URS

May 4, 2018

TO: Cris Matthews (Ecology)
FROM: Karen Mixon (URS)

CC: Mike Droppo (Kinder Morgan), Patrick Davis (Trans Mountain), Cary Brown (URS), Demetrio Cabanillas (URS), Dan Heimbigner (Whatcom Environmental)

RE:	URS Progress Report – January 1 to April 15, 2018
PROJECT:	Cleanup Action Consent Decree No. 14-2-01294-9 (effective 6-5-2014) Laurel Station 1009 E. Smith Road, Bellingham, Washington
TRANS MOUNTAIN PM:	Mike Droppo
ECOLOGY CASE MGR:	Cris Matthews
URS PROJ NO:	60566153
URS PROJ MGR:	Karen Mixon

Introduction:
This progress report is presented in accordance with Consent Decree 14-2-01294-9 (effective 6-5-2014) and is intended to present the information as noted under Section XI PROGRESS REPORTS in the Consent Decree. As this quarterly report is delayed, the time period covered is through April 15, 2018 instead of March 31, 2018.

Work Accomplished During Reporting Period:

DPE System Operation
The DPE well locations are shown on attached **Figure 2 Site Plan and DPE Well Locations**.

In January 2018, the system operated in SVE mode with 4 to 8 wells operating (DPE-2, -3, -5, -6, -7, -8, -9 and/or -10). A significant increase in mass removal was observed from the wells located beneath the Pump Station Building, specifically DPE-3. Wells DPE-2, -3, -6, and -7 were operated most of January. Wells DPE-5, -8, -9, and -10 were operated to mitigate carbon loading during the month. The system was down 5 days for groundwater sampling and maintenance. The increase in mass removal resulted in 3 carbon changeouts in January. The system continued operating in SVE mode in February with 6 to 10 wells operating during the month. Although most of the mass removal during this period came from the wells beneath the Pump Station Building, all wells were opened during the latter part of the month to conserve carbon usage while increasing the onsite carbon supply in preparation for more frequent carbon changeouts. The system was down 2 days for a carbon changeout at the end of February. In March, the system operated in SVE mode with no downtime and all 10 DPE wells (DPE-1 through DPE-10) were operational. Water levels were monitored monthly and high enough to support DPE mode, however the system was maintained in SVE mode to take advantage of the increase in observed mass removal.

Treated groundwater from the system was sampled weekly by Whatcom Environmental as required by the Administrative Order to the facility NPDES permit. Because the system operated in SVE mode only during this reporting period, minimal water was released in January (98 gallons), and February (99 gallons). No water was released in March. There were no exceedances of indicator levels specified in the permit for treated groundwater samples collected during this period.

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As of March 26, 2018, approximately 4,629 pounds (15.7 barrels) of constituents of concern (COCs) have been removed from the vapor phase since the system started operating in July 2015. Graphs showing the cumulative removal of COCs from vapor by the system through March 26, 2018 are attached to this report. The pounds removed are based on calculations made using PID and flow measurements at the combined vapor monitoring point prior to the vapor GAC vessels. As of March 26, 2018, approximately 134,218 gallons of water have been removed from the subsurface since the system was started in July 2015. A graph showing groundwater volumes removed is included with this report. Water removed in January and February was due to condensate in the system. No measureable product has been observed or recovered by the system to date.

Air monitoring using FID and/or PID field instruments was conducted by Whatcom Environmental weekly to monitor the vapor GAC treatment system. In March, the use of the FID for air monitoring was discontinued. The carbon was changed out if the PID measurements at the mid-treatment location exceeded 50 ppm. The vapor GAC was changed out on January 9, 23, and 30, 2018, and February 28, 2018.

Groundwater Monitoring

The well locations are shown on **Figure 2 Site Plan and DPE Well Locations**. Wells MW-4, MW-6, MW-15, MW-16, and DPE-4 are intended to be sampled quarterly.

URS conducted groundwater sample collection for the 4th quarter of 2017 on January 4, 2018. Based on water levels in the wells, only well MW-6 was sampled. Water level data for the monitoring well network is provided in **Table 1** attached to this progress report. The 4th quarter 2017 sampling planned for December 27, 2017 was delayed until January 4, 2018 to avoid longer shutdown of the DPE system over the holiday period. URS notified Ecology to confirm the change in schedule was acceptable.

URS completed the data review for the 4th quarter 2017 groundwater sample collection. The summary data table (**Table 2**), data validation memo, and laboratory report are attached to this progress report. Diesel-range petroleum hydrocarbons (0.12 mg/L) at well MW-6 were below the site groundwater cleanup level of 0.5 mg/L. BTEX, gasoline- and motor oil-range petroleum hydrocarbons, and PAHs were not detected or were detected below site cleanup levels.

URS conducted the 1st quarter 2018 groundwater sampling on April 5, 2018.

Submittals/Agency Contacts

- Kinder Morgan and URS met with Cris Matthews from Ecology following a project team meeting at the Laurel Station facility on March 6, 2018. The status of the Completion Report and overall project activity were discussed followed by a site walk.
- URS submitted the 2017 quarterly groundwater data including the results from January 4, 2018 to Ecology's EIM database on April 2, 2018.

Deviations to Approved Plans Not Previously Documented:
None

Deviation to Scope of Work and Schedule as Presented in the Cleanup Action Plan (Exhibit A of Consent Decree):
There were no changes from previous progress reports to the overall Scope of Work described in the Cleanup Action Plan (CAP).

Data Received During Reporting Period:

- Groundwater monitoring data collected on January 4, 2018

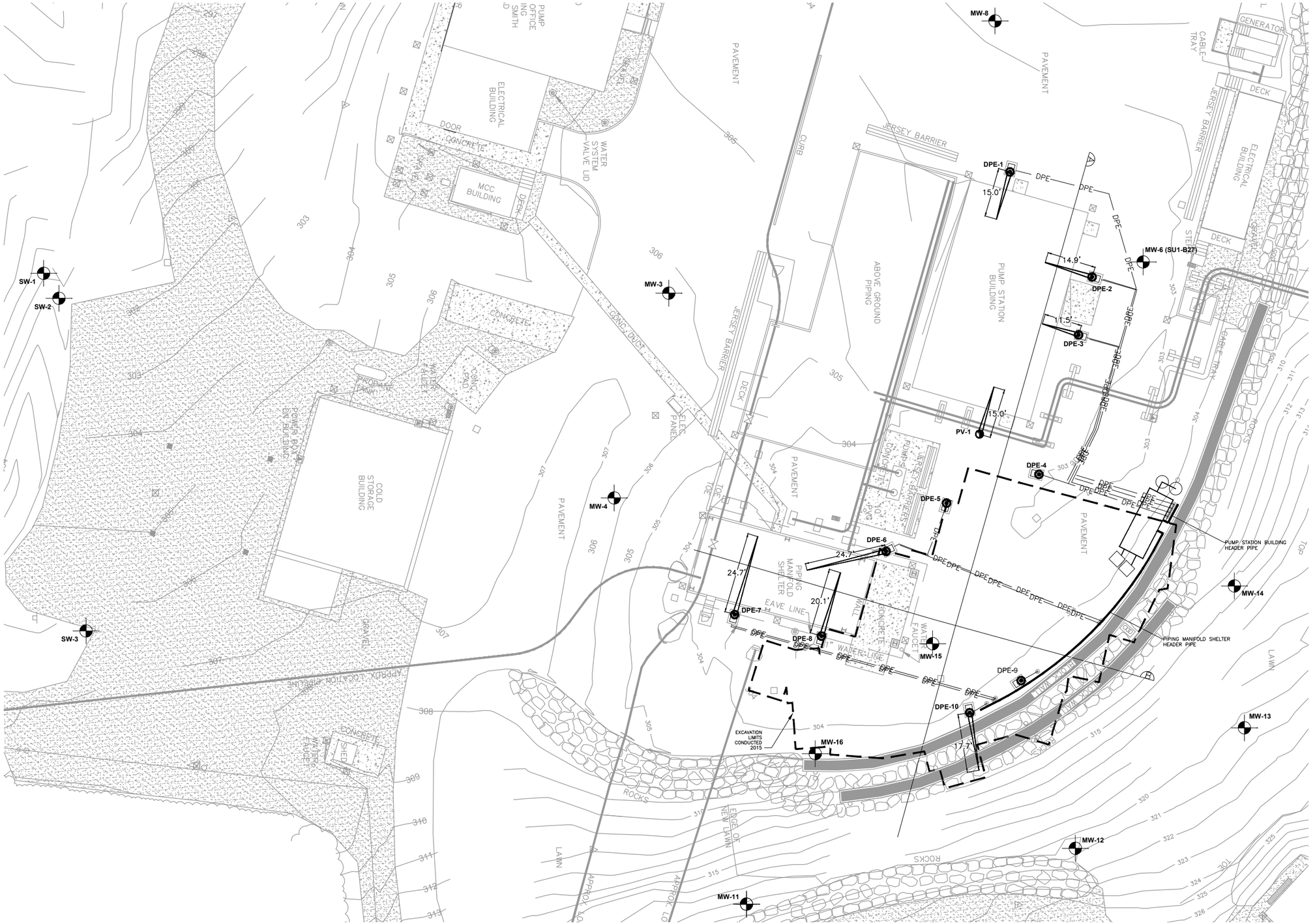
Plans for the Next Reporting Period:
The following are planned activities for the period from April 15 through June 30, 2018.

