



June 27, 2017

Mr. Steve Teel  
Site Manager/Hydrogeologist  
Washington State Department of Ecology  
Toxics Cleanup Program, Southwest Regional Office  
P.O. Box 47775  
Olympia, Washington 98504-7775

**Subject: Groundwater Monitoring Report, May 2017  
CenturyLink Longview Facility  
1305 Washington Way, Longview, Washington 98632**

Dear Mr. Teel:

This letter provides a summary of the groundwater sampling event conducted on May 4, 2017. Groundwater monitoring events are being conducted as a continuation of the Groundwater Monitoring Plan developed in 2008 under the Voluntary Cleanup Program. Groundwater monitoring was conducted in accordance with the Final Direct-Push Sampling Plan, dated March 2, 2015, and approved by Washington State Department of Ecology (Ecology).

### **Groundwater Levels**

The depth to groundwater was measured using an electronic static water level indicator that was lowered into each well. Depth to groundwater was measured to the nearest hundredth of a foot from the top of the well casing. Static water levels ranged from 4.04 to 4.22 feet above mean sea level (amsl), and are summarized in the table below and shown on Figure 1. Groundwater levels were approximately 2.49 feet higher than observed in October 2016.

### **MAY 4, 2017 GROUNDWATER ELEVATIONS**

<b>Location</b>	<b>Surveyed Top of Casing (ft amsl)</b>	<b>May 4, 2017 Depth to Water (ft)</b>	<b>May 4, 2017 Groundwater Elevation (ft amsl)</b>
<b>MW-01</b>	15.64	10.86	4.78
<b>MW-02</b>	16.17	11.49	4.68
<b>MW-03</b>	15.02	10.26	4.76
<b>MW-04</b>	14.55	9.85	4.70
<b>MW-05</b>	14.75	10.10	4.65

Notes:  
ft                      Feet  
ft amsl              Feet above mean sea level

Based on groundwater level data shown on Figure 1, the direction of groundwater flow appears to be toward the west, with a relatively flat gradient of approximately 0.0007 foot per foot. Historically, groundwater flow direction has ranged from west to northwest.

### **Groundwater Sampling from Permanent Monitoring Wells**

Groundwater samples were obtained from all five permanent monitoring wells at the facility on May 4, 2017 and a duplicate sample was collected from well MW-05. After groundwater level measurements were documented, field personnel collected groundwater samples using a peristaltic pump. New dedicated tubing was used to collect the sample at each well. In accordance with the work plan, low-flow sampling procedures were used. Sampling flow rates ranged from 200 to 350 milliliters per minute for purging and groundwater sample collection.

A calibrated YSI 600 multi-probe water meter was used to measure field parameters during well purging, and before and after sampling. A HACH 2100Q meter was used to measure turbidity. Water quality parameters measured with the YSI 600 included pH, dissolved oxygen, oxidation-reduction potential, and specific conductance. Low-flow pumping continued until field parameters stabilized within acceptable parameter limits, before samples were collected. Attachment A includes the logs of field parameters measured during the low-flow sampling.

### **Groundwater Sample Analysis**

Once obtained, groundwater samples were labeled in accordance with Tetra Tech, Inc. (Tetra Tech) standard operating procedures, placed in a cooler, and chilled to below 4 degrees Celsius. Samples were delivered directly to ALS Laboratories (ALS), located at 1317 S. 13<sup>th</sup> Avenue in Kelso, Washington. Samples were delivered following standard chain-of-custody protocol. Chain-of-custody forms are included with the laboratory data packages in Attachment B.

ALS analyzed the samples for total petroleum hydrocarbons-diesel (TPH-DRO) and total petroleum hydrocarbons-residual range organics (TPH-RRO) by Method Northwest Total Petroleum Hydrocarbons-Diesel Extended Range (Ecology 1997), without silica gel cleanup. ALS also analyzed the samples for polycyclic aromatic hydrocarbons (PAH) by modified U.S. Environmental Protection Agency Method 625-Selected Ion Monitoring. The samples were filtered with a 0.7-micron ( $\mu\text{m}$ ) filter before analysis by the PAH method.

### **Groundwater Sample Analytical Results**

Table 1 presents analyte concentrations for the sample analyses of permanent groundwater wells sampled during the May 2017 event. TPH-DRO was detected in the sample from well MW-02 at a concentration of 570 micrograms per liter ( $\mu\text{g/L}$ ). Low concentrations of TPH-DRO were detected in samples from the remaining wells; concentrations ranged from 23 to 47  $\mu\text{g/L}$ . Four of the five monitoring wells had levels below the Washington Model Toxic Control Act (MTCA) Method A cleanup level for groundwater of 500  $\mu\text{g/L}$ .

TPH-RRO was detected in all five wells, ranging from 31 to 200  $\mu\text{g/L}$ . Concentrations from all five wells were below the 500  $\mu\text{g/L}$  TPH-RRO MTCA Method A cleanup level for groundwater.

Most of the TPH-DRO and TPH-RRO detections have an associated J qualifier which indicates the concentration is estimated because the constituent was detected below the reporting limit, but above the method detection limit.

The laboratory method blank contained TPH-DRO at a concentration of 27  $\mu\text{g/L}$  with a J qualifier and TPH-RRO at 53  $\mu\text{g/L}$  with a J qualifier. These detections could be used to revise and lower the reported concentrations for the field samples, but such revisions would not significantly affect the results or change the conclusions in this report.

Low concentrations of PAHs were detected in all monitoring wells; Table 1 summarizes these results. There are no total PAH or compound-specific MTCA Method A cleanup levels for PAHs. The MTCA Method A cleanup level of 0.1 µg/L for PAHs is based on the benzo(a)pyrene toxic equivalent quotient (BaP TEQ). Table 1 also shows the BaP TEQ results, which are based on the individual PAH analytical results in Appendix B.

Table 2 summarizes the historical results for DRO and RRO for each well. Table 3 summarizes the historical results for BaP TEQ for each well.

### **Conclusions and Recommendations**

For this first sampling event of 2017, analytical results for samples from all five wells were below MTCA Method A cleanup levels for BaP TEQ and TPH-RRO. Four of the wells were below the MTCA Method A cleanup level for TPH-DRO, however, the sample from MW-02 contained a concentration of TPH-DRO that slightly exceeded the MTCA Method A cleanup level.

The results from the May 2017 event were similar to the March 2016 results, when concentrations from well MW-02 also exceeded the cleanup level for TPH-DRO, though the concentration was not as high in May 2017 as March 2016. Both concentrations that exceeded the MTCA Method A cleanup level occurred in spring after historically high groundwater levels. It is possible that residual TPH contamination may be present in the smear zone and during high groundwater level events, this residual TPH soil contamination dissolves into the groundwater. In the subsequent July, October, and December 2016 groundwater monitoring events, TPH concentrations at MW-02 decreased significantly, indicating that the newly dissolved TPH rapidly degrades. Continued low groundwater TPH concentrations at downgradient wells MW-04 and MW-05 indicate that the TPH plume is stable and not migrating downgradient at significant concentrations.

Tetra Tech recommends that groundwater sampling at the five monitoring wells continue every 18 months to monitor plume stability and continued attenuation of contaminant concentrations to below MTCA Method A cleanup levels. These groundwater sampling events would alternate between spring and fall to obtain groundwater concentration data from high and low groundwater conditions, respectively. This monitoring schedule was discussed with you during our March 22, 2017 teleconference. Accordingly, the next groundwater monitoring events will be conducted in fall 2018 and spring 2020.

If you have any questions or concerns, please contact me at (303) 312-8856 or [david.berestka@tetrattech.com](mailto:david.berestka@tetrattech.com).

Sincerely,



David Berestka, P.E.  
Project Manager  
Tetra Tech, Inc.



