recovery Control Limits(%)

ur1	= Dibromofluoromethane	73-122
ur2	= Toluene-d8	78-129
ur3	= 4-Bromofluorobenzene	68-117

esults flagged with an asterisk (*) indicate values outside control criteria.
esults flagged with a pound (#) indicate the control criteria is not applicable.

Client:	SLR International	**Service Request:**	K1100469
Project:	Longview Former Arco/101.00173.00010	**Date Extracted:**	01/19/2011
Sample Matrix:	Water	**Date Analyzed:**	01/19/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1100379-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG1100668

Analyte Name	Sample Result	Batch QCMS KWG1100668-1 Matrix Spike			Batch QCDMS KWG1100668-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	10.4	10.0	104	10.6	10.0	106	69-126	2	30
Toluene	ND	10.3	10.0	103	10.6	10.0	106	66-128	2	30
Ethylbenzene	ND	9.92	10.0	99	10.3	10.0	103	65-126	3	30
m,p-Xylenes	ND	19.6	20.0	98	20.5	20.0	103	63-130	5	30
o-Xylene	ND	9.88	10.0	99	10.2	10.0	102	65-130	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ient:	SLR International	**Service Request:**	K1100469
oject:	Longview Former Arco/101.00173.00010	**Date Extracted:**	01/19/2011
mple Matrix:	Water	**Date Analyzed:**	01/19/2011

Lab Control Spike Summary
Volatile Organic Compounds

traction Method:	EPA 5030B	**Units:**	ug/L
alysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1100668

	Lab Control Sample KWG1100668-3 Lab Control Spike			
alyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
nzene	10.7	10.0	107	74-118
luene	10.7	10.0	107	74-117
hylbenzene	10.1	10.0	101	71-118
p-Xylenes	20.4	20.0	102	73-119
Xylene	10.1	10.0	101	74-120

ults flagged with an asterisk (*) indicate values outside control criteria.

cent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

CHAIN OF CUSTODY

Columbia Analytical Services

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR#: K1100469

PAGE _____ OF _____ COC #_____

PROJECT NAME: Longview Former ARCO
PROJECT NUMBER: 101.00173.00010
PROJECT MANAGER: Mike Staton
COMPANY/ADDRESS: SLR
CITY/STATE/ZIP:
E-MAIL ADDRESS: MStaton@SLRconsulting.com
PHONE #: (425) 402-8800 FAX #:
SAMPLER'S SIGNATURE: Chris Kramer

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐	Hydrocarbons (*see below) Gas ☒ 8021 ☐ BTEX ☒ Diesel ☐ Oil ☐ Fuel Fingerprint ☐ NW-HCID ☐	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics Tri ☐ Tetra ☐ 8151M PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO4, PO4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	REMARKS
INF-11811	1/18/11	945		W	6		X	X												
Eff1-11811	↓	950		↓	5		X	X												
Eff2-11811	↓	955		↓	5		X	X												

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. # _____
Bill To: _____

TURNAROUND REQUIREMENTS

___ ~~24 hr.~~ ___ 48 hr.
X 5 Day
___ Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

5 Day TAT

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Chris Kramer	Signature:	Signature:	Signature:
Date/Time: 1/18/11 1240	Date/Time: 1/18/11 1240	Date/Time:	Date/Time:
Printed Name: Chris Kramer	Printed Name: Les Kennedy	Printed Name:	Printed Name:
Firm: SLR	Firm: EAS	Firm:	Firm:

RCOC #1 03/10

Columbia Analytical Services

1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

February 23, 2011 Analytical Report for Service Request No: K1101258

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview Former ARCO #0855/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on February 15, 2011. For your reference, these analyses have been assigned our service request number K1101258.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton
Project Chemist

MS/ln

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	In accordance with the 2007 EPA Methods Update Rule published in the Federal Register, the holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value that was detected outside the quantitation range.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
Sample Matrix:	Water	**Date Received:**	02/15/2011

Gasoline Range Organics

Sample Name:	INF-21511	**Units:**	ug/L
Lab Code:	K1101258-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/17/11	02/17/11	KWG1101556	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	94	50-150	02/17/11	Acceptable

Comments

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
Sample Matrix:	Water	**Date Received:**	02/15/2011

Gasoline Range Organics

Sample Name:	EFF1-21511	**Units:**	ug/L
Lab Code:	K1101258-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/17/11	02/17/11	KWG1101556	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	94	50-150	02/17/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
Sample Matrix:	Water	**Date Received:**	02/15/2011

Gasoline Range Organics

Sample Name:	EFF2-21511	**Units:**	ug/L
Lab Code:	K1101258-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/17/11	02/17/11	KWG1101556	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	94	50-150	02/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	SLR International	**Service Request:**	K1101258
roject:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
ample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

ample Name:	Method Blank	**Units:**	ug/L
ab Code:	KWG1101556-3	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	NWTPH-Gx		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
asoline Range Organics-NWTPH	ND	U	250	1	02/17/11	02/17/11	KWG1101556	

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
,4-Difluorobenzene	93	50-150	02/17/11	Acceptable

omments:

Client: SLR International
Project: Longview Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1101258

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
INF-21511	K1101258-001	94
EFF1-21511	K1101258-002	94
EFF2-21511	K1101258-003	94
INF-21511DUP	KWG1101556-1	94
Method Blank	KWG1101556-3	93
Lab Control Sample	KWG1101556-2	98

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	02/17/2011
Sample Matrix:	Water	**Date Analyzed:**	02/17/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	INF-21511	**Units:**	ug/L
Lab Code:	K1101258-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1101556

Analyte Name	MRL	Sample Result	INF-21511DUP KWG1101556-1 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Gasoline Range Organics-NWTPH	250	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	02/17/2011
Sample Matrix:	Water	**Date Analyzed:**	02/17/2011

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1101556

	Lab Control Sample KWG1101556-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics-NWTPH	518	500	104	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
Sample Matrix:	Water	**Date Received:**	02/15/2011

