TETRA TECH

September 21, 2015

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:** **Direct-push Groundwater Investigation and Groundwater Monitoring Report, July 2015**
**CenturyLink Longview Facility**
**1305 Washington Way, Longview, Washington 98632**

Dear Mr. Teel:

This memorandum provides a summary report for the direct-push groundwater investigation and groundwater sampling event conducted on July 20 to July 22, 2015. The groundwater monitoring events are being conducted as a continuation of the Groundwater Monitoring Plan developed in 2008 under the Voluntary Cleanup Program. Direct-push groundwater monitoring was conducted in accordance with the Final Direct-Push Sampling Plan, dated March 2, 2015, and approved by Washington Department of Ecology (Ecology).

## Direct-push Groundwater Sampling

Six temporary groundwater sampling wells, DPGW-1 through DPGW-6, were installed at the site on July 20 and July 21. Cascade Drilling, L.P., of Woodinville, Washington used a Geoprobe 7720 to install the temporary wells. Temporary wells were installed by direct-pushing a 2-inch outside diameter (OD) direct bush core, to 17 feet below ground surface (bgs). The soil cores were retracted and logged. In general, at approximately 9 to 10 feet bgs, soils were typically sand and silty sand with clay stringers. In the screened intervals for the temporary wells, approximately 12 to 17 feet bgs, soils were typically coarse sand. Boring logs are included as Attachment A. No visual signs of contamination, such as staining or a sheen, were noted in the soil cores. No detections of volatile organic compounds were detected by the photoionization detector. No petroleum hydrocarbon or other odors were noted.

At DPGW-1 through DPGW-4, a 5-foot long, polyvinylchloride (PVC), 2-inch OD by ¾-inch inside diameter prepacked screen, was installed at a depth of 12 to 17 feet bgs. At DPGW-5 and DPGW-6, a 4-foot long, ¾-inch diameter stainless steel screen was installed at a depth of 13 to 17 feet bgs. The different screens installed at DPGW-5 and DPGW-6 were the result of the driller forgetting to bring the correct pre-packed screens. A field decision was made to use the non-prepacked screens at these two upgradient (DPGW-5) and sidegradient (DPGW-6) temporary wells. Attachment B shows the well construction logs for each temporary well.

Groundwater levels were measured at each of the six temporary wells and were 13 to 15 feet bgs. Each of the temporary wells was screened across the water table.

At each of the temporary wells, low-flow purging with a peristaltic pump and new ¼-inch diameter polyethylene tubing was conducted for 15 to 20 minutes at a rate of 300 to 500 milliliters per minute.

A calibrated YSI 556 multi-probe water meter was used to measure field parameters during well purging, and before sampling. Water quality parameters included pH, dissolved oxygen (DO), oxidation reduction potential (ORP), and specific conductance. Attachment C includes the logs of field parameters measured during the low-flow sampling.

After sampling, all of the temporary wells were removed by pulling the casing and screen, backfilling the hole with bentonite pellets, and resurfacing with cold-patch asphalt or concrete to match the surrounding pavement.

***Groundwater Levels in Permanent Monitoring Wells***

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 1.77 to 1.92 feet above mean sea level, and are summarized in the table below and shown in Figure 1. Groundwater levels were approximately 2 feet lower than observed in March 2015. Groundwater levels from the temporary direct-push wells are not included in the table or the figure, as the temporary wells were not developed, were not allowed to equilibrate with the aquifer for 24 hours, and the top of casing elevations were not surveyed.

**JULY 21, 2015 GROUNDWATER ELEVATIONS**

| Location | Surveyed Top of Casing (ft amsl) | 2015 Quarter 2 Depth to Water (ft) | 2015 Quarter 2 Groundwater Elevation (ft amsl) |
|---|---|---|---|
| **MW-01** | 15.64 | 13.76 | 1.88 |
| **MW-02** | 16.17 | 14.32 | 1.85 |
| **MW-03** | 15.02 | 13.10 | 1.92 |
| **MW-04** | 14.55 | 12.74 | 1.81 |
| **MW-05** | 14.75 | 12.98 | 1.77 |

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 0.0004 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 July 21 and July 22, 2015. After groundwater level measurements were documented, field personnel collected groundwater samples using a peristaltic pump. Dedicated tubing was used for each well. In accordance with the work plan, low-flow sampling procedures were used. Sampling flow rates ranged from 300 to 450 milliliters per minute for purging and groundwater sample collection.

A calibrated YSI 556 multi-probe water meter was used to measure field parameters during well purging, and before sampling. Water quality parameters included pH, DO, ORP, and specific conductance. Low-flow pumping continued until field parameters stabilized within acceptable parameter limits, before samples were collected. Attachment C 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. 13th 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 E.

ALS analyzed the samples for total petroleum hydrocarbons-diesel (TPH-DRORO) 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 (PAHs) by modified U.S. Environmental Protection Agency Method 625-Selected Ion Monitoring. The samples were passed through a 0.7-micron (µm) filter before analysis by the PAH method.

## Groundwater Sample Results

Table 1 presents analyte concentrations for the sample analyses of temporary and permanent groundwater wells sampled during the July 2015 investigation. TPH-DRO was detected at low levels in samples from all 11 wells, ranging from approximately 15 micrograms per liter (µg/L) to 77 µg/L, as shown on Figure 2. TPH-RRO was detected at low levels in all 11 samples, ranging from 27 µg/L to 71 µg/L, as shown on Figure 4. All TPH-DRO and TPH RRO concentrations were well below the 500 µg/L Washington Model Toxic Control Act Method A limit for groundwater.

All TPH-DRO and TPH-RRO detections carry a J qualifier that indicates that the constituent was detected below the method detection limit, but above zero. The method blank was nondetect for TPH-DRO, and 25 ug/L with a J qualifier for TPH-RRO.

Low levels of TPH-DRO and TPH-RRO detected in samples from the upgradient well (DPGW-5) and sidegradient well (DPGW-6) suggest that there may be other dilute sources of TPH-DRO and TPH-RRO near the site.

As shown on Figures 1 and 2, the locations with the highest TPH-DRO and TPH-RRO concentrations are MW-1, MW-2, MW-4, MW-5 and DPGW-4. These locations are all in the UST source area or are downgradient from the source area.

Total PAH results shown on Table 1 and Figure 4 are the sum of all the individual PAH analytes. Individual PAH analyte results are not provided in the table, but are available in Attachment D. Low levels of PAHs were detected in all permanent monitoring wells and in all temporary wells, except DPGW-6. Total PAH concentrations ranged from 0.0042 µg/L in upgradient temporary well DPGW-5, to 0.29 J µg/L in MW-04. The highest total PAH concentrations were detected in downgradient wells MW-04, MW-05, and DPGW-4.

There are no Total PAH or compound specific MTCA PAH action levels. MTCA action levels for PAHs are based on the benzo(a)pyrene toxic equivalent quotient (BaP TEQ). The MTCA action level for BaP TEQ is 0.1 µg/L. The BaP TEQ results are also shown on Table 1 and Figure 5, and are based on the individual PAH analytical results in Appendix D. PAHs contributing to BaP TEQ were below detection limits in all permanent and temporary monitoring wells, except for MW-01 (BAP TEQ = 0.00029 J µg/L) and DPGW-4 (BAP TEQ = 0.00027 J µg/L). These BaP TEQ concentrations were well below the MTCA action level of 0.1 µg/L.

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

The direct-push groundwater investigation provided further delineation of the petroleum hydrocarbon plume and demonstrated that low levels of TPH and PAHs have migrated to west and northwest from the former UST location; however, levels of all constituents of concern are well below Washington MTCA action levels. In 2015, two rounds of sampling at the site and an expanded groundwater investigation have shown that TPH-DRO, TPH-RRO, and BaP TEQ concentrations are below Washington MTCA limits throughout the site.

Tetra Tech recommends that annual groundwater sampling be conducted at the five permanent groundwater monitoring wells for the next two years (2016 and 2017 calendar years). If the results from these two events demonstrate that contaminant concentrations remain below MTCA levels and are stable or decreasing, Tetra Tech recommends that the site be issued a “no further action” status letter.

If you have any questions or concerns, please call me at (303) 312-8843.

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

# ANALYTICAL RESULTS TABLES

# TABLE 1
# GROUNDWATER SAMPLE 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** | 7/22/2015 | 22 J | 52 J | 0.0077 J | 0.00029 J |
| **MW-02** | 7/22/2015 | 77 J | 71 J | 0.019 J | ND |
| **MW-03** | 7/21/2015 | 21 J | 49 J | 0.0056 J | ND |
| **MW-04** | 7/21/2015 | 24 J | 52 J | 0.29 J | ND |
| **MW-05** | 7/21/2015 | 30 J | 42 J | 0.15 J | ND |
| **DPGW-1** | 7/20/2015 | 17 J | 28 J | 0.011 J | ND |
| **DPGW-2** | 7/20/2015 | 19 J | 27 J | 0.013 J | ND |
| **DPGW-3** | 7/21/2015 | 15 J | 34 J | 0.0059 J | ND |
| **DPGW-4** | 7/21/2015 | 41 J | 68 J | 0.085 J | 0.00027 J |
| **DPGW-5** | 7/20/2015 | 18 J | 40 J | 0.0042 J | ND |
| **DPGW-6** | 7/20/2015 | 21 J | 45 J | ND | ND |

**Notes:**

All concentrations in micrograms per liter (µg/L)
For wells with duplicate samples, the highest value reported is shown for each constituent

| | |
|---|---|
| BaP TEQ | Benzo(a)Pyrene Toxic Equivalent Quotient |
| J | Estimated quantity below reporting limit |
| MTCA | Model Toxics Control Act Method A for groundwater |
| NA | Not applicable (no applicable MTCA standard) |
| ND | Analyte not detected |
| PAH | Polycyclic aromatic hydrocarbon |
| TPH-DRO | Total petroleum hydrocarbons diesel range organics |
| TPH-RRO | Total petroleum hydrocarbons residual range organics |

## 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 |
|---|---|---|---|---|---|---|---|
| **TPH-DRO (MTCA Method A Cleanup Level = 500 µg/L)** | 3/25/1992 | Bailer | 82 | 112 | -- | -- | -- |
| | 12/16/2003 | Bailer | ND | ND | ND | -- | -- |
| | 8/10/2006 | Bailer | ND | 140 | ND | -- | -- |
| | 9/23/2008 | Bailer | -- | -- | -- | ND | ND |
| | 2/26/2010 | Bailer | -- | -- | -- | ND | 140 |
| | 9/2/2011 | Bailer | -- | -- | -- | 73 | 120 |
| | 2/26/2013 | Bailer | -- | -- | -- | **1,700** | ND |
| | 6/3/2013 | Bailer | ND | 66 | ND | 210 | ND |
| | 12/5/2013 | Bailer | ND | ND | ND | **1,500** | ND |
| | 3/27/2014 | Bailer | 63 | 87 | ND | **550** | 47 |
| | 6/25/2014 | Bailer | 50 | 33 | ND | **1,100** | ND |
| | 9/10/2014 | Bailer | 240 | 90 | 36 | **790** | 48 |
| | 3/5/2015 | Low Flow | 22 | 82 | 20 | 20 | 27 |
| | 7/20/2015 | Low Flow | 22 | 77 | 21 | 24 | 30 |
| **TPH-RRO (MTCA Method A Cleanup Level = 500 µg/L)** | 8/10/2006 | Bailer | ND | ND | ND | -- | -- |
| | 9/23/2008 | Bailer | -- | -- | -- | ND | 140 |
| | 2/26/2010 | Bailer | -- | -- | -- | 140 | 200 |
| | 9/2/2011 | Bailer | -- | -- | -- | 350 | 210 |
| | 2/26/2013 | Bailer | -- | -- | -- | **11,000** | 140 |
| | 6/3/2013 | Bailer | 150 | ND | ND | **1,600** | ND |
| | 12/5/2013 | Bailer | 440 | 120 | 120 | **11,000** | 170 |
| | 3/27/2014 | Bailer | 370 | 63 | ND | **3,900** | 190 |
| | 6/25/2014 | Bailer | 340 | 62 | 21 | **8,400** | 51 |
| | 9/10/2014 | Bailer | **1,500** | ND | ND | **6,600** | 82 |
| | 3/5/2015 | Low Flow | 43 | 70 | 37 | 48 | 53 |
| | 7/20/2015 | Low Flow | 52 | 71 | 49 | 52 | 42 |

**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

| | |
|---|---|
| J | Estimated quantity below reporting limit |
| MTCA | Model Toxics Control Act Method A for groundwater |
| ND | Analyte not detected |
| TPH-DRO | Total petroleum hydrocarbons diesel range organics |
| TPH-RRO | Total petroleum hydrocarbons residual range organics |
| -- | Not sampled |

**TABLE 3**
**HISTORICAL GROUNDWATER SAMPLE RESULTS – BAP TEQ**
**CENTURYLINK LONGVIEW, WASHINGTON FACILITY**

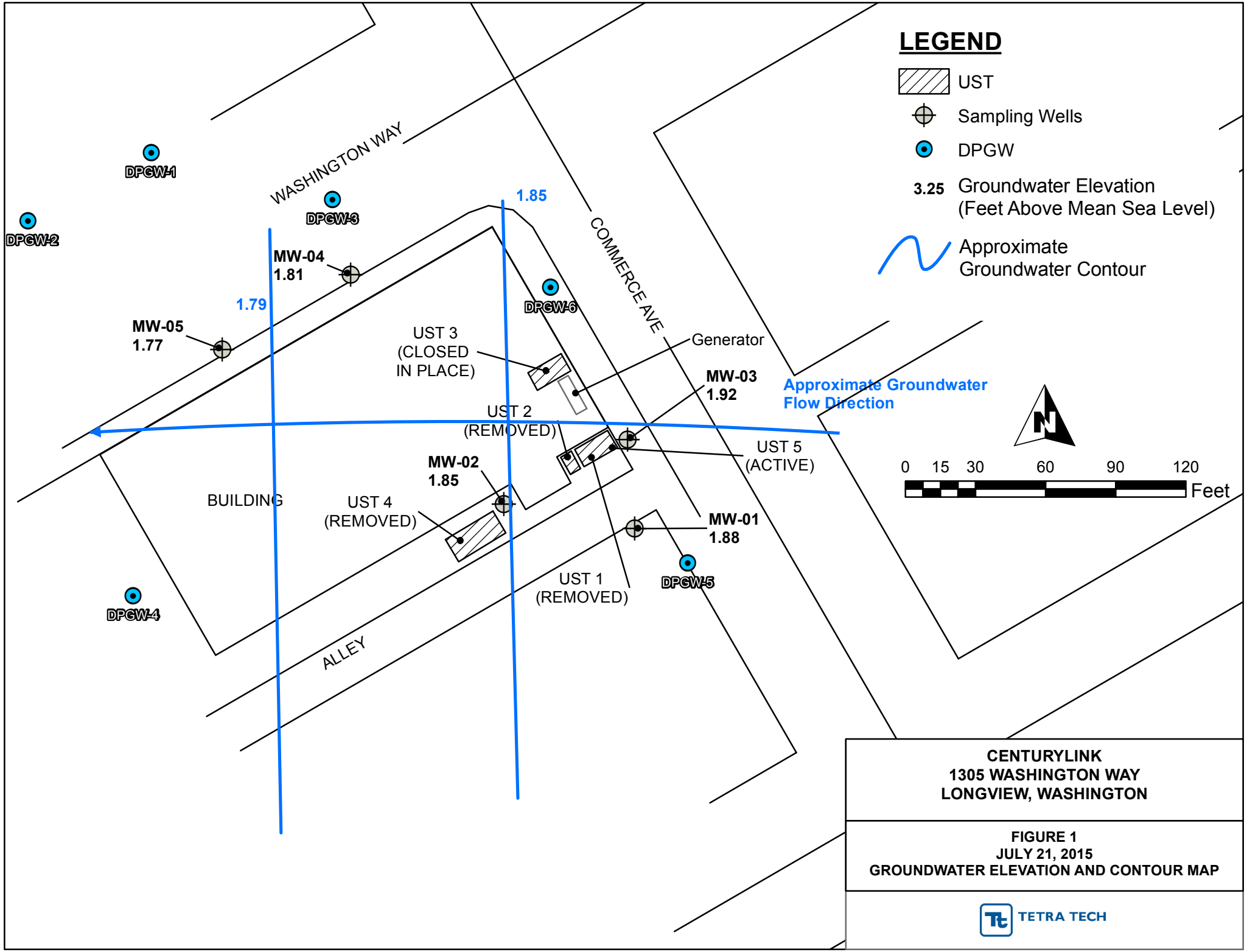
| Analyte | Date | Sampling Method | MW-01 | MW-02 | MW-03 | MW-04 | MW-05 |
|---|---|---|---|---|---|---|---|
| **BaP TEQ** | 6/3/2013 | Bailer | **2.2** | ND | ND | **0.36** | ND |
| **Unfiltered analysis** | 12/5/2013 | Bailer | **0.20** | 0.027 | 0.074 | **1.4** | 0.0062 |
| | 3/27/2014 | Bailer | **0.37** | 0.080 | 0.049 | **0.27** | 0.073 |
| **(MTCA Method A Cleanup Level = 0.1 µg/L)** | 6/25/2014 | Bailer | **0.39** | 0.012 | 0.00033 | **0.40** | 0.0054 |
| | 9/10/2014 | Bailer | **0.14** | 0.090 | ND | **0.39** | ND |
| **BaP TEQ** | 12/5/2013 | Bailer | ND | -- | ND | ND | -- |
| | 3/27/2014 | Bailer | ND | ND | -- | ND | ND |
| **Filtered analysis** | 6/25/2014 | Bailer | ND | -- | -- | ND | -- |
| | 9/10/2014 | Bailer | 0.0003 | 0.00027 | -- | ND | -- |
| **(MTCA Method A Cleanup Level = 0.1 µg/L)** | 3/5/2015 | Low Flow | 0.00074 | 0.00038 | ND | 0.00044 | 0.00029 |
| | 7/20/2015 | Low Flow | 0.00029 | ND | ND | ND | ND |

