



May 30, 2023

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

Sent via e-mail to [steve.teel@ecy.wa.gov](mailto:steve.teel@ecy.wa.gov)

**Subject: Groundwater Monitoring Report, March 2023  
Lumen Longview Facility  
1305 Washington Way, Longview, Washington 98632**

Dear Mr. Teel:

Tetra Tech, Inc. (Tetra Tech) on behalf of Lumen Technologies, Inc. (Lumen) is providing this summary of the groundwater sampling event conducted on March 23, 2023, at the Lumen Facility in Longview, Washington. Groundwater monitoring events are being conducted as a continuation of the Groundwater Monitoring Plan developed in 2008 under the Voluntary Cleanup Program. Groundwater monitoring was conducted generally in accordance with the March 2015 Final Direct-Push Sampling Plan (Tetra Tech 2015) and approved by the Washington State Department of Ecology (Ecology).

## Groundwater Levels

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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 3.09 to 3.22 feet above mean sea level (amsl) and are summarized on Table 1 and shown on Figure 1. Groundwater levels were approximately 1.55 to 1.62 feet higher than observed in September 2021 (the last monitoring event).

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

## Groundwater Samples from Permanent Monitoring Wells

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Groundwater samples were obtained from all five permanent monitoring wells at the facility. Per the groundwater monitoring plan, a field duplicate sample is collected during every other sampling event; because a field duplicate was collected during the September 2021 sampling event, a field duplicate was not collected during this event. After groundwater level measurements were documented, field personnel collected groundwater samples using a peristaltic pump. New dedicated tubing was used to collect the sample at each well. In accordance with the monitoring plan, low-flow sampling procedures were used. Sampling flow rates were kept below 500 milliliters per minute for purging and groundwater sample collection.

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

## Groundwater Sample Analysis

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Once obtained, groundwater samples were labeled in accordance with Tetra Tech standard operating procedures (SOP), placed in a cooler, and chilled to below 4 degrees Celsius. Samples were delivered to ALS Laboratories (ALS), located at 1317 South 13th Avenue in Kelso, Washington. Samples were delivered following standard chain-of-custody protocol. The chain-of-custody form is included with the laboratory analytical reports in Attachment B.

ALS analyzed the samples for total petroleum hydrocarbons-diesel range organics (TPH-DRO) and total petroleum hydrocarbons-residual range organics (TPH-RRO) by Northwest Total Petroleum Hydrocarbons-Diesel Extended Range Methodology (Ecology 1997), without silica gel cleanup.

ALS analyzed the samples for polycyclic aromatic hydrocarbons (PAH) by U.S. Environmental Protection Agency (EPA) Method 8270-Selected Ion Monitoring (SIM). The PAH samples were filtered with a 0.7-micrometer ( $\mu\text{m}$ ) filter before analysis.

## Groundwater Sample Analytical Results

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Table 2 presents a summary of groundwater analytical results for the samples collected during the March 23, 2023, event. Laboratory data were reviewed in accordance with Tetra Tech SOP 203-2 (Tetra Tech 2021). All sample results were found usable as reported.

TPH-DRO and TPH-RRO concentrations were not detected in samples collected. Estimated concentrations of total PAHs were detected in all monitoring well samples. Currently, there are no total PAH or compound-specific Model Toxics Control Act (MTCA) Method A cleanup levels for PAHs. The MTCA Method A cleanup level for the carcinogenic PAHs of 0.1 microgram per liter ( $\mu\text{g/L}$ ) is based on the benzo(a)pyrene toxic equivalent quotient (BaP TEQ). Table 2 also shows the BaP TEQ results, which are based on the individual PAH analytical results multiplied by a toxicity equivalent factor (TEF). All BaP TEQ results were below the MTCA Method A cleanup level of 0.1  $\mu\text{g/L}$ .

Table 3 summarizes the historical results for TPH-DRO and TPH-RRO for each monitoring well sample. Table 4 summarizes the historical results for BaP TEQ and total PAHs for each monitoring well sample.

The current groundwater monitoring data have been successfully uploaded to Ecology's Environmental Information Management (EIM) database.

## Conclusions and Recommendations

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For the March 2023 sampling event, analytical results from all five monitoring well samples were below the MTCA Method A cleanup level of 0.1  $\mu\text{g/L}$  for BaP TEQ. TPH-DRO and TPH-RRO concentrations were also below the MTCA Method A cleanup level of 500  $\mu\text{g/L}$ .

Mr. Steve Teel  
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Continued low groundwater TPH concentrations at downgradient wells MW-04 and MW-05 indicate that the TPH plume is stable and not migrating downgradient at significant concentrations.

On March 22, 2017, Tetra Tech Engineer Mr. Dave Berestka and Ecology's Mr. Steve Teel discussed a proposed monitoring schedule. Groundwater sampling at the five monitoring wells would continue every 18 months to monitor plume stability and continued attenuation of contaminant concentrations to below MTCA Method A cleanup levels. These groundwater sampling events would alternate between spring and fall to obtain groundwater concentration data from high and low groundwater conditions. Eight sesquiannual events are required to demonstrate plume stability.

Tetra Tech recommends that groundwater sampling at the five monitoring wells, the next groundwater monitoring event will be conducted in fall 2024.

If you have any questions or concerns, please contact me at (303) 312-8813 or [mark.reisig@tetrattech.com](mailto:mark.reisig@tetrattech.com).

Sincerely,



Mark Reisig  
Program Manager  
Tetra Tech, Inc.

cc: Joe Robertson, Regional Environmental Health and Safety Manager, Lumen

Attachments:

- A Low-Flow Groundwater Sampling Parameter Forms
- B Laboratory Analytical Report and Chain-of-Custody Record

## References

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- Tetra Tech, Inc. (Tetra Tech). 2015. Direct-Push Groundwater Investigation and Sampling Plan: CenturyLink Longview facility, Longview, Washington. March 2.
- Tetra Tech. 2021. Standard Operating Procedure Number 203 Revision Number 02, Laboratory Analytical Data Verification. November.
- Washington State Department of Ecology (Ecology). 1997. Analytical Methods for Petroleum Hydrocarbons. (<https://fortress.wa.gov/ecy/publications/documents/97602.pdf>). Accessed on December 13, 2021.