Volatile Organic Compounds

Sample Name:	INF-21511	**Units:**	ug/L
Lab Code:	K1101258-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**15**		0.50	1	02/17/11	02/17/11	KWG1101540	
Toluene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
Ethylbenzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
m,p-Xylenes	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
o-Xylene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	73-122	02/17/11	Acceptable
Toluene-d8	97	78-129	02/17/11	Acceptable
4-Bromofluorobenzene	92	68-117	02/17/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
Sample Matrix:	Water	**Date Received:**	02/15/2011

Volatile Organic Compounds

Sample Name:	EFF1-21511	**Units:**	ug/L
Lab Code:	K1101258-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
Toluene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
Ethylbenzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
m,p-Xylenes	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
o-Xylene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	73-122	02/17/11	Acceptable
Toluene-d8	98	78-129	02/17/11	Acceptable
4-Bromofluorobenzene	93	68-117	02/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	SLR International	**Service Request:**	K1101258
roject:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	02/15/2011
ample Matrix:	Water	**Date Received:**	02/15/2011

Volatile Organic Compounds

ample Name:	EFF2-21511	**Units:**	ug/L
ab Code:	K1101258-003	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
enzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
oluene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
thylbenzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
,p-Xylenes	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
-Xylene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	93	73-122	02/17/11	Acceptable
oluene-d8	97	78-129	02/17/11	Acceptable
-Bromofluorobenzene	91	68-117	02/17/11	Acceptable

omments:

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1101540-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
Toluene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
Ethylbenzene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
m,p-Xylenes	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	
o-Xylene	ND	U	0.50	1	02/17/11	02/17/11	KWG1101540	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	73-122	02/17/11	Acceptable
Toluene-d8	97	78-129	02/17/11	Acceptable
4-Bromofluorobenzene	90	68-117	02/17/11	Acceptable

Comments:

Client: SLR International **Service Request:** K1101258
Project: Longview Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B **Units:** PERCENT
Analysis Method: 8260B **Level:** Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Batch QC	K1101072-005	90	97	94
NF-21511	K1101258-001	92	97	92
FF1-21511	K1101258-002	92	98	93
FF2-21511	K1101258-003	93	97	91
Method Blank	KWG1101540-4	92	97	90
Batch QCMS	KWG1101540-1	93	100	92
Batch QCDMS	KWG1101540-2	93	99	94
Lab Control Sample	KWG1101540-3	94	100	93

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	73-122
Sur2 =	Toluene-d8	78-129
Sur3 =	4-Bromofluorobenzene	68-117

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	02/17/2011
Sample Matrix:	Water	**Date Analyzed:**	02/17/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1101072-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG1101540

Analyte Name	Sample Result	Batch QCMS KWG1101540-1 Matrix Spike			Batch QCDMS KWG1101540-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	9.64	10.0	96	9.40	10.0	94	69-126	3	30
Toluene	ND	9.62	10.0	96	9.23	10.0	92	66-128	4	30
Ethylbenzene	ND	9.36	10.0	94	9.12	10.0	91	65-126	3	30
m,p-Xylenes	ND	18.5	20.0	92	17.9	20.0	89	63-130	3	30
o-Xylene	ND	9.31	10.0	93	9.08	10.0	91	65-130	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1101258
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	02/17/2011
Sample Matrix:	Water	**Date Analyzed:**	02/17/2011

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1101540

	Lab Control Sample KWG1101540-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	8.55	10.0	86	74-118
Toluene	8.41	10.0	84	74-117
Ethylbenzene	8.23	10.0	82	71-118
m,p-Xylenes	16.1	20.0	81	73-119
o-Xylene	8.26	10.0	83	74-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

CHAIN OF CUSTODY

Columbia Analytical Services

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR#: K1101258

PAGE 1 OF 1 COC #

PROJECT NAME: Longview Former ARCO #0855
PROJECT NUMBER: 101.00173.00010
PROJECT MANAGER: Mike Staton
COMPANY/ADDRESS: SLR
CITY/STATE/ZIP:
E-MAIL ADDRESS: MStaton@SLRConsulting.com
PHONE #: (425) 402-8800 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐	Volatile Organics 624☐ 8260☐	Hydrocarbons 8021☐ BTEX☐ Gas☒ Diesel☐ Oil☐ ☐ Fuel Fingerprint (*see below) ☐ NW-HCID	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	Metals, Total or Dissolved (See list below)	Cyanide☐ Hex-Chrom☐	pH, Cond, Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐	REMARKS
INF-2511	2/15/11	1200		W	6		X	X											
EFF1-2511	↓	1205		↓	6		X	X											
EFF2-2511	↓	1210		↓	6		X	X											

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ ~~24 hr.~~ ___ 48 hr.
X 5 Day
___ Standard (10-15 working days)
___ Provide FAX Results
Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

5 DAY TAT

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: 2/15/11 1245	Signature: 12:45	Signature:	Signature:
Date/Time:	Date/Time: 2-15-11	Date/Time:	Date/Time: 2/15/11 12:45
Printed Name: Chris Kramer	Printed Name: Brad Rubin	Printed Name:	Printed Name:
Firm: SLR	Firm: CAS	Firm:	Firm:

5

Columbia Analytical Services™ 1317 S 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

March 21, 2011 Analytical Report for Service Request No: K1102229

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview Former ARCO #0855/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on March 15, 2011. For your reference, these analyses have been assigned our service request number K1102229.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton
Project Chemist

MS/dlm

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	In accordance with the 2007 EPA Methods Update Rule published in the Federal Register, the holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value that was detected outside the quantitation range.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Gasoline Range Organics

Sample Name:	INF-31511	**Units:**	ug/L
Lab Code:	K1102229-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	03/16/11	03/16/11	KWG1102501	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	03/16/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Gasoline Range Organics

Sample Name:	EFF1-31511	**Units:**	ug/L
Lab Code:	K1102229-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	03/16/11	03/16/11	KWG1102501	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	03/16/11	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Gasoline Range Organics

Sample Name:	EFF2-31511	**Units:**	ug/L
Lab Code:	K1102229-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	03/17/11	03/17/11	KWG1102501	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	03/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1102501-1	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	03/17/11	03/17/11	KWG1102501	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	03/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Longview Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1102229

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Batch QC	K1102017-021	88
INF-31511	K1102229-001	91
EFF1-31511	K1102229-002	91
EFF2-31511	K1102229-003	91
Batch QCDUP	KWG1102501-3	87
Method Blank	KWG1102501-1	91
Lab Control Sample	KWG1102501-2	95