**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 |
| J | Estimated quantity below reporting limit |
| MTCA | Model Toxics Control Act Method A for groundwater |
| ND | Analyte not detected |
| -- | Not analyzed |

# FIGURES


LEGEND
UST
Sampling Wells
DPGW
3.25 Groundwater Elevation (Feet Above Mean Sea Level)
Approximate Groundwater Contour
WASHINGTON WAY
COMMERCE AVE
ALLEY
BUILDING
DPGW-1
DPGW-2
DPGW-3
DPGW-4
DPGW-5
DPGW-6
MW-04 1.81
MW-05 1.77
MW-01 1.88
MW-02 1.85
MW-03 1.92
1.85
1.79
UST 3 (CLOSED IN PLACE)
UST 2 (REMOVED)
UST 4 (REMOVED)
UST 1 (REMOVED)
UST 5 (ACTIVE)
Generator
Approximate Groundwater Flow Direction
N
0 15 30 60 90 120
Feet
CENTURYLINK
1305 WASHINGTON WAY
LONGVIEW, WASHINGTON
FIGURE 1
JULY 21, 2015
GROUNDWATER ELEVATION AND CONTOUR MAP
TETRA TECH

VERIZON
(FORMERLY FIRESTONE)

SUBWAY

SB-01

SB-02

DPGW-1
17J

WASHINGTON WAY

DPGW-3
15J

DPGW-6
21J

COMMERCE AVE

COLUMBIA BANK

DPGW-2
19J

MW-04
24J

MW-05
30J

UST 3
(CLOSED
IN PLACE)

GUTTER LINE

CENTURY LINK

Generator

MW-03
21J

UST 5
(ACTIVE)

KIM BOWL
RESTAURANT & LOUNGE

UST 1
(REMOVED)

UST 2
(REMOVED)

APPROXIMATE
GROUNDWATER
FLOW DIRECTION AT
TIME OF SAMPLING

DPGW-5
18J

MW-01
22J

DPGW-4
41J

MW-02
77J

UST 4
(REMOVED)

ALLEY

BASIS OF BEARING:
NAD83/91, WA SOUTH ZONE

20' 0 20' 40'

SCALE: 1" = 40'

LEGEND

| | |
|---|---|
| MW-01 | MONITORING WELL LOCATION - SAMPLE DATES: JULY 21-22, 2015 |
| SB-01 | FORMER SOIL BORING LOCATION |
| DPGW-1 | DIRECT-PUSH GROUNDWATER SAMPLING LOCATION - SAMPLE DATES: JULY 20-21, 2015 |
| UST | UNDERGROUND STORAGE TANK |
| 22 | DIESEL RANGE ORGANICS CONCENTRATION IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L) |

NOTES:

1. UST 5 WAS INSTALLED IN THE FORMER LOCATION OF UST 1.
2. SAMPLE DATES: JULY 20-22, 2015
3. J = ESTIMATED VALUE, CONCENTRATION IS BELOW DETECTION LIMIT.

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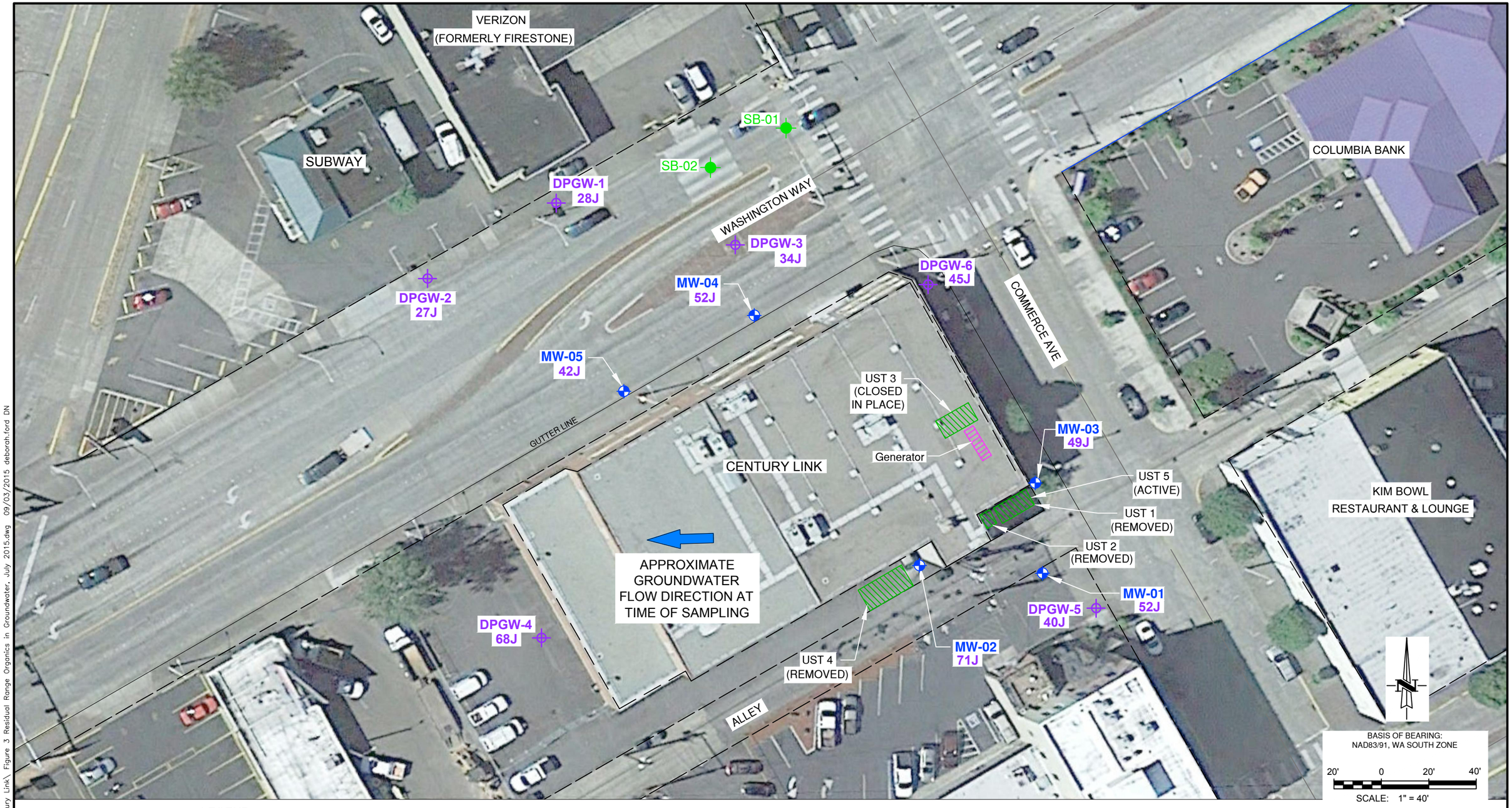
FIGURE 2
DIESEL RANGE ORGANICS IN GROUNDWATER, JULY 2015

TETRA TECH

C:\Users\Public\Documents\Work\Century Link\ Figure 2 Diesel Range Organics in Groundwater, July 2015.dwg 09/03/2015 deborah.ford DN




LEGEND

| | |
|---|---|
| MW-01 | MONITORING WELL LOCATION - SAMPLE DATES: JULY 21-22, 2015 |
| SB-01 | FORMER SOIL BORING LOCATION |
| DPGW-1 | DIRECT-PUSH GROUNDWATER SAMPLING LOCATION - SAMPLE DATES: JULY 20-21, 2015 |
| UST | UNDERGROUND STORAGE TANK |
| 52 | RESIDUAL RANGE ORGANICS CONCENTRATION IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L) |

NOTES:

1. UST 5 WAS INSTALLED IN THE FORMER LOCATION OF UST 1.
2. SAMPLE DATES: JULY 20-22, 2015
3. J = ESTIMATED VALUE, CONCENTRATION IS BELOW DETECTION LIMIT.

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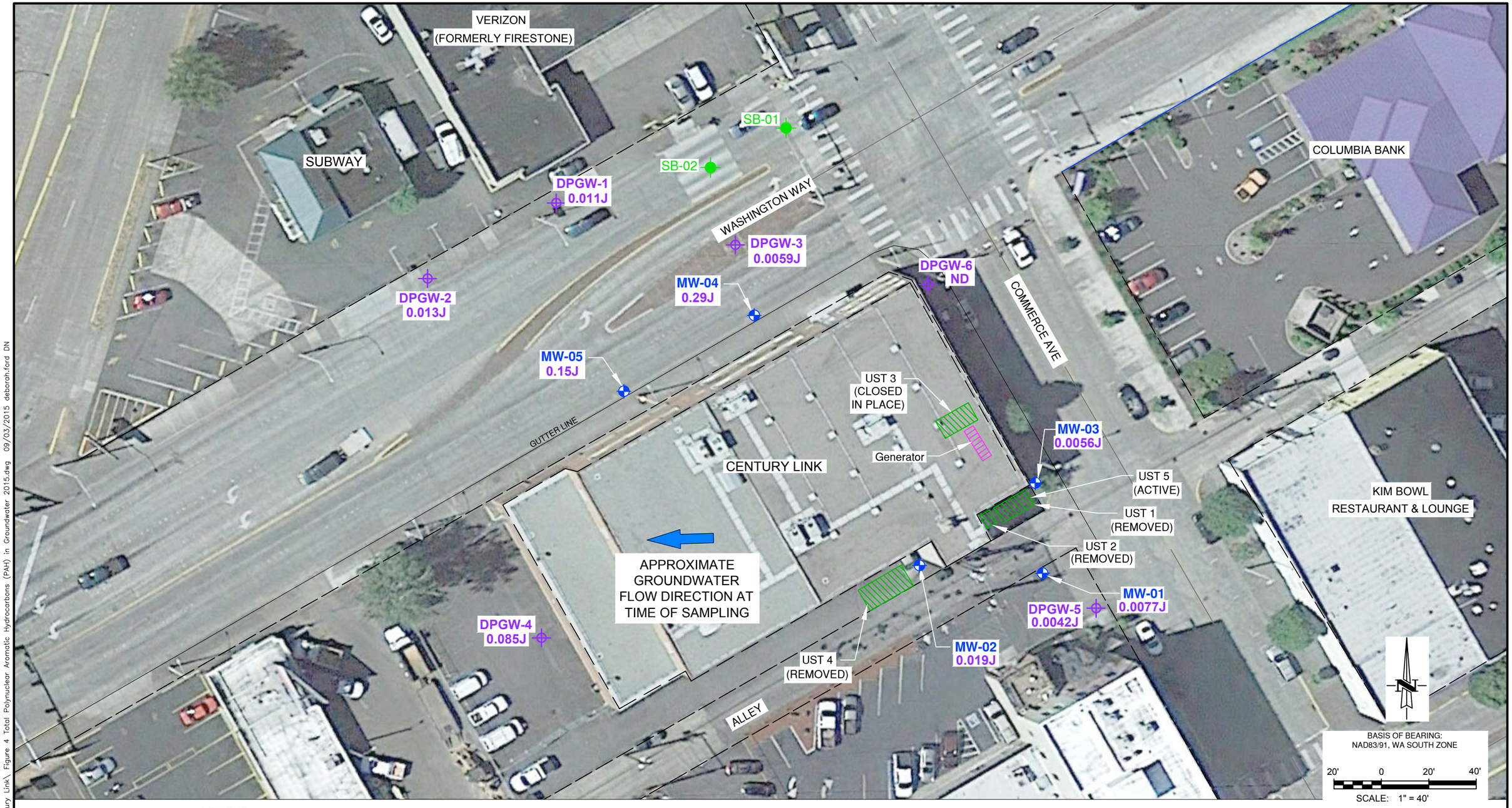
FIGURE 3

RESIDUAL RANGE ORGANICS IN GROUNDWATER, JULY 2015

TETRA TECH

C:\Users\Public\Documents\Work\Century Link\Figure 3 Residual Range Organics in Groundwater, July 2015.dwg 09/03/2015 deborah.ford DN




LEGEND

| | |
|---|---|
| MW-01 | MONITORING WELL LOCATION - SAMPLE DATES: JULY 21-22, 2015 |
| SB-01 | FORMER SOIL BORING LOCATION |
| DPGW-1 | DIRECT-PUSH GROUNDWATER SAMPLING LOCATION - SAMPLE DATES: JULY 20-21, 2015 |
| UST | UNDERGROUND STORAGE TANK |
| 0.0077 | TOTAL POLYNUCLEAR AROMATIC HYDROCARBONS (PAH) IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L) |

NOTES:

1. UST 5 WAS INSTALLED IN THE FORMER LOCATION OF UST 1.
2. SAMPLE DATES: JULY 20-22, 2015
3. J = ESTIMATED VALUE, CONCENTRATION IS BELOW DETECTION LIMIT.
4. ND = NOT DETECTED

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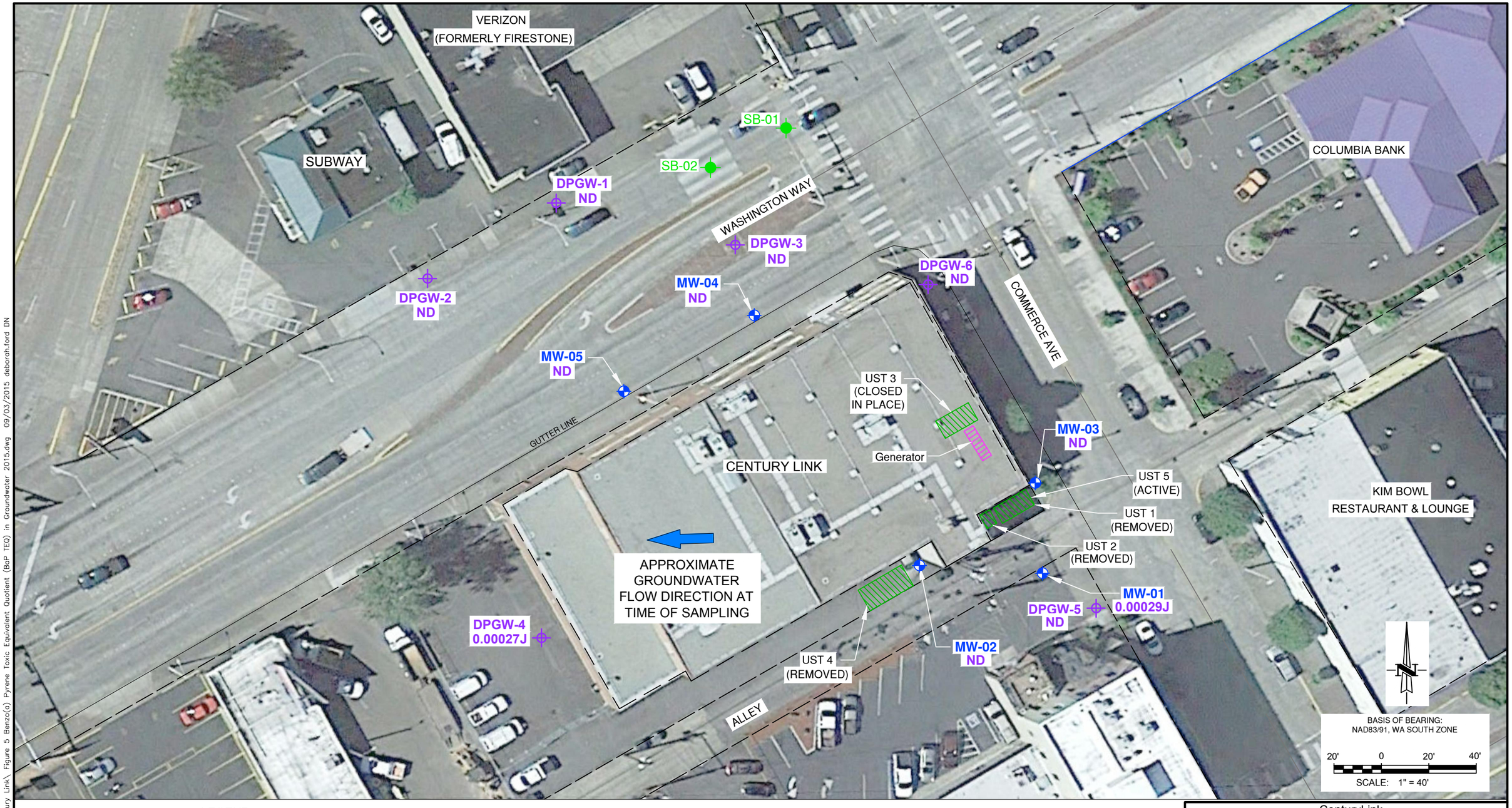
FIGURE 4
TOTAL POLYNUCLEAR AROMATIC HYDROCARBONS
(PAH) IN GROUNDWATER, JULY 2015