Rob Tisdale, Ph.D.  
Chemist and Program Manager  
Tetra Tech, Inc.

cc: Ed Clement, Regional Environmental Health and Safety Manager, CenturyLink

Attachments:

- A Low-Flow Groundwater Sampling Parameter Forms
- B Laboratory Analytical Reports and Chain-of-Custody Records

## **ANALYTICAL RESULTS TABLES**

**TABLE 1**  
**GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**CENTURYLINK LONGVIEW, WASHINGTON FACILITY**

Analyte		TPH-DRO	TPH-RRO	Total PAH	BaP TEQ
MTCA Method A Cleanup Level		500 (µg/L)	500 (µg/L)	NA	0.1 (µg/L)
Location	Date				
MW-01	5/04/2017	42 J	86 J	0.015	0.00026
MW-02	5/04/2017	570 Y	200 J	0.70	<0.020
MW-03	5/04/2017	47 J	54 J	0.010	<0.00020
MW-04	5/04/2017	24 J	37 J	0.017	0.00023
MW-05	5/04/2017	23 J	31 J	0.0096	0.00024
MW-05-DUP	5/04/2017	27 J	48 J	0.020	0.00024

**Notes:**

All concentrations in micrograms per liter (µg/L)

BaP TEQ      Benzo(a)Pyrene Toxic Equivalent Quotient  
 J              Data qualifier indicating that the result is an estimated quantity below the reporting limit  
 MTCA        Model Toxics Control Act Method A for groundwater  
 NA            Not applicable (no applicable MTCA standard)  
 PAH          Polycyclic aromatic hydrocarbon  
 TPH-DRO    Total petroleum hydrocarbons diesel range organics  
 TPH-RRO    Total petroleum hydrocarbons residual range organics  
 Y              The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard  
 < 0.01        Concentration is less than the method detection limit shown

**TABLE 2**  
**HISTORICAL GROUNDWATER SAMPLE RESULTS – DRO AND RRO**  
**CENTURYLINK LONGVIEW, WASHINGTON FACILITY**

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
<b>TPH-DRO</b> <b>(MTCA Method A</b> <b>Cleanup Level =</b> <b>500 µg/L)</b>	3/25/1992	Bailer	82	112	<50	--	--
	12/16/2003	Bailer	<250	<250	<250	--	--
	8/10/2006	Bailer	<50	140	<50	--	--
	9/23/2008	Bailer	--	--	--	<50	140
	2/26/2010	Bailer	--	--	--	<25	100
	9/2/2011	Bailer	--	--	--	73	120
	2/26/2013	Bailer	--	--	--	<b>1,700</b>	<51
	6/3/2013	Bailer	<50	66	<50	210	<50
	12/5/2013	Bailer	97	72	47	<b>1,500</b>	100
	3/27/2014	Bailer	63	87	<250	<b>550</b>	47
	6/25/2014	Bailer	50	33	<260	<b>1,100</b>	<260
	9/10/2014	Bailer	240	90	36	<b>790</b>	48
	3/5/2015	Low Flow	22	82	20	20	27
	7/20/2015	Low Flow	22	77	21	24	30
	12/18/15	Low Flow	38	83	46	96	120
	3/31/16	Low Flow	41	<b>1,500</b>	58	30	30
	7/7/2016	Low Flow	24	330	22	34	21
	10/13/2016	Low Flow	23	130	39	39	48
	12/09/2016	Low Flow	37	120	63	70	67
	5/04/2017	Low Flow	42	<b>570</b>	47	24	23
<b>TPH-RRO</b> <b>(MTCA Method A</b> <b>Cleanup Level =</b> <b>500 µg/L)</b>	3/25/1992	Bailer	<200	<200	<200	--	--
	8/10/2006	Bailer	<250	<250	<250	--	--
	9/23/2008	Bailer	--	--	--	<250	<250
	2/26/2010	Bailer	--	--	--	140	200
	9/2/2011	Bailer	--	--	--	350	210
	2/26/2013	Bailer	--	--	--	<b>11,000</b>	220
	6/3/2013	Bailer	150	<100	<100	<b>1,600</b>	<100
	12/5/2013	Bailer	440	120	120	<b>11,000</b>	170
	3/27/2014	Bailer	370	63	<500	<b>3,900</b>	190
	6/25/2014	Bailer	340	62	21	<b>8,400</b>	51
	9/10/2014	Bailer	<b>1,500</b>	140	120	<b>6,600</b>	82
	3/5/2015	Low Flow	43	70	37	48	53
	7/20/2015	Low Flow	52	71	49	52	42
	12/18/15	Low Flow	84	160	81	81	82
	3/31/16	Low Flow	83	340	110	54	53
	7/7/2016	Low Flow	44	140	41	33	34
	10/13/2016	Low Flow	94	130	98	90	100
	12/09/2016	Low Flow	140	180	130	110	110
	5/04/2017	Low Flow	86	200	54	37	31

**Notes:**

All concentrations in micrograms per liter (µg/L)

**Bold** values indicate exceedance of the MTCA Method A Cleanup Level

For wells with duplicate samples, the highest value reported is shown for each constituent

MTCA Model Toxics Control Act Method A for groundwater

TPH-DRO Total petroleum hydrocarbons diesel range organics

TPH-RRO Total petroleum hydrocarbons residual range organics

-- Not sampled

< 0.01 Concentration is less than the method detection limit shown

**TABLE 3**  
**HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS –**  
**BAP TEQ AND TOTAL PAH**  
**CENTURYLINK LONGVIEW, WASHINGTON FACILITY**