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	03/16/2011
Sample Matrix:	Water	**Date Analyzed:**	03/16/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1102017-021	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1102501

Analyte Name	MRL	Sample Result	Batch QCDUP KWG1102501-3 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Gasoline Range Organics-NWTPH	250	250	ND	ND	NC	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	03/17/2011
Sample Matrix:	Water	**Date Analyzed:**	03/17/2011

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1102501

	Lab Control Sample KWG1102501-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics-NWTPH	486	500	97	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Volatile Organic Compounds

Sample Name:	INF-31511	**Units:**	ug/L
Lab Code:	K1102229-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**16**		0.50	1	03/16/11	03/16/11	KWG1102404	
Toluene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Ethylbenzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
m,p-Xylenes	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
o-Xylene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	105	73-122	03/16/11	Acceptable
Toluene-d8	119	78-129	03/16/11	Acceptable
4-Bromofluorobenzene	103	68-117	03/16/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Volatile Organic Compounds

Sample Name:	EFF1-31511	**Units:**	ug/L
Lab Code:	K1102229-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Toluene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Ethylbenzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
m,p-Xylenes	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
o-Xylene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	103	73-122	03/16/11	Acceptable
Toluene-d8	124	78-129	03/16/11	Acceptable
4-Bromofluorobenzene	103	68-117	03/16/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	03/15/2011
Sample Matrix:	Water	**Date Received:**	03/15/2011

Volatile Organic Compounds

Sample Name:	EFF2-31511	**Units:**	ug/L
Lab Code:	K1102229-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Toluene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Ethylbenzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
m,p-Xylenes	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
o-Xylene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	106	73-122	03/16/11	Acceptable
Toluene-d8	121	78-129	03/16/11	Acceptable
4-Bromofluorobenzene	99	68-117	03/16/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1102404-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Toluene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
Ethylbenzene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
m,p-Xylenes	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	
o-Xylene	ND	U	0.50	1	03/16/11	03/16/11	KWG1102404	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	102	73-122	03/16/11	Acceptable
Toluene-d8	120	78-129	03/16/11	Acceptable
4-Bromofluorobenzene	106	68-117	03/16/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Longview Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1102229

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Batch QC	K1102070-018	103	119	104
INF-31511	K1102229-001	105	119	103
EFF1-31511	K1102229-002	103	124	103
EFF2-31511	K1102229-003	106	121	99
Method Blank	KWG1102404-4	102	120	106
Batch QCMS	KWG1102404-1	100	119	108
Batch QCDMS	KWG1102404-2	100	119	107
Lab Control Sample	KWG1102404-3	101	120	108

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	73-122
Sur2 =	Toluene-d8	78-129
Sur3 =	4-Bromofluorobenzene	68-117

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	03/16/2011
Sample Matrix:	Water	**Date Analyzed:**	03/16/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1102070-018	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C	**Extraction Lot:**	KWG1102404

Analyte Name	Sample Result	Batch QCMS KWG1102404-1 Matrix Spike			Batch QCDMS KWG1102404-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	8.66	10.0	87	8.19	10.0	82	69-126	6	30
Toluene	ND	8.99	10.0	90	8.60	10.0	86	66-128	4	30
Ethylbenzene	ND	8.83	10.0	88	8.32	10.0	83	65-126	6	30
m,p-Xylenes	ND	17.7	20.0	89	16.6	20.0	83	63-130	6	30
o-Xylene	ND	8.99	10.0	90	8.48	10.0	85	65-130	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1102229
Project:	Longview Former ARCO #0855/101.00173.00010	**Date Extracted:**	03/16/2011
Sample Matrix:	Water	**Date Analyzed:**	03/16/2011

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260C	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1102404

	Lab Control Sample KWG1102404-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	9.10	10.0	91	74-118
Toluene	9.31	10.0	93	74-117
Ethylbenzene	9.20	10.0	92	71-118
m,p-Xylenes	18.2	20.0	91	73-119
o-Xylene	9.23	10.0	92	74-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services™

CHAIN OF CUSTODY

SR#: K1102229

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

PAGE 1 OF 1 COC #

PROJECT NAME	Longview Former ARCO #0855
PROJECT NUMBER	101.00173.00010
PROJECT MANAGER	Mike Staton
COMPANY/ADDRESS	SLR
CITY/STATE/ZIP	
E-MAIL ADDRESS	MStaton@SLRConsulting.com
PHONE # 425-402-8800	FAX #
SAMPLER'S SIGNATURE	

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐	Volatile Organics 624☐ 8260☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	Metals, Total or Dissolved (See list below)	Cyanide☐ Hex-Chrom☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐					REMARKS
INF-31511	3/15/11	1040		W	6		X	X																
Eff2-31511	↓	1045		↓	6		X	X																
EFF2-31511	↓	1050		↓	6		X	X																

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

___ V. EDD

INVOICE INFORMATION

P.O. # _____

Bill To: _____

TURNAROUND REQUIREMENTS

____ 24 hr. ____ 48 hr.

X 5 Day

____ Standard (10-15 working days)

____ Provide FAX Results

_____ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

5 Day TAT

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature]	Signature: [signature]	Signature	Signature
Date/Time: 3/15/11 1130	Date/Time: 3/15/11 1131	Date/Time	Date/Time
Printed Name: Chris Kramer	Printed Name: [illegible]	Printed Name	Printed Name
Firm: SLR	Firm: CAS KELSO	Firm	Firm

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

April 15, 2011 Analytical Report for Service Request No: K1103120

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview - Former Arco #0855/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on April 11, 2011. For your reference, these analyses have been assigned our service request number K1103120.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton

Mike Shelton
Project Chemist

MS/jw

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	In accordance with the 2007 EPA Methods Update Rule published in the Federal Register, the holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value that was detected outside the quantitation range.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value that was detected outside the quantitation range.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
Sample Matrix:	Water	**Date Received:**	04/11/2011

Gasoline Range Organics

Sample Name:	INF-41111	**Units:**	ug/L
Lab Code:	K1103120-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	04/12/11	04/12/11	KWG1103339	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	50-150	04/12/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
Sample Matrix:	Water	**Date Received:**	04/11/2011