## **ANALYTICAL RESULTS TABLES**

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**TABLE 1**  
**MARCH 23, 2023, GROUNDWATER ELEVATIONS**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

Location	Surveyed Top of Casing (ft amsl)	March 23, 2023 Depth to Water (ft)	March 23, 2023 Groundwater Elevation (ft amsl)
<b>MW-01</b>	15.64	12.43	3.21
<b>MW-02</b>	16.17	12.99	3.18
<b>MW-03</b>	15.02	11.80	3.22
<b>MW-04</b>	14.55	11.44	3.11
<b>MW-05</b>	14.75	11.66	3.09

**Notes:**

ft	Feet
ft amsl	Feet above mean sea level
MW	Monitoring well

**TABLE 2**  
**2023 GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

Analyte		TPH-DRO	TPH-RRO	Total PAHs	BaP TEQ
MTCA Method A Cleanup Level		500 (µg/L)	500 (µg/L)	NA (µg/L)	0.1 (µg/L)
Location	Date				
<b>MW-01</b>	3/23/2023	62 J	210 J	0.0144 J	0.002679
<b>MW-02</b>	3/23/2023	84 J	98 J	0.0201 J	0.002752
<b>MW-03</b>	3/23/2023	44 J	120 J	0.0079 J	0.002782
<b>MW-04</b>	3/23/2023	35 J	86 J	0.2139 J	0.002762
<b>MW-05</b>	3/23/2023	50 J	95 J	0.0223 J	0.002679

**Notes:**

**Bold** values indicate the concentration exceeds the MTCA Method A cleanup level for groundwater.

µg/L Microgram per liter

BaP TEQ Benzo(a)pyrene toxic equivalent quotient

DUP Duplicate

J The result is an estimated value

MTCA Model Toxics Control Act

NA Not applicable (no applicable MTCA standard)

PAH Polycyclic aromatic hydrocarbon

TPH-DRO Total petroleum hydrocarbons diesel range organics

TPH-RRO Total petroleum hydrocarbons residual range organics

U Undetected at the method reporting limit shown

**TABLE 3**  
**HISTORICAL GROUNDWATER SAMPLE RESULTS – TPH-DRO AND TPH-RRO**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
<b>TPH-DRO</b> (MTCA Method A Cleanup Level = 500 µg/L)	3/25/1992	Bailer	82	112	50 U	--	--
	12/16/2003	Bailer	250 U	250 U	250 U	--	--
	8/10/2006	Bailer	50 U	140	50 U	--	--
	9/23/2008	Bailer	--	--	--	50 U	140
	2/26/2010	Bailer	--	--	--	25 U	100
	9/2/2011	Bailer	--	--	--	73	120
	2/26/2013	Bailer	--	--	--	<b>1,700</b>	51 U
	6/3/2013	Bailer	50 U	66	50 U	210	50 U
	12/5/2013	Bailer	97	72	47	<b>1,500</b>	100
	3/27/2014	Bailer	63	87	250 U	<b>550</b>	47
	6/25/2014	Bailer	50	33	260 U	<b>1,100</b>	260 U
	9/10/2014	Bailer	240	90	36	<b>790</b>	48
	3/5/2015	Low Flow	22	82	20	20	27
	7/20/2015	Low Flow	22	77	21	24	30
	12/18/15	Low Flow	38	83	46	96	120
	3/31/16	Low Flow	41	<b>1,500</b>	58	30	30
	7/7/2016	Low Flow	24	330	22	34	21
	10/13/2016	Low Flow	23	130	39	39	48
	12/09/2016	Low Flow	37	120	63	70	67
	5/04/2017	Low Flow	42	<b>570</b>	47	24	23
	11/16/2018	Low Flow	48	96	61	60	77
	3/19/2020	Low Flow	280 U	280 U	280 U	270 U	280 U
	9/21/2021	Low Flow	<b>690 Z</b>	260 U	270 U	270 U	270 U
	3/23/2023	Low Flow	62 J	84 J	44 J	35 J	50 J
<b>TPH-RRO</b> (MTCA Method A Cleanup Level = 500 µg/L)	3/25/1992	Bailer	200 U	200 U	200 U	--	--
	8/10/2006	Bailer	250 U	250 U	250 U	--	--
	9/23/2008	Bailer	--	--	--	250 U	250 U
	2/26/2010	Bailer	--	--	--	140	200
	9/2/2011	Bailer	--	--	--	350	210
	2/26/2013	Bailer	--	--	--	<b>11,000</b>	220
	6/3/2013	Bailer	150	100 U	100 U	<b>1,600</b>	100 U
	12/5/2013	Bailer	440	120	120	<b>11,000</b>	170
	3/27/2014	Bailer	370	63	500 U	<b>3,900</b>	190
	6/25/2014	Bailer	340	62	21	<b>8,400</b>	51
	9/10/2014	Bailer	<b>1,500</b>	140	120	<b>6,600</b>	82
	3/5/2015	Low Flow	43	70	37	48	53
	7/20/2015	Low Flow	52	71	49	52	42
	12/18/15	Low Flow	84	160	81	81	82
	3/31/16	Low Flow	83	340	110	54	53
	7/7/2016	Low Flow	44	140	41	33	34
	10/13/2016	Low Flow	94	130	98	90	100
	12/09/2016	Low Flow	140	180	130	110	110
	5/04/2017	Low Flow	86	200	54	37	31
	11/16/2018	Low Flow	130	140	240	110	380
	3/19/2020	Low Flow	550 U	550 U	550 U	540 U	550 U
	9/21/2021	Low Flow	<b>690 Z</b>	520 U	530 U	530 U	530 U
	3/23/2023	Low Flow	210 J	98 J	120 J	86 J	95 J



**TABLE 3 (CONTINUED)**  
**HISTORICAL GROUNDWATER SAMPLE RESULTS – TPH-DRO AND TPH-RRO**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

**Notes:**

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

**Bold** values indicate the concentration exceeds the MTCA Method A cleanup level for groundwater.

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

Blue shading indicates current reporting period results.

