SLR

October 17, 2014
Project 101.00173.00011

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

Re: Groundwater Sampling Report – September 2014 Event
Former Arco Service Station #0855, Longview, Washington

Dear Mr. Middleton:

On behalf of Wakefield Family LLC (the property owner), SLR International Corporation (SLR) has prepared this report to present the results of the annual groundwater sampling event that was conducted in September 2014 at the above-referenced site. The former Arco Service Station #0855 property is located at 4603 Ocean Beach Highway, near the western end of Longview, Washington (see Figure 1). The purposes of the groundwater sampling program are to assess the effectiveness of the previous remedial actions, and to monitor the natural attenuation of the remaining petroleum hydrocarbon concentrations in the shallow groundwater-bearing unit and the deeper aquifer over time.

BACKGROUND

From September through December 2007, a total of 3,403.36 tons of petroleum hydrocarbon-impacted soil was excavated and hauled to the Hillsboro Landfill for disposal, and 20,785 gallons of shallow groundwater were extracted from the open excavations and treated prior to discharge to the sanitary sewer system (SLR, 2008a). After completing the 2007 remedial action at the property, quarterly groundwater sampling results in 2007 and 2008 showed that the samples from all of the shallow groundwater monitoring wells, except MW-10, and from all of the deep groundwater monitoring wells, except DMW-4, DMW-5, DMW-9, and DMW-10, contained petroleum hydrocarbon concentrations below the Model Toxics Control Act (MTCA) Method A groundwater cleanup levels for four consecutive quarters (SLR, 2008a; SLR, 2008b; and SLR, 2008c). To remediate the remaining impacted groundwater in the deep aquifer, a deep groundwater recovery well (RW-1) was installed and a recovery/treatment system initially operated from June 2009 through July 2011. The system was deactivated after the groundwater concentrations in all of the deep wells were near or below the Method A cleanup levels. The locations of the shallow groundwater monitoring wells are shown on Figure 2, and the locations of the deep groundwater monitoring wells and RW-1 are shown on Figure 3.

From September 2009 through December 2012, the groundwater sampling program consisted of conducting annual sampling events (collect samples from all of the shallow and deep monitoring wells) in September, and conducting quarterly sampling events (collect samples

from shallow well MW-10 and from deep wells DMW-5, DMW-9, and DMW-10) in December, March, and June. In March 2012, deep well DMW-4 was added to the quarterly sampling program. The groundwater sampling results showed that samples from shallow well MW-10 and from deep wells DMW-4, DMW-5, and DMW-9 contained petroleum hydrocarbon concentrations below the MTCA Method A cleanup levels for four consecutive quarters (SLR, 2009; SLR, 2010a; SLR, 2010b; SLR, 2010c; SLR, 2010d; SLR, 2011a; SLR, 2011b; SLR, 2011c; SLR, 2011d; SLR, 2012a; SLR, 2012b; SLR, 2012c; SLR, 2012d; and SLR, 2013a). Therefore, MW-10, DMW-4, DMW-5, and DMW-9 were eliminated from the future quarterly groundwater sampling events.

Based on the results of the previous investigation activities at the site, the lateral extents of the hydrocarbon-impacted deep groundwater were effectively delineated in all directions, except to the southwest (west and south of well DMW-10). To delineate the southwestern extent of the impacted deep groundwater, two deep groundwater monitoring wells (designated DMW-11 and DMW-12) were installed to the west and south, respectively, of DMW-10 in May 2013. The locations of DMW-11 and DMW-12 are shown on Figure 3. SLR collected groundwater samples from DMW-11 and DMW-12 in May and June 2013, and the samples did not contain petroleum hydrocarbon concentrations greater than the method reporting limits (SLR, 2013b). In June 2013, a groundwater sample was also collected from DMW-10, and the sample contained a benzene concentration [38 micrograms per liter (µg/L)] that exceeded the MTCA Method A cleanup level (5 µg/L).

Based on the results of the May and June 2013 groundwater sampling events, the remaining hydrocarbon-impacted deep groundwater at the site was confined to a localized area near well DMW-10. To recover the remaining impacted groundwater, a deep groundwater recovery well (designated RW-2) was installed approximately 5 feet northeast of DMW-10 (see Figure 3), and the modified recovery/treatment system operated from June through October 2013. A total of 2,149,779 gallons of groundwater were extracted and treated during the 2013 system operations (SLR, 2014a). The system was deactivated on October 30, 2013, because the benzene concentrations in the treatment system influent samples had decreased to below the MTCA Method A cleanup levels (SLR, 2014a) and all of the groundwater samples collected in September 2013, including from DMW-10, contained petroleum hydrocarbon concentrations below the Method A cleanup levels (SLR, 2013b).

After the installation of the new monitoring wells in May 2013, the groundwater sampling program has consisted of conducting annual sampling events (collect samples from all of the shallow and deep monitoring wells) in September, and conducting quarterly sampling events (collect samples from deep wells DMW-10, DMW-11, and DMW-12) in December, March, and June. The June and September 2013 sampling results were described above. In December 2013 and March 2014, the samples from DMW-10, DMW-11, and DMW-12 did not contain petroleum hydrocarbon concentrations greater than the MTCA Method A cleanup levels (SLR, 2014a and SLR, 2014b). The groundwater sampling results from the June 2013 through March 2014 sampling events showed that samples from deep wells DMW-11 and DMW-12 contained petroleum hydrocarbon concentrations below the Method A cleanup

levels for four consecutive quarters (SLR, 2013b; SLR, 2014a; and SLR, 2014b). Therefore, DMW-11 and DMW-12 were eliminated from the future quarterly groundwater sampling events. In June 2014, a groundwater sample was only collected from deep well DMW-10, and the groundwater sampling results from the September 2013 through June 2014 sampling events showed that the samples from DMW-10 contained petroleum hydrocarbon concentrations below the Method A cleanup levels for four consecutive quarters (SLR, 2013b; SLR, 2014a; SLR, 2014b; and SLR, 2014c). The groundwater sample analytical results from the September and December 2013 sampling events and the March and June 2014 sampling events showed that the 2013 deep groundwater recovery operations effectively removed the remaining petroleum hydrocarbon-impacted deep groundwater at the site.