Gasoline Range Organics

Sample Name:	EFF1-41111	**Units:**	ug/L
Lab Code:	K1103120-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	04/12/11	04/12/11	KWG1103339	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
,4-Difluorobenzene	95	50-150	04/12/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
Sample Matrix:	Water	**Date Received:**	04/11/2011

Gasoline Range Organics

Sample Name:	EFF2-41111	**Units:**	ug/L
Lab Code:	K1103120-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	04/12/11	04/12/11	KWG1103339	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	50-150	04/12/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103339-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	04/12/11	04/12/11	KWG1103339	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	50-150	04/12/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Longview - Former Arco #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1103120

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
INF-41111	K1103120-001	95
EFF1-41111	K1103120-002	95
EFF2-41111	K1103120-003	95
EFF1-41111DUP	KWG1103339-1	95
Method Blank	KWG1103339-3	95
Lab Control Sample	KWG1103339-2	99

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	04/12/2011
Sample Matrix:	Water	**Date Analyzed:**	04/12/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	EFF1-41111	**Units:**	ug/L
Lab Code:	K1103120-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1103339

			EFF1-41111DUP KWG1103339-1 Duplicate Sample			
Analyte Name	**MRL**	**Sample Result**	**Result**	**Average**	**Relative Percent Difference**	**RPD Limit**
Gasoline Range Organics-NWTPH	250	ND	ND	ND	-	30

esults flagged with an asterisk (*) indicate values outside control criteria.

esults flagged with a pound (#) indicate the control criteria is not applicable.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	04/12/2011
Sample Matrix:	Water	**Date Analyzed:**	04/12/2011

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103339

	Lab Control Sample KWG1103339-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics-NWTPH	505	500	101	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	SLR International	**Service Request:**	K1103120
roject:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
ample Matrix:	Water	**Date Received:**	04/11/2011

Volatile Organic Compounds

ample Name:	INF-41111	**Units:**	ug/L
ab Code:	K1103120-001	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	8260C		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
enzene	**13**		0.50	1	04/13/11	04/13/11	KWG1103320	
oluene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
thylbenzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
ı,p-Xylenes	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
-Xylene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	110	73-122	04/13/11	Acceptable
oluene-d8	117	78-129	04/13/11	Acceptable
-Bromofluorobenzene	105	68-117	04/13/11	Acceptable

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
Sample Matrix:	Water	**Date Received:**	04/11/2011

Volatile Organic Compounds

Sample Name:	EFF1-41111	**Units:**	ug/L
Lab Code:	K1103120-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Toluene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Ethylbenzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
m,p-Xylenes	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
o-Xylene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	112	73-122	04/13/11	Acceptable
Toluene-d8	118	78-129	04/13/11	Acceptable
4-Bromofluorobenzene	104	68-117	04/13/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	04/11/2011
Sample Matrix:	Water	**Date Received:**	04/11/2011

Volatile Organic Compounds

Sample Name:	EFF2-41111	**Units:**	ug/L
Lab Code:	K1103120-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Toluene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Ethylbenzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
m,p-Xylenes	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
o-Xylene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	113	73-122	04/13/11	Acceptable
Toluene-d8	118	78-129	04/13/11	Acceptable
4-Bromofluorobenzene	104	68-117	04/13/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1103320-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Toluene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
Ethylbenzene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
m,p-Xylenes	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	
o-Xylene	ND	U	0.50	1	04/13/11	04/13/11	KWG1103320	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	109	73-122	04/13/11	Acceptable
Toluene-d8	117	78-129	04/13/11	Acceptable
4-Bromofluorobenzene	105	68-117	04/13/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Longview - Former Arco #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1103120

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Batch QC	K1103027-002	110	117	103
NF-41111	K1103120-001	110	117	105
FF1-41111	K1103120-002	112	118	104
FF2-41111	K1103120-003	113	118	104
Method Blank	KWG1103320-4	109	117	105
Batch QCMS	KWG1103320-1	108	117	109
Batch QCDMS	KWG1103320-2	107	118	109
Lab Control Sample	KWG1103320-3	107	118	110

urrogate Recovery Control Limits (%)

ur1	= Dibromofluoromethane	73-122
ur2	= Toluene-d8	78-129
ur3	= 4-Bromofluorobenzene	68-117

esults flagged with an asterisk (*) indicate values outside control criteria.
esults flagged with a pound (#) indicate the control criteria is not applicable.

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	04/13/2011
Sample Matrix:	Water	**Date Analyzed:**	04/13/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1103027-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C	**Extraction Lot:**	KWG1103320

Analyte Name	Sample Result	Batch QCMS KWG1103320-1 Matrix Spike			Batch QCDMS KWG1103320-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	10.1	10.0	101	9.84	10.0	98	69-126	3	30
Toluene	ND	10.6	10.0	106	10.3	10.0	103	66-128	3	30
Ethylbenzene	ND	10.1	10.0	101	9.66	10.0	97	65-126	4	30
m,p-Xylenes	ND	20.0	20.0	100	19.4	20.0	97	63-130	3	30
o-Xylene	ND	9.94	10.0	99	9.53	10.0	95	65-130	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1103120
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	04/13/2011
Sample Matrix:	Water	**Date Analyzed:**	04/13/2011

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260C	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1103320

	Lab Control Sample KWG1103320-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	9.87	10.0	99	74-118
Toluene	10.4	10.0	104	74-117
Ethylbenzene	9.74	10.0	97	71-118
m,p-Xylenes	19.5	20.0	98	73-119
o-Xylene	9.73	10.0	97	74-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

CHAIN OF CUSTODY

Columbia Analytical Services

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR#: K1103120

PAGE 1 OF 1 COC #

PROJECT NAME: Longview - Former Arco #0855
PROJECT NUMBER: 101.00173.00010
PROJECT MANAGER: Mike Stanton
COMPANY/ADDRESS: SLR
CITY/STATE/ZIP:
E-MAIL ADDRESS: MStanton@slrconsulting.com
PHONE # (425) 402-8800 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐	Hydrocarbons (*see below) 8021 ☐ BTEX ☒ Gas ☒ Diesel ☐ Oil ☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 SGT ☐ 1664 HEM ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐	Hex-Chrom ☐	pH, Cond, Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	REMARKS
INF-41111	4/11/11	1330		W	6		X	X													
EFF1-41111	↓	1335		↓	↓		X	X													
EFF2-41111	↓	1340		↓	↓		X	X													