MTCA            Model Toxics Control Act

TPH-DRO      Total petroleum hydrocarbons diesel range organics

TPH-RRO      Total petroleum hydrocarbons residual range organics

--              Not sampled

J                The result is an estimated value

U                Undetected at the method reporting limit shown

Z                The chromatographic fingerprint does not resemble a petroleum product

**TABLE 4**  
**HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS –**  
**BAP TEQ AND TOTAL PAH**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
<b>BaP TEQ</b>  <b>Unfiltered analysis</b> <b>(MTCA Method A</b> <b>Cleanup Level = 0.1</b> <b>µg/L)</b>	6/3/2013	Bailer	<b>2.2</b>	0.1 U	0.1 U	<b>0.36</b>	0.1 U
	12/5/2013	Bailer	<b>0.20</b>	0.027	0.074	<b>1.4</b>	0.0062
	3/27/2014	Bailer	<b>0.37</b>	0.080	0.049	<b>0.27</b>	0.073
	6/25/2014	Bailer	<b>0.39</b>	0.012	0.00033	<b>0.40</b>	0.0054
	9/10/2014	Bailer	<b>0.14</b>	0.090	0.0037	<b>0.39</b>	0.0051
<b>BaP TEQ</b>  <b>Filtered analysis</b>  <b>(MTCA Method A</b> <b>Cleanup Level = 0.1</b> <b>µg/L)</b>	12/5/2013	Bailer	0.00033	--	0.00068	0.00084	--
	3/27/2014	Bailer	0.019 U	0.019 U	--	0.019 U	0.019 U
	6/25/2014	Bailer	0.020 U	--	--	0.200 U	--
	9/10/2014	Bailer	0.00030	0.00027	--	0.020 U	--
	3/5/2015	Low Flow	0.00074	0.00038	0.019 U	0.00044	0.00029
	7/20/2015	Low Flow	0.00029	0.020 U	0.021 U	0.021 U	0.021 U
	12/18/2015	Low Flow	0.0065	0.00029	0.019 U	0.00050	0.00039
	3/31/2016	Low Flow	0.00035	0.020 U	0.020 U	0.00026	0.020 U
	7/7/2016	Low Flow	0.020 U	0.020 U	0.00027	0.00035	0.020 U
	10/13/2016	Low Flow	0.0026 U	0.0026 U	0.00028	0.00040	0.00041
	12/09/2016	Low Flow	0.00028	0.020 U	0.00032	0.00032	0.020 U
	5/04/2017	Low Flow	0.00026	0.020 U	0.00020	0.00023	0.00024
	11/16/2018	Low Flow	0.00020	0.00026	0.00020	0.00023	0.00019
	3/19/2020	Low Flow	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
	9/21/2021	Low Flow	0.0035 J	0.020 U	0.020 U	0.020 U	0.020 U
	3/23/2023	Low Flow	0.002679	0.002752	0.002782	0.002762	0.002679
<b>Total PAHs</b>  <b>Unfiltered analysis</b> <b>(No MTCA Method A</b> <b>Cleanup Level)</b>	6/3/2013	Bailer	16	1.6	0.1 U	8.7	0.1 U
	12/5/2013	Bailer	1.7	0.83	0.85	16	2.4
	3/27/2014	Bailer	3.5	1.3	0.50	3.1	0.80
	6/25/2014	Bailer	3.9	2.3	0.12	4.8	0.37
	9/10/2014	Bailer	1.2	1.5	0.049	6.0	5.5
<b>Total PAHs</b>  <b>Filtered analysis</b>  <b>(No MTCA Method A</b> <b>Cleanup Level)</b>	12/5/2013	Bailer	0.028	--	0.043	0.52	--
	3/27/2014	Bailer	0.018	0.21	--	0.080	0.064
	6/25/2014	Bailer	0.063	--	--	0.11	--
	9/10/2014	Bailer	0.012	0.041	--	0.42	--
	3/5/2015	Low Flow	0.046	0.58	0.013	0.24	0.26
	7/20/2015	Low Flow	0.0077	0.019	0.0056	0.29	0.15
	12/18/2015	Low Flow	0.039	1.9	0.019 U	9.7	8.5
	3/31/2016	Low Flow	0.0035	0.032	0.020 U	0.041	0.0092
	7/7/2016	Low Flow	0.020 U	0.019	0.0092	2.2	0.024
	10/13/2016	Low Flow	0.0083	0.034	0.016	0.68	2.8
	12/09/2016	Low Flow	0.0028	0.0070	0.029	4.7	1.1
	5/04/2017	Low Flow	0.015	0.70	0.01	0.017	0.0096
	11/16/2018	Low Flow	0.039	0.107	0.044	0.794	0.068
	3/19/2020	Low Flow	0.0082	0.078	0.0107	0.014	0.0101
	9/21/2021	Low Flow	0.045 J	0.0035 J	0.0078 J	0.01428 J	0.0134 J
	3/23/2023	Low Flow	0.0144 J	0.0201 J	0.0079 J	0.2139 J	0.0223 J

**TABLE 4 (CONTINUED)**  
**HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS –**  
**BAP TEQ AND TOTAL PAH**  
**LUMEN LONGVIEW, WASHINGTON FACILITY**

**Notes:**

**Bold** values indicate the concentration exceeds the MTCA Method A cleanup level for groundwater.

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

Blue shading indicates current reporting period results.