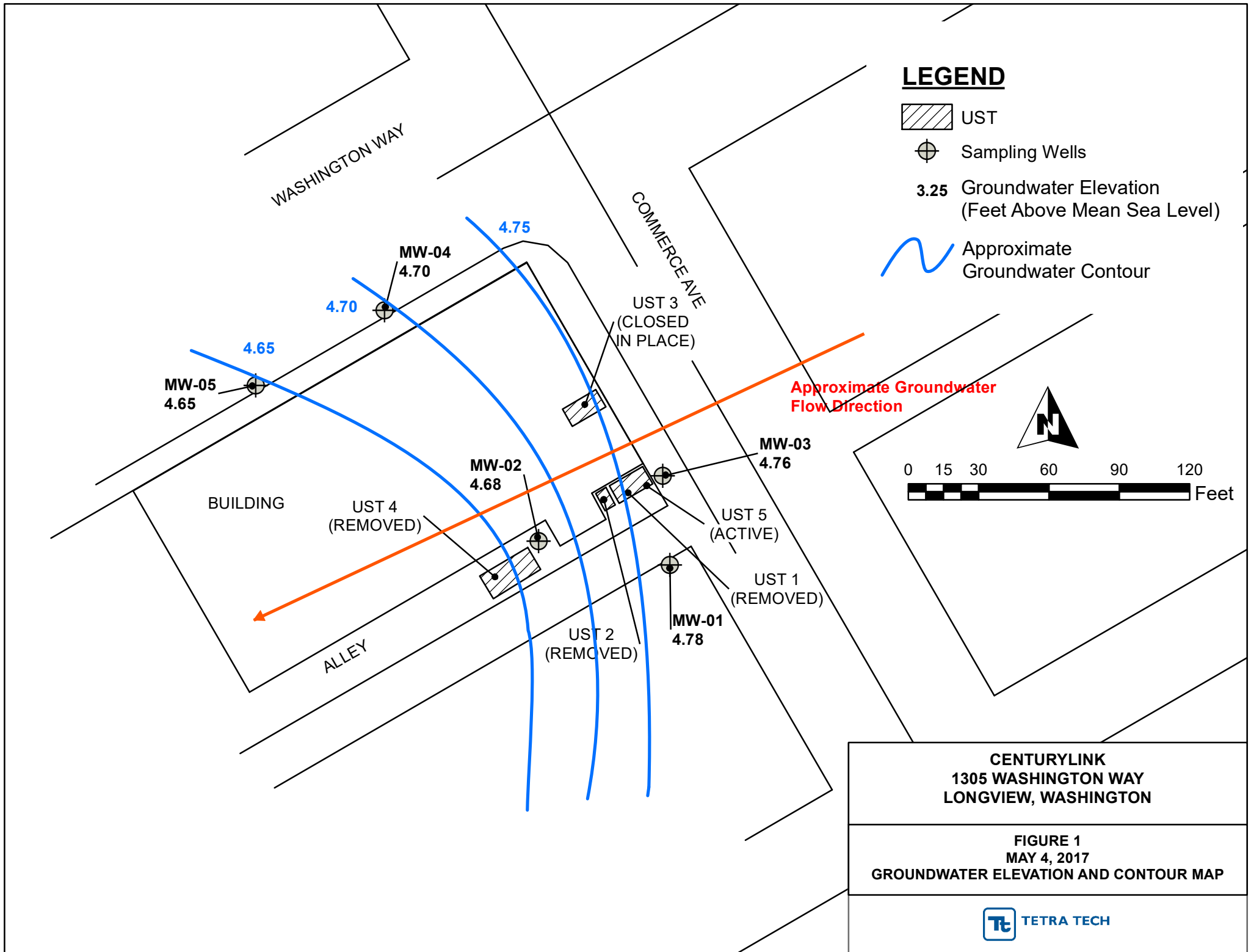
Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
<b>BaP TEQ</b>  <b>Unfiltered analysis</b> (MTCA Method A Cleanup Level = 0.1 µg/L)	6/3/2013	Bailer	<b>2.2</b>	< 0.1	< 0.1	<b>0.36</b>	< 0.1
	12/5/2013	Bailer	<b>0.20</b>	0.027	0.074	<b>1.4</b>	0.0062
	3/27/2014	Bailer	<b>0.37</b>	0.080	0.049	<b>0.27</b>	0.073
	6/25/2014	Bailer	<b>0.39</b>	0.012	0.00033	<b>0.40</b>	0.0054
	9/10/2014	Bailer	<b>0.14</b>	0.090	0.0037	<b>0.39</b>	0.0051
<b>BaP TEQ</b>  <b>Filtered analysis</b> (MTCA Method A Cleanup Level = 0.1 µg/L)	12/5/2013	Bailer	0.00033	--	0.00068	0.00084	--
	3/27/2014	Bailer	< 0.019	< 0.019	--	< 0.019	< 0.019
	6/25/2014	Bailer	< 0.020	--	--	< 0.200	--
	9/10/2014	Bailer	0.00030	0.00027	--	< 0.020	--
	3/5/2015	Low Flow	0.00074	0.00038	< 0.019	0.00044	0.00029
	7/20/2015	Low Flow	0.00029	< 0.020	< 0.021	< 0.021	< 0.021
	12/18/2015	Low Flow	0.0065	0.00029	< 0.019	0.00050	0.00039
	3/31/2016	Low Flow	0.00035	< 0.020	< 0.020	0.00026	< 0.020
	7/7/2016	Low Flow	< 0.020	< 0.020	0.00027	0.00035	< 0.020
	10/13/2016	Low Flow	<0.0026	<0.0026	0.00028	0.00040	0.00041
	12/09/2016	Low Flow	0.00028	<0.020	0.00032	0.00032	<0.020
	5/04/2017	Low Flow	0.00026	<0.020	0.00020	0.00023	0.00024
<b>Total PAH</b>  <b>Unfiltered analysis</b> (No MTCA Method A Cleanup Level)	6/3/2013	Bailer	16	1.6	< 0.1	8.7	< 0.1
	12/5/2013	Bailer	1.7	0.83	0.85	16	2.4
	3/27/2014	Bailer	3.5	1.3	0.50	3.1	0.80
	6/25/2014	Bailer	3.9	2.3	0.12	4.8	0.37
	9/10/2014	Bailer	1.2	1.5	0.049	6.0	5.5
<b>Total PAH</b>  <b>Filtered analysis</b> (No MTCA Method A Cleanup Level)	12/5/2013	Bailer	0.028	--	0.043	0.52	--
	3/27/2014	Bailer	0.018	0.21	--	0.080	0.064
	6/25/2014	Bailer	0.063	--	--	0.11	--
	9/10/2014	Bailer	0.012	0.041	--	0.42	--
	3/5/2015	Low Flow	0.046	0.58	0.013	0.24	0.26
	7/20/2015	Low Flow	0.0077	0.019	0.0056	0.29	0.15
	12/18/2015	Low Flow	0.039	1.9	< 0.019	9.7	8.5
	3/31/2016	Low Flow	0.0035	0.032	< 0.020	0.041	0.0092
	7/7/2016	Low Flow	< 0.020	0.019	0.0092	2.2	0.024
	10/13/2016	Low Flow	0.0083	0.034	0.016	0.68	2.8
	12/09/2016	Low Flow	0.0028	0.0070	0.029	4.7	1.1
	5/04/2017	Low Flow	0.015	0.70	0.01	0.017	0.0096

**Notes:**

All concentrations in micrograms per liter (µg/L)  
**Bold** values indicate exceedance of the MTCA Cleanup Level  
For wells with duplicate samples, the highest value reported is shown for each constituent  
BaP TEQ      Benzo(a)Pyrene Toxic Equivalent Quotient  
MTCA          Model Toxics Control Act Method A for groundwater  
PAH            Polycyclic aromatic hydrocarbon  
--              Not analyzed  
< 0.01        Concentration is less than the method detection limit shown

**FIGURE**





**LEGEND**



UST

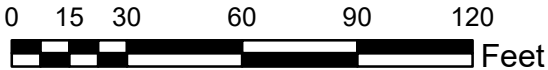


Sampling Wells

3.25 Groundwater Elevation  
(Feet Above Mean Sea Level)



Approximate  
Groundwater Contour



**CENTURYLINK**  
**1305 WASHINGTON WAY**  
**LONGVIEW, WASHINGTON**

**FIGURE 1**  
**MAY 4, 2017**  
**GROUNDWATER ELEVATION AND CONTOUR MAP**

**ATTACHMENT A**  
**LOW-FLOW GROUNDWATER SAMPLING PARAMETER FORMS**

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page \_\_\_\_ of \_\_\_\_  
Date 5/4/17

Well Name <u>MW-1</u>	Screen Interval _____
Project <u>CenturyLink Longview</u>	Station Elevation <u>10.86'</u> GND _____ TOC _____
Project No. _____	Immiscible Phases Present <input type="checkbox"/> Yes <input type="checkbox"/> No
Well Location _____	Static Water Level (from TOC) _____ Type _____
Sample Date <u>5-4-17</u>	Well Stick Up _____ Measured with _____
Sampling Personnel _____	Static Elevation <u>10.86'</u> PID Readings (background) _____
_____	Well Depth <u>19.6</u> MEAS <input checked="" type="checkbox"/> RPTD _____ PID Reading (TOC) _____
_____	Feet of Water _____ Wells Installed by _____
Sample ID <u>MW-1</u>	Gallons/Foot _____ Installation Date _____
Duplicate ID <u>-</u>	Casing Volume _____ Development Date(s) _____

## FIELD CHEMISTRY CALIBRATIONS

Date/Time \_\_\_\_\_ Spec. Conductance: Standard \_\_\_\_\_  $\mu\text{mhos/cm}$  at 25 $^{\circ}\text{C}$  Reading \_\_\_\_\_  $\mu\text{mhos/cm}$  at \_\_\_\_\_ $^{\circ}\text{C}$   
 pH: pH 4.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}\text{C}$  pH 7.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}\text{C}$  pH 10.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}\text{C}$  Slope NA  
 Dissolved Oxygen: D.O. Meter \_\_\_\_\_ mg/L at \_\_\_\_\_ $^{\circ}\text{C}$  PID: Calibration Gas Isobutylene PPM 100 Span NA Reading \_\_\_\_\_