TETRA TECH

C:\Users\Public\Documents\Work\Century Link\ Figure 4 Total Polynuclear Aromatic Hydrocarbons (PAH) in Groundwater 2015.dwg 09/03/2015 deborah.ford DN




LEGEND

| | |
|---|---|
| MW-01 | MONITORING WELL LOCATION - SAMPLE DATES: JULY 21-22, 2015 |
| SB-01 | FORMER SOIL BORING LOCATION |
| DPGW-1 | DIRECT-PUSH GROUNDWATER SAMPLING LOCATION - SAMPLE DATES: JULY 20-21, 2015 |
| UST | UNDERGROUND STORAGE TANK |
| 0.00029 | BENZO(A) PYRENE TOXIC EQUIVALENT QUOTIENT (BAP TEQ) CONCENTRATIONS) IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L) |

NOTES:

1. UST 5 WAS INSTALLED IN THE FORMER LOCATION OF UST 1.
2. SAMPLE DATES: JULY 20-22, 2015
3. J = ESTIMATED VALUE, CONCENTRATION IS BELOW DETECTION LIMIT.
4. ND = NOT DETECTED

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FIGURE 5

BENZO(A) PYRENE TOXIC EQUIVALENT QUOTIENT (BAP TEQ) CONCENTRATIONS IN GROUNDWATER, JULY 2015

TETRA TECH

C:\Users\Public\Documents\Work\Century Link\ Figure 5 Benzo(a) Pyrene Toxic Equivalent Quotient (BaP TEQ) in Groundwater 2015.dwg 09/03/2015 deborah.ford DN

**ATTACHMENT A**
**DIRECT-PUSH TEMPORARY WELL BORING LOGS**

TriEco A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DPGW-1 | Date Started: 7/20/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/20/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: MP |
| Outer Diameter of Boring: ~~2"~~ 2" | Drilling Subcontractor: Cascade |
| Inner Diameter of Well Casing: 3/4" | Driller: |
| Depth to Water (ft./bgs.) | Location Sketch: |

| Time | Depth (ft) bgs | Drive Interval | Recovered Interval | Sample ID | Blow count (per 6 inches) / V.B. utility type, dia. | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | | | 0'-5' cleared by hand due to proximity of utilities<br>-no log 0'-5'- | | | Zero PID readings |
| 5 | | | 95% | | | 5'-8.5' - sandy silt, ~~brownish~~ gray<br>8.5'-10' - clay with red veins | | | |
| 10 | | | 80% | | | 10'-17' - coarse sand, brown, grey, and white | | | |
| 15 | | | 70% | | | | | | |
| 17 | | | | | | saturated around: 12' | | | |

TriEco
A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DP60-02 | Date Started: 7/20/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/20/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: VP |
| Outer Diameter of Boring: | Drilling Subcontractor: Cascade |
| Inner Diameter of Well Casing: ≈ 3/4" | Driller: |
| Depth to Water (ft./bgs.) | Location Sketch: |

| Time | Depth (ft) bgs | Drive Interval | Recovered Interval | Sample ID | V.B. utility type, dia. / Blow count (per 6 inches) | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | | 0' to 0.5' | 80% | | | Asphalt/ gravel | | | |
| | | 0.5' to 3.5' | | | | Brown silty sand, cohesive | | | |
| | | 3.5 to 5' | | | | Gray silty sand | | | |
| | | 5' to 9' | | 80% | | brown silty sand | | | |
| | | 9' to 10' | | | | Brown clay, red stains | | | |

TriEco
A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| Time | Depth (ft) bgs | Drive Interval | Recovered Interval | Sample ID | Blow count (per 6 inches) / P.I.D. (ppm) / V.B. utility type, dia. | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | | | 90% | | | Gray coarse sand, rocky | | | |
| 15' | | | | | | Gray coarse sand | | | |
| 17' | | | | | | | | | |
| 20' | | | | | | coarse white, small gravel | | | |

S:\AECRU\Hunters Point Shipyard\DO 0019 (PLOB X027)\WE2-Plans\Draft SAP\for Angela\appendices\Appendix C\04 Soil Boring and Well Installation Log.doc

TriEco A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DPGW-3 | Date Started: 7/21/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/21/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: MP + UP |
| Outer Diameter of Boring: 2" | Drilling Subcontractor: Cascade |
| Inner Diameter of Well Casing: 3/4" | Driller: |
| Depth to Water (ft./bgs.) | Location Sketch: |

| Time | Depth (ft) bgs | Drive Interval | Recovered Interval | Sample ID | Blow count (per 6 inches) / V.B. utility type, dia. | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 75% | | | 0-2.5' concrete chips and sub-surface asphalt | | | |
| | | | | | | 2.5-4.5 sandy silt, brown, very fine | | | |
| 5 | | | | | | 4.5-5 brown sandy silt, more coarse | | | |
| | | | 100% | | | 5-9.5 brown sandy silt, moist | | | |
| | | | | | | 9.5-10 clay (brown), moist, red markings, gray markings | | | |
| 10 | | | | | | | | | |
| | | | 95% | | | 10-12' soft, brown clay, high moisture, high plasticity red markings | | | |
| 15 | | | | | | 12-15 coarse sand with brown, gray, white specs high moisture | | | |
| 17 total | | | | | | water table at 11' | | | |
| 22 | | | | | | 15-17' coarse sand with white, grey, brown specs. Gray color more prominent | | | |

Zero PID readings



total depth = 17'
Well set at 17'

TriEco A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DPGW-4 | Date Started: 7/21/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/21/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: MP |
| Outer Diameter of Boring: 2¼" | Drilling Subcontractor: |
| Inner Diameter of Well Casing: 3/4" | Driller: Cascade |
| Depth to Water (ft./bgs.) | Location Sketch: |

| Time | Depth (ft) bgs | Drive Interval | % Recovered Interval | Sample ID | Blow count (per 6 inches) / V.B. utility type, dia. | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 90% | | | 0'-1' - asphalt surface and subsurface | | | Zero PID readings |
| 5 | | | | | | 1'-4.5' - sandy silt, greyish brown. | | | |
| | | | 85% | | | 4.5'-13' - coarse sand. brey, brown, and white specks - unsaturated | | | |
| 10 | | | | | | | | | |
| | | | 100% | | | 13'-17' coarse sand, grey, brown, + white. Saturated | | | |
| 15 | | | | | | | | | |
| | | | 70% | | | | | | |
| 17 - total | | | | | | | | | |
| | | | | | | Saturated zone at ≥ 13' | | | |

TriEco A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DPGW-5 | Date Started: 7/20/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/20/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: |
| Outer Diameter of Boring: 2" | Drilling Subcontractor: |
| Inner Diameter of Well Casing: 3/4" | Driller: |
| Depth to Water (ft./bgs.) | Location Sketch: |

@ 11:20 ≈ 13.8'

| Time | Depth (ft) bgs | Drive Interval | % Recovered ~~Interval~~ | Sample ID | V.B. utility type, dia. / Blow count (per 6 inches) | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | | 80% | | | 0-3" - Concrete<br>3-6" - subsidewalk material/asphalt<br>0.5'-4' - sandy silt, brownish grey<br>4'-9' - silty sand, brownish<br>9'-10.5' - gray clay with red veins, moist<br>10.5'-12' - fine sand, reddish brown<br>12-13' - coarse grey speckled sand<br>13'-14' - redder sand with pebbles, moist<br>14-17 - reddish coarse sand with some stone + gravel<br>Saturated zone starts at ≈ 13' | | 5 | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 |
| | 10 | | 80% | | | | | 10 | |
| | 15 | | 90% | | | | | 15 | |
| | | 17 total | | | | | | | |

TriEco
A Joint Venture

# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:
Project Name:

| | |
|---|---|
| Boring Number: DP6W-6 | Date Started: 7/20/15 |
| Drilling Method: (*Circle one*) HSA Continuous Core/Direct Push/Hand Auger | Date Completed: 7/20/15 |
| Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum | Logged By: |
| Outer Diameter of Boring: 2" | Drilling Subcontractor: |
| Inner Diameter of Well Casing: 3/4" | Driller: |
| Depth to Water (ft./bgs.) 13.65' | Location Sketch: |

| Time | Depth (ft) bgs | Drive Interval | Recovered Interval | Sample ID | V.B. utility type, dia. / Blow count (per 6 inches) | Description | USCS soil symbol | Well construction | OVM (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 80% | | | 0-4" concrete<br>0.5'-4' sandy silt, brownish grey | | | |
| | 5 | | | | | 4'-11' brown clay with red veins | | | |
| | | | 80% | | | 11-12' - reddish colored sand/silt | | | |
| | 10 | | | | | 12'-15' - course sand with pebbles - brown | | | |
| | | | 85% | | | 15-17' - coarse sand with Pebbles - grey | | | |
| | 15 | | | | | | | | |
| | 17' total | | | | | saturated zone starts at 13' | | | |

PID readings zero

**ATTACHMENT B**
**DIRECT-PUSH TEMPORARY WELL CONSTRUCTION DIAGRAMS**

TriEco
A Joint Venture

Typical of all Temp DPGW Wells — PVC — DPGW 1-4

# MONITORING WELL COMPLETION RECORD

## DRILLING INFORMATION

DRILLING BEGAN:
DATE 7/20-7/21/15 TIME
WELL INSTALLATION BEGAN:
DATE TIME
WELL COMPLETION FINISHED:
DATE 7/20-7/24/15 TIME
DRILLING CO. Cascade
DRILLER Frank Scott
LICENSE
DRILL RIG Geo Probe
DRILLING METHOD:
☐ HOLLOW STEM AUGER
☐ AIR ROTARY
☑ Direct Push
DIAMETER OF AUGERS:
ID OD 2"

## BENTONITE SEAL

AMOUNT CALCULATED None
AMOUNT USED
☐ PELLETS, SIZE
☐ CHIPS, SIZE
☐
PRODUCT
MFG. BY
METHOD INSTALLED
☐ POURED ☐ TREMIE
AMOUNT OF WATER USED

## FILTER PACK

AMOUNT CALCULATED PVC pre
AMOUNT USED packed
☐ SAND, SIZE screens
☐ FORMATION COLLAPSE:
FROM TO
PRODUCT
MFG. BY
METHOD INSTALLED:
☐ POURED ☐ TREMIE

## SURVEY INFORMATION

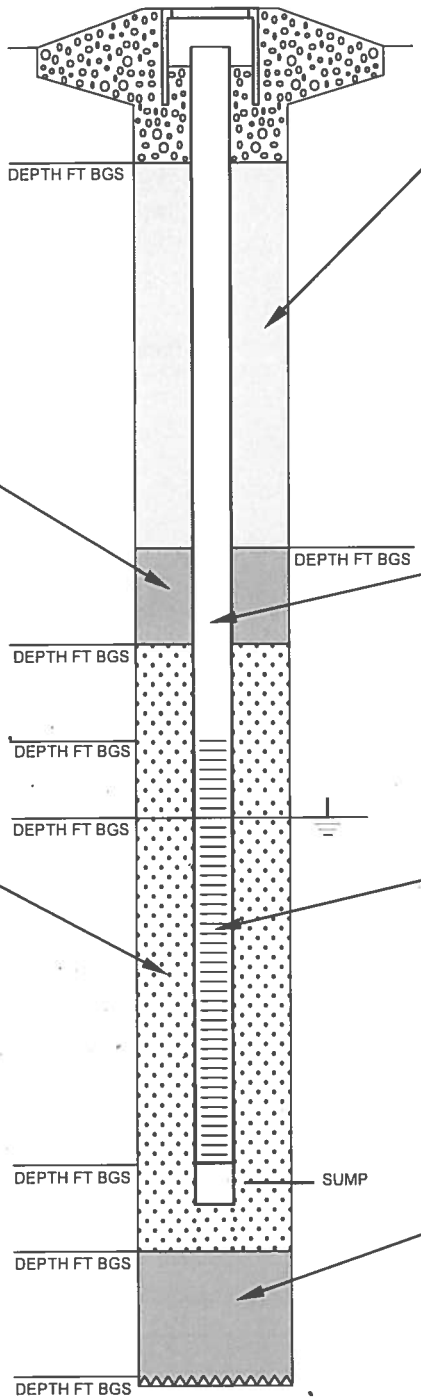
TOC ELEVATION
GROUND ELEVATION Not
NORTHING COORD. surveyed
EASTING COORD.
DATE SURVEYED
SURVEY CO.

## CENTRALIZERS USED?

☐ YES ☐ NO
CENTRALIZER DEPTHS:

## SURFACE COMPLETION

☐ FLUSH MOUNT
☐ ABOVE GROUND W/BUMPER POST
☐ CONCRETE ☐ ASPHALT




## MONITORING WELL

MONITORING WELL NO. temp well
PROJECT
SITE not named
BOREHOLE NO.
WELL PERMIT NO.
~~TOC~~ TO BOTTOM OF WELL 17'
GS

## ANNULAR SEAL

AMOUNT CALCULATED
AMOUNT USED
☐ GROUT FORMULA
PORTLAND CEMENT
BENTONITE
WATER
☐ PREPARED MIX
PRODUCT
MFG. BY
METHOD INSTALLED
☐ POURED ☐ TREMIE

## CASING

☑ SCHEDULE 40 PVC
☐
PRODUCT
MFG BY.
CASING DIAMETER (in):
ID 3/4" OD
LENGTH OF CASING 15'

## WELL SCREEN

☑ SCHEDULE 40 PVC
☐
PRODUCT
MFG. BY:
CASING DIAMETER (in):
ID 3/4" OD
SLOT SIZE
LENGTH OF SCREEN 5'

## BOREHOLE BACKFILL

AMOUNT CALCULATED
AMOUNT USED
☑ BENTONITE CHIPS, SIZE
☐ BENTONITE PELLETS, SIZE
☐ SLURRY
☐ FORMATION COLLAPSE
FROM TO
PRODUCT
MFG. BY
METHOD INSTALLED:
☐ POURED ☐ TREMIE

TriEco
A Joint Venture

Typical of all Temp Steel - DPGW 5+ DPGW 6 DPGW wells

# MONITORING WELL COMPLETION RECORD

## DRILLING INFORMATION

DRILLING BEGAN:
DATE 7/20/15 TIME
WELL INSTALLATION BEGAN:
DATE 7/20/15 TIME
WELL COMPLETION FINISHED:
DATE 7/20/15 TIME
DRILLING CO. Cascade
DRILLER Frank Scott
LICENSE
DRILL RIG GeoProbe
DRILLING METHOD:
☐ HOLLOW STEM AUGER
☐ AIR ROTARY
☑ Direct Push
DIAMETER OF AUGERS:
ID OD 2"

## BENTONITE SEAL

AMOUNT CALCULATED None
AMOUNT USED
☐ PELLETS, SIZE
☐ CHIPS, SIZE
☐
PRODUCT
MFG. BY
METHOD INSTALLED
☐ POURED ☐ TREMIE
AMOUNT OF WATER USED

## FILTER PACK

AMOUNT CALCULATED
AMOUNT USED None
☐ SAND, SIZE
☐ FORMATION COLLAPSE:
FROM TO
PRODUCT
MFG. BY
METHOD INSTALLED:
☐ POURED ☐ TREMIE

## SURVEY INFORMATION

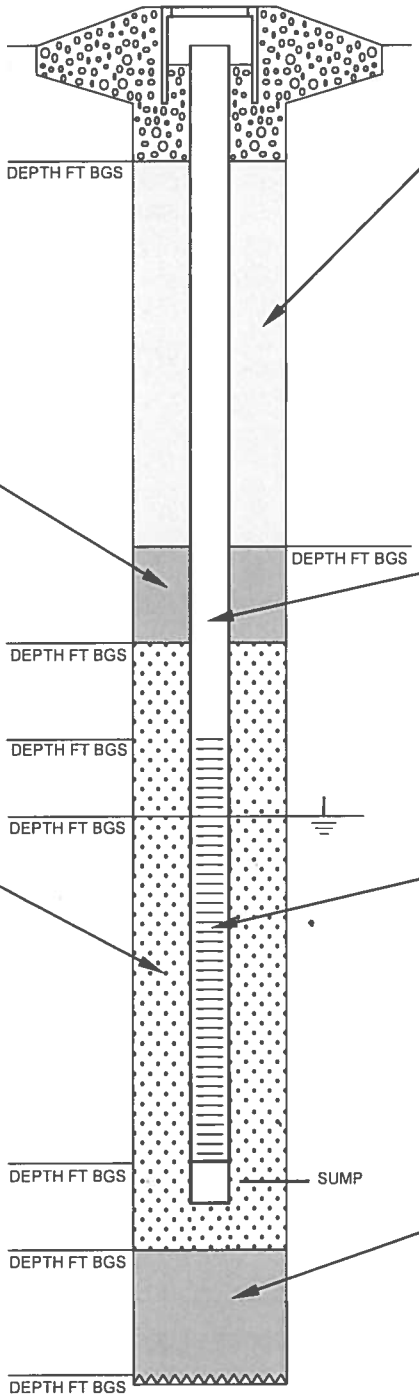
TOC ELEVATION Not
GROUND ELEVATION Surveyed
NORTHING COORD.
EASTING COORD.
DATE SURVEYED
SURVEY CO.