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
X 5 Day
___ Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

5 Day TAT

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature]	Signature: [signature]	Signature	Signature
Date/Time: 4/11/11 1400	Date/Time: 4/11/11 1410	Date/Time	Date/Time
Printed Name: Chris Kramer	Printed Name: Les Kennedy	Printed Name	Printed Name
Firm: SLR	Firm: CAS	Firm	Firm

BCOC #1 03/10

5

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

May 20, 2011 Analytical Report for Service Request No: K1104383

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview - Former Arco #0855/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on May 17, 2011. For your reference, these analyses have been assigned our service request number K1104383.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton
Project Chemist

MS/jw

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Gasoline Range Organics

Sample Name:	INF-51711	**Units:**	ug/L
Lab Code:	K1104383-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	13	1	05/18/11	05/18/11	KWG1104517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	05/18/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Gasoline Range Organics

Sample Name:	EFF1-51711	**Units:**	ug/L
Lab Code:	K1104383-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	13	1	05/18/11	05/18/11	KWG1104517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	05/18/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Gasoline Range Organics

Sample Name:	EFF2-51711	**Units:**	ug/L
Lab Code:	K1104383-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	13	1	05/18/11	05/18/11	KWG1104517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	92	50-150	05/18/11	Acceptable

Comments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1104517-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	13	1	05/18/11	05/18/11	KWG1104517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	05/18/11	Acceptable

Comments:

Client: SLR International
Project: Longview - Former Arco #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1104383

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Batch QC	K1104218-001	91
INF-51711	K1104383-001	91
EFF1-51711	K1104383-002	91
EFF2-51711	K1104383-003	92
Batch QCDUP	KWG1104517-1	91
Method Blank	KWG1104517-4	91
Lab Control Sample	KWG1104517-2	95
Duplicate Lab Control Sample	KWG1104517-3	95

Surrogate Recovery Control Limits (%)

Sur1 =	1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	05/18/2011
Sample Matrix:	Water	**Date Analyzed:**	05/18/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1104218-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1104517

Analyte Name	MRL	MDL	Sample Result	Batch QCDUP KWG1104517-1 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Gasoline Range Organics-NWTPH	250	13	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	05/18/2011
Sample Matrix:	Water	**Date Analyzed:**	05/18/2011

Lab Control Spike/Duplicate Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1104517

	Lab Control Sample KWG1104517-2 Lab Control Spike			Duplicate Lab Control Sample KWG1104517-3 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Gasoline Range Organics-NWTPH	457	500	91	500	500	100	80-119	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Volatile Organic Compounds

Sample Name:	INF-51711	**Units:**	ug/L
Lab Code:	K1104383-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**14**		0.50	1	05/18/11	05/18/11	KWG1104437	
Toluene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Ethylbenzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
m,p-Xylenes	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
o-Xylene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	97	73-122	05/18/11	Acceptable
Toluene-d8	103	78-129	05/18/11	Acceptable
4-Bromofluorobenzene	95	68-117	05/18/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Volatile Organic Compounds

Sample Name:	EFF1-51711	**Units:**	ug/L
Lab Code:	K1104383-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Toluene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Ethylbenzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
m,p-Xylenes	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
o-Xylene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	05/18/11	Acceptable
Toluene-d8	104	78-129	05/18/11	Acceptable
4-Bromofluorobenzene	96	68-117	05/18/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	05/17/2011
Sample Matrix:	Water	**Date Received:**	05/17/2011

Volatile Organic Compounds

Sample Name:	EFF2-51711	**Units:**	ug/L
Lab Code:	K1104383-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Toluene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Ethylbenzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
m,p-Xylenes	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
o-Xylene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	05/18/11	Acceptable
Toluene-d8	104	78-129	05/18/11	Acceptable
4-Bromofluorobenzene	96	68-117	05/18/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1104437-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Toluene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
Ethylbenzene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
m,p-Xylenes	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	
o-Xylene	ND	U	0.50	1	05/18/11	05/18/11	KWG1104437	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	97	73-122	05/18/11	Acceptable
Toluene-d8	102	78-129	05/18/11	Acceptable
4-Bromofluorobenzene	96	68-117	05/18/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Longview - Former Arco #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1104383

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Batch QC	K1104246-001	99	103	95
INF-51711	K1104383-001	97	103	95
EFF1-51711	K1104383-002	99	104	96
EFF2-51711	K1104383-003	99	104	96
Method Blank	KWG1104437-4	97	102	96
Batch QCMS	KWG1104437-1	99	106	100
Batch QCDMS	KWG1104437-2	101	106	100
Lab Control Sample	KWG1104437-3	100	107	99

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	73-122
Sur2 =	Toluene-d8	78-129
Sur3 =	4-Bromofluorobenzene	68-117

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	05/18/2011
Sample Matrix:	Water	**Date Analyzed:**	05/18/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1104246-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C	**Extraction Lot:**	KWG1104437

Analyte Name	Sample Result	Batch QCMS KWG1104437-1 Matrix Spike			Batch QCDMS KWG1104437-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	ND	10.7	10.0	107	10.5	10.0	105	69-126	2	30
Toluene	ND	10.9	10.0	109	10.6	10.0	106	66-128	3	30
Ethylbenzene	ND	11.4	10.0	114	10.9	10.0	109	65-126	4	30
m,p-Xylenes	ND	22.8	20.0	114	21.8	20.0	109	63-130	4	30
o-Xylene	ND	11.0	10.0	110	10.6	10.0	106	65-130	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1104383
Project:	Longview - Former Arco #0855/101.00173.00010	**Date Extracted:**	05/18/2011
Sample Matrix:	Water	**Date Analyzed:**	05/18/2011

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260C	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1104437

	Lab Control Sample KWG1104437-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	9.71	10.0	97	74-118
Toluene	9.75	10.0	98	74-117
Ethylbenzene	9.94	10.0	99	71-118
m,p-Xylenes	19.9	20.0	100	73-119
o-Xylene	9.99	10.0	100	74-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