PURGING													
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed (Purged)		PID/OVA Reading		Depth to Water (ft)	Comments
								Gallons	Casing Vol.	Location	Value		
1400	250	4.41	6.48	131.9	15.14	0.276	2.89						
1405	250	4.05	6.40	141.2	15.20	0.277	2.58	0.25					
1410	250	3.88	6.39	144.3	15.18	0.278	2.49	0.75					
1415	250	4.06	6.38	146.5	15.09	0.279	1.85	1.5					
1420	250	4.00	6.37	148.1	15.12	0.279	1.88	2					
1425	250	3.86	6.37	149.3	15.22	0.280	1.83	2.25					
1430	250	3.33	6.39	148.3	15.6	0.285	1.54	3 gal					

## SAMPLE PARAMETERS

1430	3.78	7	6.36	150.5	15.18	0.28	1.83						
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Condition of well: \_\_\_\_\_

Remarks: tubing set 15.5' below TOC, 3- 500mL amber, 1- 500 mL amber w/ HCl

## FIELD EQUIPMENT

pH Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Field Chemistry Calibrations
Spec. Cond. Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Fractions _____
Pump <u>Dedicated Bladder Pump</u>	Serial Number <u>NA</u>	Number of Bottles _____
Water Level Meter <u>Solinst</u>	Serial Number _____	Sample Depth _____
D.O. Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Field Notebook _____
Filter Apparatus _____	Filters _____	Sample Method <u>Micropurge</u>
Temperature Measure _____		
Interface Probe _____	Serial Number _____	
PID/OVA _____	Serial Number _____	Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page \_\_\_\_ of \_\_\_\_  
Date 5/11/17

Well Name <u>MW-2</u>	Screen Interval _____	Station Elevation <u>1149'</u> GND _____ TOC _____	Immiscible Phases Present <input type="checkbox"/> Yes <input type="checkbox"/> No
Project <u>CenturyLink Longview</u>	Static Water Level (from TOC) _____	Type _____	
Project No. _____	Well Stick Up _____	Measured with _____	
Well Location <u>MW-2, parking lot</u>	Static Elevation <u>11.49</u>	PID Readings (background) _____	
Sample Date <u>5-11-17</u>	Well Depth <u>19.9'</u> MEAS <input checked="" type="checkbox"/> RPTD _____	PID Reading (TOC) _____	
Sampling Personnel <u>SD, VP</u>	Feet of Water _____	Wells Installed by _____	
Sample ID <u>MW-2</u>	Gallons/Foot _____	Installation Date _____	
Duplicate ID <u>-</u>	Casing Volume _____	Development Date(s) _____	

## FIELD CHEMISTRY CALIBRATIONS

Date/Time \_\_\_\_\_ Spec. Conductance: Standard \_\_\_\_\_  $\mu$ mhos/cm at 25 $^{\circ}$ C Reading \_\_\_\_\_  $\mu$ mhos/cm at \_\_\_\_\_ $^{\circ}$ C  
pH: pH 4.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C pH 7.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C pH 10.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C Slope NA  
Dissolved Oxygen: D.O. Meter \_\_\_\_\_ mg/L at \_\_\_\_\_ $^{\circ}$ C PID: Calibration Gas Isobutylene PPM 100 Span NA Reading \_\_\_\_\_

## PURGING

1530

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. ( $^{\circ}$ C)	Specific Conduct. ( $\mu$ mhos/cm at $^{\circ}$ C)	Turbidity (NTU)	Cumulative Volume of Water Removed (Purged)		PID/OVA Reading		Depth to Water (ft)	Comments
								Gallons	Casing Vol.	Location	Value		
1525	350	2.31	6.61	141.1	16.33	0.524	0.55	0.25					
1535	250	1.88	6.53	143.9	16.44	0.517	0.50						
1540	250	0.99	6.48	146.9	16.24	0.485	0.48	1					
1545	250	0.84	6.45	149.2	16.22	0.478	0.39	1.5					
1550	250	0.75	6.45	149.6	16.22	0.464	0.37	1.75					
1555	250	0.67	6.43	150.3	16.30	0.457	0.34						
1600	250	0.71	6.43	150.3	16.4	0.449	0.37						
1625	250	0.82	6.44	151.1	16.23	0.428	0.32	3.75					

1605

## SAMPLE PARAMETERS

	250	0.63	6.48	151.1	16.41	0.439	0.33	3					
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Condition of well: Good

Remarks: purging started 1520

## FIELD EQUIPMENT

pH Meter <u>YSI 556 650</u>	Serial Number _____	Field Chemistry Calibrations
Spec. Cond. Meter <u>YSI 556 650</u>	Serial Number _____	Fractions _____
Pump <u>Dedicated Bladder Pump</u>	Serial Number <u>NA</u>	Number of Bottles _____
Water Level Meter <u>Solinst</u>	Serial Number _____	Sample Depth _____
D.O. Meter <u>YSI 556 650</u>	Serial Number _____	Field Notebook _____
Filter Apparatus _____	Filters _____	Sample Method <u>Micropurge</u>
Temperature Measure _____	Serial Number _____	
Interface Probe _____	Serial Number _____	
PID/OVA _____	Serial Number _____	Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of       
Date 5.4.17

Well Name <u>MW-3</u>	Screen Interval <u>                    </u>
Project <u>Kentucky Link Longview</u>	Station Elevation <u>            </u> GND <u>            </u> TOC <u>            </u>
Project No. <u>                    </u>	Static Water Level (from TOC) <u>10.26</u>
Well Location <u>MW-3, Sidewalk</u>	Well Stick Up <u>            </u>
Sample Date <u>5.4.17</u>	Static Elevation <u>10.26</u>
Sampling Personnel <u>SD, JP</u>	Well Depth <u>19.95</u> MEAS <input checked="" type="checkbox"/> RPTD <u>            </u>
	Feet of Water <u>                    </u>
Sample ID <u>MW-3</u>	Gallons/Foot <u>                    </u>
Duplicate ID <u>            </u>	Casing Volume <u>                    </u>
	Immiscible Phases Present <input type="checkbox"/> Yes <input type="checkbox"/> No
	Type <u>                    </u>
	Measured with <u>                    </u>
	PID Readings (background) <u>            </u>
	PID Reading (TOC) <u>            </u>
	Wells Installed by <u>                    </u>
	Installation Date <u>                    </u>
	Development Date(s) <u>                    </u>

## FIELD CHEMISTRY CALIBRATIONS

Date/Time                      Spec. Conductance: Standard                       $\mu$ mhos/cm at 25 $^{\circ}$ C Reading                       $\mu$ mhos/cm at               $^{\circ}$ C  
pH: pH 4.00 -              at               $^{\circ}$ C pH 7.00 -              at               $^{\circ}$ C pH 10.00 -              at               $^{\circ}$ C Slope NA  
Dissolved Oxygen: D.O. Meter              mg/L at               $^{\circ}$ C PID: Calibration Gas Isobutylene PPM 100 Span NA Reading                     

PURGING													
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. ( $^{\circ}$ C)	Specific Conduct. ( $\mu$ mhos/cm at $^{\circ}$ C)	Turbidity (NTU)	Cumulative Volume of Water Removed (Purged)		PID/OVA Reading		Depth to Water (ft)	Comments
								Gallons	Casing Vol.	Location	Value		
0905	360	2.14	6.74	202.0	14.01	0.285	11.1					10.26	No odor
0910	200	2.09	6.50	139.0	14.22	0.285	8.27	1.5				10.26	"
0915	250	1.90	6.47	118.0	14.25	0.290	5.05	1.75				10.26	"
0920	200	1.70	6.46	111.6	14.24	0.293	4.62	2.0				10.26	"
0925	200	1.71	6.43	105.1	14.16	0.295	3.99	2.25				10.26	"
0930	200	1.52	6.43	104.1	14.13	0.295	2.44	2.5				10.25	"
0935	200	1.49	6.43	102.9	14.19	0.295	1.80	2.75				10.25	"
0940	200	1.43	6.43	104.1	14.15	0.295	1.79	3.0				10.25	"
0945	200	1.40	6.44	104.3	14.10	0.296	1.71	3.25				10.25	"