## CENTRALIZERS USED?

☐ YES ☐ NO
CENTRALIZER DEPTHS:

## SURFACE COMPLETION

☐ FLUSH MOUNT
☐ ABOVE GROUND W/BUMPER POST
☐ CONCRETE ☐ ASPHALT




## MONITORING WELL

MONITORING WELL NO. Temp, not named
PROJECT
SITE
BOREHOLE NO.
WELL PERMIT NO.
~~TOC~~ TO BOTTOM OF WELL 17'
GS

## ANNULAR SEAL

AMOUNT CALCULATED
AMOUNT USED
☐ GROUT FORMULA
PORTLAND CEMENT
BENTONITE
WATER
☐ PREPARED MIX
PRODUCT
MFG. BY
METHOD INSTALLED
☐ POURED ☐ TREMIE

## CASING

☐ SCHEDULE 40 PVC
☑ Steel
PRODUCT
MFG BY.
CASING DIAMETER (in):
ID 3/4" OD
LENGTH OF CASING 15'

## WELL SCREEN

☐ SCHEDULE 40 PVC
☑ Steel
PRODUCT
MFG. BY:
CASING DIAMETER (in):
ID 3/4" OD
SLOT SIZE
LENGTH OF SCREEN 4'

## BOREHOLE BACKFILL

AMOUNT CALCULATED
AMOUNT USED
☑ BENTONITE CHIPS, SIZE
☐ BENTONITE PELLETS, SIZE
☐ SLURRY
☐ FORMATION COLLAPSE
FROM TO
PRODUCT
MFG. BY
METHOD INSTALLED:
☐ POURED ☐ TREMIE

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

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/20/15

**Well Name** DP GW-1

Project Century Link - Longview GW Sampling

Project No. _____

Well Location _____

**Sample Date** 7/20/15

Sampling Personnel Mike P
Vanessa P.

**Sample ID** _____

**Duplicate ID** _____

Screen Interval _____

Station Elevation _____ GND ____ TOC _____

Static Water Level (from TOC) _____

Well Stick Up 2' 3"

Static Elevation 13.8' DTW

Well Depth 17' MEAS ____ RPTD _____

Feet of Water _____

Gallons/Foot _____

Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No

Type _____

Measured with _____

PID Readings (background) _____

PID Reading (TOC) _____

Wells Installed by _____

Installation Date _____

Development Date(s) _____

inlet at 15.5' BGS

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C

pH: pH 4.00 - _____ at _____ • C pH 7.00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA

Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** @ 15:00 start

| 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 | | |
| 15:05 | 450 | 4.3 | 6.32 | -4.3 | 17.88 | 0.381 | 185.1 | | | | | | |
| 1510 | 450 | 0.07 | 6.15 | 6.1 | 17.38 | 0.346 | 38.6 | | | | | | |
| 1515 | 450 | 0.08 | 6.05 | 13.2 | 17.04 | 0.342 | 21.2 | | | | | | |
| 1519 | 450 | 0.07 | 6.04 | 25.1 | 16.76 | 0.337 | 7 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**SAMPLE PARAMETERS** Sampled at 15:20

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15:20 | 450 | 0.07 | 6.04 | 25.1 | 16.76 | 0.337 | 7 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____

Spec. Cond. Meter _____ Serial Number _____

Pump _____ Serial Number _____

Water Level Meter _____ Serial Number _____

D.O. Meter _____ Serial Number _____

Filter Apparatus _____ Filters _____

Temperature Measure _____

Interface Probe _____ Serial Number _____

PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____

_____

_____

Number of Bottles _____

Sample Depth _____

Field Notebook _____

Sample Method _____

_____

Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/20/15

**Well Name** DP6V - 2
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/20/15
Sampling Personnel Mike P
Vanessa P

**Sample ID** _____
**Duplicate ID** _____

Screen Interval _____
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) _____
Well Stick Up 2'4"
Static Elevation 109 13.84'
Well Depth 17' MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

inlet set at 15.5' BGS

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25•C Reading _____ µmhos/cm at ____•C
pH: pH 4.00 - _____ at _____•C pH 7.00 - _____ at _____•C pH 10.00 - _____ at _____•C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____•C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

PURGING @ 15:57 started

| 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 | | |
| 16:00 | 400 | 0.05 | 6.61 | 1.4 | 17.91 | 0.877 | 610 | | | | | | |
| 16:05 | 300 | 0.05 | 6.39 | -5.1 | 17.43 | 0.335 | 76.6 | | | | | | |
| 16:10 | 300 | 0.04 | 6.30 | -8.4 | 17.04 | 0.327 | 60.2 | | | | | | |
| 16:15 | 400 | 0.04 | 6.28 | -0.5 | 17.01 | 0.332 | 26.2 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**SAMPLE PARAMETERS** Sampled at 16:15

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16:15 | 400 | 0.04 | 6.28 | -0.5 | 17.01 | 0.332 | 26.2 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
_____
_____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
_____
Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/21/15

**Well Name** DPGW-3 | Screen Interval 12-17' (2" SCH 40 PVC)

Project Century Link - Longview GW Sampling | Station Elevation _____ GND ___ TOC ___ | Immiscible Phases Present ☐ Yes ☐ No

Project No. _____ | Static Water Level (from TOC) _____ | Type _____

Well Location _____ | Well Stick Up 2'5" | Measured with _____

**Sample Date** 7/21/15 | Static Elevation 14.28' DTW 13.65 | PID Readings (background) _____

Sampling Personnel Mike Pp, Vanessa Pp | Well Depth 17' MEAS ___ RPTD ✓ | PID Reading (TOC) _____

Feet of Water _____ | Wells Installed by _____

**Sample ID** _____ | Gallons/Foot _____ | Installation Date _____

**Duplicate ID** _____ | Casing Volume _____ | Development Date(s) _____

inlet at 15.5'

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ | Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C

pH: pH 4.00 - _____ at _____ • C | pH 7.00 - _____ at _____ • C | pH 10.00 - _____ at _____ • C | Slope NA

Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C | PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** started at 11:08

| 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 | | |
| 11:10 | 500 | 0.21 | 6.61 | -7.8 | 16.91 | 0.418 | 63.4 | | | | | | |
| 11:15 | 400 | 0.49 | 6.33 | 5.9 | 16.31 | 0.407 | 13.5 | | | | | | |
| 11:20 | 400 | -.13 | 6.33 | 11.7 | 16.07 | 0.407 | 5.9 | | | | | | |
| 11:25 | 400 | 0.12 | 6.28 | 16.0 | 15.92 | 0.408 | 2.3 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**SAMPLE PARAMETERS** Sampled at 11:25

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11:25 | 400 | 0.12 | 6.28 | 16.0 | 15.92 | 0.408 | 2.3 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____

Spec. Cond. Meter _____ Serial Number _____

Pump _____ Serial Number _____

Water Level Meter _____ Serial Number _____

D.O. Meter _____ Serial Number _____

Filter Apparatus _____ Filters _____

Temperature Measure _____

Interface Probe _____ Serial Number _____

PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____

_____

_____

Number of Bottles _____

Sample Depth _____

Field Notebook _____

Sample Method _____

_____

Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/21/15

**Well Name** DPGW-4

Project Century Link - Longview GW Sampling

Project No. _____

Well Location _____

**Sample Date** 7/21/15

Sampling Personnel Mike P
Vanessa P.

**Sample ID** _____

**Duplicate ID** _____

Screen Interval 16.48

Station Elevation _____ GND ___ TOC _____

Static Water Level (from TOC) _____

Well Stick Up ~2' 1"

Static Elevation 14.38' DTW

Well Depth 17' MEAS ___ RPTD ✓

Feet of Water _____

Gallons/Foot _____

Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No

Type _____

Measured with _____

PID Readings (background) _____

PID Reading (TOC) _____

Wells Installed by _____

Installation Date _____

Development Date(s) _____

inlet at 15.5' BBGS

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25•C Reading _____ µmhos/cm at ____•C

pH: pH 4.00 - _____ at _____•C pH 7.00 - _____ at _____•C pH 10.00 - _____ at _____•C Slope NA

Dissolved Oxygen: D.O. Meter _____ mg/L at _____•C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** started at 9:24

| 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 | | |
| 9:25 | 500 | 8.22 | 6.33 | -16.7 | 17.5 | 0.416 | 139.3 | | | | | | |
| 9:30 | 450 | 6.61 | 6.35 | -17.8 | 17.3 | 0.410 | 57.4 | | | | | | |
| 9:35 | 450 | 5.19 | 6.42 | -14.9 | 17.1 | 0.407 | 12.6 | | | | | | |
| 9:40 | 450 | 4.09 | 6.42 | -11.1 | 17.04 | 0.406 | 7.1 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**SAMPLE PARAMETERS** sampled at 9:40

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 940 | 450 | 4.09 | 6.42 | -11.1 | 17.04 | 0.406 | 7.1 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____

Spec. Cond. Meter _____ Serial Number _____

Pump _____ Serial Number _____

Water Level Meter _____ Serial Number _____

D.O. Meter _____ Serial Number _____

Filter Apparatus _____ Filters _____

Temperature Measure _____

Interface Probe _____ Serial Number _____

PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____

_____

_____

Number of Bottles _____

Sample Depth _____

Field Notebook _____

Sample Method _____

_____

Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/20/15

**Well Name** DP6W-5
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/20/15
Sampling Personnel Mike P. / Vanessa P.
_____
**Sample ID** _____
**Duplicate ID** _____

Screen Interval 13'-17' BGS
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) _____
Well Stick Up _____
Static Elevation 13.8' DTW
Well Depth 17' MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____
inlet set at 15' BGS

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by Cascade
Installation Date 7/20/15
Development Date(s) Developed for 20 mins, 5 gal removed

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25•C Reading _____ µmhos/cm at ____•C
pH: pH 4.00 - _____ at _____•C pH 7.00 - _____ at _____•C pH 10.00 - _____ at _____•C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____•C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** start at 12:08

| 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 | | |
| 12:10 | 400 | 47.1 | 6.23 | -88 | 15.8 | 0.491 | 23.3 | | | | | | |
| 12:15 | 400 | 46.1 | 6.24 | -0.3 | 15.36 | 0.477 | 11.8 | | | | | | |
| 12:20 | 400 | 46.1 | 6.23 | 6.0 | 15.17 | 0.471 | 5.9 | | | | | | |
| 12:25 | 400 | 49.1 | 6.26 | 6.5 | 15.10 | 0.470 | 6.2 | | | | | | |
| | | ↑ | | | | | | | | | | | |
| | | recorded % DO by accident | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**SAMPLE PARAMETERS** sampled at 12:25

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1225 | 400 | 49.1 | 6.26 | 6.5 | 15.10 | 0.470 | 6.2 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
_____
_____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
_____
Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/20/15

**Well Name** DPGW-6
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/20/15
Sampling Personnel Mike P.
Vanessa P.
_____
**Sample ID** _____
**Duplicate ID** _____

Screen Interval 13 - 17' BGS
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) _____
Well Stick Up _____
Static Elevation ~~[illegible]~~ 13.65' DTW
Well Depth 17' MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____
inlet set at 15.5' BGS

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C
pH: pH 4.00 - _____ at _____ • C pH 7.00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** @ 13:40

| 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 | | |
| 13:40 | 500 | 32.9 | 6.08 | 41.9 | 15.39 | 0.537 | 12.1 | | | | | | |
| 13:45 | 400 | 26.7 | 6.47 | 50.2 | 15.24 | 0.537 | 17.0 | | | | | | |
| 13:50 | 400 | 26.7 | 6.49 | 54.1 | 15.24 | 0.537 | 10.9 | | | | | | |
| | | ↑ | recorded % DO by accident | | | | | | | | | | |

**SAMPLE PARAMETERS** sampled at 13:50

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1350 | 400 | 26.7 | 6.49 | 54.1 | 15.24 | 0.537 | 10.9 | | | | | | |

Condition of well: _____
Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
_____
_____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
_____
Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/22/15

**Well Name** MW-1
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/22/15
Sampling Personnel Mike P
Vanessa P
**Sample ID** _____
**Duplicate ID** _____

Screen Interval _____
Station Elevation _____ GND ____ TOC _____
Static Water Level (from TOC) 13.78'
Well Stick Up _____
Static Elevation _____
Well Depth _____ MEAS ____ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

**FIELD CHEMISTRY CALIBRATIONS**
tubing inlet set at 15.5'
Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C
pH: pH 4.00 - _____ at _____ • C pH 7.00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** started at 10:57

| 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 | | |
| 11:00 | 400 | 1.47 | 6.50 | 203.5 | 14.98 | 0.359 | 23.5 | | | | | | |
| 1105 | 400 | 0.76 | 6.35 | 183.4 | 14.70 | 0.359 | 26.5 | | | | | | |
| 1110 | 400 | 0.45 | 6.40 | 70.3 | 14.62 | 0.360 | 55.0 | | | | | | |
| 1115 | 400 | 0.50 | 6.40 | 52.0 | 14.59 | 0.360 | | | | | | | |
| | Purging paused due to pump battery dying | | | | | | | | | | | | |
| 1130 | 450 | 0.39 | 6.44 | 17.34 | 15.21 | 0.365 | 4.1 | | | | | | |
| 1135 | | 0.40 | 6.41 | 13.1 | 14.71 | 0.365 | 4.2 | | | | | | |
| 1140 | 400 | 0.48 | 6.41 | 7.1 | 14.75 | 0.366 | 6.1 | | | | | | |
| 1145 | 400 | 0.44 | 6.42 | 0.1 | 14.71 | 0.369 | 0.7 | | | | | | |
| 1150 | 400 | 0.31 | 6.42 | -2.8 | 14.67 | 0.369 | -1.1 | | | | | | |
| post→ 1200 | | 0.97 | 6.41 | 2.2 | 14.72 | 0.371 | -1.9 | | | | | | |

**SAMPLE PARAMETERS** sample time 1150

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1150 | 400 | 0.31 | 6.42 | -2.8 | 14.67 | 0.369 | -1.1 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
Discharge Water Containerized ☒ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/22/15

**Well Name** MW-2
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/22/15
Sampling Personnel Mike P
Vanessa P
**Sample ID** _____
**Duplicate ID** _____

Screen Interval _____
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) 14.32'
Well Stick Up _____
Static Elevation _____
Well Depth _____ MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

tubing inlet set at 16' BTC

**FIELD CHEMISTRY CALIBRATIONS**
Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C
pH: pH 4.00 - _____ at _____ • C pH 7 00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** started at 9:57

| 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 | | |
| 1000 | 500 | 5.04 | 6.15 | 216.7 | 16.28 | 0.582 | 0.3 | | | | | | |
| 1005 | 450 | 5.63 | 6.22 | 210.4 | 15.90 | 0.555 | -1.5 | | | | | | |
| 1010 | 400 | 4.96 | 6.22 | 204.6 | 15.86 | 0.521 | -0.6 | | | | | | |
| 1015 | | 4.22 | 6.22 | 202.8 | 15.86 | 0.511 | 1.7 | | | | | | |
| 1020 | | 3.97 | 6.22 | 203.2 | 15.9 | 0.506 | 2.6 | | | | | | |
| 1025 | 400 | 3.46 | 6.22 | 203.5 | 15.9 | 0.501 | 0.6 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Sample Parameters

**SAMPLE PARAMETERS** sample time - 1030

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1046 | 400 | 2.54 | 6.23 | 204.6 | 15.91 | 0.484 | 18.7 | | | | | | |

post

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
Discharge Water Containerized ☒ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/21/15

**Well Name** MW-3
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** 7/21/15
Sampling Personnel Mike P
Vanessa P.
_____
**Sample ID** _____
**Duplicate ID** _____

Screen Interval _____
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) 13.1'
Well Stick Up _____
Static Elevation _____
Well Depth _____ MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____
tubing inlet set at 15.5' BTC

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

**FIELD CHEMISTRY CALIBRATIONS**

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C
pH: pH 4.00 - _____ at _____ • C pH 7.00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