SEPTEMBER 2014 SAMPLING EVENT

SLR personnel conducted an annual groundwater sampling event on September 17 and 18, 2014, to further verify that the shallow and deep groundwater at the site no longer contain petroleum hydrocarbon concentrations greater than the MTCA Method A cleanup levels. Immediately prior to sampling, SLR measured the depths to groundwater in all of the shallow monitoring wells (MW-5, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, and MW-14), all of the deep monitoring wells (DMW-3, DMW-4, DMW-5, DMW-6, DMW-7, DMW-8, DMW-9, DMW-10, DMW-11, and DMW-12), and in the inactive deep groundwater recovery wells (RW-1 and RW-2) by using an electronic water level probe. The depth to groundwater measurements were converted to groundwater elevations by using the results of previous well elevation surveys conducted by Gibbs and Olson, Inc., of Longview, Washington. The depths to groundwater in the shallow wells ranged from 4.77 to 8.05 feet below the tops of the well casings. The groundwater elevations in the shallow wells ranged from 1.00 to 4.17 feet above the NAVD 88 datum. The depths to groundwater in the deep wells ranged from 5.24 to 11.18 feet below the tops of the well casings. The groundwater elevations in the deep wells ranged from 1.25 to 1.47 feet above the NAVD 88 datum. The groundwater elevations in the shallow and deep wells were inconsistent and could not be used to determine the general groundwater flow direction beneath the site area. The groundwater monitoring data from the September 2014 sampling event, as well as from the previous groundwater sampling events, are presented in Table 1. The groundwater elevations in the shallow and deep wells on September 17, 2014, are shown on Figures 2 and 3, respectively.

SLR personnel collected groundwater samples from all of the shallow monitoring wells (MW-5, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, and MW-14) and all of the deep monitoring wells (DMW-3, DMW-4, DMW-5, DMW-6, DMW-7, DMW-8, DMW-9, DMW-10, DMW-11, and DMW-12) for laboratory analysis. SLR purged the wells by using a peristaltic pump with dedicated tubing at a flow rate of approximately 0.33 liters per minute. During purging, field parameters of temperature, conductivity, dissolved oxygen, pH, and oxidation-reduction potential were measured every three minutes. Each groundwater sample was collected following the stabilization of the field parameter measurements.

SLR submitted the groundwater samples to Friedman & Bruya, Inc. (F&B) in Seattle, Washington, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B, and gasoline-range organics (GRO) by the Ecology Method NWTPH-Gx. The analytical results showed that all of the samples contained analyte concentrations that were either below the MTCA Method A cleanup levels or the method reporting limits. The groundwater sample analytical results from the September 2014 event, as well as from the previous sampling events, are presented in Table 2. The benzene and GRO concentrations in the September 2014 samples from the shallow and deep monitoring wells are shown on Figures 2 and 3, respectively. A copy of the laboratory analytical report is attached.

CONCLUSIONS

The groundwater sample analytical results from the September 2014 sampling event provided additional evidence that the shallow and deep groundwater at the site no longer contain petroleum hydrocarbon concentrations greater than the MTCA Method A cleanup levels. After the 2007 soil and shallow groundwater remedial action, the results of the quarterly groundwater sampling program have shown that the groundwater samples from all of the shallow monitoring wells at the site have contained petroleum hydrocarbon concentrations below the Method A cleanup levels for four consecutive quarters and the subsequent annual samples have verified that the concentrations have remained below the cleanup levels. After the deep groundwater remedial actions in 2009 through 2011 and in 2013, the results of the quarterly groundwater sampling program have shown that the groundwater samples from all of the deep monitoring wells at the site have contained petroleum hydrocarbon concentrations below the Method A cleanup levels for four consecutive quarters and the subsequent annual samples have verified that the concentrations have remained below the cleanup levels. Since the groundwater sampling results show that petroleum hydrocarbon concentrations in the shallow and deep groundwater beneath the subject property area are currently below the Method A cleanup levels, the groundwater sampling program should be discontinued.

If you have any questions, please contact Mike Staton at (425) 471-0479.

Sincerely,

SLR International Corporation

Michael D. Staton, L.G.
Principal Geologist

Attachments: Limitations
References
Tables 1 and 2
Figures 1 through 3
Laboratory Analytical Report

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

LIMITATIONS

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

Opinions and recommendations contained herein apply to conditions existing when services were performed and are intended only for the client, purposes, location, timeframes, 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 Corporation (SLR). 2008a. *Remedial Action Report, Former Arco Service Station #0855, 4603 Ocean Beach Highway, Longview, Washington.* July 21.

SLR. 2008b. *Quarterly Groundwater Sampling Report – July 2008 Event, Former Arco Service Station #0855, Longview, Washington.* August 29.

SLR. 2008c. *Quarterly Groundwater Sampling Report – September/October 2008 Event, Former Arco Service Station #0855, Longview, Washington.* October 29.

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

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

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

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

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

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

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

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

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

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

SLR. 2012b. *Groundwater Sampling Report – March 2012 Event, Former Arco Service Station #0855, Longview, Washington.* April 13.

SLR. 2012c. *Groundwater Sampling Report – June 2012 Event, Former Arco Service Station #0855, Longview, Washington.* August 10.

SLR. 2012d. *Groundwater Sampling Report – September 2012 Event, Former Arco Service Station #0855, Longview, Washington.* November 19.

SLR. 2013a. *Groundwater Sampling Report – December 2012 Event, Former Arco Service Station #0855, Longview, Washington.* February 25.