- Continue to operate and maintain the DPE system.
- Provide memo to Ecology with explanation of intent of Completion Report submitted to Ecology in December 2017. Respond to Ecology concerns/comments regarding the Completion Report.
- Complete the data review and tabulation of 1st quarter 2018 groundwater sample collection from March 2018. Submit with the quarterly progress report on July 10, 2018.

Please contact Karen Mixon at (206) 438-2234 if you have any questions or comments regarding this progress report.

References:
URS Corporation, 2015. Final Compliance Monitoring Plan, Laurel Station, 1009 East Smith Road, Bellingham, Washington, January 16.

Attachments:
Figure 2, Site Plan and DPE Well Locations (from the O&M Manual, February 5, 2016)
DPE System Performance Graphs, March 2018
Table 1 – Monitoring Well Groundwater Elevation Data Summary
Table 2 – Quarterly Groundwater Monitoring Results
Data Validation Report – Quarterly Groundwater Samples – January 2018
ARI Lab Report 18A0065



Legend

- Cross Section Location
- DPE Container
- Liquid-Phase Carbon Vessels
- Vapor-Phase Carbon Vessels
- Dual Phase Extraction Well Vault
- Excavation Limits (2014-2015)
- Installed at Angle Shown With Horizontal Extent
- Dual-Phase Extraction (DPE) Well
- Monitoring Well
- Passive Vent Well
- Segmented Concrete Block (Retaining Wall)
- DPE — Underground DPE Lateral Pipe

NT

0 15 30

SCALE IN FEET

Figure 2

Site Plan and DPE Well Locations

Laurel Station
Bellingham, Washington

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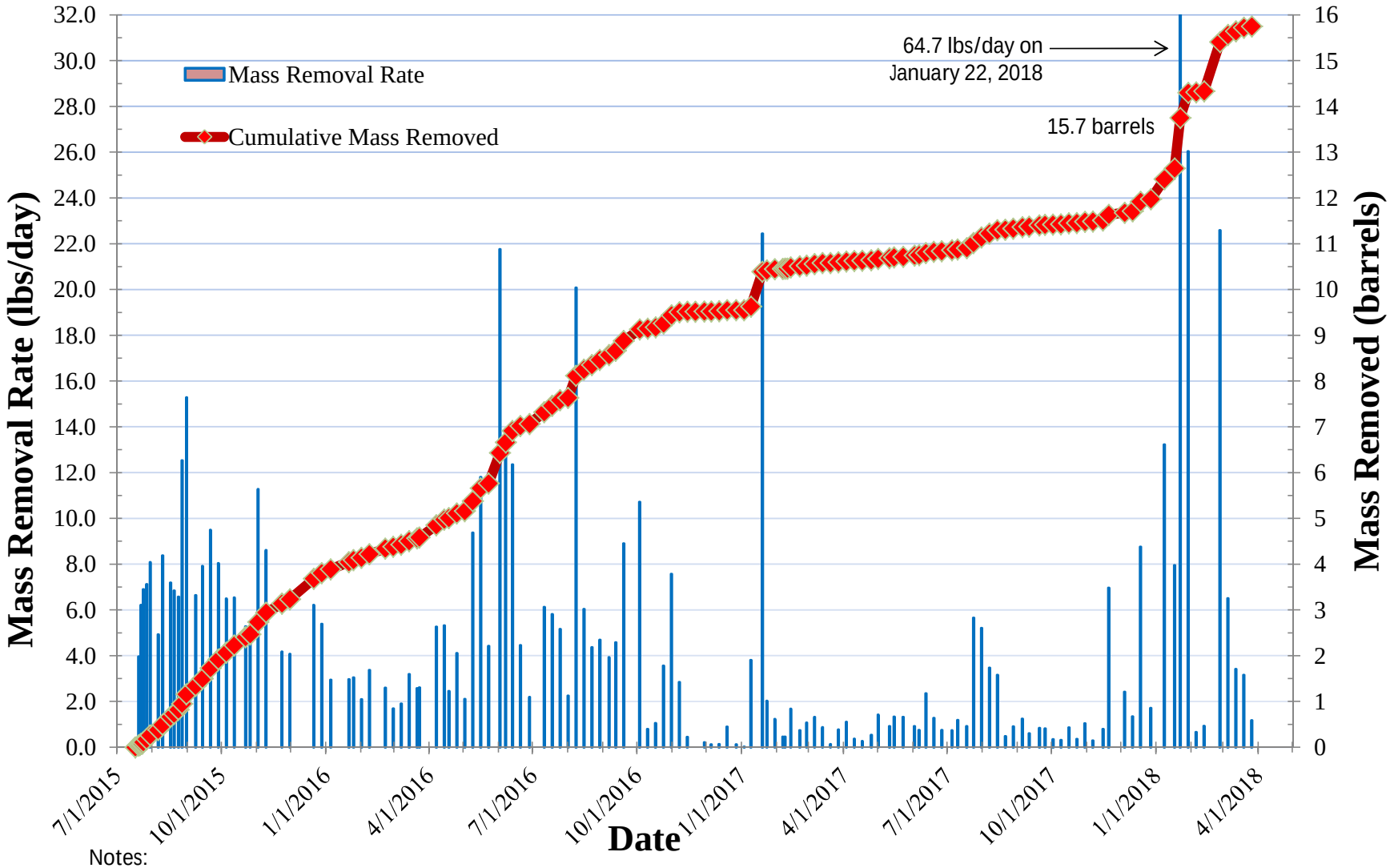
COMBINED SYSTEM MASS REMOVAL DATA

Laurel Station DPE System

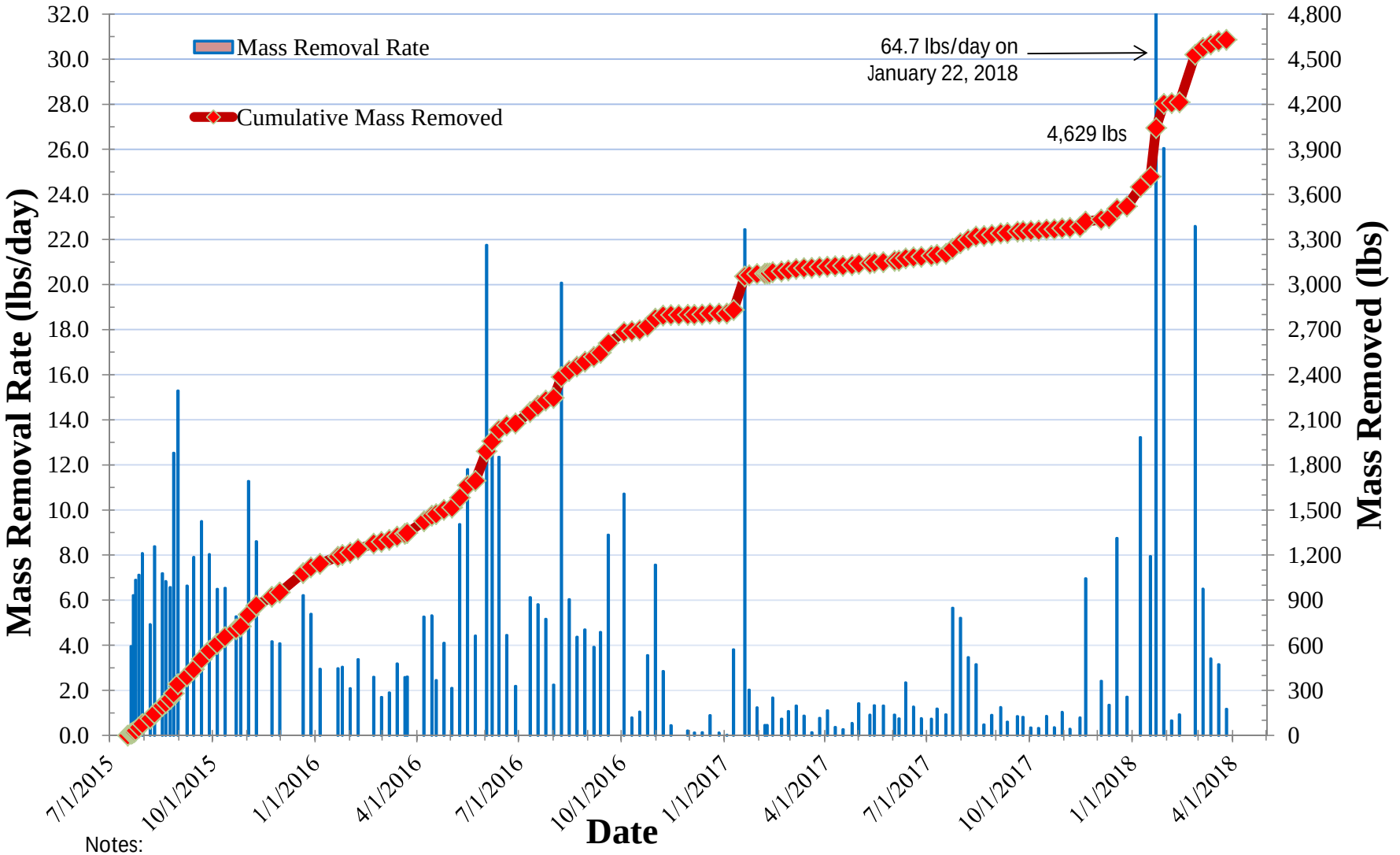


Notes:

1. Data shown from July 17, 2015 through March 26, 2018, after approximately 32 months of operation.
2. The Cumulative Mass Removed is based on data taken from the pre-treatment sampling port directly before carbon treatment.