PURGING Started at 16:12

| 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 | | |
| 16:15 | 450 | .95 | 6.45 | 112.2 | 15.58 | 0.899 | 0.5 | | | | | | |
| 1620 | 450 | -0.78 | 6.16 | 131.7 | 15.29 | 0.410 | -2.2 | | | | | | |
| 1625 | 450 | 0.59 | 6.00 | 166.2 | 15.31 | 0.417 | -4.2 | | | | | | |
| 1630 | 450 | 0.11 | 6.05 | 161.2 | 15.09 | 0.416 | -4.3 | | | | | | |
| 1635 | 450 | 0.20 | 6.03 | 160.6 | 14.99 | 0.417 | -4.3 | | | | | | |
| 1640 | 450 | 0.57 | 6.07 | 151.1 | 14.99 | 0.419 | -4.7 | | | | | | |
| 1645 | 450 | 0.41 | 6.09 | 143.1 | 14.94 | 0.417 | -4.2 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Post 1655 | 450 | 0.25 | 6.15 | 130.7 | 15.02 | 0.418 | -4.2 | | | | | | |

**SAMPLE PARAMETERS** Sampled at 16:45

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16:45 | 450 | 0.41 | 6.09 | 143.1 | 14.94 | 0.417 | -4.2 | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
_____
_____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
_____
Discharge Water Containerized ■ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/24/15

**Well Name** MW-4

Project Century Link - Longview GW Sampling

Project No. _____

Well Location _____

**Sample Date** _____

Sampling Personnel _____

_____

_____

**Sample ID** _____

**Duplicate ID** _____

Screen Interval _____

Station Elevation _____ GND ___ TOC _____

Static Water Level (from TOC) 12.74'

Well Stick Up _____

Static Elevation _____

Well Depth _____ MEAS ___ RPTD _____

Feet of Water _____

Gallons/Foot _____

Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No

Type _____

Measured with _____

PID Readings (background) _____

PID Reading (TOC) _____

Wells Installed by _____

Installation Date _____

Development Date(s) _____

**FIELD CHEMISTRY CALIBRATIONS** tubing inlet set at 15.5'

Date/Time _____ Spec. Conductance: Standard _____ µmhos/cm at 25• C Reading _____ µmhos/cm at ____• C

pH: pH 4.00 - _____ at _____ • C pH 7.00 - _____ at _____ • C pH 10.00 - _____ at _____ • C Slope NA

Dissolved Oxygen: D.O. Meter _____ mg/L at _____ • C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** Started at 13:53

| 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 | | |
| 13:55 | 450 | -0.07 | 6.28 | 118.2 | 15.6 | 0.398 | 5 | | | | | | |
| 1400 | 450 | -0.16 | 6.19 | 84.2 | 15.31 | 0.397 | -1.7 | | | | | | |
| 1405 | 450 | -1.42 | 6.13 | 72.2 | 15.33 | 0.397 | -3.1 | | | | | | |
| 1410 | 450 | -6.8 | 6.21 | 67.1 | 15.32 | 0.395 | -3.9 | | | | | | |
| 1415 | 450 | 00.16 | 6.20 | 63.7 | 15.36 | 0.395 | -4.4 | | | | | | |
| 1420 | 450 | 1.27 | 6.19 | 59.5 | 16.41 | 0.395 | -5.7 | | | | | | |
| 1425 | 450 | 1.16 | 6.19 | 57.0 | 15.41 | 0.394 | -4.4 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Post 14:35 | 450 | 17.4 | 6.19 | 63.6 | 15.45 | 0.396 | -4.5 | | | | | | |

**SAMPLE PARAMETERS** sampled at 14:25

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____

Spec. Cond. Meter _____ Serial Number _____

Pump _____ Serial Number _____

Water Level Meter _____ Serial Number _____

D.O. Meter _____ Serial Number _____

Filter Apparatus _____ Filters _____

Temperature Measure _____

Interface Probe _____ Serial Number _____

PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____

_____

_____

Number of Bottles _____

Sample Depth _____

Field Notebook _____

Sample Method _____

_____

Discharge Water Containerized ☒ Yes ☐ No

Tetra Tech EM Inc.

# MICROPURGING GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 7/21/15

**Well Name** MW-5
Project Century Link - Longview GW Sampling
Project No. _____
Well Location _____
**Sample Date** _____
Sampling Personnel _____
_____
_____
**Sample ID** _____
**Duplicate ID** _____

Screen Interval _____
Station Elevation _____ GND ___ TOC _____
Static Water Level (from TOC) 12.98'
Well Stick Up _____
Static Elevation +2.98' DTW
Well Depth _____ MEAS ___ RPTD _____
Feet of Water _____
Gallons/Foot _____
Casing Volume _____

Immiscible Phases Present ☐ Yes ☐ No
Type _____
Measured with _____
PID Readings (background) _____
PID Reading (TOC) _____
Wells Installed by _____
Installation Date _____
Development Date(s) _____

**FIELD CHEMISTRY CALIBRATIONS** tubing set at 15.5' BTC

Date/Time _____ Spec. Conductance Standard _____ µmhos/cm at 25•C Reading _____ µmhos/cm at ____•C
pH: pH 4.00 - _____ at _____ •C pH 7.00 - _____ at _____ •C pH 10.00 - _____ at _____ •C Slope NA
Dissolved Oxygen: D.O. Meter _____ mg/L at _____ •C PID: Calibration Gas _____ PPM _____ Span _____ Reading _____

**PURGING** Started at 1242

| 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 | | |
| 1245 | 500 | 0.8 | 6.11 | 168.0 | 15.52 | 0.501 | 0 | | | | | | |
| 1250 | 400 | Purging stopped due to pump battery failing | | | | | | | | | | | |
| DO 12:55 | 350 | 0.72 | 6.10 | 193.2 | 15.86 | 0.509 | 0.1 | | | | | | |
| 0.34 13:00 | 350 | 3.4 | 5.98 | 204.8 | 15.51 | 0.511 | 0.5 | | | | | | |
| 0.39 1305 | 350 | 3.9 | 5.98 | 207.5 | 15.39 | 0.511 | -3.6 | | | | | | |
| 1310 | 350 | 0.33 | 5.98 | 211.3 | 15.35 | 0.511 | -3.7 | | | | | | |
| 1315 | 350 | 0.35 | 5.98 | 212.6 | 15.45 | 0.511 | -3.7 | | | | | | |
| 1320 | 350 | 0.29 | 6.00 | 216.1 | 15.33 | 0.509 | -3.7 | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| DSL 1330 | 350 | 1.67 | 6.01 | 217.2 | 15.51 | 0.510 | -3.7 | | | | | | |

**SAMPLE PARAMETERS** Sampled at 1320

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

Condition of well: _____

Remarks: _____

**FIELD EQUIPMENT**

pH Meter _____ Serial Number _____
Spec. Cond. Meter _____ Serial Number _____
Pump _____ Serial Number _____
Water Level Meter _____ Serial Number _____
D.O. Meter _____ Serial Number _____
Filter Apparatus _____ Filters _____
Temperature Measure _____
Interface Probe _____ Serial Number _____
PID/OVA _____ Serial Number _____

**Field Chemistry Calibrations**

Fractions _____
_____
_____
Number of Bottles _____
Sample Depth _____
Field Notebook _____
Sample Method _____
_____
Discharge Water Containerized ☒ Yes ☐ No

**ATTACHMENT D**
**LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODY RECORDS**

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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**F :** +1 360 636 1068
**www.alsglobal.com**

August 06, 2015 **Analytical Report for Service Request No:** K1507840

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

**RE: CenturyLink Longview WA / 103P3080177**

Dear Dr.Tisdale,

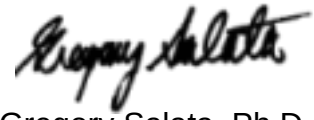
Enclosed are the results of the sample(s) submitted to our laboratory July 20, 2015
For your reference, these analyses have been assigned our service request number **K1507840.**

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. 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 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

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



Gregory Salata, Ph.D.
Client Services
Manager

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# Table of Contents

## 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 DEC UST | http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L14-51 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | Not available | - |
| Idaho DHW | http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx | - |
| ISO 17025 | http://www.pjlabs.com/ | L14-50 |
| Louisiana DEQ | http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx | 03016 |
| Maine DHS | Not available | WA01276 |
| Michigan DEQ | http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html | 9949 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Montana DPHHS | http://www.dphhs.mt.gov/publichealth/ | CERT0047 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/oqa/ | WA005 |
| North Carolina DWQ | http://www.dwqlab.org/ | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/envserv/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wisconsin DNR | http://dnr.wi.gov/ | 998386840 |
| Wyoming (EPA Region 8) | http://www.epa.gov/region8/water/dwhome/wyomingdi.html | - |
| Kelso Laboratory Website | www.alsglobal.com | 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 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/anlayte is offered by that state.

# Case Narrative

**ALS Environmental—Kelso Laboratory**
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

**ALS ENVIRONMENTAL**

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request No.:** | K1507840 |
| **Project:** | CentruyLink Longview WA/ 103P3080177 | **Date Received:** | 07/20/15 |
| **Sample Matrix:** | Water | | |

**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**

Four water samples were received for analysis at ALS Environmental on 07/20/15. The samples were received in good condition and consistent with the accompanying chain of custody form, except where noted on the cooler receipt and preservation form included in this report. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

**Diesel Range Organics by Method NWTPH-Dx**

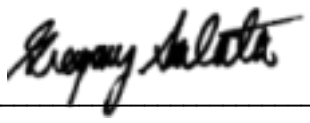
**Sample Notes and Discussion:**
Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

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

**Polynuclear Aromatic Hydrocarbons by EPA Method 8270**

**Sample Notes and Discussion:**
A Matrix Spike/Matrix Spike Duplicate (MS/MSD) was not extracted with this sample batch. 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.

**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

# 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.
Part of the ALS Group A Campbell Brothers Limited Company

**Work Order No.:** K1507840

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Manager:** | David Berestka | | | **Bill to:** | Vanessa Pineda | | |
| **Client Name:** | Tetra Tech | | | **Company:** | Tetra Tech | | |
| **Address:** | 216 16th Street | | | **Address:** | 216 16th Street Suite 1500 | | |
| **City, State ZIP:** | Denver, CO 80202 | | | **City, State ZIP:** | Denver, CO 80202 | | |
| **Email:** | David.Berestka@tetratech.com | **Phone:** | 303-312-8856 | **Email:** | vanessa.pineda@tetratech.com | **Phone** | 303-312-8812 |
| Project Name: | CenturyLink Longview WA | | | | | | |
| Project Number: | 103P3080177 | | | | | | |
| P.O. Number: | | | | | | | |
| Sampler's Name: | Mike Pavarini/Vanessa Pineda | | | | | | |

**SAMPLE RECEIPT**

| | | | | |
|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: |
| Sample Custody Seals: | Yes | No | N/A | |

**REQUESTED ANALYSIS**

**TAT**

- [X] Routine
- [ ] Same Day ***
- [ ] Next Day ***
- [ ] 3 Day
- [ ] 6 Day

*** Please call for availability

**Due Date:**

**Comments**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | NWTPHDx diesel and motor oil (no silica gel cleanup) | PAH 625 SIM (filtered-no silica gel cleanup) |
|---|---|---|---|---|---|---|---|
| DPGW-5 | W | 7/20/15 | 12:25 | | 4 | 1 | 3 |
| DPGW-6 | W | | 13:50 | | 4 | 1 | 3 |
| DPGW-1 | W | | 15:20 | | 4 | 1 | 3 |
| DPGW-2 | W | | 16:15 | | 4 | 1 | 3 |

| | |
|---|---|
| Total | 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 |
| Dissolved | 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**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Vanessa Pineda | | 7/20/15 1725 | GREGORY SALATA | | 7/20/15 1725 |

PC GS

## Cooler Receipt and Preservation Form

Client / Project: TETRA TECH / CENTURY LINK Service Request *K15* 07840

Received: 7/20/15 Opened: 7/21/15 By: [signature] Unloaded: 7/21/15 By: [signature]

1. Samples were received via? *Mail* *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 (NA) | Tracking Number (NA) | Filed |
|---|---|---|---|---|---|---|---|---|
| 4.8 | 4.7 | 6.4 | 6.3 | -0.1 | 350 | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
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:***

Two bottles for "DPGW-2" arrived outside of the one cooler. Placed in TOGO overnight until samples logged in the AM.

*Page* _____ *of* _____

# 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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-5 | **Units:** | ug/L |
| **Lab Code:** | K1507840-001 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **18** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **40** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 83 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 82 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-6 | **Units:** | ug/L |
| **Lab Code:** | K1507840-002 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **21** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **45** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 96 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 92 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-1 | **Units:** | ug/L |
| **Lab Code:** | K1507840-003 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **17** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **28** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 82 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 80 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-2 | **Units:** | ug/L |
| **Lab Code:** | K1507840-004 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **19** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **27** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 69 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 69 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506770-3 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | ND | U | 250 | 11 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **25** | J | 500 | 19 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 77 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 77 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507840
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

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

**Extraction Method:** METHOD **Units:** Percent
**Analysis Method:** NWTPH-Dx **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 |
|---|---|---|---|
| DPGW-5 | K1507840-001 | 83 | 82 |
| DPGW-6 | K1507840-002 | 96 | 92 |
| DPGW-1 | K1507840-003 | 82 | 80 |
| DPGW-2 | K1507840-004 | 69 | 69 |
| Method Blank | KWG1506770-3 | 77 | 77 |
| Lab Control Sample | KWG1506770-1 | 96 | 91 |
| Duplicate Lab Control Sample | KWG1506770-2 | 95 | 91 |

**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 | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/24/2015 |
| **Sample Matrix:** | Water | **Date Analyzed:** | 07/30/2015 |

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

| | | | |
|---|---|---|---|
| **Extraction Method:** | METHOD | **Units:** | ug/L |
| **Analysis Method:** | NWTPH-Dx | **Basis:** | NA |
| | | **Level:** | Low |
| | | **Extraction Lot:** | KWG1506770 |

| | Lab Control Sample KWG1506770-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506770-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Diesel Range Organics (DRO) | 2850 | 3200 | 89 | 3110 | 3200 | 97 | 46-140 | 9 | 30 |
| Residual Range Organics (RRO) | 1440 | 1600 | 90 | 1550 | 1600 | 97 | 45-159 | 8 | 30 |

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

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

# 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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-5 | **Units:** | ug/L |
| **Lab Code:** | K1507840-001 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0042** | J | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | ND | U | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 90 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 78 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-6 | **Units:** | ug/L |
| **Lab Code:** | K1507840-002 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | ND | U | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 92 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 103 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 78 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-1 | **Units:** | ug/L |
| **Lab Code:** | K1507840-003 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0085** | J | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | **0.0029** | J | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 88 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 101 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 78 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/20/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/20/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-2 | **Units:** | ug/L |
| **Lab Code:** | K1507840-004 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.010** | J | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | **0.0032** | J | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 89 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 101 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 77 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506668-3 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | ND | U | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 92 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 101 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506668-4 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 2-Methylnaphthalene | ND | U | 0.019 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| 1-Methylnaphthalene | ND | U | 0.019 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthylene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Acenaphthene | ND | U | 0.019 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluorene | ND | U | 0.019 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Phenanthrene | ND | U | 0.019 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Anthracene | ND | U | 0.019 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Carbazole | ND | U | 0.019 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Fluoranthene | ND | U | 0.019 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Pyrene | ND | U | 0.019 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benz(a)anthracene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Chrysene | ND | U | 0.019 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(b)fluoranthene† | ND | U | 0.019 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(k)fluoranthene | ND | U | 0.019 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(a)pyrene | ND | U | 0.019 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.019 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Dibenz(a,h)anthracene | ND | U | 0.019 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |
| Benzo(g,h,i)perylene | ND | U | 0.019 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506668 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 93 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

QA/QC Report

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507840
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

## Surrogate Recovery Summary
## Polynuclear Aromatic Hydrocarbons

**Extraction Method:** EPA 3520C **Units:** Percent
**Analysis Method:** 8270D SIM **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 | Sur3 |
|---|---|---|---|---|
| DPGW-5 | K1507840-001 | 90 | 102 | 78 |
| DPGW-6 | K1507840-002 | 92 | 103 | 78 |
| DPGW-1 | K1507840-003 | 88 | 101 | 78 |
| DPGW-2 | K1507840-004 | 89 | 101 | 77 |
| Method Blank | KWG1506668-3 | 92 | 101 | 80 |
| Method Blank | KWG1506668-4 | 93 | 102 | 80 |
| Lab Control Sample | KWG1506668-1 | 92 | 101 | 82 |
| Duplicate Lab Control Sample | KWG1506668-2 | 93 | 102 | 83 |

**Surrogate Recovery Control Limits (%)**

| | | | |
|---|---|---|---|
| Sur1 | = | Fluorene-d10 | 46-114 |
| Sur2 | = | Fluoranthene-d10 | 51-121 |
| Sur3 | = | Terphenyl-d14 | 58-140 |