24607 CHAIN OF CUSTODY

SR# K1164383

COC Set ____ of ____

Page 1 OF 1 COC# ____

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

Project Name	Longview - Rome ARCO #0855
Project Number	101.00173.00010
Project Manager	Mike Staton
Company Name	SLR
Comany Address	
City/State/Zip	
E-Mail Address	MStaton@SLRConsulting.com
Phone #	425-402-8800
FAX #	
Sampler Signature	

	Sample ID	Date	Time	Lab ID	Matrix	Number of Containers	8260B / VOC_FP (BTEX)	NWTPH-Gx / NW_GAS	14D			Remarks
1	INF-51711	5/17/11	1320		W	6	X	X				1
2	EFF1-51711	↓	1325		↓	6	X	X				2
3	EFF2-51711	↓	1330		↓	6	X	X				3
4												4
5												5
6												6
7												7
8												8
9												9
10												10
11												11

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

___ V. EDD

Invoice Information

P.O.# ____

Bill To: ____

Turnaround Requirements

~~24 hr.~~ ___ 48 hr.

~~5 Day~~ Standard (10-15 working days)

___ Provide Fax Results

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: 5 Day TAT

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other ____ (Circle One)

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Signature	1410 5/17/11	Signature	5/17/11 1415	Signature		Signature	
Printed Name: Chris Kramer	Firm: SLR	Printed Name: SHOPKINS	Firm: CAS	Printed Name	Firm	Printed Name	Firm

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 360.577.7222 360.636.1068 (fax) www.caslab.com

June 23, 2011 Analytical Report for Service Request No: K1105414

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Former ARCO #0855/101.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on June 16, 2011. For your reference, these analyses have been assigned our service request number K1105414.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton
Project Chemist

MS/jw

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	SLR International	**Service Request No.:**	K1105414
Project:	Former ARCO #855	**Date Received:**	6/16/11
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

Sample Receipt

Three water samples were received for analysis at Columbia Analytical Services on 6/16/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recovery of Toluene for sample Batch QC was not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

Approved by Mike Nelson Date 6/23/11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	06/15/2011
Sample Matrix:	Water	**Date Received:**	06/16/2011

Gasoline Range Organics

Sample Name:	INF-061511	**Units:**	ug/L
Lab Code:	K1105414-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	06/20/11	06/20/11	KWG1105684	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	06/20/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	06/15/2011
Sample Matrix:	Water	**Date Received:**	06/16/2011

Gasoline Range Organics

Sample Name:	EFF1-061511	**Units:**	ug/L
Lab Code:	K1105414-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	06/20/11	06/20/11	KWG1105684	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	06/20/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	06/15/2011
Sample Matrix:	Water	**Date Received:**	06/16/2011

Gasoline Range Organics

Sample Name:	EFF2-061511	**Units:**	ug/L
Lab Code:	K1105414-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	06/20/11	06/20/11	KWG1105684	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	90	50-150	06/20/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1105684-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	06/20/11	06/20/11	KWG1105684	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	90	50-150	06/20/11	Acceptable

Comments:

Client: SLR International
Project: Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1105414

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
INF-061511	K1105414-001	91
EFF1-061511	K1105414-002	91
EFF2-061511	K1105414-003	90
Method Blank	KWG1105684-3	90
Lab Control Sample	KWG1105684-1	94
Duplicate Lab Control Sample	KWG1105684-2	94

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

Client: SLR International
Project: Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1105414
Date Extracted: 06/20/2011
Date Analyzed: 06/20/2011

Lab Control Spike/Duplicate Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1105684

	Lab Control Sample KWG1105684-1 Lab Control Spike			Duplicate Lab Control Sample KWG1105684-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Gasoline Range Organics-NWTPH	456	500	91	495	500	99	80-119	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	06/15/2011
Sample Matrix:	Water	**Date Received:**	06/16/2011

Volatile Organic Compounds

Sample Name:	INF-061511	**Units:**	ug/L
Lab Code:	K1105414-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**15**		0.50	1	06/17/11	06/17/11	KWG1105531	
Toluene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Ethylbenzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
m,p-Xylenes	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
o-Xylene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	80	73-122	06/17/11	Acceptable
Toluene-d8	87	78-129	06/17/11	Acceptable
4-Bromofluorobenzene	78	68-117	06/17/11	Acceptable

Comments:

Client: SLR International
Project: Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1105414
Date Collected: 06/15/2011
Date Received: 06/16/2011

Volatile Organic Compounds

Sample Name: EFF1-061511
Lab Code: K1105414-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Toluene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Ethylbenzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
m,p-Xylenes	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
o-Xylene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	82	73-122	06/17/11	Acceptable
Toluene-d8	88	78-129	06/17/11	Acceptable
4-Bromofluorobenzene	78	68-117	06/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	06/15/2011
Sample Matrix:	Water	**Date Received:**	06/16/2011

Volatile Organic Compounds

Sample Name:	EFF2-061511	**Units:**	ug/L
Lab Code:	K1105414-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Toluene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Ethylbenzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
m,p-Xylenes	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
o-Xylene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	81	73-122	06/17/11	Acceptable
Toluene-d8	88	78-129	06/17/11	Acceptable
4-Bromofluorobenzene	77	68-117	06/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1105531-5	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Toluene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
Ethylbenzene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
m,p-Xylenes	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	
o-Xylene	ND	U	0.50	1	06/17/11	06/17/11	KWG1105531	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	81	73-122	06/17/11	Acceptable
Toluene-d8	89	78-129	06/17/11	Acceptable
4-Bromofluorobenzene	78	68-117	06/17/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: SLR International
Project: Former ARCO #0855/101.00173.00010
Sample Matrix: Water

Service Request: K1105414

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
Batch QC	K1105338-002	90	92	83
MW-061511	K1105414-001	80	87	78
EFF1-061511	K1105414-002	82	88	78
EFF2-061511	K1105414-003	81	88	77
Method Blank	KWG1105531-5	81	89	78
Batch QCMS	KWG1105531-1	91	97	85
Batch QCDMS	KWG1105531-2	90	96	85
Lab Control Sample	KWG1105531-3	90	97	86
Duplicate Lab Control Sample	KWG1105531-4	91	96	84