SLR. 2013b. *Well Installation and Groundwater Sampling Report, Former Arco Service Station #0855, Longview, Washington.* October 7.

SLR. 2014a. *2013 Deep Groundwater Remediation System Performance Report, Former Arco Service Station #0855, Longview, Washington.* January 20.

SLR. 2014b. *Groundwater Sampling Report – March 2014 Event, Former Arco Service Station #0855, Longview, Washington.* April 18.

SLR. 2014c. *Groundwater Sampling Report – June 2014 Event, Former Arco Service Station #0855, Longview, Washington.* August 20.

TABLES

Table 1
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.			
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.			

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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-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
		09/02/09	7.08	NP	1.59
		12/15/09	4.63	NP	4.04
		03/18/10	4.85	NP	3.82
		06/15/10	4.84	NP	3.83
		09/14/10	6.87	NP	1.80
		12/14/10	3.03	NP	5.64
		03/16/11	2.80	NP	5.87
		06/16/11	5.66	NP	3.01
		09/14/11	7.12	NP	1.55
		12/08/11	5.57	NP	3.10
		03/13/12	2.83	NP	5.84
		06/15/12	5.44	NP	3.23
		09/11/12	7.02	NP	1.65
		12/13/12	2.99	NP	5.68
		06/12/13	5.83	NP	2.84
		09/09/13	5.30	NP	3.37
		12/13/13	5.09	NP	3.58
		03/20/14	3.08	NP	5.59
		06/16/14	5.70	NP	2.97
		09/17/14	7.04	NP	1.63
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.			

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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-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
		09/02/09	4.55	NP	1.90
		12/15/09	3.31	NP	3.14
		03/18/10	3.05	NP	3.40
		06/15/10	2.48	NP	3.97
		09/14/10	4.32	NP	2.13
		12/14/10	2.70	NP	3.75
		03/16/11	2.15	NP	4.30
		06/16/11	2.37	NP	4.08
		09/14/11	4.79	NP	1.66
		12/08/11	3.52	NP	2.93
		03/13/12	2.76	NP	3.69
		06/15/12	3.01	NP	3.44
		09/11/12	4.78	NP	1.67
		12/13/12	3.04	NP	3.41
		06/12/13	3.10	NP	3.35
		09/09/13	3.28	NP	3.17
		12/13/13	3.10	NP	3.35
		03/20/14	2.88	NP	3.57
		06/16/14	2.83	NP	3.62
		09/17/14	4.77	NP	1.68
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
		09/02/09	5.20	NP	4.23
		12/15/09	4.51	NP	4.92
		03/18/10	4.64	NP	4.79
		06/15/10	4.72	NP	4.71
		09/14/10	4.94	NP	4.49
		12/14/10	4.66	NP	4.77
		03/16/11	3.91	NP	5.52
		06/16/11	4.83	NP	4.60
		09/14/11	5.35	NP	4.08
		12/08/11	4.78	NP	4.65
		03/13/12	4.25	NP	5.18
		06/15/12	4.78	NP	4.65
		09/11/12	5.38	NP	4.05
		12/13/12	4.48	NP	4.95
		06/12/13	4.84	NP	4.59
		09/09/13	4.60	NP	4.83
		12/13/13	4.73	NP	4.70
		03/20/14	4.51	NP	4.92
		06/16/14	4.70	NP	4.73
		09/17/14	5.26	NP	4.17

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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-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
		09/02/09	7.76	NP	1.76
		12/15/09	5.97	NP	3.55
		03/18/10	8.14	NP	1.38
		06/15/10	5.15	NP	4.37
		09/14/10	7.88	NP	1.64
		12/14/10	3.42	NP	6.10
		03/16/11	3.54	NP	5.98
		06/16/11	6.40	NP	3.12
		09/14/11	8.01	NP	1.51
		12/08/11	5.36	NP	4.16
		03/13/12	3.73	NP	5.79
		06/15/12	5.93	NP	3.59
		09/11/12	7.71	NP	1.81
		12/13/12	4.17	NP	5.35
		06/12/13	6.23	NP	3.29
		09/09/13	6.01	NP	3.51
		12/13/13	5.47	NP	4.05
		03/20/14	4.26	NP	5.26
		06/16/14	6.85	NP	2.67
		09/17/14	8.05	NP	1.47
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
		09/02/09	7.52	NP	0.64
		12/15/09	4.35	NP	3.81
		03/18/10	4.17	NP	3.99
		06/15/10	4.22	NP	3.94
		09/14/10	6.28	NP	1.88
		12/14/10	1.86	NP	6.30
		03/16/11	2.59	NP	5.57
		06/16/11	5.43	NP	2.73
		09/14/11	8.17	NP	-0.01
		12/08/11	4.18	NP	3.98
		03/13/12	5.91	NP	2.25
		06/15/12	4.94	NP	3.22
		09/11/12	6.63	NP	1.53
		12/13/12	3.45	NP	4.71
		06/12/13	5.15	NP	3.01
		09/09/13	5.06	NP	3.10
		12/13/13	4.16	NP	4.00
		03/20/14	3.12	NP	5.04
		06/16/14	5.73	NP	2.43
		09/17/14	7.16	NP	1.00