µg/L Micrograms per liter

-- Not analyzed

J Estimated Concentration

U Undetected at the method reporting limit shown

BaP TEQ

MTCA

PAH

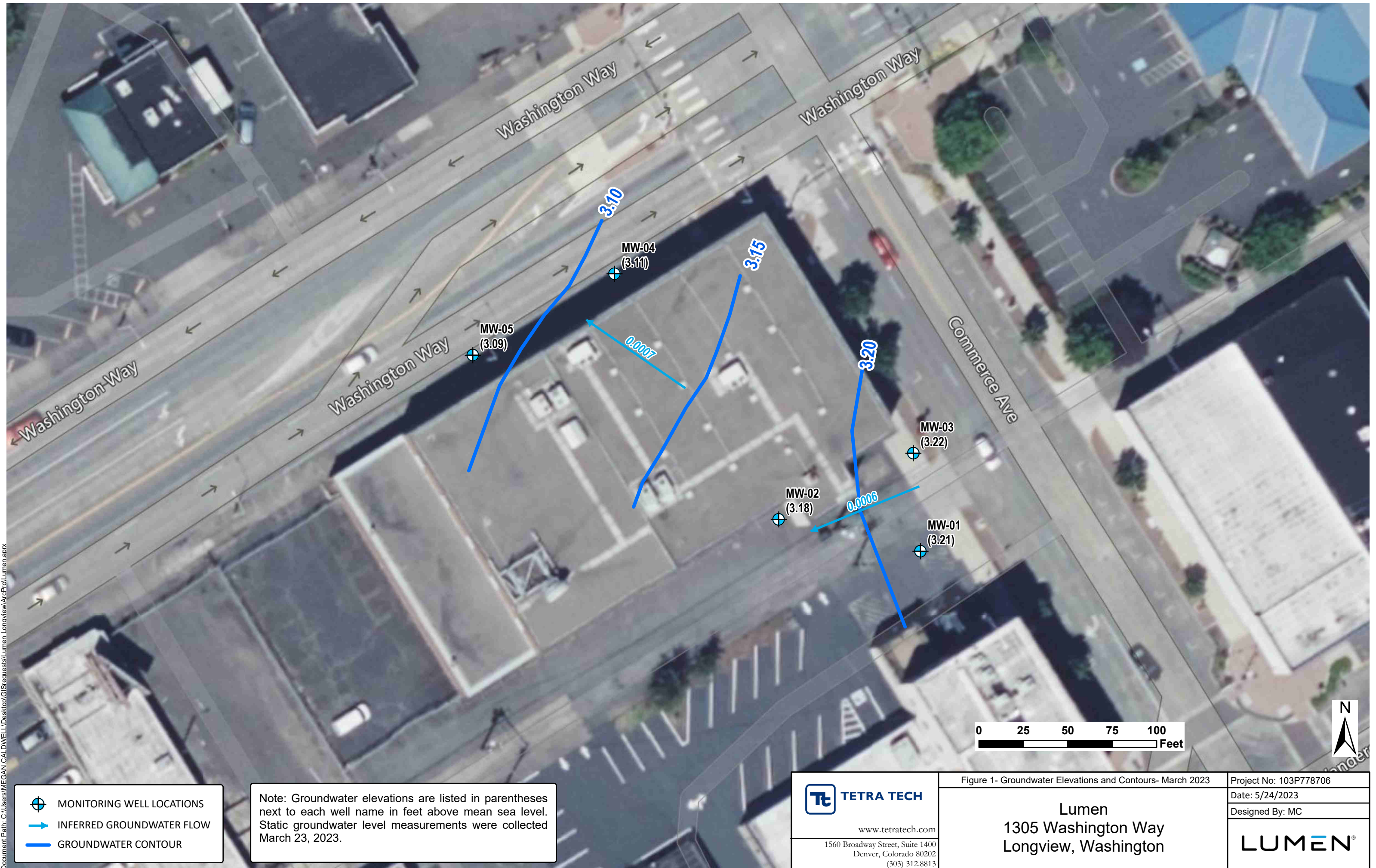
Benzo(a)pyrene toxic equivalent quotient

Model Toxics Control Act


Polycyclic aromatic hydrocarbon


**FIGURE**


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Document Path: C:\Users\MEGAN CALDWELL\Desktop\GIS\requests\Lumen\_Lon\view\ArcPro\Lumen.aprx

 MONITORING WELL LOCATIONS

 INFERRED GROUNDWATER FLOW

 GROUNDWATER CONTOUR

Note: Groundwater elevations are listed in parentheses next to each well name in feet above mean sea level. Static groundwater level measurements were collected March 23, 2023.

 **TETRA TECH**

www.tetrattech.com

1560 Broadway Street, Suite 1400  
Denver, Colorado 80202  
(303) 312.8813

Figure 1- Groundwater Elevations and Contours- March 2023		Project No: 103P778706
<b>Lumen</b> 1305 Washington Way Longview, Washington		Date: 5/24/2023
		Designed By: MC
		<b>LUMEN</b>

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

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2. A ~~boy~~ <sup>boy with</sup> tubing)







Page 2 of 2

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbidity (NTU)	Depth to Water (ft)
<b>Stabilization Criteria</b>	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: Groundwater was clear during purging.



## Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-03	Screen Interval:	
Well Location:	East Side of Building	Sample Depth:	~ 16 ft below TOC
Project:	Lumen (CenturyLink) - Longview	Static Water Level:	11.80 ft bgs C11.79 ft bgs with tubing
Sample Date:	3/23/23	Depth to LNAPL:	NA
Sampling Personnel:	D. Chen & H. Nival	Total Depth of Casing:	19.93'
Sample ID:	MW-03	Begin Purge (Time):	1320
Sample Time:	1356	Casing Diameter (inches):	2
Duplicate ID:	NA	Purge Method:	Peristaltic
Field QC Designation:	HS/MSD	Actual Final Purge Volume:	~8,640 mL
		Immiscible Layer Present:	No

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond ( $\mu$ mhos/cm) mS	Turbidity (NTU)	Depth to Water (ft)
1322	240	2.68	6.49	134.5	13.9	0.299	6.10	11.83
1325	240	2.00	6.47	134.7	13.9	0.298	0.87	11.83
1328	240	1.55	6.46	134.8	13.9	0.298	1.43	11.84
1331	240	1.27	6.46	134.4	13.9	0.298	1.05	11.83
1334	240	1.12	6.45	134.1	13.9	0.299	0.82	11.83
1338	240	0.92	6.44	123.8	13.9	0.302	0.70	11.84
1341	240	0.74	6.43	108.1	13.9	0.303	0.59	11.84
1344	240	0.65	6.42	100.8	14.0	0.303	0.58	11.84
1347	240	0.61	6.42	94.1	14.0	0.304	0.56	11.84
1350	240	0.57	6.42	87.9	14.0	0.305	0.46	11.83
1353	240	0.51	6.42	83.0	13.9	0.306	0.42	11.84
1356	240	0.47	6.42	78.4	14.0	0.30	0.39	11.84

Clear, some floating organic material

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Table of Contents (with & without taking)

clear, some floating material

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## Micropurge Groundwater Sampling Data Sheet

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not fit ~~dig~~ with tubing  
below TOC

Page 2 of 2[illegible]



**ATTACHMENT B**  
**LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORD**

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April 14, 2023

Service Request No:K2303471

Mark Reisig  
Tetra Tech, Inc.  
1560 Broadway  
Suite 1400  
Denver, CO 80202

**Laboratory Results for: Lumen Longview**

Dear Mark,

Enclosed are the results of the sample(s) submitted to our laboratory March 23, 2023  
For your reference, these analyses have been assigned our service request number **K2303471**.