## SAMPLE PARAMETERS

0950	200	1.43	6.46	104.0	14.20	0.299	1.67	4.0				10.27	
------	-----	------	------	-------	-------	-------	------	-----	--	--	--	-------	--

Condition of well:                     

Remarks: 3-500 mL Amber, 1-500 mL Amber w/HCl - Set tubing @ 15.5' below TOC

## FIELD EQUIPMENT

pH Meter <u>YSI 550 650</u>	Serial Number <u>034982</u>	Field Chemistry Calibrations
Spec. Cond. Meter <u>YSI 556 650</u>	Serial Number <u>"</u>	Fractions <u>                    </u>
Pump <u>Dedicated Bladder Pump</u>	Serial Number <u>NA</u>	
Water Level Meter <u>Solinst</u>	Serial Number <u>0044801</u>	Number of Bottles <u>4</u>
D.O. Meter <u>YSI 556 650</u>	Serial Number <u>034982</u>	Sample Depth <u>                    </u>
Filter Apparatus <u>                    </u>	Filters <u>                    </u>	Field Notebook <u>                    </u>
Temperature Measure <u>YSI 650</u>	<u>034982</u>	Sample Method <u>Micropurge</u>
Interface Probe <u>                    </u>	Serial Number <u>                    </u>	
PID/OVA <u>NA</u>	Serial Number <u>                    </u>	Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page \_\_\_\_ of \_\_\_\_

Date 5/4/17

Well Name <u>MW-4</u>	Screen Interval _____	Station Elevation _____ GND _____ TOC _____	Immiscible Phases Present <input type="checkbox"/> Yes <input type="checkbox"/> No
Project <u>Century Link Longview</u>	Static Water Level (from TOC) <u>9.85'</u>	Well Stick Up _____	Type _____
Project No. _____	Static Elevation <u>9.85'</u>	Well Depth <u>19.75</u> MEAS <input checked="" type="checkbox"/> RPTD _____	Measured with _____
Well Location <u>MW-4, Washington Way</u>	Feet of Water _____	Well Installed by _____	PID Readings (background) _____
Sample Date <u>5/4/17</u>	Gallons/Foot _____	Installation Date _____	PID Reading (TOC) _____
Sampling Personnel <u>SD, VP</u>	Casing Volume _____	Development Date(s) _____	
Sample ID <u>MW-4</u>			
Duplicate ID _____			

## FIELD CHEMISTRY CALIBRATIONS

Date/Time \_\_\_\_\_ Spec. Conductance: Standard \_\_\_\_\_  $\mu$ mhos/cm at 25 $^{\circ}$ C Reading \_\_\_\_\_  $\mu$ mhos/cm at \_\_\_\_\_ $^{\circ}$ C  
 pH: pH 4.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C pH 7.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C pH 10.00 - \_\_\_\_\_ at \_\_\_\_\_ $^{\circ}$ C Slope NA  
 Dissolved Oxygen: D.O. Meter \_\_\_\_\_ mg/L at \_\_\_\_\_ $^{\circ}$ C PID: Calibration Gas Isobutylene PPM 100 Span NA Reading \_\_\_\_\_

## PURGING

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. ( $^{\circ}$ C)	Specific Conduct. ( $\mu$ mhos/cm at $^{\circ}$ C)	Turbidity (NTU)	Cumulative Volume of Water Removed (Purged)		PID/OVA Reading		Depth to Water (ft)	Comments
								Gallons	Casing Vol	Location	Value		
1230	250	2.37	6.12	156.9	14.01	0.233	1.04	1 gal					
1235	250	1.91	6.12	153.4	14.39	0.235	0.64	1.5 gal					
1240	250	1.90	6.13	149.5	14.45	0.237	0.52	1.75 gal					
1245	250	1.91	6.11	143.5	14.5	0.236	0.49	2 gal					
1250	250	1.85	6.11	141.0	14.5	0.237	0.45	2.5 gal					
1305	250	1.85	6.14	135.1	14.78	0.241	0.43	3 gal				9.86'	

## SAMPLE PARAMETERS 1.84

1255	250	1.84	6.11	139	14.6	0.237	0.44	2.75					
------	-----	------	------	-----	------	-------	------	------	--	--	--	--	--

Condition of well: rain water inside traffic monument, lock nut  
 Remarks: set tubing 15.5' below TOC, 3- 500 mL amber, 1 500 mL amber w/ HCl

## FIELD EQUIPMENT

pH Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Field Chemistry Calibrations
Spec. Cond. Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Fractions _____
Pump <u>Dedicated Bladder Pump</u>	Serial Number <u>NA</u>	Number of Bottles _____
Water Level Meter <u>Solinst</u>	Serial Number _____	Sample Depth _____
D.O. Meter <u>YSI 556</u> <u>650</u>	Serial Number _____	Field Notebook _____
Filter Apparatus _____	Filters _____	Sample Method <u>Micropurge</u>
Temperature Measure _____		
Interface Probe <u>YSI 650</u>	Serial Number _____	
PID/OVA _____	Serial Number _____	Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Well Name <u>MW-5</u>	Screen Interval <u>                    </u>	Station Elevation <u>          </u> GND <u>          </u> TOC <u>          </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input type="checkbox"/> No
Project <u>Century Link Longview</u>	Static Water Level (from TOC) <u>10.10'</u>	Type <u>                    </u>	
Project No. <u>                    </u>	Well Stick Up <u>-</u>	Measured with <u>                    </u>	
Well Location <u>MW-5, Washington Way</u>	Static Elevation <u>10.10'</u>	PID Readings (background) <u>-</u>	
Sample Date <u>5.4.17</u>	Well Depth <u>19.6'</u> MEAS <input checked="" type="checkbox"/> RPTD <u>          </u>	PID Reading (TOC) <u>-</u>	
Sampling Personnel <u>VP, SD</u>	Feet of Water <u>                    </u>	Wells Installed by <u>                    </u>	
Sample ID <u>MW-5</u>	Gallons/Foot <u>                    </u>	Installation Date <u>                    </u>	
Duplicate ID <u>Dup-5.4.17</u>	Casing Volume <u>                    </u>	Development Date(s) <u>                    </u>	

## FIELD CHEMISTRY CALIBRATIONS

Date/Time                      Spec. Conductance: Standard                       $\mu$ mhos/cm at 25  $^{\circ}$ C Reading                       $\mu$ mhos/cm at             $^{\circ}$ C  
 pH: pH 4.00 -            at             $^{\circ}$ C pH 7.00 -            at             $^{\circ}$ C pH 10.00 -            at             $^{\circ}$ C Slope NA  
 Dissolved Oxygen: D.O. Meter            mg/L at             $^{\circ}$ C PID: Calibration Gas Isobutylene PPM 100 Span NA Reading                     

PURGING													
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. ( $^{\circ}$ C)	Specific Conduct. ( $\mu$ mhos/cm at $^{\circ}$ C)	Turbidity (NTU)	Cumulative Volume of Water Removed (Purged)		PID/OVA Reading		Depth to Water (ft)	Comments
								Gallons	Casing Vol.	Location	Value		
1100	300	4.95	6.38	124.9	13.78	0.337	0.4	0.25					
1105	300	4.55	6.27	134.7	13.72	0.337	0.46	0.5					
1110	300	4.63	6.20	141.0	13.75	0.333	0.41	0.75					
1115	300	4.61	6.19	146.1	13.75	0.335	0.30	1					
1120	300	4.55	6.15	153.0	13.72	0.325	0.27	1.25					
1125	300	4.49	6.14	157.7	13.76	0.338	0.26	1.50					