Table 1
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-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
		09/02/09	6.33	NP	1.88
		12/15/09	3.09	NP	5.12
		03/18/10	3.46	NP	4.75
		06/15/10	3.65	NP	4.56
		09/14/10	5.65	NP	2.56
		12/14/10	1.45	NP	6.76
		03/16/11	1.90	NP	6.31
		06/16/11	4.77	NP	3.44
		09/14/11	5.35	NP	2.86
		12/08/11	3.89	NP	4.32
		03/13/12	2.00	NP	6.21
		06/15/12	4.25	NP	3.96
		09/11/12	6.34	NP	1.87
		12/13/12	2.78	NP	5.43
		06/12/13	4.72	NP	3.49
		09/09/13	4.16	NP	4.05
		12/13/13	3.87	NP	4.34
		03/20/14	2.85	NP	5.36
		06/16/14	4.79	NP	3.42
		09/17/14	6.31	NP	1.90
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
		09/02/09	7.04	NP	1.99
		12/15/09	2.24	NP	6.79
		03/18/10	1.48	NP	7.55
		06/15/10	1.65	NP	7.38
		09/14/10	5.80	NP	3.23
		12/14/10	1.48	NP	7.55
		03/16/11	1.45	NP	7.58
		06/16/11	3.12	NP	5.91
		09/14/11	6.97	NP	2.06
		12/08/11	2.46	NP	6.57
		03/13/12	1.74	NP	7.29
		06/15/12	3.16	NP	5.87
		09/11/12	6.76	NP	2.27
		12/13/12	2.02	NP	7.01
		06/12/13	2.25	NP	6.78
		09/09/13	2.41	NP	6.62
		12/13/13	2.45	NP	6.58
		03/20/14	1.50	NP	7.53
		06/16/14	5.38	NP	3.65
		09/17/14	6.95	NP	2.08

Table 1
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-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
		09/02/09	6.93	NP	1.46
		12/15/09	1.77	NP	6.62
		03/18/10	1.65	NP	6.74
		06/15/10	1.78	NP	6.61
		09/14/10	6.23	NP	2.16
		12/14/10	1.37	NP	7.02
		03/16/11	1.41	NP	6.98
		06/16/11	4.77	NP	3.62
		09/14/11	7.25	NP	1.14
		12/08/11	1.88	NP	6.51
		03/13/12	1.45	NP	6.94
		06/15/12	1.98	NP	6.41
		09/11/12	6.75	NP	1.64
		12/13/12	1.46	NP	6.93
		06/12/13	1.90	NP	6.49
		09/09/13	1.58	NP	6.81
		12/13/13	1.80	NP	6.59
		03/20/14	1.56	NP	6.83
		06/16/14	2.62	NP	5.77
		09/17/14	6.77	NP	1.62
Deep 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.			
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
		09/02/09	5.19	NP	1.47
		12/15/09	4.71	NP	1.95
		03/18/10	4.55	NP	2.11
		06/15/10	4.42	NP	2.24
		09/14/10	5.01	NP	1.65
		12/14/10	4.36	NP	2.30
		03/16/11	3.95	NP	2.71
		06/16/11	4.10	NP	2.56
		09/14/11	4.73	NP	1.93
		12/08/11	7.52	NP	-0.86
		03/13/12	6.24	NP	0.42
		06/15/12	4.70	NP	1.96
		09/11/12	4.98	NP	1.68
		12/13/12	5.24	NP	1.42
		06/12/13	4.61	NP	2.05
		09/09/13	4.87	NP	1.79
		12/13/13	4.80	NP	1.86
		03/20/14	4.35	NP	2.31
		06/16/14	4.54	NP	2.12
		09/17/14	5.24	NP	1.42

Table 1
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 Wells (continued)					
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
		09/02/09	7.13	NP	1.42
		12/15/09	6.26	NP	2.29
		03/18/10	6.43	NP	2.12
		06/15/10	6.11	NP	2.44
		09/14/10	6.97	NP	1.58
		12/14/10	5.18	NP	3.37
		03/16/11	5.55	NP	3.00
		06/16/11	6.11	NP	2.44
		09/14/11	7.20	NP	1.35
		12/08/11	6.67	NP	1.88
		03/13/12	5.66	NP	2.89
		06/15/12	6.44	NP	2.11
		09/11/12	7.18	NP	1.37
		12/13/12	6.09	NP	2.46
		06/12/13	6.59	NP	1.96
		09/09/13	6.53	NP	2.02
		12/13/13	6.52	NP	2.03
		03/20/14	5.93	NP	2.62
		06/16/14	6.62	NP	1.93
		09/17/14	7.26	NP	1.29
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
		09/02/09	6.75	NP	1.39
		12/15/09	5.87	NP	2.27
		03/18/10	6.03	NP	2.11
		06/15/10	5.68	NP	2.46
		09/14/10	6.55	NP	1.59
		12/14/10	4.80	NP	3.34
		03/16/11	5.17	NP	2.97
		06/16/11	5.69	NP	2.45
		09/14/11	6.79	NP	1.35
		12/08/11	6.28	NP	1.86
		03/13/12	5.25	NP	2.89
		06/15/12	6.05	NP	2.09
		09/11/12	6.74	NP	1.40
		12/13/12	5.69	NP	2.45
		06/12/13	6.17	NP	1.97
		09/09/13	6.15	NP	1.99
		12/13/13	5.57	NP	2.57
		03/20/14	6.13	NP	2.01
		06/16/14	6.19	NP	1.95
		09/17/14	6.88	NP	1.26

Table 1
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 Wells (continued)					
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
		09/02/09	7.79	NP	1.36
		12/15/09	6.89	NP	2.26
		03/18/10	7.06	NP	2.09
		06/15/10	6.74	NP	2.41
		09/14/10	7.59	NP	1.56
		12/14/10	5.79	NP	3.36
		03/16/11	6.18	NP	2.97
		06/16/11	6.75	NP	2.40
		09/14/11	7.82	NP	1.33
		12/08/11	7.31	NP	1.84
		03/13/12	6.34	NP	2.81
		06/15/12	7.09	NP	2.06
		09/11/12	5.38	NP	3.77
		12/13/12	6.72	NP	2.43
		06/12/13	7.23	NP	1.92
		09/09/13	7.17	NP	1.98
		12/13/13	7.17	NP	1.98
		03/20/14	6.61	NP	2.54
		06/16/14	7.25	NP	1.90
		09/17/14	7.90	NP	1.25
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
		09/02/09	6.74	NP	1.38
		12/15/09	5.85	NP	2.27
		03/18/10	5.93	NP	2.19
		06/15/10	5.82	NP	2.30
		09/14/10	6.55	NP	1.57
		12/14/10	5.27	NP	2.85
		03/16/11	5.15	NP	2.97
		06/16/11	5.70	NP	2.42
		09/14/11	6.64	NP	1.48
		12/08/11	6.28	NP	1.84
		03/13/12	5.22	NP	2.90
		06/15/12	6.05	NP	2.07
		09/11/12	6.76	NP	1.36
		12/13/12	5.69	NP	2.43
		06/12/13	6.19	NP	1.93
		09/09/13	6.14	NP	1.98
		12/13/13	6.17	NP	1.95
		03/20/14	5.56	NP	2.56
		06/16/14	6.22	NP	1.90
		09/17/14	6.86	NP	1.26