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

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

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

Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
PHONE +1 360 577 7222 | FAX +1 360 636 1068  
ALS Group USA, Corp.  
dba ALS Environmental



## Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Received:** 03/23/2023

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 03/23/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### Semivolatiles by GC/MS:

Method 8270D, 04/12/2023: 2-Methylnaphthalene was flagged as outside the control criterion for Continuing Calibration Verification (CCV). In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The ALS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

Method 8270D, 04/12/2023: The spike recovery of Carbazole for Laboratory Control Sample (LCS) KQ2305384-02 was outside the lower control criterion. The analyte in question was not detected in the associated field samples. The error associated with reduced recovery indicated a potential low bias. The data was flagged to indicate the problem.

#### Semivolatile GC:

No significant anomalies were noted with this analysis.

Approved by Noel D. O'Connell

Date 04/14/2023

### SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

<b>CLIENT ID: MW-04</b>	<b>Lab ID: K2303471-004</b>
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Analyte	Results	Flag	MDL	MRL	Units	Method
1-Methylnaphthalene	0.0029	J	0.0013	0.020	ug/L	8270D
Acenaphthene	0.015	J	0.0012	0.020	ug/L	8270D
Anthracene	0.0020	J	0.00082	0.020	ug/L	8270D
Benz(a)anthracene	0.0018	J	0.00097	0.020	ug/L	8270D
Diesel Range Organics (C12 - C25 DRO)	35	J	12	270	ug/L	NWTPH-Dx
Naphthalene	0.19		0.0014	0.020	ug/L	8270D
Pyrene	0.0022	J	0.0010	0.020	ug/L	8270D
Residual Range Organics (C25 - C36 RRO)	86	J	21	540	ug/L	NWTPH-Dx

<b>CLIENT ID: MW-01</b>	<b>Lab ID: K2303471-001</b>
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Analyte	Results	Flag	MDL	MRL	Units	Method
Acenaphthene	0.011	J	0.0012	0.020	ug/L	8270D
Dibenzofuran	0.0017	J	0.00096	0.020	ug/L	8270D
Diesel Range Organics (C12 - C25 DRO)	62	J	12	270	ug/L	NWTPH-Dx
Naphthalene	0.0017	J	0.0014	0.020	ug/L	8270D
Residual Range Organics (C25 - C36 RRO)	210	J	21	540	ug/L	NWTPH-Dx

<b>CLIENT ID: MW-02</b>	<b>Lab ID: K2303471-002</b>
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Analyte	Results	Flag	MDL	MRL	Units	Method
Acenaphthene	0.0086	J	0.0012	0.020	ug/L	8270D
Anthracene	0.0021	J	0.00082	0.020	ug/L	8270D
Benz(a)anthracene	0.0017	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.00098	J	0.00096	0.020	ug/L	8270D
Diesel Range Organics (C12 - C25 DRO)	84	J	12	260	ug/L	NWTPH-Dx
Naphthalene	0.0020	J	0.0014	0.020	ug/L	8270D
Pyrene	0.0047	J	0.0010	0.020	ug/L	8270D
Residual Range Organics (C25 - C36 RRO)	98	J	20	520	ug/L	NWTPH-Dx

<b>CLIENT ID: MW-03</b>	<b>Lab ID: K2303471-003</b>
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Analyte	Results	Flag	MDL	MRL	Units	Method
Acenaphthene	0.0034	J	0.0012	0.020	ug/L	8270D
Benz(a)anthracene	0.0020	J	0.00097	0.020	ug/L	8270D
Diesel Range Organics (C12 - C25 DRO)	44	J	13	280	ug/L	NWTPH-Dx
Naphthalene	0.0025	J	0.0014	0.020	ug/L	8270D
Residual Range Organics (C25 - C36 RRO)	120	J	22	560	ug/L	NWTPH-Dx

<b>CLIENT ID: MW-05</b>	<b>Lab ID: K2303471-005</b>
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Analyte	Results	Flag	MDL	MRL	Units	Method
Acenaphthene	0.0082	J	0.0012	0.020	ug/L	8270D
Anthracene	0.0029	J	0.00082	0.020	ug/L	8270D
Dibenzofuran	0.0013	J	0.00096	0.020	ug/L	8270D
Diesel Range Organics (C12 - C25 DRO)	50	J	13	280	ug/L	NWTPH-Dx



### SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: MW-05		Lab ID: K2303471-005				
Analyte	Results	Flag	MDL	MRL	Units	Method
Fluorene	0.0058	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.0019	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0022	J	0.0011	0.020	ug/L	8270D
Residual Range Organics (C25 - C36 RRO)	95	J	22	560	ug/L	NWTPH-Dx



## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706

**Service Request:**K2303471

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2303471-001	MW-01	3/23/2023	0948
K2303471-002	MW-02	3/23/2023	1505
K2303471-003	MW-03	3/23/2023	1356
K2303471-004	MW-04	3/23/2023	1056
K2303471-005	MW-05	3/23/2023	1147