COMBINED SYSTEM MASS REMOVAL DATA

Laurel Station DPE System



Notes:

1. Data shown from July 17, 2015 through March 26, 2018, after approximately 32 months of operation.
2. The Cumulative Mass Removed is based on data taken from the pre-treatment sampling port directly before carbon treatment.

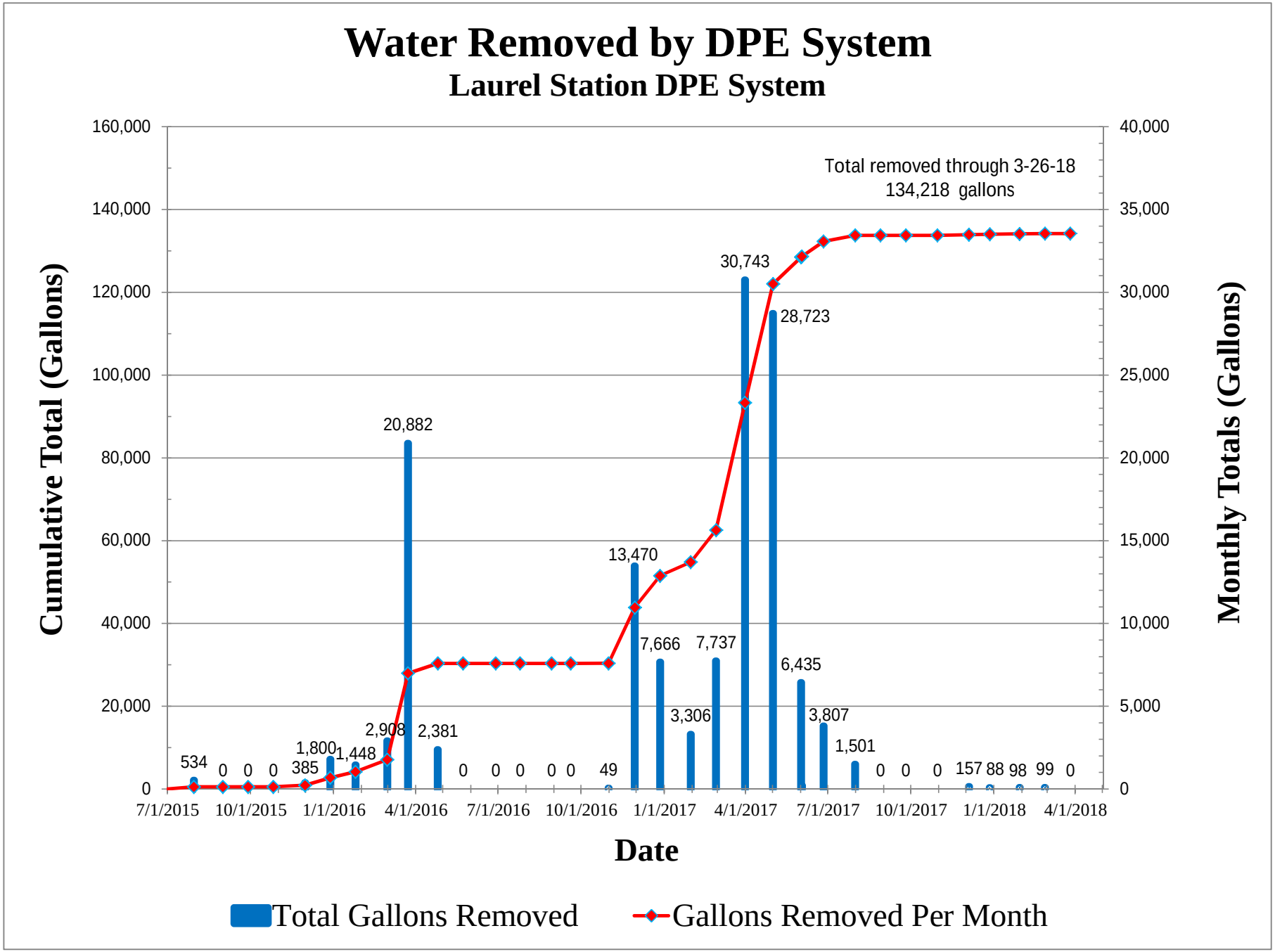

Water Removed by DPE System
Laurel Station DPE System
Total removed through 3-26-18
134,218 gallons
Cumulative Total (Gallons)
Monthly Totals (Gallons)
Date
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
534
0
0
0
385
1,800
1,448
2,908
20,882
2,381
0
0
0
0
0
49
13,470
7,666
3,306
7,737
30,743
28,723
6,435
3,807
1,501
0
0
0
157
88
98
99
0
7/1/2015
10/1/2015
1/1/2016
4/1/2016
7/1/2016
10/1/2016
1/1/2017
4/1/2017
7/1/2017
10/1/2017
1/1/2018
4/1/2018
Total Gallons Removed
Gallons Removed Per Month

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
SW-1	4/23/2015	18.50				4.30	296.34	14.20
	12/14/2015	18.35				4.10	296.54	14.25
	1/25/2016	18.68				5.09	295.55	13.59
	2/22/2016 *	17.39				14.20	286.44	3.19
	3/21/2016	18.57				5.08	295.56	13.49
	4/25/2016	18.59				DRY	NC	NC
	5/23/2016	18.62				DRY	NC	NC
	6/27/2016	18.40				4.72	295.92	13.68
	8/8/2016	18.37				4.85	295.79	13.52
	8/30/2016	18.40				3.60	297.04	14.80
	9/26/2016	18.37				4.85	295.79	13.52
	10/24/2016	18.40				4.54	296.10	13.86
	11/21/2016	18.36				4.65	295.99	13.71
	12/21/2016	18.40				4.43	296.21	13.97
	1/23/2017	18.40				2.80	297.84	15.60
	3/6/2017	18.25	300.64	5 - 20	295.64 - 280.64	3.48	297.16	14.77
	3/21/2017	18.52				4.17	296.47	14.35
	3/29/2017	18.45				2.82	297.82	15.63
	6/21/2017	18.39				4.95	295.69	13.44
	6/26/2017	18.56				5.65	294.99	12.91
	7/31/2017	18.41				7.18	293.46	11.23
	8/28/2017	18.38				7.69	292.95	10.69
	9/25/2017	18.27				5.70	294.94	12.57
	9/27/2017	18.20				5.97	294.67	12.23
	10/30/2017	18.31				5.00	295.64	13.31
	11/20/2017	18.37				3.09	297.55	15.28
	12/18/2017	18.44				2.99	297.65	15.45
	1/4/2018	18.47				5.00	295.64	13.47
	1/22/2018	18.27				4.09	296.55	14.18
	2/26/2018	18.43				4.65	295.99	13.78
	3/26/2018	18.37				4.52	296.12	13.85
SW-2	4/23/2015	49.75		40 - 50	261.37 - 251.37	37.59	263.78	12.16
	2/22/2016	50.26				DRY	NC	NC
	3/21/2016	50.03				36.86	264.51	13.17
	4/25/2016	50.25				DRY	NC	NC
	5/23/2016	50.15				DRY	NC	NC
	6/27/2016	49.75				37.61	263.76	12.14
	8/8/2016	50.20				37.64	263.73	12.56
	8/30/2016 *	56.60				38.02	263.35	18.58
	9/26/2016	50.47				37.87	263.50	12.60
	10/24/2016 *	55.00				38.29	263.08	16.71
	11/21/2016	51.30				37.44	263.93	13.86
	12/21/2016	50.69				37.23	264.14	13.46
	1/23/2017 *	53.50				37.53	263.84	15.97
	3/6/2017	49.60				37.29	264.08	12.31
	3/21/2017	49.91	301.37			46.69	254.68	3.22
	3/29/2017	49.89				36.85	264.52	13.04
	6/21/2017	49.61				37.21	264.16	12.40
	6/26/2017	50.10				37.42	263.95	12.68
	7/31/2017	49.81				37.84	263.53	11.97
	8/28/2017	49.82				37.79	263.58	12.03
	9/25/2017	49.87				37.83	263.54	12.04
	9/27/2017	49.69				37.97	263.40	11.72
	10/30/2017	49.84				38.09	263.28	11.75
	11/20/2017	49.83				38.98	262.39	10.85
	12/18/2017	49.92				37.92	263.45	12.00
	1/4/2018	49.92				37.39	263.98	12.53
	1/22/2018	49.81				37.17	264.20	12.64
	2/26/2018	49.84				37.15	264.22	12.69
	3/26/2018	49.80				37.49	263.88	12.31
SW-3[c]	4/23/2015	34.75				32.19	277.29	2.56
	12/14/2015	34.78				33.11	276.37	1.67
	1/25/2016	35.12				32.40	277.08	2.72
	2/22/2016	34.86				DRY	NC	NC
	3/21/2016	34.91				31.98	277.50	2.93
	4/25/2016	34.91				DRY	NC	NC
	5/23/2016	35.03				DRY	NC	NC
	6/27/2016	34.70				DRY	NC	NC
	8/8/2016 *	32.60				DRY	NC	NC
	8/30/2016	35.10				32.40	277.08	2.70
	9/26/2016	35.20				33.29	276.19	1.91
	10/24/2016	34.69				32.65	276.83	2.04
	11/21/2016 *	33.77				32.17	277.31	1.60
	12/21/2016	35.14				32.29	277.19	2.85
	1/23/2017	34.65				32.70	276.78	1.95
	3/6/2017	34.66	309.48	22 - 32	284.48 - 274.48	31.69	277.79	2.97
	3/21/0217	34.08				31.70	277.78	2.38
	3/29/2017	34.85				31.82	277.66	3.03
	6/21/2017	34.68				33.63	275.85	1.05
	6/26/2017	34.84				33.70	275.78	1.14
	7/31/2017	34.80				34.42	275.06	0.38
	8/28/2017	34.74				DRY	NC	NC
	9/25/2017	34.64				DRY	NC	NC
	9/27/2017	34.45				DRY	NC	NC
	10/30/2017	30.66				DRY	NC	NC
	11/20/2017	34.66				33.38	276.10	1.28
	12/18/2017	34.71				32.43	277.05	2.28
	1/4/2018	frozen @ 4.79				well frozen at top		
	1/22/2018	34.71				31.94	277.54	2.77
	2/26/2018	34.76				32.15	277.33	2.61
	3/26/2018	34.73				33.00	276.48	1.73