Table 1
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 Wells (continued)					
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
		09/02/09	7.69	NP	1.40
		12/15/09	6.80	NP	2.29
		03/18/10	6.81	NP	2.28
		06/15/10	6.55	NP	2.54
		09/14/10	7.50	NP	1.59
		12/14/10	6.52	NP	2.57
		03/16/11	6.26	NP	2.83
		06/16/11	6.60	NP	2.49
		09/14/11	7.23	NP	1.86
		12/08/11	7.19	NP	1.90
		03/13/12	6.17	NP	2.92
		06/15/12	6.98	NP	2.11
		09/11/12	7.72	NP	1.37
		12/13/12	6.61	NP	2.48
		06/12/13	7.13	NP	1.96
		09/09/13	7.10	NP	1.99
		12/13/13	7.05	NP	2.04
		03/20/14	6.93	NP	2.16
		06/16/14	7.12	NP	1.97
		09/17/14	7.79	NP	1.30
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
		09/02/09	7.44	NP	1.42
		12/15/09	6.54	NP	2.32
		03/18/10	6.69	NP	2.17
		06/15/10	6.39	NP	2.47
		09/14/10	7.23	NP	1.63
		12/14/10	5.66	NP	3.20
		03/16/11	5.87	NP	2.99
		06/16/11	6.39	NP	2.47
		09/14/11	7.46	NP	1.40
		12/08/11	6.95	NP	1.91
		03/13/12	5.91	NP	2.95
		06/15/12	6.73	NP	2.13
		09/11/12	7.45	NP	1.41
		12/13/12	6.37	NP	2.49
		06/12/13	6.87	NP	1.99
		09/09/13	6.82	NP	2.04
		12/13/13	6.80	NP	2.06
		03/20/14	6.22	NP	2.64
		06/16/14	6.88	NP	1.98
		09/17/14	7.56	NP	1.30

Table 1
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 Wells (continued)					
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
		09/02/09	6.99	NP	1.39
		12/15/09	6.09	NP	2.29
		03/18/10	6.25	NP	2.13
		06/15/10	5.91	NP	2.47
		09/14/10	6.77	NP	1.61
		12/14/10	5.02	NP	3.36
		03/16/11	5.38	NP	3.00
		06/16/11	5.92	NP	2.46
		09/14/11	7.02	NP	1.36
		12/08/11	6.51	NP	1.87
		03/13/12	5.50	NP	2.88
		06/15/12	6.28	NP	2.10
		09/11/12	7.03	NP	1.35
		12/13/12	5.92	NP	2.46
		06/12/13	6.44	NP	1.94
		09/09/13	6.40	NP	1.98
		12/13/13	6.38	NP	2.00
		03/20/14	5.78	NP	2.60
		06/16/14	6.45	NP	1.93
		09/17/14	7.13	NP	1.25
DMW-11	12.46	05/06/13	10.55	NP	1.91
		06/12/13	10.49	NP	1.97
		09/09/13	10.46	NP	2.00
		12/13/13	10.44	NP	2.02
		03/20/14	9.84	NP	2.62
		06/16/14	10.51	NP	1.95
		09/17/14	11.18	NP	1.28
DMW-12	7.69	05/06/13	5.80	NP	1.89
		06/12/13	5.72	NP	1.97
		09/09/13	5.76	NP	1.93
		12/13/13	5.66	NP	2.03
		03/20/14	5.16	NP	2.53
		06/16/14	5.76	NP	1.93
		09/17/14	6.43	NP	1.26
RW-1	8.08	09/02/09	6.69	NP	1.39
		12/15/09	5.78	NP	2.30
		03/18/10	5.96	NP	2.12
		06/15/10	5.60	NP	2.48
		12/14/10	4.70	NP	3.38
		03/16/11	5.06	NP	3.02
		06/16/11	5.61	NP	2.47
		09/14/11	6.95	NP	1.13
		12/08/11	5.83	NP	2.25
		03/13/12	5.12	NP	2.96
		06/15/12	5.72	NP	2.36
		09/11/12	6.59	NP	1.49
		12/13/12	5.48	NP	2.60
		06/12/13	5.97	NP	2.11
		09/09/13	5.91	NP	2.17
		12/13/13	6.24	NP	1.84
		03/20/14	5.41	NP	2.67
		06/16/14	5.75	NP	2.33
		09/17/14	6.61	NP	1.47

Table 1
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 Wells (continued)					
RW-2	8.53	06/12/13	6.40	NP	2.13
		09/09/13	7.61	NP	0.92
		12/13/13	6.34	NP	2.19
		03/20/14	5.74	NP	2.79
		06/16/14	6.40	NP	2.13
		09/17/14	7.09	NP	1.44

NOTES:

NP = Free product was not present.

[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 resurveyed 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 2
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.						
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.						