**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 | **Service Request:** | K1507840 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/22/2015 |
| **Sample Matrix:** | Water | **Date Analyzed:** | 07/31/2015 |

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

| | | | |
|---|---|---|---|
| **Extraction Method:** | EPA 3520C | **Units:** | ug/L |
| **Analysis Method:** | 8270D SIM | **Basis:** | NA |
| | | **Level:** | Low |
| | | **Extraction Lot:** | KWG1506668 |

| | Lab Control Sample KWG1506668-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506668-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Naphthalene | 1.90 | 2.50 | 76 | 1.89 | 2.50 | 76 | 39-110 | 0 | 30 |
| 2-Methylnaphthalene | 1.76 | 2.50 | 70 | 1.75 | 2.50 | 70 | 39-115 | 1 | 30 |
| 1-Methylnaphthalene | 1.69 | 2.50 | 68 | 1.68 | 2.50 | 67 | 40-122 | 1 | 30 |
| Acenaphthylene | 1.98 | 2.50 | 79 | 1.99 | 2.50 | 79 | 44-115 | 0 | 30 |
| Acenaphthene | 1.96 | 2.50 | 78 | 1.95 | 2.50 | 78 | 44-113 | 0 | 30 |
| Fluorene | 2.00 | 2.50 | 80 | 1.99 | 2.50 | 80 | 48-118 | 0 | 30 |
| Phenanthrene | 2.00 | 2.50 | 80 | 1.99 | 2.50 | 80 | 47-120 | 1 | 30 |
| Anthracene | 1.81 | 2.50 | 73 | 1.77 | 2.50 | 71 | 44-117 | 2 | 30 |
| Carbazole | 2.17 | 2.50 | 87 | 2.16 | 2.50 | 86 | 45-134 | 0 | 30 |
| Fluoranthene | 2.12 | 2.50 | 85 | 2.14 | 2.50 | 85 | 48-128 | 1 | 30 |
| Pyrene | 1.96 | 2.50 | 79 | 1.97 | 2.50 | 79 | 42-133 | 0 | 30 |
| Benz(a)anthracene | 2.02 | 2.50 | 81 | 2.01 | 2.50 | 81 | 48-125 | 0 | 30 |
| Chrysene | 2.00 | 2.50 | 80 | 2.00 | 2.50 | 80 | 50-128 | 0 | 30 |
| Benzo(b)fluoranthene | 2.03 | 2.50 | 81 | 2.05 | 2.50 | 82 | 49-131 | 1 | 30 |
| Benzo(k)fluoranthene | 1.93 | 2.50 | 77 | 1.94 | 2.50 | 78 | 54-131 | 1 | 30 |
| Benzo(a)pyrene | 1.90 | 2.50 | 76 | 1.91 | 2.50 | 77 | 43-134 | 1 | 30 |
| Indeno(1,2,3-cd)pyrene | 1.89 | 2.50 | 75 | 1.87 | 2.50 | 75 | 45-133 | 1 | 30 |
| Dibenz(a,h)anthracene | 1.93 | 2.50 | 77 | 1.93 | 2.50 | 77 | 49-133 | 0 | 30 |
| Benzo(g,h,i)perylene | 1.85 | 2.50 | 74 | 1.85 | 2.50 | 74 | 51-124 | 0 | 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.

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**www.alsglobal.com**

August 06, 2015 **Analytical Report for Service Request No:** K1507897

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

**RE: CenturyLink Longview WA / 103P3080177**

Dear Dr.Tisdale,

Enclosed are the results of the sample(s) submitted to our laboratory July 22, 2015
For your reference, these analyses have been assigned our service request number **K1507897.**

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. 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 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

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

Gregory Salata, Ph.D.
Client Services
Manager

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# Table of Contents

## 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 DEC UST | http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L14-51 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | Not available | - |
| Idaho DHW | http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx | - |
| ISO 17025 | http://www.pjlabs.com/ | L14-50 |
| Louisiana DEQ | http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx | 03016 |
| Maine DHS | Not available | WA01276 |
| Michigan DEQ | http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html | 9949 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Montana DPHHS | http://www.dphhs.mt.gov/publichealth/ | CERT0047 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/oqa/ | WA005 |
| North Carolina DWQ | http://www.dwqlab.org/ | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/envserv/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wisconsin DNR | http://dnr.wi.gov/ | 998386840 |
| Wyoming (EPA Region 8) | http://www.epa.gov/region8/water/dwhome/wyomingdi.html | - |
| Kelso Laboratory Website | www.alsglobal.com | 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 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/anlayte is offered by that state.

# Case Narrative

**ALS Environmental—Kelso Laboratory**
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

**ALS ENVIRONMENTAL**

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request No.:** | K1507897 |
| **Project:** | CentruyLink Longview WA/ 103P3080177 | **Date Received:** | 07/21/15-07/22/15 |
| **Sample Matrix:** | Water and Soil | | |

**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 and one soil sample was received for analysis at ALS Environmental between 07/21/15 and 07/22/15. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

**Diesel Range Organics by Method NWTPH-Dx**

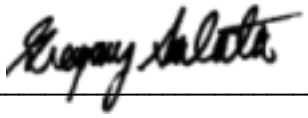
**Relative Percent Difference Exceptions:**
The Relative Percent Difference (RPD) criterion for the replicate analysis of Diesel Range Organics (DRO) and Residual Range Organics (RRO) in sample DP-I DW-1 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

**Sample Notes and Discussion:**
Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD) in preparation group KWG1506771. 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 (Soil)**

**Relative Percent Difference Exceptions:**
The Relative Percent Difference (RPD) for the replicate analysis of several analytes in sample Batch QC KWG1506909-9 were outside the control limits. The variability in the results was attributed to the suspected heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

**Approved by** 

The Relative Percent Difference (RPD) criterion for the replicate analysis of several analytes in sample Batch QC KWG1506909-9 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

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

**Polynuclear Aromatic Hydrocarbons by EPA Method 8270 (Water)**

**Sample Notes and Discussion:**
The results reported for Fluorene in samples DPGW-4 and MW-5 may contain a slight bias. The chromatogram indicated the presence of non-target background components. The matrix interference may have resulted in a slight high bias in the affected samples. The results were flagged with "X" to indicate the issue.

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

**Approved by**_____

# Chain of Custody

**ALS Environmental—Kelso Laboratory**
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# 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.
Part of the ALS Group A Campbell Brothers Limited Company

**Work Order No.:** K1507897

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Manager:** | David Berestka | | | **Bill to:** | Vanessa Pineda | | |
| **Client Name:** | Tetra Tech | | | **Company:** | Tetra Tech | | |
| **Address:** | 216 16th Street | | | **Address:** | 216 16th Street Suite 1500 | | |
| **City, State ZIP:** | Denver, CO 80202 | | | **City, State ZIP:** | Denver, CO 80202 | | |
| **Email:** | David.Berestka@tetratech.com | **Phone:** | 303-312-8856 | **Email:** | vanessa.pineda@tetratech.com | **Phone** | 303-312-8812 |
| Project Name: | CenturyLink Longview WA | | | | | | |
| Project Number: | 103P3080177 | | | | | | |
| P.O. Number: | | | | | | | |
| Sampler's Name: | Mike Pavarini/Vanessa Pineda | | | | | | |

**SAMPLE RECEIPT**

| | | | | |
|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: |
| Sample Custody Seals: | Yes | No | N/A | |

**REQUESTED ANALYSIS**

**TAT**

- [x] Routine
- [ ] Same Day ***
- [ ] Next Day ***
- [ ] 3 Day
- [ ] 6 Day

*** Please call for availability

**Due Date:**

**Comments**

| Sample Identification | | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | NWTPHDx diesel and motor oil (no silica gel cleanup) | PAH 625 SIM (filtered-no silica gel cleanup) |
|---|---|---|---|---|---|---|---|---|
| DUP | 1 | GW | 7/21/15 | 00000 | | 4 | 1 | 3 |
| DPGW-4 | 2 | GW | 7/21/15 | 0940 | | 4 | 1 | 3 |
| DPGW-3 | 3 | GW | 7/21/15 | 1125 | | 4 | 1 | 3 |
| MW-5 | 4 | GW | 7/21/15 | 1320 | | 4 | 1 | 3 |
| MW-4 | 5 | GW | 7/21/15 | 1425 | | 4 | 1 | 3 |
| MW-3 | 6 | GW | 7/21/15 | 1645 | | 4 | 1 | 3 |
| DP-IDW-1 | 7 | Soil | 7/21/15 | 1500 | | 2 | 1 | 1 |

| | |
|---|---|
| Total | 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 |
| Dissolved | 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**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Vanessa Pineda | | 1725 7/21/15 | | | |
| | | | | | 7/21/15 1725 |

PC 6v29

# Cooler Receipt and Preservation Form

Client / Project: Tetra Tech Service Request *K15* 07897

Received: 7/21/15 Opened: 7/22/15 By: [signature] Unloaded: 7/22/15 By: [signature]

1. Samples were received via? *Mail* *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 NA | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|---|
| 0.7 | 0.6 | 5.4 | 5.3 | -0.1 | 354 | | | |
| 15.6 | 15.6 | 7.9 | 7.9 | 0 | 329 | | No ice | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
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:*** _____

***Page*** _____ ***of*** _____

# General Chemistry

**ALS Environmental—Kelso Laboratory**
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/15 |
| **Sample Matrix:** | Soil | **Date Received:** | 07/22/15 |
| **Analysis Method:** | 160.3 Modified | **Units:** | Percent |
| **Prep Method:** | None | **Basis:** | As Received |

**Solids, Total**

| Sample Name | Lab Code | Result | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|
| DP-I DW-1 | K1507897-007 | **87.1** | - | 1 | 07/22/15 13:12 | |

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/15 |
| **Sample Matrix:** | Soil | **Date Received:** | 07/22/15 |
| | | **Date Analyzed:** | 07/22/15 |

**Replicate Sample Summary**

**General Chemistry Parameters**

| | | | |
|---|---|---|---|
| **Sample Name:** | DP-I DW-1 | **Units:** | Percent |
| **Lab Code:** | K1507897-007 | **Basis:** | As Received |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample K1507897-007DUP Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Solids, Total | 160.3 Modified | - | 87.1 | 88.2 | 87.7 | 1 | 20 |

**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.

# 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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DUP | **Units:** | ug/L |
| **Lab Code:** | K1507897-001 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **14** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **30** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 85 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 82 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-4 | **Units:** | ug/L |
| **Lab Code:** | K1507897-002 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **41** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **68** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 88 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 87 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-3 | **Units:** | ug/L |
| **Lab Code:** | K1507897-003 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **15** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **34** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 73 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 73 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-5 | **Units:** | ug/L |
| **Lab Code:** | K1507897-004 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **30** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **42** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 82 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 81 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-4 | **Units:** | ug/L |
| **Lab Code:** | K1507897-005 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **24** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **52** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 78 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 79 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-3 | **Units:** | ug/L |
| **Lab Code:** | K1507897-006 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **21** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **49** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 73 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 71 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506770-3 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | ND | U | 250 | 11 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **25** | J | 500 | 19 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 77 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 77 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Soil | **Date Received:** | 07/22/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DP-I DW-1 | **Units:** | mg/Kg |
| **Lab Code:** | K1507897-007 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3550B | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **16** | J | 29 | 1.4 | 1 | 07/23/15 | 07/29/15 | KWG1506816 | |
| Residual Range Organics (RRO) | **140** | O | 120 | 3.4 | 1 | 07/23/15 | 07/29/15 | KWG1506816 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 91 | 50-150 | 07/29/15 | Acceptable |
| n-Triacontane | 81 | 50-150 | 07/29/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Soil | **Date Received:** | NA |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | mg/Kg |
| **Lab Code:** | KWG1506816-3 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3550B | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **2.5** | J | 25 | 1.2 | 1 | 07/23/15 | 07/25/15 | KWG1506816 | |
| Residual Range Organics (RRO) | **5.7** | J | 99 | 2.9 | 1 | 07/23/15 | 07/25/15 | KWG1506816 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 77 | 50-150 | 07/25/15 | Acceptable |
| n-Triacontane | 73 | 50-150 | 07/25/15 | Acceptable |

**Comments:**

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507897
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

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

**Extraction Method:** METHOD **Units:** Percent
**Analysis Method:** NWTPH-Dx **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 |
|---|---|---|---|
| DUP | K1507897-001 | 85 | 82 |
| DPGW-4 | K1507897-002 | 88 | 87 |
| DPGW-3 | K1507897-003 | 73 | 73 |
| MW-5 | K1507897-004 | 82 | 81 |
| MW-4 | K1507897-005 | 78 | 79 |
| MW-3 | K1507897-006 | 73 | 71 |
| Method Blank | KWG1506770-3 | 77 | 77 |
| Lab Control Sample | KWG1506770-1 | 96 | 91 |
| Duplicate Lab Control Sample | KWG1506770-2 | 95 | 91 |

**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.**

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507897
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Soil

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

**Extraction Method:** EPA 3550B **Units:** Percent
**Analysis Method:** NWTPH-Dx **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 |
|---|---|---|---|
| DP-I DW-1 | K1507897-007 | 91 | 81 |
| DP-I DW-1DUP | KWG1506816-1 | 90 | 81 |
| Method Blank | KWG1506816-3 | 77 | 73 |
| Lab Control Sample | KWG1506816-2 | 93 | 83 |

**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 | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/23/2015 |
| **Sample Matrix:** | Soil | **Date Analyzed:** | 07/29/2015 |

## Duplicate Sample Summary
## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | DP-I DW-1 | **Units:** | mg/Kg |
| **Lab Code:** | K1507897-007 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3550B | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | **Extraction Lot:** | KWG1506816 |

| Analyte Name | MRL | MDL | Sample Result | DP-I DW-1DUP KWG1506816-1 Duplicate Sample Result | Average | Relative Percent Difference | RPD Limit |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 29 | 1.4 | 16 | 5.1 | 11 | 103 # | 40 |
| Residual Range Organics (RRO) | 120 | 3.4 | 140 | 39 | 90 | 112 # | 40 |

**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.

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/24/2015 |
| **Sample Matrix:** | Water | **Date Analyzed:** | 07/30/2015 |

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

| | | | |
|---|---|---|---|
| **Extraction Method:** | METHOD | **Units:** | ug/L |
| **Analysis Method:** | NWTPH-Dx | **Basis:** | NA |
| | | **Level:** | Low |
| | | **Extraction Lot:** | KWG1506770 |

| | Lab Control Sample KWG1506770-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506770-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Diesel Range Organics (DRO) | 2850 | 3200 | 89 | 3110 | 3200 | 97 | 46-140 | 9 | 30 |
| Residual Range Organics (RRO) | 1440 | 1600 | 90 | 1550 | 1600 | 97 | 45-159 | 8 | 30 |

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

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

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/23/2015 |
| **Sample Matrix:** | Soil | **Date Analyzed:** | 07/25/2015 |

## Lab Control Spike Summary
## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Extraction Method:** | EPA 3550B | **Units:** | mg/Kg |
| **Analysis Method:** | NWTPH-Dx | **Basis:** | Dry |
| | | **Level:** | Low |
| | | **Extraction Lot:** | KWG1506816 |

Lab Control Sample
KWG1506816-2
**Lab Control Spike**

| Analyte Name | Result | Spike Amount | %Rec | %Rec Limits |
|---|---|---|---|---|
| Diesel Range Organics (DRO) | 249 | 267 | 94 | 42-134 |
| Residual Range Organics (RRO) | 118 | 133 | 88 | 48-141 |