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	73-122
Sur2 =	Toluene-d8	78-129
Sur3 =	4-Bromofluorobenzene	68-117

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Extracted:**	06/17/2011
Sample Matrix:	Water	**Date Analyzed:**	06/17/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1105338-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C	**Extraction Lot:**	KWG1105531

Analyte Name	Sample Result	Batch QCMS KWG1105531-1 Matrix Spike			Batch QCDMS KWG1105531-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	25	10200	10000	101	9840	10000	98	69-126	3	30
Toluene	57000	62800	10000	55 #	61100	10000	38 #	66-128	3	30
Ethylbenzene	4000	13800	10000	99	13200	10000	93	65-126	4	30
m,p-Xylenes	13000	32400	20000	96	31400	20000	91	63-130	3	30
o-Xylene	4400	14300	10000	99	13800	10000	94	65-130	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1105414
Project:	Former ARCO #0855/101.00173.00010	**Date Extracted:**	06/17/2011
Sample Matrix:	Water	**Date Analyzed:**	06/17/2011

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260C	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1105531

	Lab Control Sample KWG1105531-3 Lab Control Spike			Duplicate Lab Control Sample KWG1105531-4 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Benzene	10.7	10.0	107	10.5	10.0	105	74-118	1	30
Toluene	10.9	10.0	109	10.7	10.0	107	74-117	1	30
Ethylbenzene	10.6	10.0	106	10.4	10.0	104	71-118	2	30
m,p-Xylenes	21.4	20.0	107	20.8	20.0	104	73-119	3	30
o-Xylene	10.4	10.0	104	10.3	10.0	103	74-120	1	30

esults flagged with an asterisk (*) indicate values outside control criteria.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

CHAIN OF CUSTODY

SR#: K1105414

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

PAGE 1 OF 1 COC #

PROJECT NAME	Former ARCO #0855, Longview, WA
PROJECT NUMBER	101.00173.00010
PROJECT MANAGER	MIKE STATON
COMPANY/ADDRESS	SLR INTERNATIONAL CORP
	22118 30TH AVE SE, G-202
CITY/STATE/ZIP	BOTHELL, WA 98021
E-MAIL ADDRESS	mstaton@slrconsulting.com
PHONE #	(425) 402-8800
FAX #	(425) 402-8488
SAMPLER'S SIGNATURE	

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐	Volatile Organics 624☐ 8260☐ 8021☒ BTEX☒	Hydrocarbons (*see below) Gas☒ Diesel☐ Oil☐	☐ Fuel Fingerprint (FIQ) ☐☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	Metals, Total or Dissolved (See list below)	Cyanide☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐	REMARKS
INF-061511	6/15/11	1650		W	3		X	X									Hex-Chrom☐			
EFF1-061511	↓	1655		↓	↓		X	X												
EFF2-061511	↓	1700		↓	↓		X	X												

REPORT REQUIREMENTS

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. Data Validation Report (includes all raw data)
- ___ IV. CLP Deliverable Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # 101.00173.00010

Bill To: SLR

TURNAROUND REQUIREMENTS

- ___ 24 hr. ___ 48 hr.
- X 5 Day
- ___ Standard (10-15 working days)
- ___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI (NORTHWEST) OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 6/16/11	Date/Time: 6/16/11 1007	Date/Time:	Date/Time:
Printed Name: CHRIS LEE	Printed Name: Brad Tubin	Printed Name:	Printed Name:
Firm: 1007	Firm: CAS	Firm:	Firm:

Columbia Analytical Services™ 1317 S. 13th Avenue, Kelso, WA 98626 | 360.577.7222 | 360.636.1068 (fax) www.caslab.com

July 20, 2011 Analytical Report for Service Request No: K1106376

Mike Staton
SLR International
22118 20th Avenue, Suite G202
Bothell, WA 98021

RE: Longview Former ARCO #0855/001.00173.00010

Dear Mike:

Enclosed are the results of the rush samples submitted to our laboratory on July 14, 2011. For your reference, these analyses have been assigned our service request number K1106376.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at MShelton@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Mike Shelton

Mike Shelton
Project Chemist

MS/lg

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.1 definition*: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Agency	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DEQ	WA100010
South Carolina DHEC	61002
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	SLR International	**Service Request No.:**	K1106376
Project:	Longview Former Arco #0855	**Date Received:**	7/14/11
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

Sample Receipt

Three water samples were received for analysis at Columbia Analytical Services on 7/14/11. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Matrix Spike Recovery Exceptions:
The matrix spike recovery of Benzene for sample INF-71411DMS was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

Approved by Mike Skelton Date 7/21/11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
Sample Matrix:	Water	**Date Received:**	07/14/2011

Gasoline Range Organics

Sample Name:	INF-71411	**Units:**	ug/L
Lab Code:	K1106376-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	07/15/11	07/15/11	KWG1106673	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	07/15/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
Sample Matrix:	Water	**Date Received:**	07/14/2011

Gasoline Range Organics

Sample Name:	EFF1-71411	**Units:**	ug/L
Lab Code:	K1106376-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	07/15/11	07/15/11	KWG1106673	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	07/15/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
Sample Matrix:	Water	**Date Received:**	07/14/2011

Gasoline Range Organics

Sample Name:	EFF2-71411	**Units:**	ug/L
Lab Code:	K1106376-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	07/15/11	07/15/11	KWG1106673	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	07/15/11	Acceptable

Comments:

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1106673-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	07/15/11	07/15/11	KWG1106673	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	07/15/11	Acceptable

Comments:

Client: SLR International
Project: Longview Former ARCO #0855/001.00173.00010
Sample Matrix: Water

Service Request: K1106376

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5030B
Analysis Method: NWTPH-Gx

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1
Batch QC	K1106335-002	89
NF-71411	K1106376-001	89
FF1-71411	K1106376-002	89
FF2-71411	K1106376-003	89
Batch QCDUP	KWG1106673-1	89
Method Blank	KWG1106673-3	89
Lab Control Sample	KWG1106673-2	92

Surrogate Recovery Control Limits (%)

Sur1 = 1,4-Difluorobenzene	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Extracted:**	07/15/2011
Sample Matrix:	Water	**Date Analyzed:**	07/15/2011