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
DPE-4	4/23/2015	16.91	302.30	6.5 - 16.5	298.51 - 288.51	8.46	293.30	8.45
	10/26/2015	17.00				16.50	285.80	0.50
	12/14/2015	15.70				15.50	286.80	0.20
	1/25/2016	15.70				14.77	287.53	0.93
	2/22/2016	16.14				15.90	286.40	0.24
	3/21/2016	15.09				14.95	287.35	0.14
	4/25/2016	15.14				DRY	NC	NC
	5/23/2016	15.15				DRY	NC	NC
	6/23/2016	15.13				DRY	NC	NC
	8/1/2016	16.16				DRY	NC	NC
	8/30/2016	15.11				DRY	NC	NC
	9/26/2016	14.88				DRY	NC	NC
	10/24/2016	14.90				DRY	NC	NC
	11/21/2016	15.12				15.07	287.23	0.05
	12/21/2016	15.40				DRY	NC	NC
	1/23/2017	14.82				DRY	NC	NC
	3/9/2017	14.87				DRY	NC	NC
	3/21/2017	15.12				DRY	NC	NC
	3/29/2017	15.12				DRY	NC	NC
	6/21/2017	15.14				DRY	NC	NC
	6/26/2017	15.12				DRY	NC	NC
	7/31/2017	15.14				15.11	287.19	0.03
	8/28/2017	15.14				DRY	NC	NC
	9/25/2017	15.14				DRY	NC	NC
	9/27/2017	15.01				DRY	NC	NC
	10/30/2017	15.14				DRY	NC	NC
	11/20/2017	15.13				DRY	NC	NC
	12/18/2017	15.12				DRY	NC	NC
	1/4/2018	14.85				DRY	NC	NC
	1/22/2018	15.11				DRY	NC	NC
	2/26/2018	15.10				14.88	287.42	0.22
	3/26/2018	15.17				14.03	288.27	1.14
MW-3	4/23/2015	33.40	305.83	24 - 34	281.83 - 271.83	DRY	NC	NC
	12/14/2015	33.55				DRY	NC	NC
	1/25/2016	33.39				DRY	NC	NC
	2/22/2016	33.48				DRY	NC	NC
	3/21/2016	33.99				33.36	272.47	0.63
	4/25/2016 *	34.91				DRY	NC	NC
	5/23/2016	33.86				DRY	NC	NC
	6/23/2016 *	35.10				34.50	271.33	0.60
	6/27/2016 *	34.60				33.73	272.10	0.87
	8/8/2016	33.35				DRY	NC	NC
	8/30/2016	34.09				34.00	271.83	0.09
	9/26/2016	33.33				DRY	NC	NC
	10/24/2016	33.88				33.32	272.51	0.56
	11/21/2016	33.80				33.43	272.40	0.37
	12/21/2016	33.40				33.35	272.48	0.05
	1/23/2017	34.00				29.08	276.75	4.92
	3/6/2017	33.47				DRY	NC	NC
	3/21/2017	33.70				DRY	NC	NC
	3/29/2017	33.60				DRY	NC	NC
	6/21/2017	33.51				DRY	NC	NC
	6/26/2017	33.61				DRY	NC	NC
	7/31/2017	33.56				DRY	NC	NC
	8/28/2017	33.54				33.46	272.37	0.08
	9/25/2017	33.55				33.41	272.42	0.14
	9/27/2017	33.38				DRY	NC	NC
	10/30/2017	33.57				33.42	272.41	0.15
	11/20/2017	33.59				33.49	272.34	0.10
	12/18/2017	33.59				33.43	272.40	0.16
	1/4/2018	33.59				DRY	NC	NC
	1/22/2018	33.58				33.47	272.36	0.11
	2/26/2018	33.58				DRY	NC	NC
	3/26/2018	33.57				33.45	272.38	0.12
MW-4	4/23/2015	30.15	305.68	20 - 30	285.67 - 275.67	28.07	277.61	2.08
	12/14/2015	30.16				DRY	NC	NC
	1/25/2016	30.34				29.04	276.64	1.30
	2/22/2016	30.37				24.33	281.35	6.04
	3/21/2016	30.35				25.86	279.82	4.49
	4/25/2016 *	33.79				DRY	NC	NC
	5/23/2016	30.47				DRY	NC	NC
	6/23/2016	30.15				29.84	275.84	0.31
	6/27/2016	30.12				29.85	275.83	0.27
	8/8/2016	29.87				DRY	NC	NC
	8/30/2016 *	35.40				29.87	275.81	5.53
	9/26/2016	30.03				DRY	NC	NC
	10/24/2016 *	33.50				24.41	281.27	9.09
	11/21/2016 *	31.30				26.71	278.97	4.59
	12/21/2016	30.04				28.74	276.94	1.30
	1/23/2017 *	33.70				33.35	272.33	0.35
	3/6/2017	30.09				27.02	278.66	3.07
	3/21/2017	31.50				24.14	281.54	7.36
	3/29/2017	30.25				28.91	276.77	1.34
	6/21/2017	30.19				29.45	276.23	0.74
	6/26/2017	30.19				29.44	276.24	0.75
	7/31/2017	30.17				29.84	275.84	0.33
	8/28/2017	30.18				DRY	NC	NC
	9/25/2017	30.19				29.94	275.74	0.25
	9/27/2017	29.99				DRY	NC	NC
	10/30/2017	30.19				29.94	275.74	0.25
	11/20/2017	30.21				29.56	276.12	0.65
	12/18/2017	30.20				29.21	276.47	0.99
	1/4/2018	30.19				28.33	277.35	1.86
	1/22/2018	30.21				28.38	277.30	1.83
	2/26/2018	30.23				28.53	277.15	1.70
	3/26/2018	30.19				29.08	276.60	1.11