129428

CHAIN OF CUSTODY

129428

001

SR# K2303471COC Set 1 of 1

COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Page 1 of 1

Project Name <u>Lumen-Longview</u>		Project Number: <u>103P778706</u>		7D 14D		NUMBER OF CONTAINERS B270D / PAH SIM Filter SVM / Filter SVM NWTPH-Dx / NW_TPH 1 2 3 4 5 6 7 8 9 10										Remarks				
Project Manager <u>Mark Reising</u>																				
Company <u>Tetra Tech</u>																				
Address <u>1560 Broadway, Suite 1400, Denver, CO 80202</u>																				
Phone # <u>(303) 312-8813</u>		email <u>mark.reising@tetra-tech.com</u>																		
Sampler Signature <u>Dan K.</u>		Sampler Printed Name <u>Danielle Gibson</u>																		
CLIENT SAMPLE ID	LABID	SAMPLING Date Time	Matrix																	
1. <u>MW-01</u>		<u>3/23/23 0948</u>	<u>GW</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>													
2. <u>MW-02</u>		<u>1505</u>	<u>↓</u>	<u>5</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>													
3. <u>MW-03</u>		<u>1356</u>	<u>↓</u>	<u>15</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>													<u>MS/MSD*</u>
4. <u>MW-04</u>		<u>1056</u>	<u>↓</u>	<u>5</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>													
5. <u>MW-05</u>		<u>1147</u>	<u>↓</u>	<u>5</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>													
6.																				
7.																				
8.																				
9.																				
10.																				

<b>Report Requirements</b> <input type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD		<b>Invoice Information</b> P.O.# _____ Bill To: _____ Turnaround Requirements <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input checked="" type="checkbox"/> Standard		Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Special Instructions/Comments: <u>* HoV MS/MSD analysis.</u> <u>** Filter in lab.</u> *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)															
Relinquished By: <u>Dan K.</u>		Received By: <u>M. Mulligan</u>		Relinquished By:				Received By:				Relinquished By:				Received By:			
Signature <u>Danielle Gibson</u>		Signature <u>M. Mulligan</u>		Signature				Signature				Signature				Signature			
Printed Name <u>Tetra Tech</u>		Printed Name <u>ALS</u>		Printed Name				Printed Name				Printed Name				Printed Name			
Firm <u>3/23/23 1601</u>		Firm <u>3/23/23 1601</u>		Firm				Firm				Firm				Firm			
Date/Time		Date/Time		Date/Time				Date/Time				Date/Time				Date/Time			

## Cooler Receipt and Preservation Form

Client Tetra Tech Service Request K23 03471  
 Received: 3/23/23 Opened: 3/23/23 By: mm Unloaded: 3/23/23 By: mm

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

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
<u>8.2</u> <u>10.0</u>	<u>9.0</u> <u>10.9</u>	<u>1202</u> ↓					

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:

If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":

5. Were samples received within the method specified temperature ranges? NA Y N

If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM.

NA Y N

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

6. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves

7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N

8. Were samples received in good condition (unbroken) NA Y N

9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N

10. Did all sample labels and tags agree with custody papers? NA Y N

11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N

12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below

NA Y N

13. Were VOA vials received without headspace? Indicate in the table below.

NA Y N

14. Was C12/Res negative? NA Y N

NA Y N

15. Were samples received within the method specified time limit? If not, notate the error below and notify the PM

NA Y N

16. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

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

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



## Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- 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.
- 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**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdwlabservice.htm">http://ndep.nv.gov/bsdwlabservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

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

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

## 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.

ALS Group USA, Corp.  
dba ALS Environmental

Analyst Summary report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706

**Service Request:** K2303471

**Sample Name:** MW-01  
**Lab Code:** K2303471-001  
**Sample Matrix:** Ground Water

**Date Collected:** 03/23/23  
**Date Received:** 03/23/23

**Analysis Method**  
8270D  
NWTPH-Dx

**Extracted/Digested By**  
CEHRENFELD  
GTRIGG

**Analyzed By**  
EBRUNO  
AALUMBAUGH

**Sample Name:** MW-02  
**Lab Code:** K2303471-002  
**Sample Matrix:** Ground Water

**Date Collected:** 03/23/23  
**Date Received:** 03/23/23

**Analysis Method**  
8270D  
NWTPH-Dx

**Extracted/Digested By**  
CEHRENFELD  
GTRIGG

**Analyzed By**  
EBRUNO  
AALUMBAUGH

**Sample Name:** MW-03  
**Lab Code:** K2303471-003  
**Sample Matrix:** Ground Water

**Date Collected:** 03/23/23  
**Date Received:** 03/23/23

**Analysis Method**  
8270D  
NWTPH-Dx

**Extracted/Digested By**  
CEHRENFELD  
GTRIGG

**Analyzed By**  
EBRUNO  
AALUMBAUGH

**Sample Name:** MW-04  
**Lab Code:** K2303471-004  
**Sample Matrix:** Ground Water

**Date Collected:** 03/23/23  
**Date Received:** 03/23/23

**Analysis Method**  
8270D  
NWTPH-Dx

**Extracted/Digested By**  
CEHRENFELD  
GTRIGG

**Analyzed By**  
EBRUNO  
AALUMBAUGH

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

Analyst Summary report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706

**Service Request:** K2303471

**Sample Name:** MW-05  
**Lab Code:** K2303471-005  
**Sample Matrix:** Ground Water

**Date Collected:** 03/23/23  
**Date Received:** 03/23/23

**Analysis Method**  
8270D  
NWTPH-Dx

**Extracted/Digested By**  
CEHRENFELD  
GTRIGG

**Analyzed By**  
EBRUNO  
AALUMBAUGH





## Sample Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Semivolatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

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

Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 09:48  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-01  
**Lab Code:** K2303471-001