## SAMPLE PARAMETERS

1130	300	4.43	6.14	159.0	13.91	0.331	0.24	9.25				10.2'	
------	-----	------	------	-------	-------	-------	------	------	--	--	--	-------	--

Condition of well: rain water inside traffic monument, purging started 1055  
 Remarks: set tipping @ 15.5' below TOC, 3-500 mL Amber, 1-500 mL Amber w/ HCl

## FIELD EQUIPMENT

pH Meter <u>YSI 556</u> <u>650</u>	Serial Number <u>034982</u>	Field Chemistry Calibrations
Spec. Cond. Meter <u>YSI 556</u> <u>650</u>	Serial Number <u>"</u>	Fractions <u>                    </u>
Pump <u>Dedicated Bladder Pump</u>	Serial Number <u>NA</u>	
Water Level Meter <u>Solinst</u>	Serial Number <u>004489</u>	Number of Bottles <u>4</u>
D.O. Meter <u>YSI 556</u> <u>650</u>	Serial Number <u>034982</u>	Sample Depth <u>                    </u>
Filter Apparatus <u>-</u>	Filters <u>                    </u>	Field Notebook <u>                    </u>
Temperature Measure <u>YSI 650</u>		Sample Method <u>Micropurge</u>
Interface Probe <u>NA</u>	Serial Number <u>                    </u>	
PID/OVA <u>NA</u>	Serial Number <u>                    </u>	Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# Chain of Custody

ADDRESS 1317 South 13th Ave., Kelso, WA 98626  
PHONE 1 360 577 7222 FAX 1 360 636 1068  
Columbia Analytical Services, Inc.

Work Order No.:

Part of the ALS Group A Campbell Brothers Limited Company



<b>Project Manager:</b> David Bereska		<b>Bill to:</b> Vanessa Pineda	
<b>Client Name:</b> Tetra Tech		<b>Company:</b> Tetra Tech	
<b>Address:</b> 216 16th Street		<b>Address:</b> 216 16th Street Suite 1500	
<b>City, State ZIP:</b> Denver, CO 80202		<b>City, State ZIP:</b> Denver, CO 80202	
<b>Email:</b> David.Bereska@tetratech.com		<b>Email:</b> vanessa.pineda@tetratech.com	
<b>Project Name:</b> CenturyLink Longview WA		<b>Phone:</b> 303-312-8856	
<b>Project Number:</b> 103P3080219		<b>Phone:</b> 303-312-8812	
<b>P.O. Number:</b>		<b>TAT</b>	
<b>Sampler's Name:</b> Mike Pavarini/Vanessa Pineda		<b>REQUESTED ANALYSIS</b>	

SAMPLE RECEIPT					
Sample Identification	Matrix	Date Sampled	Time Sampled		
				Temp Blank Present	
				Yes	No
				Yes	No
MW-3	GW	5-4-17	10:09:50		
MW-5	GW	5-4-17	11:30		
MW-4	GW	5-4-17	12:55		
MW-1	GW	5-4-17	14:30		
MW-2	GW	5-4-17	16:05		
DUP-504-17	GW	5-4-17	00:00		

Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID	No. of Containers	NMT/PHDX diesel and motor oil (no silica gel cleanup)	PAH 625 SIM (filtered-no silica gel cleanup)	Due Date:	Comments
MW-3	GW	5-4-17	10:09:50		4	1	3		
MW-5	GW	5-4-17	11:30		4	1	3		
MW-4	GW	5-4-17	12:55		4	1	3		
MW-1	GW	5-4-17	14:30		4	1	3		
MW-2	GW	5-4-17	16:05		4	1	3		
DUP-504-17	GW	5-4-17	00:00		4	1	3		

RELINQUISHED BY		RECEIVED BY	
Print Name	Signature	Print Name	Signature
Vanessa Pineda	<i>[Signature]</i>	Smith	<i>[Signature]</i>



Additional Methods Available Upon Request	
Print Name	Date/Time
Vanessa Pineda	5/4/17 17:05





TETRA TECH, INC.  
DAILY TAILGATE SAFETY MEETING FORM

Date: 5/4/17 Time: 0900 Project No.: \_\_\_\_\_  
Client: Century Link Site Location: Longview, WA  
Site Activities Planned for Today: Groundwater sampling  
Weather Conditions: sunny, ~70°F

Safety Topics Discussed	
<b>Protective clothing and equipment:</b> <u>Steel toe boots, safety glasses, safety vests</u>	
<b>Chemical and physical hazards:</b> <u>bottles have HCl</u>	
<b>Emergency procedures:</b> <u>Go to hospital</u>	
<b>Equipment hazards:</b> <u>none</u>	
<b>Other:</b> 	
Attendees	
Printed Name	Signature
<u>Scott Duzan</u>	
<u>Kimberly Walker</u>	

Meeting Conducted by:

Vanessa Pineda  
Name

  
Signature



## APPROVAL AND SIGN-OFF FORM

## Project No.:

I have read, understood, and agree with the information set forth in this Health and Safety Plan and will follow the direction of the Site Safety Coordinator (SSC) as well as procedures and guidelines established in the Tetra Tech, Inc., Health and Safety Manual. I understand the training and medical requirements for conducting field work and have met these requirements.

Tetra Tech has prepared this plan solely for the purpose of the health and safety protection of Tetra Tech employees. Subcontractors, visitors, and others at the site, while required to read and follow the provisions outlined in this plan at a minimum, should refer to their safety program for specific information related to their health and safety protection.

Name	Company / Agency / Organization	Signature	Date
SCOTT DUZAN	TETRA TECH INC (EMI)	Scott Duzan	5-4-17

I have read, understood, and agree with the information set forth in this Health and Safety Plan and comply with and will enforce this HASP, as well as procedures and guidelines established in the Tetra Tech, Inc., Health and Safety Manual.

Name	Project-Specific Position	Signature	Date
Vorossia Pineda	Project Manager		
	Field Team Leader		5-4-17
	Site Safety Coordinator		
★ Kimberly Walker	Subcontractor SSC		5-4-17

Tetra Tech has prepared this plan solely for the purpose of the health and safety protection of Tetra Tech employees. Subcontractors, visitors, and others at the site, while required to read, acknowledge and follow the provisions outlined in this plan at a minimum, should refer to their safety program for specific information related to health and safety.

Note: Use Additional sheets as necessary to ensure that all personnel sign and affirm this document.

**ATTACHMENT B**  
**LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS**  
**MAY 2017 SAMPLING EVENT**



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ALS Environmental  
ALS Group USA, Corp  
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F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

May 26, 2017

**Analytical Report for Service Request No: K1704466**

Rob Tisdale  
Tetra Tech EM, Incorporated  
216 16th St , Suite 1500  
Denver, CO 80202

**RE: CenturyLink Longview WA / 103P3080219**

Dear Rob,

Enclosed are the results of the sample(s) submitted to our laboratory May 04, 2017  
For your reference, these analyses have been assigned our service request number **K1704466**.

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

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at [Chris.Leaf@ALSGlobal.com](mailto:Chris.Leaf@ALSGlobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Chris Leaf  
Project Manager



---

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## Table of Contents

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Polynuclear Aromatic Hydrocarbons

## Acronyms

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

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

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

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso**  
**State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L14-51
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjlabs.com/">http://www.pjlabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdwlabservice.htm">http://ndep.nv.gov/bsdwlabservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.





## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

## ALS ENVIRONMENTAL

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request No.:** K1704466  
**Date Received:** 05/04/17

### Case Narrative

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

#### Sample Receipt

Six water samples were received for analysis at ALS Environmental on 05/04/17. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory. Per instructions, the samples were passed through a 0.7 um filter prior to extraction for Polynuclear Aromatic Hydrocarbons by EPA Method 8270.