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
MW-6	4/23/2015	26.55				16.51	286.27	10.04
	11/30/2015	NA				16.17	286.61	10.38
	12/14/2015	26.56				12.92	289.86	13.64
	1/25/2016	26.74				13.59	289.19	13.15
	2/22/2016	26.77				12.89	289.89	13.88
	3/21/2016	26.65				13.02	289.76	13.63
	4/25/2016	26.73				DRY	NC	NC
	5/23/2016	26.84				DRY	NC	NC
	6/23/2016	26.78				19.17	283.61	7.61
	6/27/2016	26.70				18.52	284.26	8.18
	8/8/2016	26.81				23.31	279.47	3.50
	8/30/2016	27.06				25.91	276.87	1.15
	9/26/2016	26.63				16.67	286.11	9.96
	10/24/2016	26.55				12.94	289.84	13.61
	11/21/2016	26.76				15.20	287.58	11.56
	12/21/2016	26.62				12.81	289.97	13.81
	1/23/2017	26.55	302.78	11 - 26	291.78 - 276.78	13.25	289.53	13.30
	3/6/2017	26.48				12.81	289.97	13.67
	3/21/2017	26.17				12.76	290.02	13.41
	3/29/2017	26.75				12.55	290.23	14.20
	6/21/2017	26.64				15.63	287.15	11.01
	6/26/2017	26.73				18.54	284.24	8.19
	7/31/2017	26.71				26.14	276.64	0.57
	8/28/2017	26.73				26.15	276.63	0.58
	9/25/2017	26.72				21.48	281.30	5.24
	9/27/2017	26.73				22.32	280.46	4.41
	10/30/2017	26.72				13.45	289.33	13.27
	11/20/2017	26.72				12.86	289.92	13.86
	12/18/2017	26.72				12.62	290.16	14.10
	1/4/2018	26.72				12.89	289.89	13.83
	1/22/2018	26.71				13.01	289.77	13.70
	2/26/2018	26.72				12.90	289.88	13.82
	3/26/2018	26.73				12.80	289.98	13.93
MW-8	4/23/2015	37.10				DRY	NC	NC
	12/14/2015	37.08				DRY	NC	NC
	1/25/2016	37.28				DRY	NC	NC
	2/22/2016	37.13				36.91	265.33	0.22
	3/21/2016	37.45				37.00	265.24	0.45
	4/25/2016	37.41				DRY	NC	NC
	5/23/2016	37.55				37.05	265.19	0.50
	6/23/2016	37.50				37.04	265.20	0.46
	6/27/2016	37.20				DRY	NC	NC
	8/8/2016	37.68				37.08	265.16	0.60
	8/30/2016	37.96				DRY	NC	NC
	9/26/2016	37.80				37.10	265.14	0.70
	10/24/2016	37.60				37.08	265.16	0.52
	11/21/2016	37.40				37.15	265.09	0.25
	12/21/2016	37.14				37.08	265.16	0.06
	1/23/2017	37.59				36.97	265.27	0.62
	3/6/2017	37.15	302.24	23 - 38	279.24 - 264.24	DRY	NC	NC
	3/21/2017	31.42				31.05	271.19	0.37
	3/29/2017	37.40				DRY	NC	NC
	6/21/2017	37.40				DRY	NC	NC
	6/26/2017	37.03				DRY	NC	NC
	7/31/2017	37.28				37.05	265.19	0.23
	8/28/2017	37.29				37.09	265.15	0.20
	9/25/2017	37.26				37.09	265.15	0.17
	9/27/2017	37.08				DRY	NC	NC
	10/30/2017	37.29				37.08	265.16	0.21
	11/20/2017	37.27				33.83	268.41	3.44
	12/18/2017	37.30				37.08	265.16	0.22
	1/4/2018	37.26				37.08	265.16	0.18
	1/22/2018	37.26				37.00	265.24	0.26
	2/26/2018	37.29				37.02	265.22	0.27
	3/26/2018	37.27				37.05	265.19	0.22
MW-11[c]	4/23/2015	48.15				DRY	NC	NC
	11/30/2015	NA				47.54	273.77	0.61
	12/14/2015	48.17				47.21	274.10	0.96
	1/25/2016 *	46.93				DRY	NC	NC
	2/22/2016	48.21				46.86	274.45	1.35
	3/21/2016	48.52				46.96	274.35	1.56
	4/25/2016	48.69				DRY	NC	NC
	5/23/2016	48.73				DRY	NC	NC
	6/27/2016	48.30				DRY	NC	NC
	8/8/2016	48.02				DRY	NC	NC
	8/30/2016	48.80				48.48	272.83	0.32
	10/24/2016	48.95				48.00	273.31	0.95
	9/26/2016 *	38.00				DRY	NC	NC
	11/21/2016	48.42				47.22	274.09	1.20
	12/21/2016	48.60				47.60	273.71	1.00
	1/23/2017	48.90				47.23	274.08	1.67
	3/6/2017	48.24	321.31	25 - 45	293.31 - 273.31	46.91	274.40	1.33
	3/21/2017	48.48				46.85	274.46	1.63
	3/29/2017	48.41				47.05	274.26	1.36
	6/21/2017	48.30				47.98	273.33	0.32
	6/26/2017	48.58				48.08	273.23	0.50
	7/31/2017	48.40				48.08	273.23	0.32
	8/28/2017	48.36				48.09	273.22	0.27
	9/25/2017	48.38				48.08	273.23	0.30
	9/27/2017	48.18				48.09	273.22	0.09
	10/30/2017	48.42				48.10	273.21	0.32
	11/20/2017	48.41				47.61	273.70	0.80
	12/18/2017	48.39				48.07	273.24	0.32
	1/4/2018	48.45				47.90	273.41	0.55
	1/22/2018	48.45				47.36	273.95	1.09
	2/26/2018	48.42				47.46	273.85	0.96
	3/26/2018	48.40				47.41	273.90	0.99

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
MW-12[c]	4/23/2015	51.60				DRY	NC	NC
	11/30/2015	NA				50.69	272.84	0.91
	12/14/2015	51.80				51.20	272.33	0.60
	1/25/2016	52.12				DRY	NC	NC
	2/22/2016	51.99				DRY	NC	NC
	3/21/2016	52.20				51.74	271.79	0.46
	4/25/2016	52.12				DRY	NC	NC
	5/23/2016	52.22				DRY	NC	NC
	6/27/2016	51.75				DRY	NC	NC
	8/8/2016	51.72				DRY	NC	NC
	8/30/2016	52.55				DRY	NC	NC
	9/26/2016	52.50				DRY	NC	NC
	10/24/2016	52.50				DRY	NC	NC
	11/21/2016	51.89				51.80	271.73	0.09
	12/21/2016	52.67				51.77	271.76	0.90
	1/23/2017	52.25	323.53	29 - 49	291.53 - 271.53	DRY	NC	NC
	3/6/2017	51.69				DRY	NC	NC
	3/21/2017	52.45				DRY	NC	NC
	3/29/2017	51.89				DRY	NC	NC
	6/21/2017	51.70				DRY	NC	NC
	6/26/2017	51.83				DRY	NC	NC
	7/31/2017	51.83				DRY	NC	NC
	8/28/2017	51.82				DRY	NC	NC
	9/25/2017	51.87				DRY	NC	NC
	9/27/2017	51.65				DRY	NC	NC
	10/30/2017	51.92				DRY	NC	NC
	11/20/2017	51.89				DRY	NC	NC
	12/18/2017	51.86				DRY	NC	NC
	1/4/2018	51.86				51.60	271.93	0.26
	1/22/2018	51.82				DRY	NC	NC
	2/26/2018	51.90				DRY	NC	NC
	3/26/2018	51.86				DRY	NC	NC
MW-13	4/23/2015	62.45				DRY	NC	NC
	11/30/2015	NA				63.48	NC	NC
	12/14/2015	62.62				DRY	NC	NC
	1/25/2016	63.21				62.45	260.75	0.76
	2/22/2016	62.56				DRY	NC	NC
	3/21/2016	63.06				DRY	NC	NC
	4/25/2016	63.09				DRY	NC	NC
	5/23/2016	63.11				DRY	NC	NC
	6/27/2016	62.60				DRY	NC	NC
	8/8/2016	62.50				DRY	NC	NC
	8/30/2016	63.29				DRY	NC	NC
	9/26/2016	63.91				DRY	NC	NC
	10/24/2016 *	63.70				DRY	NC	NC
	11/21/2016	63.00				62.52	260.68	0.48
	12/21/2016	62.90				DRY	NC	NC
	1/23/2017	63.36				DRY	NC	NC
	3/6/2017	62.50	323.20	39 - 59	281.20 - 261.20	DRY	NC	NC
	3/21/2017	63.47				DRY	NC	NC
	3/29/2017	62.68				DRY	NC	NC
	6/21/2017	62.60				DRY	NC	NC
	6/26/2017	63.08				DRY	NC	NC
	7/31/2017	62.70				62.57	260.63	0.13
	8/28/2017	62.68				62.58	260.62	0.10
	9/25/2017	62.68				62.61	260.59	0.07
	9/27/2017	62.54				DRY	NC	NC
	10/30/2017	62.66				62.62	260.58	0.04
	11/20/2017	62.69				62.61	260.59	0.08
	12/18/2017	62.76				62.61	260.59	0.15
	1/4/2018	62.69				DRY	NC	NC
	1/22/2018	62.65				DRY	NC	NC
	2/26/2018	62.69				DRY	NC	NC
	3/26/2018	62.69				DRY	NC	NC
MW-14	4/23/2015	50.75				DRY	NC	NC
	11/30/2015	NA				50.72	266.05	0.03
	12/14/2015	50.94				DRY	NC	NC
	1/25/2016	51.37				DRY	NC	NC
	2/22/2016	51.24				50.77	266.00	0.47
	3/21/2016	51.46				50.73	266.04	0.73
	4/25/2016	51.46				DRY	NC	NC
	5/23/2016	51.12				DRY	NC	NC
	6/27/2016	50.90				DRY	NC	NC
	8/8/2016	51.30				DRY	NC	NC
	8/30/2016 *	52.00				DRY	NC	NC
	9/26/2016	51.80				50.72	266.05	1.08
	10/24/2016	51.65				46.90	269.87	4.75
	11/21/2016	51.20				50.85	265.92	0.35
	12/21/2016	51.30				51.23	265.54	0.07
	1/23/2017	51.50				50.61	266.16	0.89
	3/6/2017	50.82	316.77	30 - 50	286.77 - 266.77	50.69	266.08	0.13
	3/21/2017	51.35				50.78	265.99	0.57
	3/29/2017	50.89				DRY	NC	NC
	6/21/2017	50.65				DRY	NC	NC
	6/26/2017	50.98				50.77	266.00	0.21
	7/31/2017	50.96				50.76	266.01	0.20
	8/28/2017	50.96				50.78	265.99	0.18
	9/25/2017	50.97				50.83	265.94	0.14
	9/27/2017	50.80				DRY	NC	NC
	10/30/2017	51.02				50.82	265.95	0.20
	11/20/2017	50.99				50.81	265.96	0.18
	12/18/2017	51.02				50.85	265.92	0.17
	1/4/2018	51.01				50.88	265.89	0.13
	1/22/2018	51.02				50.87	265.90	0.15
	2/26/2018	51.01				50.76	266.01	0.25
	3/26/2018	51.01				50.78	265.99	0.23