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:05	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:05	3/24/23	*
Acenaphthene	<b>0.011 J</b>	0.020	0.0012	1	04/12/23 15:05	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 15:05	3/24/23	
Anthracene	ND U	0.020	0.00082	1	04/12/23 15:05	3/24/23	
Benz(a)anthracene	ND U	0.020	0.00097	1	04/12/23 15:05	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 15:05	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 15:05	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 15:05	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 15:05	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 15:05	3/24/23	*
Chrysene	ND U	0.020	0.00076	1	04/12/23 15:05	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 15:05	3/24/23	
Dibenzofuran	<b>0.0017 J</b>	0.020	0.00096	1	04/12/23 15:05	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 15:05	3/24/23	
Fluorene	ND U	0.020	0.0011	1	04/12/23 15:05	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 15:05	3/24/23	
Naphthalene	<b>0.0017 J</b>	0.020	0.0014	1	04/12/23 15:05	3/24/23	
Phenanthrene	ND U	0.020	0.0011	1	04/12/23 15:05	3/24/23	
Pyrene	ND U	0.020	0.0010	1	04/12/23 15:05	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	99	42 - 133	04/12/23 15:05	
Fluorene-d10	99	42 - 131	04/12/23 15:05	
Terphenyl-d14	83	32 - 129	04/12/23 15:05	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 15:05  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-02  
**Lab Code:** K2303471-002

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:30	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:30	3/24/23	*
Acenaphthene	<b>0.0086 J</b>	0.020	0.0012	1	04/12/23 15:30	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 15:30	3/24/23	
Anthracene	<b>0.0021 J</b>	0.020	0.00082	1	04/12/23 15:30	3/24/23	
Benz(a)anthracene	<b>0.0017 J</b>	0.020	0.00097	1	04/12/23 15:30	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 15:30	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 15:30	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 15:30	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 15:30	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 15:30	3/24/23	*
Chrysene	ND U	0.020	0.00076	1	04/12/23 15:30	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 15:30	3/24/23	
Dibenzofuran	<b>0.00098 J</b>	0.020	0.00096	1	04/12/23 15:30	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 15:30	3/24/23	
Fluorene	ND U	0.020	0.0011	1	04/12/23 15:30	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 15:30	3/24/23	
Naphthalene	<b>0.0020 J</b>	0.020	0.0014	1	04/12/23 15:30	3/24/23	
Phenanthrene	ND U	0.020	0.0011	1	04/12/23 15:30	3/24/23	
Pyrene	<b>0.0047 J</b>	0.020	0.0010	1	04/12/23 15:30	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	93	42 - 133	04/12/23 15:30	
Fluorene-d10	93	42 - 131	04/12/23 15:30	
Terphenyl-d14	61	32 - 129	04/12/23 15:30	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 13:56  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-03  
**Lab Code:** K2303471-003

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:56	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 15:56	3/24/23	*
Acenaphthene	<b>0.0034 J</b>	0.020	0.0012	1	04/12/23 15:56	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 15:56	3/24/23	
Anthracene	ND U	0.020	0.00082	1	04/12/23 15:56	3/24/23	
Benz(a)anthracene	<b>0.0020 J</b>	0.020	0.00097	1	04/12/23 15:56	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 15:56	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 15:56	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 15:56	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 15:56	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 15:56	3/24/23	*
Chrysene	ND U	0.020	0.00076	1	04/12/23 15:56	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 15:56	3/24/23	
Dibenzofuran	ND U	0.020	0.00096	1	04/12/23 15:56	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 15:56	3/24/23	
Fluorene	ND U	0.020	0.0011	1	04/12/23 15:56	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 15:56	3/24/23	
Naphthalene	<b>0.0025 J</b>	0.020	0.0014	1	04/12/23 15:56	3/24/23	
Phenanthrene	ND U	0.020	0.0011	1	04/12/23 15:56	3/24/23	
Pyrene	ND U	0.020	0.0010	1	04/12/23 15:56	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	43	42 - 133	04/12/23 15:56	
Fluorene-d10	49	42 - 131	04/12/23 15:56	
Terphenyl-d14	32	32 - 129	04/12/23 15:56	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 10:56  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-04  
**Lab Code:** K2303471-004

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	<b>0.0029 J</b>	0.020	0.0013	1	04/12/23 16:21	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 16:21	3/24/23	*
Acenaphthene	<b>0.015 J</b>	0.020	0.0012	1	04/12/23 16:21	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 16:21	3/24/23	
Anthracene	<b>0.0020 J</b>	0.020	0.00082	1	04/12/23 16:21	3/24/23	
Benz(a)anthracene	<b>0.0018 J</b>	0.020	0.00097	1	04/12/23 16:21	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 16:21	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 16:21	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 16:21	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 16:21	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 16:21	3/24/23	*
Chrysene	ND U	0.020	0.00076	1	04/12/23 16:21	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 16:21	3/24/23	
Dibenzofuran	ND U	0.020	0.00096	1	04/12/23 16:21	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 16:21	3/24/23	
Fluorene	ND U	0.020	0.0011	1	04/12/23 16:21	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 16:21	3/24/23	
Naphthalene	<b>0.19</b>	0.020	0.0014	1	04/12/23 16:21	3/24/23	
Phenanthrene	ND U	0.020	0.0011	1	04/12/23 16:21	3/24/23	
Pyrene	<b>0.0022 J</b>	0.020	0.0010	1	04/12/23 16:21	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	93	42 - 133	04/12/23 16:21	
Fluorene-d10	98	42 - 131	04/12/23 16:21	
Terphenyl-d14	75	32 - 129	04/12/23 16:21	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 11:47  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-05  
**Lab Code:** K2303471-005

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 16:47	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 16:47	3/24/23	*
Acenaphthene	<b>0.0082 J</b>	0.020	0.0012	1	04/12/23 16:47	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 16:47	3/24/23	
Anthracene	<b>0.0029 J</b>	0.020	0.00082	1	04/12/23 16:47	3/24/23	
Benz(a)anthracene	ND U	0.020	0.00097	1	04/12/23 16:47	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 16:47	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 16:47	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 16:47	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 16:47	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 16:47	3/24/23	*
Chrysene	ND U	0.020	0.00076	1	04/12/23 16:47	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 16:47	3/24/23	
Dibenzofuran	<b>0.0013 J</b>	0.020	0.00096	1	04/12/23 16:47	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 16:47	3/24/23	
Fluorene	<b>0.0058 J</b>	0.020	0.0011	1	04/12/23 16:47	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 16:47	3/24/23	
Naphthalene	<b>0.0019 J</b>	0.020	0.0014	1	04/12/23 16:47	3/24/23	
Phenanthrene	<b>0.0022 J</b>	0.020	0.0011	1	04/12/23 16:47	3/24/23	
Pyrene	ND U	0.020	0.0010	1	04/12/23 16:47	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	94	42 - 133	04/12/23 16:47	
Fluorene-d10	99	42 - 131	04/12/23 16:47	
Terphenyl-d14	69	32 - 129	04/12/23 16:47	