Table 2
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-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
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<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.						
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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/09/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 2
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-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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<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
	09/12/12	<1.0	<1.0	<1.0	<3.0	160	NA
	09/10/13	1.1	<1.0	<1.0	<3.0	120	NA
	09/17/14	<1.0	<1.0	1.1	<3.0	430	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
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<1.0	<1.0	<1.0	<3.0	<100	NA
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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 2
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-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
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<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
	03/13/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	06/15/12	1.0	<1.0	<1.0	<3.0	<100	NA
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/13/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 2
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
	03/13/12	3.0	<1.0	<1.0	<3.0	<100	NA
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<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
	09/12/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<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
	09/11/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/09/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<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
	0911/12	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/09/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/17/14	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 2
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
	03/13/12	1.9	<1.0	<1.0	<3.0	310	NA
	06/15/12	<1.0	<1.0	<1.0	<3.0	160	NA
	09/11/12	<1.0	<1.0	<1.0	<3.0	230	NA
	09/10/13	<1.0	<1.0	<1.0	<3.0	160	NA
	09/17/14	<1.0	<1.0	<1.0	<3.0	200	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
	03/13/12	**37**	1.0	3.6	14	260	NA
	06/15/12	**51**	1.4	1.7	20	400	NA
	09/11/12	**29**	<1.0	<1.0	<3.0	200	NA
	12/13/12	**34**	1.4	4.7	3.3	260	NA
	06/12/13	**38**	2.8	<1.0	4.0	300	NA
	09/09/13	2.0	<1.0	<1.0	<3.0	<100	NA
	12/13/13	1.5	<1.0	<1.0	<3.0	<100	NA
	03/20/14	1.1	<1.0	<1.0	<3.0	<100	NA
	06/16/14	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<1.0	<1.0	<1.0	<3.0	<100	NA

Table 2
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-11	05/06/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	06/12/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/09/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/13/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	03/20/14	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<1.0	<1.0	<1.0	<3.0	<100	NA
DMW-12	05/06/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	06/12/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/09/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	12/13/13	<1.0	<1.0	<1.0	<3.0	<100	NA
	03/20/14	<1.0	<1.0	<1.0	<3.0	<100	NA
	09/18/14	<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.

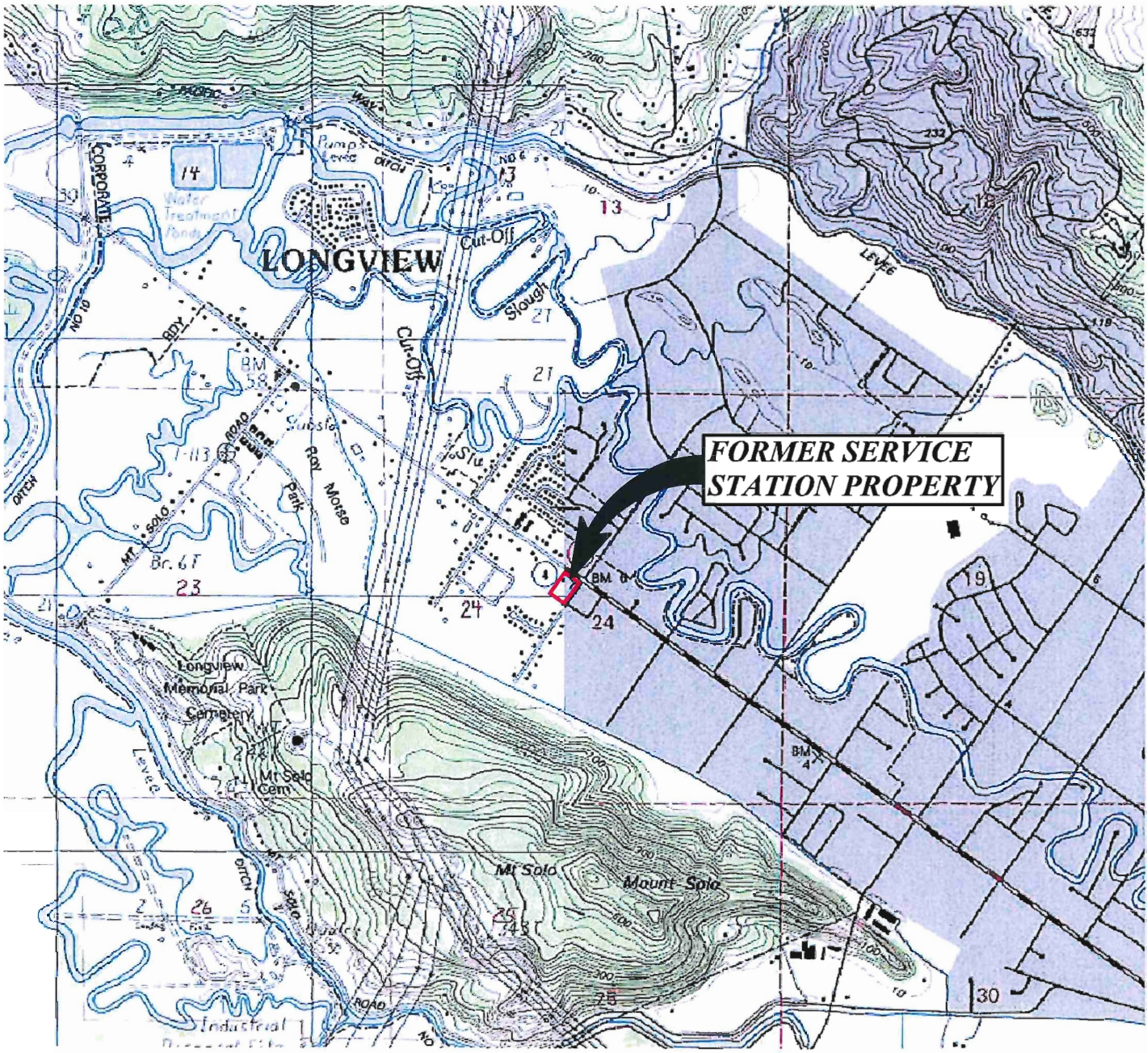
[d] Chapter 173-340 WAC, Model Toxics Control Act (MTCA) Cleanup Regulation, Method A Cleanup Levels. Amended February 12, 2001.