**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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Soil | **Date Received:** | 07/22/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DP-I DW-1 | **Units:** | ug/Kg |
| **Lab Code:** | K1507897-007 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3541 | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **1.0** | J | 5.1 | 0.61 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| 2-Methylnaphthalene | **1.6** | J | 5.1 | 0.40 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| 1-Methylnaphthalene | **1.2** | J | 5.1 | 0.52 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Acenaphthylene | ND | U | 5.1 | 0.60 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Acenaphthene | ND | U | 5.1 | 0.77 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Fluorene | ND | U | 5.1 | 0.62 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Phenanthrene | **4.3** | J | 5.1 | 1.5 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Anthracene | ND | U | 5.1 | 0.59 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Carbazole | ND | U | 5.1 | 2.4 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Fluoranthene | **1.8** | J | 5.1 | 0.99 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Pyrene | **2.3** | J | 5.1 | 0.77 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benz(a)anthracene | **1.1** | J | 5.1 | 0.73 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Chrysene | **2.0** | J | 5.1 | 0.81 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(b)fluoranthene† | **1.8** | J | 5.1 | 0.93 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(k)fluoranthene | ND | U | 5.1 | 0.88 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(a)pyrene | **1.4** | J | 5.1 | 0.77 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Indeno(1,2,3-cd)pyrene | **1.2** | J | 5.1 | 0.88 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Dibenz(a,h)anthracene | ND | U | 5.1 | 0.81 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(g,h,i)perylene | **2.5** | J | 5.1 | 0.86 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 78 | 17-104 | 08/03/15 | Acceptable |
| Fluoranthene-d10 | 92 | 27-106 | 08/03/15 | Acceptable |
| Terphenyl-d14 | 71 | 35-109 | 08/03/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Sediment | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/Kg |
| **Lab Code:** | KWG1506909-7 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3541 | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 2.6 | 0.60 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| 2-Methylnaphthalene | ND | U | 2.6 | 0.39 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| 1-Methylnaphthalene | ND | U | 2.6 | 0.51 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Acenaphthylene | ND | U | 2.6 | 0.59 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Acenaphthene | ND | U | 2.6 | 0.76 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Fluorene | ND | U | 2.6 | 0.61 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Phenanthrene | ND | U | 2.6 | 1.4 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Anthracene | ND | U | 2.6 | 0.58 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Carbazole | ND | U | 2.6 | 2.3 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Fluoranthene | ND | U | 2.6 | 0.98 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Pyrene | ND | U | 2.6 | 0.76 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benz(a)anthracene | ND | U | 2.6 | 0.72 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Chrysene | ND | U | 2.6 | 0.80 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(b)fluoranthene† | ND | U | 2.6 | 0.92 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(k)fluoranthene | ND | U | 2.6 | 0.87 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(a)pyrene | ND | U | 2.6 | 0.76 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 2.6 | 0.87 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Dibenz(a,h)anthracene | ND | U | 2.6 | 0.80 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |
| Benzo(g,h,i)perylene | ND | U | 2.6 | 0.85 | 1 | 07/28/15 | 08/03/15 | KWG1506909 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 76 | 17-104 | 08/03/15 | Acceptable |
| Fluoranthene-d10 | 86 | 27-106 | 08/03/15 | Acceptable |
| Terphenyl-d14 | 70 | 35-109 | 08/03/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

QA/QC Report

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507897
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Sediment

## Surrogate Recovery Summary
## Polynuclear Aromatic Hydrocarbons

**Extraction Method:** EPA 3541 **Units:** Percent
**Analysis Method:** 8270D SIM **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 | Sur3 |
|---|---|---|---|---|
| Batch QC | K1507730-036 | 73 | 87 | 69 |
| DP-I DW-1 | K1507897-007 | 78 | 92 | 71 |
| Batch QCDUP | KWG1506909-9 | 59 | 71 | 54 |
| Method Blank | KWG1506909-7 | 76 | 86 | 70 |
| Batch QCMS | KWG1506909-3 | 69 | 86 | 68 |
| Batch QCDMS | KWG1506909-4 | 75 | 91 | 73 |
| Lab Control Sample | KWG1506909-5 | 85 | 96 | 78 |
| Duplicate Lab Control Sample | KWG1506909-6 | 80 | 90 | 73 |

**Surrogate Recovery Control Limits (%)**

| | | | |
|---|---|---|---|
| Sur1 | = | Fluorene-d10 | 17-104 |
| Sur2 | = | Fluoranthene-d10 | 27-106 |
| Sur3 | = | Terphenyl-d14 | 35-109 |

**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 | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/28/2015 |
| **Sample Matrix:** | Sediment | **Date Analyzed:** | 08/03/2015 |

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

| | | | |
|---|---|---|---|
| **Sample Name:** | Batch QC | **Units:** | ug/Kg |
| **Lab Code:** | K1507730-036 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3541 | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | **Extraction Lot:** | KWG1506909 |

| | | Batch QCMS KWG1506909-3 Matrix Spike | | | Batch QCDMS KWG1506909-4 Duplicate Matrix Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Sample Result** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Naphthalene | 18 | 293 | 503 | 55 | 339 | 505 | 64 | 23-114 | 15 | 40 |
| 2-Methylnaphthalene | 6.6 | 270 | 503 | 52 | 317 | 505 | 61 | 24-115 | 16 | 40 |
| 1-Methylnaphthalene | 6.4 | 258 | 503 | 50 | 301 | 505 | 58 | 26-133 | 15 | 40 |
| Acenaphthylene | 13 | 309 | 503 | 59 | 358 | 505 | 68 | 32-117 | 15 | 40 |
| Acenaphthene | 20 | 302 | 503 | 56 | 351 | 505 | 66 | 33-118 | 15 | 40 |
| Fluorene | 19 | 319 | 503 | 60 | 363 | 505 | 68 | 33-125 | 13 | 40 |
| Phenanthrene | 200 | 388 | 503 | 37 | 413 | 505 | 42 | 29-125 | 6 | 40 |
| Anthracene | 63 | 366 | 503 | 60 | 400 | 505 | 67 | 30-127 | 9 | 40 |
| Carbazole | 3.0 | 360 | 503 | 71 | 417 | 505 | 82 | 37-182 | 15 | 40 |
| Fluoranthene | 290 | 537 | 503 | 48 | 562 | 505 | 53 | 35-139 | 5 | 40 |
| Pyrene | 310 | 501 | 503 | 38 | 518 | 505 | 42 | 27-134 | 3 | 40 |
| Benz(a)anthracene | 140 | 437 | 503 | 59 | 474 | 505 | 66 | 35-122 | 8 | 40 |
| Chrysene | 140 | 439 | 503 | 59 | 476 | 505 | 66 | 36-126 | 8 | 40 |
| Benzo(b)fluoranthene | 160 | 437 | 503 | 55 | 471 | 505 | 61 | 35-124 | 7 | 40 |
| Benzo(k)fluoranthene | 55 | 369 | 503 | 62 | 411 | 505 | 71 | 38-124 | 11 | 40 |
| Benzo(a)pyrene | 170 | 446 | 503 | 54 | 475 | 505 | 60 | 37-123 | 6 | 40 |
| Indeno(1,2,3-cd)pyrene | 130 | 423 | 503 | 58 | 450 | 505 | 63 | 28-133 | 6 | 40 |
| Dibenz(a,h)anthracene | 22 | 359 | 503 | 67 | 392 | 505 | 73 | 32-125 | 9 | 40 |
| Benzo(g,h,i)perylene | 140 | 463 | 503 | 64 | 487 | 505 | 68 | 33-128 | 5 | 40 |

**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.

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/28/2015 |
| **Sample Matrix:** | Sediment | **Date Analyzed:** | 08/03/2015 |

## Duplicate Sample Summary
## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Batch QC | **Units:** | ug/Kg |
| **Lab Code:** | K1507730-036 | **Basis:** | Dry |
| **Extraction Method:** | EPA 3541 | **Level:** | Low |
| **Analysis Method:** | 8270D SIM | **Extraction Lot:** | KWG1506909 |

| Analyte Name | MRL | MDL | Sample Result | Batch QCDUP KWG1506909-9 Duplicate Sample Result | Average | Relative Percent Difference | RPD Limit |
|---|---|---|---|---|---|---|---|
| Naphthalene | 5.1 | 0.61 | 18 | 11 | 15 | 51 * | 40 |
| 2-Methylnaphthalene | 5.1 | 0.40 | 6.6 | 4.3 | 5.5 | 42 # | 40 |
| 1-Methylnaphthalene | 5.1 | 0.52 | 6.4 | 3.7 | 5.0 | 54 # | 40 |
| Acenaphthylene | 5.1 | 0.60 | 13 | 7.3 | 10 | 54 # | 40 |
| Acenaphthene | 5.1 | 0.78 | 20 | 7.3 | 14 | 92 # | 40 |
| Fluorene | 5.1 | 0.62 | 19 | 8.8 | 14 | 74 # | 40 |
| Phenanthrene | 5.1 | 1.5 | 200 | 84 | 140 | 82 * | 40 |
| Anthracene | 5.1 | 0.59 | 63 | 28 | 46 | 75 * | 40 |
| Carbazole | 5.1 | 2.4 | 3.0 | ND | NC | NC * | 40 |
| Fluoranthene | 5.1 | 1.0 | 290 | 160 | 230 | 58 * | 40 |
| Pyrene | 5.1 | 0.78 | 310 | 170 | 240 | 56 * | 40 |
| Benz(a)anthracene | 5.1 | 0.74 | 140 | 72 | 110 | 63 * | 40 |
| Chrysene | 5.1 | 0.82 | 140 | 80 | 110 | 57 * | 40 |
| Benzo(b)fluoranthene | 5.1 | 0.94 | 160 | 92 | 130 | 55 * | 40 |
| Benzo(k)fluoranthene | 5.1 | 0.89 | 55 | 31 | 43 | 54 * | 40 |
| Benzo(a)pyrene | 5.1 | 0.78 | 170 | 100 | 140 | 51 * | 40 |
| Indeno(1,2,3-cd)pyrene | 5.1 | 0.89 | 130 | 80 | 110 | 49 * | 40 |
| Dibenz(a,h)anthracene | 5.1 | 0.82 | 22 | 11 | 17 | 66 * | 40 |
| Benzo(g,h,i)perylene | 5.1 | 0.87 | 140 | 90 | 120 | 46 * | 40 |

**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/103P3080177
**Sample Matrix:** Sediment

**Service Request:** K1507897
**Date Extracted:** 07/28/2015
**Date Analyzed:** 08/03/2015

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

**Extraction Method:** EPA 3541
**Analysis Method:** 8270D SIM

**Units:** ug/Kg
**Basis:** Dry
**Level:** Low
**Extraction Lot:** KWG1506909

| | Lab Control Sample KWG1506909-5 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506909-6 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Naphthalene | 356 | 500 | 71 | 334 | 500 | 67 | 32-124 | 6 | 40 |
| 2-Methylnaphthalene | 336 | 500 | 67 | 315 | 500 | 63 | 27-126 | 6 | 40 |
| 1-Methylnaphthalene | 320 | 500 | 64 | 301 | 500 | 60 | 37-129 | 6 | 40 |
| Acenaphthylene | 382 | 500 | 76 | 360 | 500 | 72 | 38-126 | 6 | 40 |
| Acenaphthene | 377 | 500 | 75 | 356 | 500 | 71 | 39-124 | 6 | 40 |
| Fluorene | 388 | 500 | 78 | 368 | 500 | 74 | 39-129 | 5 | 40 |
| Phenanthrene | 385 | 500 | 77 | 362 | 500 | 72 | 39-123 | 6 | 40 |
| Anthracene | 406 | 500 | 81 | 379 | 500 | 76 | 38-130 | 7 | 40 |
| Carbazole | 433 | 500 | 87 | 407 | 500 | 81 | 10-156 | 6 | 40 |
| Fluoranthene | 433 | 500 | 87 | 403 | 500 | 81 | 39-135 | 7 | 40 |
| Pyrene | 377 | 500 | 75 | 352 | 500 | 70 | 39-134 | 7 | 40 |
| Benz(a)anthracene | 428 | 500 | 86 | 392 | 500 | 78 | 46-120 | 9 | 40 |
| Chrysene | 421 | 500 | 84 | 384 | 500 | 77 | 49-120 | 9 | 40 |
| Benzo(b)fluoranthene | 468 | 500 | 94 | 432 | 500 | 86 | 51-121 | 8 | 40 |
| Benzo(k)fluoranthene | 459 | 500 | 92 | 420 | 500 | 84 | 55-120 | 9 | 40 |
| Benzo(a)pyrene | 424 | 500 | 85 | 391 | 500 | 78 | 49-122 | 8 | 40 |
| Indeno(1,2,3-cd)pyrene | 412 | 500 | 82 | 383 | 500 | 77 | 40-128 | 7 | 40 |
| Dibenz(a,h)anthracene | 465 | 500 | 93 | 429 | 500 | 86 | 43-125 | 8 | 40 |
| Benzo(g,h,i)perylene | 446 | 500 | 89 | 420 | 500 | 84 | 49-122 | 6 | 40 |

**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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DUP | **Units:** | ug/L |
| **Lab Code:** | K1507897-001 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.021 | 0.0024 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.021 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.021 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.021 | 0.0051 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.021 | 0.0037 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.021 | 0.0046 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.021 | 0.011 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.021 | 0.0054 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.021 | 0.0042 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.021 | 0.0031 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.021 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.021 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.021 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 92 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 98 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 78 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-4 | **Units:** | ug/L |
| **Lab Code:** | K1507897-002 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.011** | J | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | **0.0096** | J | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | **0.0093** | J | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | **0.0046** | J | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | **0.0071** | JX | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | **0.0084** | J | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | **0.032** | | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | **0.0027** | J | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 80 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 81 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | DPGW-3 | **Units:** | ug/L |
| **Lab Code:** | K1507897-003 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0059** | J | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 72 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 98 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 81 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-5 | **Units:** | ug/L |
| **Lab Code:** | K1507897-004 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.010** | J | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.021 | 0.0024 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.021 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | **0.0055** | J | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | **0.088** | | 0.021 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | **0.016** | JX | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.021 | 0.0051 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | **0.029** | | 0.021 | 0.0037 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | **0.0047** | J | 0.021 | 0.0046 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.021 | 0.011 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.021 | 0.0054 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.021 | 0.0042 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.021 | 0.0031 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.021 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.021 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.021 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 71 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 98 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 79 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-4 | **Units:** | ug/L |
| **Lab Code:** | K1507897-005 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0067** | J | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.021 | 0.0024 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.021 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | **0.0056** | J | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | **0.22** | | 0.021 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | **0.015** | J | 0.021 | 0.0039 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.021 | 0.0051 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | **0.012** | J | 0.021 | 0.0037 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | **0.024** | | 0.021 | 0.0046 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.021 | 0.011 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | **0.0079** | J | 0.021 | 0.0054 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.021 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.021 | 0.0042 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.021 | 0.0031 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.021 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.021 | 0.0027 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.021 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.021 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 73 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 94 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 79 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/21/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/21/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-3 | **Units:** | ug/L |
| **Lab Code:** | K1507897-006 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0056** | J | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 74 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 98 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506706-3 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 95 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 83 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507897 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506706-4 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 94 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

QA/QC Report

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507897
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

## Surrogate Recovery Summary
## Polynuclear Aromatic Hydrocarbons

**Extraction Method:** EPA 3520C **Units:** Percent
**Analysis Method:** EPA 625 **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 | Sur3 |
|---|---|---|---|---|
| DUP | K1507897-001 | 92 | 98 | 78 |
| DPGW-4 | K1507897-002 | 80 | 102 | 81 |
| DPGW-3 | K1507897-003 | 72 | 98 | 81 |
| MW-5 | K1507897-004 | 71 | 98 | 79 |
| MW-4 | K1507897-005 | 73 | 94 | 79 |
| MW-3 | K1507897-006 | 74 | 98 | 80 |
| Method Blank | KWG1506706-3 | 95 | 102 | 83 |
| Method Blank | KWG1506706-4 | 94 | 102 | 80 |
| Lab Control Sample | KWG1506706-1 | 93 | 102 | 83 |
| Duplicate Lab Control Sample | KWG1506706-2 | 95 | 104 | 84 |

**Surrogate Recovery Control Limits (%)**

| | | | |
|---|---|---|---|
| Sur1 | = | Fluorene-d10 | 46-114 |
| Sur2 | = | Fluoranthene-d10 | 51-121 |
| Sur3 | = | Terphenyl-d14 | 58-140 |

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

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

**Client:** Tetra Tech EM, Incorporated
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

**Service Request:** K1507897
**Date Extracted:** 07/22/2015
**Date Analyzed:** 07/31/2015

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

**Extraction Method:** EPA 3520C
**Analysis Method:** EPA 625

**Units:** ug/L
**Basis:** NA
**Level:** Low
**Extraction Lot:** KWG1506706

| | Lab Control Sample KWG1506706-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506706-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Naphthalene | 2.26 | 2.50 | 91 | 2.32 | 2.50 | 93 | 39-110 | 3 | 30 |
| 2-Methylnaphthalene | 2.07 | 2.50 | 83 | 2.13 | 2.50 | 85 | 39-115 | 3 | 30 |
| 1-Methylnaphthalene | 1.97 | 2.50 | 79 | 2.04 | 2.50 | 82 | 40-122 | 3 | 30 |
| Acenaphthylene | 2.35 | 2.50 | 94 | 2.39 | 2.50 | 96 | 44-115 | 2 | 30 |
| Acenaphthene | 2.33 | 2.50 | 93 | 2.37 | 2.50 | 95 | 44-113 | 2 | 30 |
| Fluorene | 2.35 | 2.50 | 94 | 2.41 | 2.50 | 97 | 48-118 | 3 | 30 |
| Phenanthrene | 2.35 | 2.50 | 94 | 2.43 | 2.50 | 97 | 47-120 | 3 | 30 |
| Anthracene | 2.27 | 2.50 | 91 | 2.28 | 2.50 | 91 | 44-117 | 0 | 30 |
| Carbazole | 2.53 | 2.50 | 101 | 2.59 | 2.50 | 103 | 45-134 | 2 | 30 |
| Fluoranthene | 2.51 | 2.50 | 101 | 2.58 | 2.50 | 103 | 48-128 | 3 | 30 |
| Pyrene | 2.34 | 2.50 | 94 | 2.38 | 2.50 | 95 | 42-133 | 2 | 30 |
| Benz(a)anthracene | 2.43 | 2.50 | 97 | 2.46 | 2.50 | 98 | 48-125 | 1 | 30 |
| Chrysene | 2.37 | 2.50 | 95 | 2.42 | 2.50 | 97 | 50-128 | 2 | 30 |
| Benzo(b)fluoranthene | 2.48 | 2.50 | 99 | 2.53 | 2.50 | 101 | 49-131 | 2 | 30 |
| Benzo(k)fluoranthene | 2.35 | 2.50 | 94 | 2.43 | 2.50 | 97 | 54-131 | 3 | 30 |
| Benzo(a)pyrene | 2.24 | 2.50 | 90 | 2.30 | 2.50 | 92 | 43-134 | 2 | 30 |
| Indeno(1,2,3-cd)pyrene | 2.06 | 2.50 | 82 | 2.09 | 2.50 | 83 | 45-133 | 1 | 30 |
| Dibenz(a,h)anthracene | 2.15 | 2.50 | 86 | 2.17 | 2.50 | 87 | 49-133 | 1 | 30 |
| Benzo(g,h,i)perylene | 2.07 | 2.50 | 83 | 2.10 | 2.50 | 84 | 51-124 | 2 | 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.