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
MW-15	4/23/2015	34.25				DRY	NC	NC
	10/26/2015	33.76				33.72	269.40	0.04
	11/30/2015	NA				33.82	269.30	NC
	12/14/2015	34.24				33.79	269.33	0.45
	1/25/2016	35.15				33.80	269.32	1.35
	2/22/2016 *	33.39				33.19	269.93	0.20
	3/21/2016	34.82				33.78	269.34	1.04
	4/25/2016	34.71				DRY	NC	NC
	5/23/2016	34.80				DRY	NC	NC
	6/27/2016 *	33.52				DRY	NC	NC
	8/8/2016	34.31				33.74	269.38	0.57
	8/30/2016 *	35.26				33.74	269.38	1.52
	9/26/2016 *	36.00				DRY	NC	NC
	10/24/2016	35.15				33.63	269.49	1.52
	11/21/2016	33.80				33.73	269.39	0.07
	12/21/2016	34.39				33.72	269.40	0.67
	1/23/3017	35.25	303.12	25 - 35	278.12 - 268.12	33.70	269.42	1.55
	3/6/2017	34.08				33.74	269.38	0.34
	3/21/2017	35.30				DRY	NC	NC
	3/29/2017	34.37				DRY	NC	NC
	6/21/2017	34.31				DRY	NC	NC
	6/26/2017	34.67				33.75	269.37	0.92
	7/31/2017	34.26				33.79	269.33	0.47
	8/28/2017	34.31				33.77	269.35	0.54
	9/25/2017	34.28				33.76	269.36	0.52
	9/27/2017	34.07				33.77	269.35	0.30
	10/30/2017	34.28				33.78	269.34	0.50
	11/20/2017	34.24				33.79	269.33	0.45
	12/18/2017	34.31				33.76	269.36	0.55
	1/4/2018	34.36				33.77	269.35	0.59
	1/22/2018	34.38				33.82	269.30	0.56
	2/26/2018	34.28				33.82	269.30	0.46
	3/26/2018	34.32				33.91	269.21	0.41
MW-16	4/23/2015	34.82				DRY	NC	NC
	10/26/2015	34.91				34.80	269.11	0.11
	12/14/2015	34.83				DRY	NC	NC
	1/25/2016	35.73				DRY	NC	NC
	2/22/2016	35.72				34.97	268.94	0.75
	3/21/2016	35.61				33.81	270.10	1.80
	4/25/2016	35.41				DRY	NC	NC
	5/23/2016	35.58				DRY	NC	NC
	6/27/2016	34.70				DRY	NC	NC
	8/8/2016	35.50				34.73	269.18	0.77
	8/30/2016 *	36.23				34.74	269.17	1.49
	9/26/2016 *	36.50				DRY	NC	NC
	10/24/2016 *	36.65				DRY	NC	NC
	11/21/2016	35.46				34.60	269.31	0.86
	12/21/2016 *	36.10				DRY	NC	NC
	1/23/2017	35.70				34.36	269.55	1.34
	3/6/2017	34.61	303.91	25 - 35	278.91 - 268.91	34.02	269.89	0.59
	3/21/2017	35.73				DRY	NC	NC
	3/29/2017	34.87				DRY	NC	NC
	6/21/2017	34.69				DRY	NC	NC
	6/26/2017	34.72				DRY	NC	NC
	7/31/2017	35.95				34.75	269.16	1.20
	8/28/2017	34.85				34.74	269.17	0.11
	9/25/2017	34.93				34.68	269.23	0.25
	9/27/2017	34.77				DRY	NC	NC
	10/30/2017	34.97				34.92	268.99	0.05
	11/20/2017	34.71				DRY	NC	NC
	12/18/2017	35.01				34.88	269.03	0.13
	1/4/2018	35.45				34.72	269.19	0.73
	1/22/2018	34.81				34.64	269.27	0.17
	2/26/2018	34.89				34.74	269.17	0.15
	3/26/2018	34.84				DRY	NC	NC

[a]Total depth was measured by sounding the wells prior to sampling and may differ from total depth as installed.

[b]Source of TOC elevations is Larry Steele & Associates. The TOC noted for DPE-4 is the elevation for the sampling port due to the DPE equipment installed in the well. For DPE-4, the measurement on April 23, 2015 was TOC for well casing (pre-dated DPE installation).

Notes:

Highlighted cells recorded a water column less than 0.7 foot. This is an indication that the well is dry and the water measured in the well is due to the collection of water in the bottom cap of the well.

Well is dry.

* - Indicates measured depth to bottom of well is very different than expected; impacts calculation of thickness of water column.

ft - foot

ft-TOC - feet below top of well casing

ft-NAVD88 - vertical elevation in feet relative to North American Vertical Datum of 1988

ft-bgs - feet below ground surface

NC - not calculated

NM - not measured

Table 2 - Quarterly Groundwater Monitoring Results
Laurel Station Cleanup Action
Bellingham, Washington

Sample ID	Groundwater Cleanup	MW4	MW-6														
Sample Date	Levels	4/23/15	4/23/15	4/23/15 (DUP)	12/14/15	3/29/16	3/29/16 (DUP)	6/27/16	6/27/16 (DUP)	9/26/16	12/21/16	12/21/16 (DUP)	3/29/17	6/21/17	6/21/17 (DUP)	9/27/17	1/4/18
Total Petroleum Hydrocarbons (TPH, mg/L)																	
Gasoline-range (Gx)	0.8/1.0 [a]	0.25 U	0.25 U	0.25 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Diesel-range (Dx)	NE	**0.94**	0.10 U	0.13 U	**0.12**	0.10 U	0.10 U	**0.11**	0.10 U	**0.273**	0.100 U	0.100 U	0.100 U	0.115 U	**0.124**	**0.421**	**0.117**
Motor Oil-range	NE	**0.47**	0.20 U	0.25 U	**0.22**	0.20 U	0.20 U	0.20 U	0.20 U	0.200 U	0.200 U	0.200 U	0.200 U	0.230 U	**0.269**	**0.336**	0.200 U
Total TPH (Sum Dx, Oil-range, mg/L)	0.5	**1.41**	ND	ND	**0.34**	ND	ND	**0.11**	ND	**0.273**	ND	ND	ND	ND	**0.393**	**0.757**	**0.117**
BTEX (ug/L)																	
Benzene	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	640	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	700	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
m,p-Xylene	1,600	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
o-Xylene	1,600	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Polycyclic Aromatic Hydrocarbons (ug/L)																	
1-Methylnaphthalene	1.51	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.020**	**0.017**	**0.012**	0.010 U	0.013 U	0.011 U	NA	0.010 U
2-Methylnaphthalene	32	NA	**0.019**	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.049**	**0.048**	**0.033**	**0.026**	**0.018**	**0.017**	NA	0.010 U
Acenaphthene	960	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Acenaphthylene	NE	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Anthracene	4,800	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.014**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Benzo(a)anthracene [1]	0.12	NA	**0.013**	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.020**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Benzo(b)fluoranthene [1]	0.12	NA	**0.011**	NA	0.010 U	NA	NA	NA	NA	**0.013**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Benzo(k)fluoranthene [1]	1.2	NA	0.010 U	NA	0.010 U	NA	NA	NA	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Benzo(a)pyrene [1]	0.12	NA	**0.012**	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.014**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Benzo(g,h,i)perylene	NE	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Chrysene [1]	12	NA	**0.015**	NA	**0.012**	0.10 U	0.10 U	0.10 U	0.10 U	**0.023**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Dibenz(a,h)anthracene [1]	0.012	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Dibenzofuran	16	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Fluoranthene	640	NA	**0.017**	NA	**0.013**	0.10 U	0.10 U	0.10 U	0.10 U	**0.045**	0.010 U	0.010 U	0.010 U	0.013 U	**0.015**	NA	0.010 U
Fluorene	640	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 U	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Indeno(1,2,3-cd)pyrene [1]	0.12	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	0.10 U	0.10 U	0.010 UJ	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Naphthalene	160	NA	0.010 U	NA	0.010 U	0.10 U	0.10 U	**0.22**	**0.15**	**0.670**	**0.303 J**	**0.209 J**	**0.153**	**0.164**	**0.150**	NA	**0.040**
Phenanthrene	NE	NA	0.010 U	NA	**0.010**	0.10 U	0.10 U	0.10 U	0.10 U	**0.024**	0.010 U	0.010 U	0.010 U	0.013 U	0.011 U	NA	0.010 U
Pyrene	480	NA	**0.022**	NA	**0.014**	0.10 U	0.10 U	0.10 U	0.10 U	**0.054**	0.010 U	0.010 U	0.010 U	0.013 U	**0.012**	NA	0.010 U
Total Benzofluoranthenes [2]	0.12	NA	**0.024 J**	NA	0.020 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	NA	NA	NA	NA
TTEC	0.12	NA	0.015	NA	0.00012	NC	NC	NC	NC	0.0175	NC	NC	NC	NC	NC	NC	NC

Table 2 - Quarterly Groundwater Monitoring Results
Laurel Station Cleanup Action
Bellingham, Washington