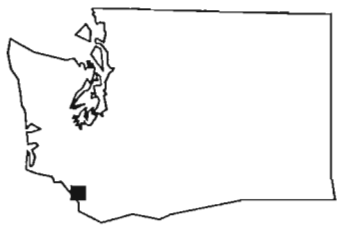
[e] Total xylenes calculated by using the formula: total xylenes concentration = (m, p-xylene concentration) + (o-xylene concentration).

[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.

FIGURES





WASHINGTON

0 2000 4000

SCALE IN FEET

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

SLR

22122 20th AVE SE
BLDG. H, SUITE 150
BOTHELL, WA 98021

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

DATE 04/11
DWN. BDT
APPR. ____
REVIS. ____
PROJECT NO.
101.00173.00011

FIGURE 1
FORMER ARCO SERVICE STATION #0855
LONGVIEW, WASHINGTON

PROPERTY LOCATION MAP

C:\DRIVE_E\Clients\SLR\101\101.00173.00011\01-01.dwg, 4/13/2012 7:48:24 AM, BDT

BOON DOX MARKET

BOON DOX TAVERN

TEXACO SERVICE STATION

LEGEND

- **MW-5** — SHALLOW GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- MW-2 — ABANDONED OR DESTROYED SHALLOW GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- (1.68) — SHALLOW GROUNDWATER ELEVATION (IN FEET) ON SEPTEMBER 17, 2014
- <1 B / 430 G — B = BENZENE CONCENTRATION IN GROUNDWATER SAMPLE (in µg/L); G = GRO CONCENTRATION IN GROUNDWATER SAMPLE (in µg/L)

OCEAN BEACH HIGHWAY

APPROXIMATE EXTENT OF 2007 SOIL EXCAVATION

SIDEWALK

SIDEWALK

MW-10 (1.47) <1 B / 430 G

MW-11 (1.00) <1 B / <100 G

FORMER UNDERGROUND DISPENSER LINES

UNDEVELOPED MARSHY LAND

MW-3

MW-4

MW-5 (1.63) <1 B / <100 G

PLANTER

MW-13 (2.08) <1 B / <100 G

FORMER DISPENSER ISLAND

MW-12 (1.90) <1 B / <100 G

MW-6

FORMER GASOLINE USTs

MW-2

FORMER SERVICE STATION BUILDING

PROPERTY LINE

MW-14 (1.62) <1 B / <100 G

MW-7

FORMER HEATING OIL UST

FORMER USED OIL UST

MW-1

GRASS STRIP

FORMER SERVICE STATION PARCEL BOUNDARY

UNDEVELOPED LAND

APPROXIMATE EXTENT OF 2007 SOIL EXCAVATION

PROPERTY LINE

MW-9 (4.17) <1 B / <100 G

BUS LANE

46TH AVENUE

MW-8 (1.68) <1 B / <100 G

HENRI'S RESTAURANT

0 30 60

SCALE IN FEET

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

DATE 9/13
DWN. MEH
APPR. MDS
REVIS.
PROJECT NO. 101.00173.00011

FIGURE 2
FORMER ARCO SERVICE STATION #0855
LONGVIEW, WASHINGTON
SHALLOW GROUNDWATER ELEVATIONS AND GROUNDWATER SAMPLING RESULTS SEPTEMBER 2014

BOON DOX MARKET

BOON DOX TAVERN

TEXACO SERVICE STATION

DMW-7 (1.26)
<1 B
<100 G

LEGEND

- **DMW-7** — DEEP GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- **RW-1** — DEEP GROUNDWATER RECOVERY WELL LOCATION AND DESIGNATION
- **RW-1** — INACTIVE DEEP GROUNDWATER RECOVERY WELL LOCATION AND LOCATION
- DMW-1 — ABANDONED DEEP GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- (1.42) DEEP GROUNDWATER ELEVATION (IN FEET) ON SEPTEMBER 17, 2014
- <1 B / 200 G — B = BENZENE CONCENTRATION IN GROUNDWATER SAMPLE (in µg/L); G = GRO CONCENTRATION IN GROUNDWATER SAMPLE (in µg/L)

OCEAN BEACH HIGHWAY

SIDEWALK

DMW-8 (1.30)
<1 B
<100 G

SIDEWALK

DMW-6 (1.25)
<1 B
<100 G

BUS LANE

DMW-5 (1.26)
<1 B
<100 G

DMW-1

DMW-9 (1.30)
<1 B
200 G

DMW-4 (1.29)
<1 B
<100 G

PLANTER

FORMER UNDERGROUND DISPENSER LINES

UNDEVELOPED MARSHY LAND

RW-1 (1.47)

FORMER DISPENSER ISLAND

46TH AVENUE

FORMER GASOLINE USTs

RW-2 (1.44)

FORMER SERVICE STATION BUILDING

DMW-11 (1.28)
<1 B
<100 G

DMW-10 (1.25)
<1 B
<100 G

DMW-2

PROPERTY LINE

HENRI'S RESTAURANT

FORMER HEATING OIL UST

FORMER USED OIL UST

GRASS STRIP

DMW-12 (1.26)
<1 B
<100 G

DMW-3 (1.42)
<1 B
<100 G

FORMER SERVICE STATION PARCEL BOUNDARY

UNDEVELOPED LAND

PROPERTY LINE

0 30 60
SCALE IN FEET

NOTE: THE DEEP GROUNDWATER RECOVERY SYSTEM WAS NOT OPERATING AT THE TIME OF THE GROUNDWATER SAMPLING EVENT.