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August 06, 2015

**Analytical Report for Service Request No:** K1507921

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

**RE: CenturyLink Longview WA / 103P3080177**

Dear Dr.Tisdale,

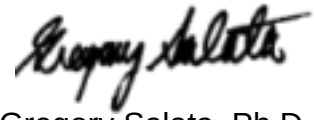
Enclosed are the results of the sample(s) submitted to our laboratory July 22, 2015
For your reference, these analyses have been assigned our service request number **K1507921.**

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. 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 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

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



Gregory Salata, Ph.D.
Client Services
Manager

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# Table of Contents

## 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 DEC UST | http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L14-51 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | Not available | - |
| Idaho DHW | http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx | - |
| ISO 17025 | http://www.pjlabs.com/ | L14-50 |
| Louisiana DEQ | http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx | 03016 |
| Maine DHS | Not available | WA01276 |
| Michigan DEQ | http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html | 9949 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Montana DPHHS | http://www.dphhs.mt.gov/publichealth/ | CERT0047 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/oqa/ | WA005 |
| North Carolina DWQ | http://www.dwqlab.org/ | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/envserv/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wisconsin DNR | http://dnr.wi.gov/ | 998386840 |
| Wyoming (EPA Region 8) | http://www.epa.gov/region8/water/dwhome/wyomingdi.html | - |
| Kelso Laboratory Website | www.alsglobal.com | 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 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/anlayte 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

**ALS ENVIRONMENTAL**

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request No.:** | K1507921 |
| **Project:** | CentruyLink Longview WA/ 103P3080177 | **Date Received:** | 07/22/15 |
| **Sample Matrix:** | Water | | |

**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**

Three water samples were received for analysis at ALS Environmental on 07/22/15. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

**Diesel Range Organics by Method NWTPH-Dx**

**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.

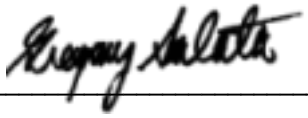
No other anomalies associated with the analysis of these samples were observed.

**Polynuclear Aromatic Hydrocarbons by EPA Method 8270**

**Elevated Detection Limits:**
The detection limit was elevated for Pyrene in sample MW-2. The chromatogram indicated the presence of non-target background components. The result was flagged to indicate the matrix interference.

**Sample Notes and Discussion:**
The result reported for Fluorene in sample MW-2 may contain a slight bias. The chromatogram indicated the presence of non-target background components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.

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

# 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.
Part of the ALS Group A Campbell Brothers Limited Company

**Work Order No.:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Manager:** | David Berestka | | | **Bill to:** | Vanessa Pineda | | |
| **Client Name:** | Tetra Tech | | | **Company:** | Tetra Tech | | |
| **Address:** | 216 16th Street | | | **Address:** | 216 16th Street Suite 1500 | | |
| **City, State ZIP:** | Denver, CO 80202 | | | **City, State ZIP:** | Denver, CO 80202 | | |
| **Email:** | David.Berestka@tetratech.com | **Phone:** | 303-312-8856 | **Email:** | vanessa.pineda@tetratech.com | **Phone** | 303-312-8812 |
| Project Name: | CenturyLink Longview WA | | | | | | |
| Project Number: | 103P3080177 | | | | | | |
| P.O. Number: | | | | | | | |
| Sampler's Name: | Mike Pavarini/Vanessa Pineda | | | | | | |

**SAMPLE RECEIPT**

| | | | | | | |
|---|---|---|---|---|---|---|
| Temperature (°C): | | | Temp Blank Present | | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice | | |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: | | |
| Sample Custody Seals: | Yes | No | N/A | | | |

**REQUESTED ANALYSIS**

**TAT**

- [x] Routine
- [ ] Same Day ***
- [ ] Next Day ***
- [ ] 3 Day
- [ ] 6 Day

*** Please call for availability

**Due Date:**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | NWTPHDx diesel and motor oil (no silica gel cleanup) | PAH 625 SIM (filtered-no silica gel cleanup) | Comments |
|---|---|---|---|---|---|---|---|---|
| MW-2 | GW | 7/22/15 | 10:30 | | 3 | 1 | 2 | |
| IDW-GW | GW | 7/22/15 | 11:25 | | 3 | 1 | 2 | |
| MW-1 | GW | 7/22/15 | 11:50 | | 3 | 1 | 2 | |

| | |
|---|---|
| Total | 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 |
| Dissolved | 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**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Vanessa Pineda | | 7/22/15 1240 | K Smith | | 7/22/15 1240 |

PC Greg

## Cooler Receipt and Preservation Form

Client / Project: Tetra tech Service Request *K15* 07921

Received: 7/22/15 Opened: 7/22/15 By: [signature] Unloaded: 7/22/15 By: [signature]

1. Samples were received via? *Mail* *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 NA | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|---|
| 1.4 | 1.2 | 10.3 | 10.1 | -0.2 | 338 | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
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:*** _____

***Page*** _____ ***of*** _____

## Gregory Salata

**From:** Pineda, Vanessa <Vanessa.Pineda@tetratech.com>
**Sent:** Thursday, July 23, 2015 9:40 AM
**To:** Tisdale, Rob; Gregory Salata
**Cc:** Berestka, David
**Subject:** RE: COC for samples from Longview

Greg,

The IDW ID for water is: IDW-GW and the sample was taken on 7/22/2015.

Thanks!

**From:** Tisdale, Rob
**Sent:** Thursday, July 23, 2015 10:13 AM
**To:** Greg Salata (gsalata@caslab.com)
**Cc:** Pineda, Vanessa; Berestka, David
**Subject:** COC for samples from Longview

Greg,

Our field team collected two IDW samples in this investigation, and one of them (for water) we do not need analyzed. I don't have a copy of the COC yet to tell you what sample ID it is (assuming it isn't obvious), but Vanessa can provide that sample ID. Please do analyze the soil IDW sample, however, since we will likely need that result to dispose of the IDW soil from the investigation.

Please let me know if you have any questions. Vanessa, please identify the IDW sample ID for Greg so the lab knows which one it is. Thanks!

**Rob Tisdale, PhD** | **Program Manager/Chemist**
Direct: 303.312.8843 | Main: 303.312.8800 | Mobile: 303.910.3995 | Fax: 303.295.2818
rob.tisdale@tetratech.com

Tetra Tech
216 16th St , Suite 1500 | Denver, CO 80202 | www.tetratech.com

# 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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/22/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/22/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-2 | **Units:** | ug/L |
| **Lab Code:** | K1507921-001 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **77** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **71** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 85 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 81 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/22/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/22/2015 |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-1 | **Units:** | ug/L |
| **Lab Code:** | K1507921-003 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | **22** | J | 260 | 12 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **52** | J | 520 | 20 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 81 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 79 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Diesel and Residual Range Organics

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506770-3 | **Basis:** | NA |
| **Extraction Method:** | METHOD | **Level:** | Low |
| **Analysis Method:** | NWTPH-Dx | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | ND | U | 250 | 11 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |
| Residual Range Organics (RRO) | **25** | J | 500 | 19 | 1 | 07/24/15 | 07/30/15 | KWG1506770 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| o-Terphenyl | 77 | 50-150 | 07/30/15 | Acceptable |
| n-Triacontane | 77 | 50-150 | 07/30/15 | Acceptable |

**Comments:**

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507921
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

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

**Extraction Method:** METHOD **Units:** Percent
**Analysis Method:** NWTPH-Dx **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 |
|---|---|---|---|
| MW-2 | K1507921-001 | 85 | 81 |
| MW-1 | K1507921-003 | 81 | 79 |
| Method Blank | KWG1506770-3 | 77 | 77 |
| Lab Control Sample | KWG1506770-1 | 96 | 91 |
| Duplicate Lab Control Sample | KWG1506770-2 | 95 | 91 |

**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 | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Extracted:** | 07/24/2015 |
| **Sample Matrix:** | Water | **Date Analyzed:** | 07/30/2015 |

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

| | | | |
|---|---|---|---|
| **Extraction Method:** | METHOD | **Units:** | ug/L |
| **Analysis Method:** | NWTPH-Dx | **Basis:** | NA |
| | | **Level:** | Low |
| | | **Extraction Lot:** | KWG1506770 |

| | Lab Control Sample KWG1506770-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506770-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Diesel Range Organics (DRO) | 2850 | 3200 | 89 | 3110 | 3200 | 97 | 46-140 | 9 | 30 |
| Residual Range Organics (RRO) | 1440 | 1600 | 90 | 1550 | 1600 | 97 | 45-159 | 8 | 30 |

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

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

# 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

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/22/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/22/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-2 | **Units:** | ug/L |
| **Lab Code:** | K1507921-001 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | **0.0061** | JX | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | **0.013** | J | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | Ui | 0.020 | 0.0067 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 94 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 101 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | 07/22/2015 |
| **Sample Matrix:** | Water | **Date Received:** | 07/22/2015 |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | MW-1 | **Units:** | ug/L |
| **Lab Code:** | K1507921-003 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | **0.0048** | J | 0.020 | 0.0038 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Benz(a)anthracene | **0.0029** | J | 0.020 | 0.0026 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 08/03/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 97 | 46-114 | 08/03/15 | Acceptable |
| Fluoranthene-d10 | 106 | 51-121 | 08/03/15 | Acceptable |
| Terphenyl-d14 | 79 | 58-140 | 08/03/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Tetra Tech EM, Incorporated | **Service Request:** | K1507921 |
| **Project:** | CenturyLink Longview WA/103P3080177 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Polynuclear Aromatic Hydrocarbons

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG1506706-4 | **Basis:** | NA |
| **Extraction Method:** | EPA 3520C | **Level:** | Low |
| **Analysis Method:** | EPA 625 | | |

| Analyte Name | Result | Q | MRL | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 2-Methylnaphthalene | ND | U | 0.020 | 0.0023 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| 1-Methylnaphthalene | ND | U | 0.020 | 0.0035 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthylene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Acenaphthene | ND | U | 0.020 | 0.0044 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluorene | ND | U | 0.020 | 0.0038 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Phenanthrene | ND | U | 0.020 | 0.0050 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Anthracene | ND | U | 0.020 | 0.0036 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Carbazole | ND | U | 0.020 | 0.0045 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Fluoranthene | ND | U | 0.020 | 0.010 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Pyrene | ND | U | 0.020 | 0.0053 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benz(a)anthracene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Chrysene | ND | U | 0.020 | 0.0034 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(b)fluoranthene† | ND | U | 0.020 | 0.0041 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(k)fluoranthene | ND | U | 0.020 | 0.0030 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(a)pyrene | ND | U | 0.020 | 0.0043 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Indeno(1,2,3-cd)pyrene | ND | U | 0.020 | 0.0026 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Dibenz(a,h)anthracene | ND | U | 0.020 | 0.0025 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |
| Benzo(g,h,i)perylene | ND | U | 0.020 | 0.0029 | 1 | 07/22/15 | 07/31/15 | KWG1506706 | |

| Surrogate Name | %Rec | Control Limits | Date Analyzed | Note |
|---|---|---|---|---|
| Fluorene-d10 | 94 | 46-114 | 07/31/15 | Acceptable |
| Fluoranthene-d10 | 102 | 51-121 | 07/31/15 | Acceptable |
| Terphenyl-d14 | 80 | 58-140 | 07/31/15 | Acceptable |

**† Analyte Comments**

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

**Comments:**

QA/QC Report

**Client:** Tetra Tech EM, Incorporated **Service Request:** K1507921
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

## Surrogate Recovery Summary
## Polynuclear Aromatic Hydrocarbons

**Extraction Method:** EPA 3520C **Units:** Percent
**Analysis Method:** EPA 625 **Level:** Low

| Sample Name | Lab Code | Sur1 | Sur2 | Sur3 |
|---|---|---|---|---|
| MW-2 | K1507921-001 | 94 | 101 | 80 |
| MW-1 | K1507921-003 | 97 | 106 | 79 |
| Method Blank | KWG1506706-4 | 94 | 102 | 80 |
| Lab Control Sample | KWG1506706-1 | 93 | 102 | 83 |
| Duplicate Lab Control Sample | KWG1506706-2 | 95 | 104 | 84 |

**Surrogate Recovery Control Limits (%)**

| | | | |
|---|---|---|---|
| Sur1 | = | Fluorene-d10 | 46-114 |
| Sur2 | = | Fluoranthene-d10 | 51-121 |
| Sur3 | = | Terphenyl-d14 | 58-140 |

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

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

**Client:** Tetra Tech EM, Incorporated
**Project:** CenturyLink Longview WA/103P3080177
**Sample Matrix:** Water

**Service Request:** K1507921
**Date Extracted:** 07/22/2015
**Date Analyzed:** 07/31/2015

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

**Extraction Method:** EPA 3520C
**Analysis Method:** EPA 625

**Units:** ug/L
**Basis:** NA
**Level:** Low
**Extraction Lot:** KWG1506706

| | Lab Control Sample KWG1506706-1 Lab Control Spike | | | Duplicate Lab Control Sample KWG1506706-2 Duplicate Lab Control Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **%Rec** | **Result** | **Spike Amount** | **%Rec** | **%Rec Limits** | **RPD** | **RPD Limit** |
| Naphthalene | 2.26 | 2.50 | 91 | 2.32 | 2.50 | 93 | 39-110 | 3 | 30 |
| 2-Methylnaphthalene | 2.07 | 2.50 | 83 | 2.13 | 2.50 | 85 | 39-115 | 3 | 30 |
| 1-Methylnaphthalene | 1.97 | 2.50 | 79 | 2.04 | 2.50 | 82 | 40-122 | 3 | 30 |
| Acenaphthylene | 2.35 | 2.50 | 94 | 2.39 | 2.50 | 96 | 44-115 | 2 | 30 |
| Acenaphthene | 2.33 | 2.50 | 93 | 2.37 | 2.50 | 95 | 44-113 | 2 | 30 |
| Fluorene | 2.35 | 2.50 | 94 | 2.41 | 2.50 | 97 | 48-118 | 3 | 30 |
| Phenanthrene | 2.35 | 2.50 | 94 | 2.43 | 2.50 | 97 | 47-120 | 3 | 30 |
| Anthracene | 2.27 | 2.50 | 91 | 2.28 | 2.50 | 91 | 44-117 | 0 | 30 |
| Carbazole | 2.53 | 2.50 | 101 | 2.59 | 2.50 | 103 | 45-134 | 2 | 30 |
| Fluoranthene | 2.51 | 2.50 | 101 | 2.58 | 2.50 | 103 | 48-128 | 3 | 30 |
| Pyrene | 2.34 | 2.50 | 94 | 2.38 | 2.50 | 95 | 42-133 | 2 | 30 |
| Benz(a)anthracene | 2.43 | 2.50 | 97 | 2.46 | 2.50 | 98 | 48-125 | 1 | 30 |
| Chrysene | 2.37 | 2.50 | 95 | 2.42 | 2.50 | 97 | 50-128 | 2 | 30 |
| Benzo(b)fluoranthene | 2.48 | 2.50 | 99 | 2.53 | 2.50 | 101 | 49-131 | 2 | 30 |
| Benzo(k)fluoranthene | 2.35 | 2.50 | 94 | 2.43 | 2.50 | 97 | 54-131 | 3 | 30 |
| Benzo(a)pyrene | 2.24 | 2.50 | 90 | 2.30 | 2.50 | 92 | 43-134 | 2 | 30 |
| Indeno(1,2,3-cd)pyrene | 2.06 | 2.50 | 82 | 2.09 | 2.50 | 83 | 45-133 | 1 | 30 |
| Dibenz(a,h)anthracene | 2.15 | 2.50 | 86 | 2.17 | 2.50 | 87 | 49-133 | 1 | 30 |
| Benzo(g,h,i)perylene | 2.07 | 2.50 | 83 | 2.10 | 2.50 | 84 | 51-124 | 2 | 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.