Sample ID Sample Date	Groundwater Cleanup Levels	PV-1 4/24/15	DPE-1 4/24/15	DPE-2 4/24/15	DPE-3 4/23/15	DPE-4 4/24/15	DPE-5 4/24/15	DPE-8 4/23/15
Total Petroleum Hydrocarbons (TPH, mg/L)								
Gasoline-range (Gx)	0.8/1.0 [a]	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Diesel-range (Dx)	NE	**0.38**	**2.1**	**0.59**	**0.86**	**0.14**	**0.46**	**0.60**
Motor Oil-range	NE	0.20 U	**0.54**	**0.23**	**0.82**	0.20 U	0.20 U	0.20 U
Total TPH (Sum Dx, Oil-range, mg/L)	0.5	**0.38**	**2.64**	**0.82**	**1.68**	**0.14**	**0.46**	**0.60**
BTEX (ug/L)								
Benzene	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	640	**0.26**	0.20 U	**0.55**	**0.37**	0.20 U	0.20 U	**0.44**
Ethylbenzene	700	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
m,p-Xylene	1,600	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
o-Xylene	1,600	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Polycyclic Aromatic Hydrocarbons (ug/L)								
1-Methylnaphthalene	1.51	0.010 U	0.010 U	**0.010**	**0.019**	0.010 U	0.010 U	0.010 U
2-Methylnaphthalene	32	0.010 U	0.010 U	0.010 U	**0.022**	0.010 U	0.010 U	0.010 U
Acenaphthene	960	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Acenaphthylene	NE	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Anthracene	4,800	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(a)anthracene [1]	0.12	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(b)fluoranthene [1]	0.12	0.010 U	**0.015**	0.010 U	**0.016**	0.010 U	0.010 U	0.010 U
Benzo(k)fluoranthene [1]	1.2	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(a)pyrene [1]	0.12	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(g,h,i)perylene	NE	0.010 U	0.010 U	0.010 U	**0.015**	0.010 U	0.010 U	0.010 U
Chrysene [1]	12	0.010 U	**0.098**	**0.013**	**0.044**	0.010 U	0.010 U	**0.011**
Dibenz(a,h)anthracene [1]	0.012	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Dibenzofuran	16	0.010 U	0.010 U	0.010 U	**0.012**	0.010 U	0.010 U	0.010 U
Fluoranthene	640	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Fluorene	640	0.010 U	0.010 U	**0.018**	**0.012**	0.010 U	**0.027**	0.010 U
Indeno(1,2,3-cd)pyrene [1]	0.12	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Naphthalene	160	0.010 U	0.021 U	0.031 U	0.010 U	0.019 U	0.033 U	0.020 U
Phenanthrene	NE	0.010 U	0.010 U	0.010 U	**0.013**	0.010 U	0.010 U	0.010 U
Pyrene	480	0.010 U	**0.057**	**0.020**	**0.031**	0.010 U	0.010 U	**0.012**
Total Benzofluoranthenes [2]	0.12	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
TTEC	0.12	NC	0.0025	0.00013	0.0020	NC	NC	0.00011

Notes:
Bolded values indicate that analyte was detected above the laboratory reporting limit.
Bolded and highlighted values exceed the project cleanup levels.
BTEX - benzene, toluene, ethylbenzene, and xylenes
J - estimated value
mg/L - milligram per liter
NA - not analyzed or not applicable
NC- not calculable
ND - not detected
NE - not established
TTEC - Total Toxicity Equivalent Concentration, reference WAC173-340-708
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
ug/L - microgram per liter

[a] Gasoline with benzene present/without benzene present

[1] This is considered a carcinogenic polycyclic aromatic hydrocarbon compound.

[2] Total benzofluoranthenes is the sum of the benzo(b)fluoranthene, benzo(j)fluoranthene, and benzo(k)fluoranthene isomers. The cleanup level of 0.12 ug/L is based on benzo(b)fluoranthene.

Memo

1111 3rd Avenue, Suite 1600
Seattle, Washington 98101
206.438.2700 Telephone
206.438.2699 Fax

To:	Karen Mixon, Project Manager	**Info:**	**FINAL**
From:	Chelsey Cook, Chemist Lucy Panteleeff, Chemist	**Date:**	March 12, 2018
RE:	Data Quality Review Quarterly Groundwater Samples – January 2018 Laurel Station Cleanup Action		

The data quality review of 1 groundwater sample and 1 trip blank collected on January 4, 2018, has been completed. The samples were analyzed by Analytical Resources, Incorporated (ARI) located in Tukwila, Washington for benzene, toluene, ethylbenzene, m,p-xylene, and o-xylene (BTEX) by EPA Method 8260C, total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology (Ecology) Methods NWTPH-Gx (gasoline-range TPH) and/or NWTPH-Dx (diesel-range and motor oil-range TPH), and/or low-level polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D modified by selected ion monitoring (SIM). Samples were analyzed for the chemical constituents as described in the *Final Compliance Monitoring Plan, Laurel Station, 1009 East Smith Road, Bellingham, Washington* dated January 16, 2015 (CMP). Due to changes in laboratory procedures, NWTPH-Gx analysis was performed using GC/MS instrumentation instead of GC/FID.

The analyses were performed in general accordance with methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846)* and Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997. The laboratory provided a full data package containing sample results and associated QA/QC data. The following samples are associated with ARI group 18A0065:

Sample ID	Laboratory ID	Requested Analyses
MW-6	18A0065-01	BTEX, NWTPH-Gx, NWTPH-Dx, PAHs
Trip Blanks	18A0065-02	BTEX, NWTPH-Gx

The following comments refer to ARI's performance in meeting the quality control specifications described in the analytical methods. Data were qualified based on the method criteria and guidance provided in the EPA document *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017. Data qualifiers that may be assigned to data from this laboratory group include:

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Multiple results reported from different analytical dates and/or dilutions. Value from another analysis should be used.

Data Quality Review
Quarterly Groundwater Samples – January 2018
Laurel Station Cleanup Action

Sample Receipt

Upon receipt by ARI, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperature was recorded. The trip blank was not noted on the COC but was received with the shipment. The laboratory logged the trip blank for BTEX and gasoline-range TPH. The cooler was received at a temperature within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C.

The laboratory noted that small (<2 millimeter) air bubbles were present in one VOA vial submitted for MW-6 and the trip blank. Data were not qualified based on the presence of small air bubbles in the sample vials.

Organic Analyses

Samples were analyzed for BTEX, TPHs, and PAHs by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Instrument Performance and Calibrations (initial and continuing) – Acceptable

3. Blanks – Acceptable

4. Surrogates – Acceptable

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

   BTEX by EPA Method 8260C and NWTPH-Gx – MS/MSDs were not performed in association with these analyses. Precision and accuracy were assessed using the LCS/LCSD.

   NWTPH-Dx and PAHs by EPA Method 8270D-SIM – MS/MSDs were not performed in association with these analyses. Accuracy was assessed using the LCS. Precision was not assessed.

7. Reporting Limits – Acceptable

Overall Assessment of Data

The data reported in this laboratory group are considered usable for meeting project objectives. The completeness for laboratory group 18A0065 is 100%.

Table 1. Summary of Qualified Data

Sample ID	ARI ID	Analyte	Result	Units	Final Result
No data qualifiers were assigned to the results reported in laboratory group 18A0065 during validation.					

Analytical Resources, Incorporated
Analytical Chemists and Consultants

19 January 2018

Karen Mixon
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: Laurel Station

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18A0065	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18A0065	Turn-around Requested:	Page: 1 of 1	
ARI Client Company: AECOM	Phone: 206-438-2700	Date: 1/4/18	Ice Present?
Client Contact: Karen Mixon		No. of Coolers:	Cooler Temps:
Client Project Name: KM-Laurel Station			
Client Project #:	Samplers: DC/LP		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Low level PAHs 8270D-SIM	DX NWTPH-Dx	GX NWTPH-Gx	BTEX 8260C					Notes/Comments
MW-6	1/4/18	1320	W	7	X	X	X	X					

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lucy Pantaleeff	Printed Name: Jacob Walte	Printed Name:	Printed Name:
	Company: AECOM	Company: ARI	Company:	Company:
	Date & Time: 1-5-18 800	Date & Time: 01/05/18 1058	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: AECOM

Project Name: KM-Laurel station

COC No(s): _____ NA

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

Assigned ARI Job No: 18A0065

Tracking No: _____ NA

Preliminary Examination Phase:

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

Were custody papers included with the cooler? ..... YES NO

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.1°C

Time: 1145

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

Temp Gun ID#: D0052O6

Cooler Accepted by: JSW Date: 01/05/18 Time: 1058

Complete custody forms and attach all shipping documents

Log-In Phase:

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

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

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

Were all bottles sealed in individual plastic bags? ..... YES NO

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

Were all bottle labels complete and legible? ..... YES NO

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

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

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

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

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

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

Date VOC Trip Blank was made at ARI..... NA BF 12/29/17

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

Samples Logged by: BF Date: 1/5/18 Time: 1444

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

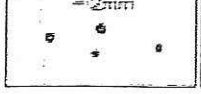
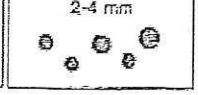
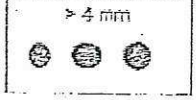
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

TBs not on CoC

TB + MW-6 both had 1 vial w/ a sm bubble

By: BF Date: 1/5/18

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-6	18A0065-01	Water	04-Jan-2018 13:20	05-Jan-2018 10:58
Trip Blanks	18A0065-02	Water	04-Jan-2018 00:00	05-Jan-2018 10:58

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270D-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Gasoline Range Organics - WA-Ecology Method NW-TPHG

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

MW-6

18A0065-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT2

Sampled: 01/04/2018 13:20
Analyzed: 05-Jan-2018 18:18

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGA0123 Sample Size: 10 mL
Prepared: 05-Jan-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Surrogate: Toluene-d8			*80-120 %*	*96.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.3*	*%*	

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

MW-6

18A0065-01 (Water)

Volatile Organic Compounds

Method: NWTPHg
Instrument: NT2

Sampled: 01/04/2018 13:20
Analyzed: 05-Jan-2018 18:18

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGA0123 Sample Size: 10 mL
Prepared: 05-Jan-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	0.100	ND	mg/L	U
Surrogate: Toluene-d8			*80-120 %*	*96.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.3*	*%*	

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

MW-6

18A0065-01 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM
Instrument: NT11

Sampled: 01/04/2018 13:20
Analyzed: 18-Jan-2018 12:34

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGA0179	Sample Size: 500 mL
	Prepared: 10-Jan-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGA0090	Initial Volume: 0.5 mL
	Cleaned: 15-Jan-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.010	**0.040**	ug/L	
2-Methylnaphthalene	91-57-6	1	0.010	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.010	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10			*42-120 %*	*77.8*	*%*	
Surrogate: Dibenzo[a,h]anthracene-d14			*29-120 %*	*90.1*	*%*	
Surrogate: Fluoranthene-d10			*57-120 %*	*91.7*	*%*	