#### Diesel and Residual Range Organics

##### **Sample Notes and Discussion:**

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

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

#### Polynuclear Aromatic Hydrocarbons by EPA Method 8270

##### **Matrix Spike Recovery Exceptions:**

The recoveries of Carbazole in replicate Matrix Spikes (MS/DMS) KWG1703800-1 and KWG1703800-2 were outside the control limits listed in the results summary. The limits are default. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

##### **Lab Control Sample Exceptions:**

The recoveries of Carbazole in replicate Laboratory Control Samples (LCS/DLCS) KWG1703800-3 and KWG1703800-4 were outside the control limits listed in the results summary. The limits were charted from data generated utilizing a sample extraction technique other than the one used for this sample batch. The values are temporarily in use until sufficient data points are generated to calculate statistical control limits based on the current extraction technique. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

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

Approved by \_\_\_\_\_

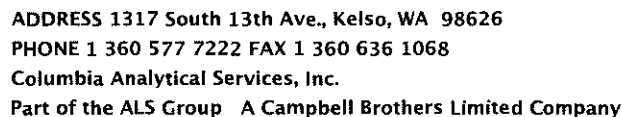




## Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

K1704466



David Berestka			Bill to:		Vanessa Pineda	
Tetra Tech			Company:		Tetra Tech	
216 16th Street			Address:		216 16th Street Suite 1500	
Denver, CO 80202			City, State ZIP:		Denver, CO 80202	
David.Berestka@tetrattech.com	Phone:	303-312-8856	Email:		vanessa.pineda@tetrattech.com	Phone 303-312-8812

CenturyLink Longview WA	REQUESTED ANALYSIS				TAT
103P3080219	silica gel	cleanup			<input checked="" type="checkbox"/> Routine
					<input type="checkbox"/> Same Day ***
Mike Pavarini/Vanessa Pineda					<input type="checkbox"/> Next Day ***

				Temp Blank Present			
		Yes	No	N/A	Wet Ice / Blue Ice		
s:		Yes	No	N/A	Total Containers:		
als:		Yes	No	N/A			

☒ Routine  
☐ Same Day \*\*\*  
☐ Next Day \*\*\*  
☐ 3 Day  
☐ 6 Day

\*\*\* Please call for availability

**Due Date:**



## Comments

[illegible]

	Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Ti, V, Zn, Zr	Additional Methods Available Upon Request
	Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Ti, V, Zn, Zr	

# RELINQUISHED BY

## RECEIVED BY

Name	Signature	Date/Time	Print Name	Signature	Date/Time
P. Noorda		5/4/17 1705	B. Smith		5/4/17 1705

PC CL

## Cooler Receipt and Preservation Form

Client Tetra Tech Service Request K1704466  
 Received: 5/4/17 Opened: 5/4/17 By: JA Unloaded: 5/5/17 By: JS

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
5.8	5.9	5.9	6.0	+0.1	364	NA		NA	
5.5	5.4	5.8	5.7	-0.1	373				

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves \_\_\_\_\_  
 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N  
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed  
 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N  
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N  
 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N  
 12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



## Diesel and Residual Range Organics

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** MW-3  
**Lab Code:** K1704466-001  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	47	J	260	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	54	J	520	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	85	50-150	05/16/17	Acceptable
n-Triacontane	84	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** MW-5  
**Lab Code:** K1704466-002  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	23	J	260	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	31	J	520	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	97	50-150	05/16/17	Acceptable
n-Triacontane	91	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_



## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** MW-4  
**Lab Code:** K1704466-003  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	24	J	260	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	37	J	520	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	71	50-150	05/16/17	Acceptable
n-Triacontane	70	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** MW-1  
**Lab Code:** K1704466-004  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	42	J	260	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	86	J	520	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	86	50-150	05/16/17	Acceptable
n-Triacontane	85	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** MW-2  
**Lab Code:** K1704466-005  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	570	Y	270	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	200	J	530	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	93	50-150	05/16/17	Acceptable
n-Triacontane	89	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Diesel and Residual Range Organics

**Sample Name:** DUP-5-04-17  
**Lab Code:** K1704466-006  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	27	J	260	12	1	05/09/17	05/16/17	KWG1703722	
Residual Range Organics (RRO)	48	J	510	20	1	05/09/17	05/16/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	50-150	05/16/17	Acceptable
n-Triacontane	96	50-150	05/16/17	Acceptable

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** NA  
**Date Received:** NA

## Diesel and Residual Range Organics

**Sample Name:** Method Blank  
**Lab Code:** KWG1703722-3  
**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	27	J	250	11	1	05/09/17	05/15/17	KWG1703722	
Residual Range Organics (RRO)	53	J	500	19	1	05/09/17	05/15/17	KWG1703722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	05/15/17	Acceptable
n-Triacontane	95	50-150	05/15/17	Acceptable

**Comments:** \_\_\_\_\_

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466

**Surrogate Recovery Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
MW-3	K1704466-001	85	84
MW-5	K1704466-002	97	91
MW-4	K1704466-003	71	70
MW-1	K1704466-004	86	85
MW-2	K1704466-005	93	89
DUP-5-04-17	K1704466-006	102	96
Method Blank	KWG1703722-3	94	95
Lab Control Sample	KWG1703722-1	95	92
Duplicate Lab Control Sample	KWG1703722-2	98	95

**Surrogate Recovery Control Limits (%)**

---

Sur1 = o-Terphenyl	50-150
Sur2 = n-Triacontane	50-150

---

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

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

## QA/QC Report

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Extracted:** 05/09/2017  
**Date Analyzed:** 05/15/2017

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Diesel and Residual Range Organics**

**Extraction Method:** EPA 3510C  
**Analysis Method:** NWTPH-Dx

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1703722

Analyte Name	Lab Control Sample KWG1703722-1 Lab Control Spike			Duplicate Lab Control Sample KWG1703722-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Diesel Range Organics (DRO)	3320	3200	104	3110	3200	97	46-140	7	30
Residual Range Organics (RRO)	1870	1600	117	1690	1600	105	45-159	11	30

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

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



# Polynuclear Aromatic Hydrocarbons

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** MW-3  
**Lab Code:** K1704466-001  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0030	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0020	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	0.0018	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	0.0012	J	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	ND	U	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0020	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	86	42-131	05/12/17	Acceptable
Fluoranthene-d10	99	42-133	05/12/17	Acceptable
Terphenyl-d14	75	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** MW-5  
**Lab Code:** K1704466-002  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0046	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0016	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	0.0010	J	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	ND	U	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0024	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	42-131	05/12/17	Acceptable
Fluoranthene-d10	99	42-133	05/12/17	Acceptable
Terphenyl-d14	80	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** MW-4  
**Lab Code:** K1704466-003  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0068	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0020	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	0.0011	J	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	0.0013	J	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	0.0038	J	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0023	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	42-131	05/12/17	Acceptable
Fluoranthene-d10	90	42-133	05/12/17	Acceptable
Terphenyl-d14	75	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** MW-1  
**Lab Code:** K1704466-004  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0076	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0015	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	0.0019	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	ND	U	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	0.0013	J	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0026	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	90	42-131	05/12/17	Acceptable
Fluoranthene-d10	103	42-133	05/12/17	Acceptable
Terphenyl-d14	85	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** MW-2  
**Lab Code:** K1704466-005  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.61		0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0015	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	0.018	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	0.028		0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	0.0062	J	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	0.0083	J	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	0.013	J	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	0.0017	J	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	0.013	J	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	ND	U	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	86	42-131	05/12/17	Acceptable
Fluoranthene-d10	98	42-133	05/12/17	Acceptable
Terphenyl-d14	80	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** 05/04/2017  
**Date Received:** 05/04/2017

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** DUP-5-04-17  
**Lab Code:** K1704466-006  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0060	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0014	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	0.0016	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	0.0057	J	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	0.0012	J	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	0.0019	J	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0024	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	101	42-131	05/12/17	Acceptable
Fluoranthene-d10	115	42-133	05/12/17	Acceptable
Terphenyl-d14	84	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