Duplicate Sample Summary
Gasoline Range Organics

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K1106335-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx	**Extraction Lot:**	KWG1106673

Analyte Name	MRL	Sample Result	Batch QCDUP KWG1106673-1 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Gasoline Range Organics-NWTPH	250	ND	ND	ND	-	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Extracted:**	07/15/2011
Sample Matrix:	Water	**Date Analyzed:**	07/15/2011

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	NWTPH-Gx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1106673

	Lab Control Sample KWG1106673-2 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Gasoline Range Organics-NWTPH	455	500	91	80-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
Sample Matrix:	Water	**Date Received:**	07/14/2011

Volatile Organic Compounds

Sample Name:	INF-71411	**Units:**	ug/L
Lab Code:	K1106376-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**11**		0.50	1	07/15/11	07/15/11	KWG1106679	
Toluene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
Ethylbenzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
m,p-Xylenes	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
o-Xylene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	109	73-122	07/15/11	Acceptable
Toluene-d8	115	78-129	07/15/11	Acceptable
4-Bromofluorobenzene	97	68-117	07/15/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	SLR International	**Service Request:**	K1106376
roject:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
ample Matrix:	Water	**Date Received:**	07/14/2011

Volatile Organic Compounds

ample Name:	EFF1-71411	**Units:**	ug/L
ab Code:	K1106376-002	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	8260C		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
enzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
oluene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
thylbenzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
,p-Xylenes	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
-Xylene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	109	73-122	07/15/11	Acceptable
oluene-d8	117	78-129	07/15/11	Acceptable
-Bromofluorobenzene	97	68-117	07/15/11	Acceptable

omments

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	07/14/2011
Sample Matrix:	Water	**Date Received:**	07/14/2011

Volatile Organic Compounds

Sample Name:	EFF2-71411	**Units:**	ug/L
Lab Code:	K1106376-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
Toluene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
Ethylbenzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
m,p-Xylenes	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
o-Xylene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	109	73-122	07/15/11	Acceptable
Toluene-d8	117	78-129	07/15/11	Acceptable
4-Bromofluorobenzene	97	68-117	07/15/11	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	SLR International	**Service Request:**	K1106376
roject:	Longview Former ARCO #0855/001.00173.00010	**Date Collected:**	NA
ample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

ample Name:	Method Blank	**Units:**	ug/L
ab Code:	KWG1 106679-4	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	8260C		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
enzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
oluene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
thylbenzene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
,p-Xylenes	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	
-Xylene	ND	U	0.50	1	07/15/11	07/15/11	KWG1106679	

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	108	73-122	07/15/11	Acceptable
oluene-d8	116	78-129	07/15/11	Acceptable
-Bromofluorobenzene	96	68-117	07/15/11	Acceptable

omments:

Client: SLR International
Project: Longview Former ARCO #0855/001.00173.00010
Sample Matrix: Water

Service Request: K1106376

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
INF-71411	K1106376-001	109	115	97
EFF1-71411	K1106376-002	109	117	97
EFF2-71411	K1106376-003	109	117	97
Method Blank	KWG1106679-4	108	116	96
INF-71411MS	KWG1106679-1	106	118	101
INF-71411DMS	KWG1106679-2	107	117	99
Lab Control Sample	KWG1106679-3	106	117	100

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	73-122
Sur2 =	Toluene-d8	78-129
Sur3 =	4-Bromofluorobenzene	68-117

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Extracted:**	07/15/2011
Sample Matrix:	Water	**Date Analyzed:**	07/15/2011

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	INF-71411	**Units:**	ug/L
Lab Code:	K1106376-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C	**Extraction Lot:**	KWG1106679

Analyte Name	Sample Result	INF-71411MS KWG1106679-1 Matrix Spike			INF-71411DMS KWG1106679-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Benzene	11	17.7	10.0	67	16.7	10.0	57 *	63-144	6	30
Toluene	ND	8.88	10.0	89	8.23	10.0	82	71-136	8	30
Ethylbenzene	ND	7.96	10.0	80	7.55	10.0	76	66-136	5	30
m,p-Xylenes	ND	15.9	20.0	79	14.8	20.0	74	67-135	7	30
o-Xylene	ND	8.08	10.0	81	7.57	10.0	76	70-130	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	SLR International	**Service Request:**	K1106376
Project:	Longview Former ARCO #0855/001.00173.00010	**Date Extracted:**	07/15/2011
Sample Matrix:	Water	**Date Analyzed:**	07/15/2011

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260C	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG1106679

	Lab Control Sample KWG1106679-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Benzene	8.27	10.0	83	69-124
Toluene	9.10	10.0	91	69-124
Ethylbenzene	8.17	10.0	82	67-121
m,p-Xylenes	16.0	20.0	80	69-121
o-Xylene	8.11	10.0	81	71-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded

Columbia Analytical Services

25159 CHAIN OF CUSTODY

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR# K1106376

COC Set____ of____

Page 1 OF 1 COC# _____

Project Name	Longview Towne Arco #0855
Project Number	401.00873.00010
Project Manager	Mike Staton
Company Name	SLR
Comany Address	
City/State/Zip	
E-Mail Address	MStaton@SLRconsulting.com
Phone #	425-402-8800
FAX #	
Sampler Signature	

Sample ID	Date	Time	Lab ID	Matrix	Number of Containers	8260B / VOC_FP (14D)	NWTPH-Gx / NW_GAS				Remarks
1 INF-71411	7/14/11	1106		W	6	X	X				1
2 EFF1-71411	"	1105		"	6	X	X				2
3 EFF2-71411	"	1110		"	6	X	X				3
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

___ V. EDD

Invoice Information

P.O.# _____

Bill To: _____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

X 5 Day

___ Standard (10-15 working days)

___ Provide Fax Results

_____ Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments: 5 Day TAT

*Indicate State Hydrocarbon Procedure: AK CA WI (Northwest) Other____(Circle One)

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

Relinquished By:		Received By:		Relinquished By:		Received By:	
Signature	Date/Time 7/14/11 1136	Signature	Date/Time 7/14/11 1136	Signature	Date/Time	Signature	Date/Time
Printed Name Chris Kramer	Firm SLR	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

9