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

MW-6

18A0065-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx
Instrument: FID4

Sampled: 01/04/2018 13:20
Analyzed: 12-Jan-2018 18:07

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGA0221
Prepared: 11-Jan-2018
Sample Size: 500 mL
Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	**0.117**	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)		1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			*50-150 %*	*89.0*	*%*	

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Trip Blanks

18A0065-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT2

Sampled: 01/04/2018 00:00
Analyzed: 05-Jan-2018 18:38

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGA0123 Sample Size: 10 mL
Prepared: 05-Jan-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Surrogate: Toluene-d8			*80-120 %*	*95.7*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.4*	*%*	

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Trip Blanks

18A0065-02 (Water)

Volatile Organic Compounds

Method: NWTPHg
Instrument: NT2

Sampled: 01/04/2018 00:00
Analyzed: 05-Jan-2018 18:38

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGA0123 Sample Size: 10 mL
Prepared: 05-Jan-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	0.100	ND	mg/L	U
Surrogate: Toluene-d8			*80-120 %*	*95.7*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.4*	*%*	

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Volatile Organic Compounds - Quality Control

Batch BGA0123 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0123-BLK1)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 11:49						
Gasoline Range Organics (Tol-Nap)	ND	0.100	mg/L							U
Surrogate: Toluene-d8	4.81		mg/L	*5.00*		*96.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.69		mg/L	*5.00*		*93.9*	*80-120*			
Blank (BGA0123-BLK2)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 11:49						
Benzene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Surrogate: Toluene-d8	4.81		ug/L	*5.00*		*96.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.69		ug/L	*5.00*		*93.9*	*80-120*			
LCS (BGA0123-BS1)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 10:05						
Gasoline Range Organics (Tol-Nap)	0.932	0.100	mg/L	1.00		93.2	72-128			
Surrogate: Toluene-d8	4.93		mg/L	*5.00*		*98.7*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.86		mg/L	*5.00*		*97.2*	*80-120*			
LCS (BGA0123-BS2)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 10:46						
Benzene	10.3	0.20	ug/L	10.0		103	80-120			
Toluene	10.4	0.20	ug/L	10.0		104	80-120			
Ethylbenzene	10.8	0.20	ug/L	10.0		108	80-120			
m,p-Xylene	22.6	0.40	ug/L	20.0		113	80-121			
o-Xylene	10.9	0.20	ug/L	10.0		109	80-121			
Surrogate: Toluene-d8	5.00		ug/L	*5.00*		*99.9*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.07		ug/L	*5.00*		*101*	*80-120*			
LCS Dup (BGA0123-BSD1)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 10:25						
Gasoline Range Organics (Tol-Nap)	0.923	0.100	mg/L	1.00		92.3	72-128	1.04	30	
Surrogate: Toluene-d8	4.90		mg/L	*5.00*		*98.1*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.94		mg/L	*5.00*		*98.8*	*80-120*			
LCS Dup (BGA0123-BSD2)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 11:06						
Benzene	9.79	0.20	ug/L	10.0		97.9	80-120	5.50	30	

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Volatile Organic Compounds - Quality Control

Batch BGA0123 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGA0123-BSD2)				Prepared: 05-Jan-2018 Analyzed: 05-Jan-2018 11:06						
Toluene	9.91	0.20	ug/L	10.0		99.1	80-120	4.60	30	
Ethylbenzene	10.3	0.20	ug/L	10.0		103	80-120	4.73	30	
m,p-Xylene	21.9	0.40	ug/L	20.0		110	80-121	2.73	30	
o-Xylene	10.5	0.20	ug/L	10.0		105	80-121	3.18	30	
Surrogate: Toluene-d8	4.98		ug/L	*5.00*		*99.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.07		ug/L	*5.00*		*101*	*80-120*			

AECOM	Project: Laurel Station	
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Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Semivolatile Organic Compounds - SIM - Quality Control

Batch BGA0179 - EPA 3510C SepF

Instrument: NT11 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0179-BLK1)				Prepared: 10-Jan-2018 Analyzed: 18-Jan-2018 11:22						
Naphthalene	ND	0.010	ug/L							U
2-Methylnaphthalene	ND	0.010	ug/L							U
1-Methylnaphthalene	ND	0.010	ug/L							U
Acenaphthylene	ND	0.010	ug/L							U
Acenaphthene	ND	0.010	ug/L							U
Dibenzofuran	ND	0.010	ug/L							U
Fluorene	ND	0.010	ug/L							U
Phenanthrene	ND	0.010	ug/L							U
Anthracene	ND	0.010	ug/L							U
Fluoranthene	ND	0.010	ug/L							U
Pyrene	ND	0.010	ug/L							U
Benzo(a)anthracene	ND	0.010	ug/L							U
Chrysene	ND	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.010	ug/L							U
Benzo(a)pyrene	ND	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.010	ug/L							U
Surrogate: 2-Methylnaphthalene-d10	0.226		ug/L	*0.300*		*75.5*	*42-120*			
Surrogate: Dibenzo[a,h]anthracene-d14	0.232		ug/L	*0.300*		*77.3*	*29-120*			
Surrogate: Fluoranthene-d10	0.258		ug/L	*0.300*		*85.9*	*57-120*			
LCS (BGA0179-BS1)				Prepared: 10-Jan-2018 Analyzed: 18-Jan-2018 11:58						
Naphthalene	0.257	0.010	ug/L	0.300		85.6	37-120			
2-Methylnaphthalene	0.261	0.010	ug/L	0.300		87.1	37-120			
1-Methylnaphthalene	0.261	0.010	ug/L	0.300		87.1	29-120			
Acenaphthylene	0.248	0.010	ug/L	0.300		82.6	41-120			
Acenaphthene	0.251	0.010	ug/L	0.300		83.8	41-120			
Dibenzofuran	0.264	0.010	ug/L	0.300		88.0	38-120			
Fluorene	0.261	0.010	ug/L	0.300		87.1	43-120			
Phenanthrene	0.290	0.010	ug/L	0.300		96.8	41-120			
Anthracene	0.266	0.010	ug/L	0.300		88.7	40-120			
Fluoranthene	0.286	0.010	ug/L	0.300		95.2	45-120			
Pyrene	0.297	0.010	ug/L	0.300		99.1	41-120			

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Semivolatile Organic Compounds - SIM - Quality Control

Batch BGA0179 - EPA 3510C SepF

Instrument: NT11 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGA0179-BS1)				Prepared: 10-Jan-2018 Analyzed: 18-Jan-2018 11:58						
Benzo(a)anthracene	0.289	0.010	ug/L	0.300		96.4	42-120			
Chrysene	0.292	0.010	ug/L	0.300		97.3	44-120			
Benzo(b)fluoranthene	0.315	0.010	ug/L	0.300		105	44-120			
Benzo(k)fluoranthene	0.273	0.010	ug/L	0.300		91.1	50-120			
Benzo(a)pyrene	0.267	0.010	ug/L	0.300		88.9	35-120			
Indeno(1,2,3-cd)pyrene	0.322	0.010	ug/L	0.300		107	37-120			
Dibenzo(a,h)anthracene	0.309	0.010	ug/L	0.300		103	34-120			
Benzo(g,h,i)perylene	0.340	0.010	ug/L	0.300		113	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.241		ug/L	*0.300*		*80.5*	*42-120*			
Surrogate: Dibenzo[a,h]anthracene-d14	0.285		ug/L	*0.300*		*95.1*	*29-120*			
Surrogate: Fluoranthene-d10	0.262		ug/L	*0.300*		*87.4*	*57-120*			

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AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Petroleum Hydrocarbons - Quality Control

Batch BGA0221 - EPA 3510C SepF

Instrument: FID4 Analyst: ML

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0221-BLK1)				Prepared: 11-Jan-2018 Analyzed: 12-Jan-2018 17:28						
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.401		mg/L	*0.450*		*89.2*	*50-150*			
LCS (BGA0221-BS1)				Prepared: 11-Jan-2018 Analyzed: 12-Jan-2018 17:47						
Diesel Range Organics (C12-C24)	2.90	0.100	mg/L	3.00		96.6	56-120			
Surrogate: o-Terphenyl	0.404		mg/L	*0.450*		*89.9*	*50-150*			

AECOM	Project: Laurel Station	
1111 Third Avenue, Suite 1600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Karen Mixon	19-Jan-2018 10:40

Certified Analyses included in this Report

Analyte	Certifications
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE

AECOM	Project: Laurel Station	
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trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

AECOM	Project: Laurel Station	
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EPA 8270D-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,CALAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Acenaphthene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Dibenzofuran	ADEC,DoD-ELAP,NELAP,CALAP
Fluorene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Phenanthrene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Anthracene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Carbazole	NELAP
Fluoranthene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Pyrene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Benzo(a)anthracene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Chrysene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Benzo(b)fluoranthene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Benzo(k)fluoranthene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Benzo(j)fluoranthene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Perylene	ADEC,NELAP,CALAP
Indeno(1,2,3-cd)pyrene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Dibenzo(a,h)anthracene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE
Benzo(g,h,i)perylene	ADEC,DoD-ELAP,NELAP,CALAP,WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE

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JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D1	Surrogate was not detected due to sample extract dilution
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.