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

DATE 10/14
DWN. MEH
APPR. MDS
REVIS.
PROJECT NO.
101.00173.00011

FIGURE 3
FORMER ARCO SERVICE STATION #0855
LONGVIEW, WASHINGTON
DEEP GROUNDWATER ELEVATIONS AND GROUNDWATER SAMPLING RESULTS SEPTEMBER 2014

LABORATORY REPORT

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 24, 2014

Mike Staton
SLR International Corp.
22118 20th Ave. SE, G-202
Bothell, WA 98021

Dear Mr. Staton:

Included are the results from the testing of material submitted on September 19, 2014 from the Wakefield Longview (WFLV) 101.00173.00011, F&BI 409348 project. There are 5 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michele Costales Poquiz

Michele Costales Poquiz
Chemist

Enclosures
SLR0924R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the SLR International Corp. Wakefield Longview (WFLV) 101.00173.00011, F&BI 409348 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
409348-01	DMW-3-0914
409348-02	DMW-4-0914
409348-03	DMW-5-0914
409348-04	DMW-6-0914
409348-05	DMW-7-0914
409348-06	DMW-8-0914
409348-07	DMW-9-0914
409348-08	DMW-10-0914
409348-09	DMW-11-0914
409348-10	DMW-12-0914
409348-11	MW-5-0914
409348-12	MW-8-0914
409348-13	MW-9-0914
409348-14	MW-10-0914
409348-15	MW-11-0914
409348-16	MW-12-0914
409348-17	MW-13-0914
409348-18	MW-14-0914

All quality control requirements were acceptable.

Date of Report: 09/24/14
Date Received: 09/19/14
Project: Wakefield Longview (WFLV) 101.00173.00011, F&BI 409348
Date Extracted: 09/19/14
Date Analyzed: 09/19/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
DMW-3-0914 409348-01	<1	<1	<1	<3	<100	95
DMW-4-0914 409348-02	<1	<1	<1	<3	<100	100
DMW-5-0914 409348-03	<1	<1	<1	<3	<100	94
DMW-6-0914 409348-04	<1	<1	<1	<3	<100	97
DMW-7-0914 409348-05	<1	<1	<1	<3	<100	94
DMW-8-0914 409348-06	<1	<1	<1	<3	<100	97
DMW-9-0914 409348-07	<1	<1	<1	<3	200	100
DMW-10-0914 409348-08	<1	<1	<1	<3	<100	97
DMW-11-0914 409348-09	<1	<1	<1	<3	<100	98
DMW-12-0914 409348-10	<1	<1	<1	<3	<100	96
MW-5-0914 409348-11	<1	<1	<1	<3	<100	92
MW-8-0914 409348-12	<1	<1	<1	<3	<100	92

Date of Report: 09/24/14
Date Received: 09/19/14
Project: Wakefield Longview (WFLV) 101.00173.00011, F&BI 409348
Date Extracted: 09/19/14
Date Analyzed: 09/19/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-9-0914 409348-13	<1	<1	<1	<3	<100	93
MW-10-0914 409348-14	<1	<1	1.1	<3	430	100
MW-11-0914 409348-15	<1	<1	<1	<3	<100	96
MW-12-0914 409348-16	<1	<1	<1	<3	<100	93
MW-13-0914 409348-17	<1	<1	<1	<3	<100	91
MW-14-0914 409348-18	<1	<1	<1	<3	<100	90
Method Blank 04-1906 MB	<1	<1	<1	<3	<100	92

Date of Report: 09/24/14
Date Received: 09/19/14
Project: Wakefield Longview (WFLV) 101.00173.00011, F&BI 409348

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 409348-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	91	65-118
Toluene	ug/L (ppb)	50	94	72-122
Ethylbenzene	ug/L (ppb)	50	95	73-126
Xylenes	ug/L (ppb)	150	94	74-118
Gasoline	ug/L (ppb)	1,000	99	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

409348

SAMPLE CHAIN OF CUSTODY MP 09-19-14

V 4

Page # 1 of 2

Send Report To Mike Staton
Company SLR International Corp
Address 22118 20th Ave SE, G202
City, State, ZIP Bothell, WA, 98021
Phone #425-402-8800 Fax #425-402-8788

SAMPLERS (signature)

PROJECT NAME/NO.: Wakefield Longview (WFLV) 101.00173.00011

PO#: 101.00173.00011

REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
DMW-3-0914	01A-C	9/18/14	1236	WATER	4		X	X										
DMW-4-0914	02	9/17/14	1608															
DMW-5-0914	03	9/18/14	1002															
DMW-6-0914	04	9/17/14	1227															
DMW-7-0914	05	9/17/14	1353															
DMW-8-0914	06	9/17/14	1458															
DMW-9-0914	07	9/17/14	1745															
DMW-10-0914	08	9/18/14	1032															
DMW-11-0914	09	9/18/14	1130															
DMW-12-0914	10	9/18/14	1206															

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Amanda Mengist	SLR	9/19/14	
Received by:		Ann Webber Bruya	FBI	9/19/14	
Relinquished by:					
Received by:		Jon Shimazu	FBI		

[redacted]

Page # 2 of 2

Send Report To Mike Staton
Company SLR International Corp
Address 22118 20th Ave SE, G202
City, State, ZIP Bothell, WA, 98021
Phone # 425-402-8800 Fax # 425-402-8458

SAMPLERS (signature) [signature]

PROJECT NAME/NO.	PO#
Wakefield Longview (WFLV) 101.60173.00011	101.60173.00011

REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
MW-5-0914	11 A-D	9/17/14	1640	WATER	4		X	X										
MW-8-0914	12	9/17/14	1258															
MW-9-0914	13	9/17/14	1425															
MW-10-0914	14	9/17/14	1526															
MW-11-0914	15	9/18/14	0939															
MW-12-0914	16	9/18/14	0900															
MW-13-0914	17	9/17/14	1709															
MW-14-0914	18	9/18/14	1102															

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Amanda Mengniot	SLR	9/19/14	
Received by: [signature]	Ann Webber-Bruya	F&B	9/19/14	
Relinquished by:				
Received by: [signature]	Jon Shannon			

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FORMS\COC\COC.DOC