## Analytical Results

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Collected:** NA  
**Date Received:** NA

## Polynuclear Aromatic Hydrocarbons

**Sample Name:** Method Blank  
**Lab Code:** KWG1703800-5  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.0034	J	0.020	0.0014	1	05/11/17	05/12/17	KWG1703800	
2-Methylnaphthalene	0.0051	J	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
1-Methylnaphthalene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Acenaphthylene	0.0031	J	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Acenaphthene	ND	U	0.020	0.0012	1	05/11/17	05/12/17	KWG1703800	
Dibenzofuran	ND	U	0.020	0.00096	1	05/11/17	05/12/17	KWG1703800	
Fluorene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Phenanthrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Anthracene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Carbazole	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	*
Fluoranthene	ND	U	0.020	0.00082	1	05/11/17	05/12/17	KWG1703800	
Pyrene	ND	U	0.020	0.0010	1	05/11/17	05/12/17	KWG1703800	
Benz(a)anthracene	0.0023	J	0.020	0.00097	1	05/11/17	05/12/17	KWG1703800	
Chrysene	ND	U	0.020	0.00076	1	05/11/17	05/12/17	KWG1703800	
Benzo(b)fluoranthene†	ND	U	0.020	0.00083	1	05/11/17	05/12/17	KWG1703800	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	05/11/17	05/12/17	KWG1703800	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	05/11/17	05/12/17	KWG1703800	
Indeno(1,2,3-cd)pyrene	0.00098	J	0.020	0.00089	1	05/11/17	05/12/17	KWG1703800	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	05/11/17	05/12/17	KWG1703800	
Benzo(g,h,i)perylene	0.0018	J	0.020	0.00086	1	05/11/17	05/12/17	KWG1703800	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	90	42-131	05/12/17	Acceptable
Fluoranthene-d10	103	42-133	05/12/17	Acceptable
Terphenyl-d14	74	32-129	05/12/17	Acceptable

## † Analyte Comments

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Comments:** \_\_\_\_\_

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466

**Surrogate Recovery Summary**  
**Polynuclear Aromatic Hydrocarbons**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>
Batch QC	K1704203-017	84	96	64
MW-3	K1704466-001	86	99	75
MW-5	K1704466-002	88	99	80
MW-4	K1704466-003	80	90	75
MW-1	K1704466-004	90	103	85
MW-2	K1704466-005	86	98	80
DUP-5-04-17	K1704466-006	101	115	84
Method Blank	KWG1703800-5	90	103	74
Batch QCMS	KWG1703800-1	100	113	85
Batch QCDMS	KWG1703800-2	82	98	67
Lab Control Sample	KWG1703800-3	84	98	77
Duplicate Lab Control Sample	KWG1703800-4	88	101	76

**Surrogate Recovery Control Limits (%)**

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Sur1 = Fluorene-d10	42-131
Sur2 = Fluoranthene-d10	42-133
Sur3 = Terphenyl-d14	32-129

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

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



## QA/QC Report

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Extracted:** 05/11/2017  
**Date Analyzed:** 05/12/2017

**Matrix Spike/Duplicate Matrix Spike Summary**  
**Polynuclear Aromatic Hydrocarbons**

**Sample Name:** Batch QC  
**Lab Code:** K1704203-017  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1703800

Analyte Name	Sample Result	Batch QCMS KWG1703800-1 Matrix Spike			Batch QCDMS KWG1703800-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Naphthalene	0.0027	2.12	2.78	76	2.25	2.78	81	45-123	6	30
2-Methylnaphthalene	ND	2.14	2.78	77	2.28	2.78	82	58-111	6	30
1-Methylnaphthalene	ND	2.28	2.78	82	2.44	2.78	88	57-113	7	30
Acenaphthylene	ND	2.40	2.78	86	2.58	2.78	93	61-118	7	30
Acenaphthene	ND	2.27	2.78	82	2.40	2.78	87	63-121	6	30
Dibenzofuran	ND	2.38	2.78	86	2.51	2.78	91	62-127	6	30
Fluorene	ND	2.30	2.78	83	2.44	2.78	88	66-123	6	30
Phenanthrene	ND	2.55	2.78	92	2.66	2.78	96	65-124	4	30
Anthracene	ND	2.21	2.78	79	2.29	2.78	82	69-125	4	30
Carbazole	ND	1.39	2.78	50 *	1.43	2.78	51 *	70-130	3	30
Fluoranthene	ND	2.35	2.78	85	2.48	2.78	89	69-125	5	30
Pyrene	0.014	2.45	2.78	88	2.51	2.78	90	59-134	2	30
Benz(a)anthracene	0.0080	2.41	2.78	86	2.61	2.78	94	71-127	8	30
Chrysene	ND	2.20	2.78	79	2.32	2.78	83	75-130	5	30
Benzo(b)fluoranthene	ND	2.16	2.78	78	2.45	2.78	88	65-139	12	30
Benzo(k)fluoranthene	ND	2.23	2.78	80	2.38	2.78	86	65-137	7	30
Benzo(a)pyrene	ND	2.24	2.78	81	2.38	2.78	86	69-132	6	30
Indeno(1,2,3-cd)pyrene	ND	2.46	2.78	89	2.74	2.78	98	62-142	10	30
Dibenz(a,h)anthracene	ND	2.38	2.78	86	2.56	2.78	92	61-138	7	30
Benzo(g,h,i)perylene	ND	2.36	2.78	85	2.51	2.78	90	63-129	6	30

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

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

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

**Client:** Tetra Tech EM, Incorporated  
**Project:** CenturyLink Longview WA/103P3080219  
**Sample Matrix:** Water

**Service Request:** K1704466  
**Date Extracted:** 05/11/2017  
**Date Analyzed:** 05/12/2017

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polynuclear Aromatic Hydrocarbons**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8270D SIM

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1703800

Analyte Name	Lab Control Sample KWG1703800-3 Lab Control Spike			Duplicate Lab Control Sample KWG1703800-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Naphthalene	2.15	2.78	78	2.20	2.78	79	52-115	2	30
2-Methylnaphthalene	2.12	2.78	76	2.22	2.78	80	48-120	5	30
1-Methylnaphthalene	2.31	2.78	83	2.38	2.78	86	47-119	3	30
Acenaphthylene	2.37	2.78	85	2.46	2.78	89	58-124	4	30
Acenaphthene	2.24	2.78	81	2.31	2.78	83	63-121	3	30
Dibenzofuran	2.73	2.78	98	2.79	2.78	101	56-132	2	30
Fluorene	2.25	2.78	81	2.31	2.78	83	68-121	3	30
Phenanthrene	2.35	2.78	85	2.51	2.78	90	64-126	7	30
Anthracene	2.21	2.78	80	2.21	2.78	80	68-127	0	30
Carbazole	1.36	2.78	49 *	1.40	2.78	50 *	68-135	3	30
Fluoranthene	2.28	2.78	82	2.33	2.78	84	70-127	2	30
Pyrene	2.25	2.78	81	2.36	2.78	85	72-127	5	30
Benz(a)anthracene	2.28	2.78	82	2.34	2.78	84	74-124	2	30
Chrysene	2.13	2.78	77	2.21	2.78	79	74-132	4	30
Benzo(b)fluoranthene	2.30	2.78	83	2.37	2.78	85	73-136	3	30
Benzo(k)fluoranthene	2.31	2.78	83	2.42	2.78	87	74-134	5	30
Benzo(a)pyrene	2.23	2.78	80	2.34	2.78	84	75-131	5	30
Indeno(1,2,3-cd)pyrene	2.40	2.78	87	2.52	2.78	91	63-136	5	30
Dibenz(a,h)anthracene	2.24	2.78	81	2.33	2.78	84	59-135	4	30
Benzo(g,h,i)perylene	2.32	2.78	84	2.42	2.78	87	63-127	4	30

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

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