## Semivolatile Organic Compounds by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
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[www.alsglobal.com](http://www.alsglobal.com)



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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 09:48  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-01  
**Lab Code:** K2303471-001

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

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	<b>62 J</b>	270	12	1	04/11/23 13:25	3/24/23	
Residual Range Organics (C25 - C36 RRO)	<b>210 J</b>	540	21	1	04/11/23 13:25	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	59	50 - 150	04/11/23 13:25	
n-Triacontane	67	50 - 150	04/11/23 13:25	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 15:05  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-02  
**Lab Code:** K2303471-002

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

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	84 J	260	12	1	04/11/23 13:47	3/24/23	
Residual Range Organics (C25 - C36 RRO)	98 J	520	20	1	04/11/23 13:47	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	55	50 - 150	04/11/23 13:47	
n-Triacontane	63	50 - 150	04/11/23 13:47	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 13:56  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-03  
**Lab Code:** K2303471-003

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

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	44 J	280	13	1	04/11/23 14:08	3/24/23	
Residual Range Organics (C25 - C36 RRO)	120 J	560	22	1	04/11/23 14:08	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	64	50 - 150	04/11/23 14:08	
n-Triacontane	73	50 - 150	04/11/23 14:08	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 10:56  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-04  
**Lab Code:** K2303471-004

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

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	35 J	270	12	1	04/11/23 14:52	3/24/23	
Residual Range Organics (C25 - C36 RRO)	86 J	540	21	1	04/11/23 14:52	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	61	50 - 150	04/11/23 14:52	
n-Triacontane	70	50 - 150	04/11/23 14:52	

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23 11:47  
**Date Received:** 03/23/23 16:01

**Sample Name:** MW-05  
**Lab Code:** K2303471-005

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

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	50 J	280	13	1	04/11/23 15:14	3/24/23	
Residual Range Organics (C25 - C36 RRO)	95 J	560	22	1	04/11/23 15:14	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	56	50 - 150	04/11/23 15:14	
n-Triacontane	64	50 - 150	04/11/23 15:14	



## QC Summary Forms

**ALS Environmental—Kelso Laboratory**  
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## Semivolatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471

**SURROGATE RECOVERY SUMMARY**  
**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

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

Sample Name	Lab Code	Fluoranthene-d10	Fluorene-d10	Terphenyl-d14
		42-133	42-131	32-129
MW-01	K2303471-001	99	99	83
MW-02	K2303471-002	93	93	61
MW-03	K2303471-003	43	49	32
MW-04	K2303471-004	93	98	75
MW-05	K2303471-005	94	99	69
Method Blank	KQ2305384-01	90	84	87
Lab Control Sample	KQ2305384-02	87	77	90
MW-03	KQ2305384-03	98	91	73
MW-03	KQ2305384-04	96	93	65



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QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** 03/23/23  
**Date Received:** 03/23/23  
**Date Analyzed:** 04/12/23  
**Date Extracted:** 03/24/23

**Duplicate Matrix Spike Summary**  
**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Sample Name:** MW-03  
**Lab Code:** K2303471-003  
**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

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

Analyte Name	Sample Result	Matrix Spike KQ2305384-03			Duplicate Matrix Spike KQ2305384-04			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1-Methylnaphthalene	ND U	2.45	2.78	88	2.46	2.78	89	57-113	<1	30
2-Methylnaphthalene	ND U	2.39	2.78	86	2.40	2.78	86	58-111	<1	30
Acenaphthene	0.0034 J	2.30	2.78	83	2.30	2.78	83	63-121	<1	30
Acenaphthylene	ND U	2.37	2.78	85	2.37	2.78	85	61-118	<1	30
Anthracene	ND U	2.58	2.78	93	2.59	2.78	93	69-125	<1	30
Benz(a)anthracene	0.0020 J	2.64	2.78	95	2.65	2.78	95	71-127	<1	30
Benzo(a)pyrene	ND U	2.95	2.78	106	2.94	2.78	106	69-132	<1	30
Benzo(b)fluoranthene	ND U	2.59	2.78	93	2.62	2.78	94	65-139	1	30
Benzo(g,h,i)perylene	ND U	2.42	2.78	87	2.19	2.78	79	63-129	10	30
Benzo(k)fluoranthene	ND U	2.46	2.78	89	2.44	2.78	88	65-137	<1	30
Carbazole	ND U	1.20	2.78	43 *	1.17	2.78	42 *	70-130	3	30
Chrysene	ND U	2.57	2.78	93	2.54	2.78	92	75-130	1	30
Dibenz(a,h)anthracene	ND U	2.56	2.78	92	2.31	2.78	83	61-138	10	30
Dibenzofuran	ND U	2.35	2.78	85	2.33	2.78	84	62-127	<1	30
Fluoranthene	ND U	2.35	2.78	85	2.34	2.78	84	69-125	<1	30
Fluorene	ND U	2.41	2.78	87	2.41	2.78	87	66-123	<1	30
Indeno(1,2,3-cd)pyrene	ND U	2.85	2.78	103	2.59	2.78	93	62-142	10	30
Naphthalene	0.0025 J	2.23	2.78	80	2.24	2.78	81	45-123	<1	30
Phenanthrene	ND U	2.42	2.78	87	2.41	2.78	87	65-124	<1	30
Pyrene	ND U	2.94	2.78	106	2.67	2.78	96	59-134	10	30

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2305384-01

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

**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 13:23	3/24/23	
2-Methylnaphthalene	ND U	0.020	0.0013	1	04/12/23 13:23	3/24/23	
Acenaphthene	<b>0.012 J</b>	0.020	0.0012	1	04/12/23 13:23	3/24/23	
Acenaphthylene	ND U	0.020	0.0011	1	04/12/23 13:23	3/24/23	
Anthracene	ND U	0.020	0.00082	1	04/12/23 13:23	3/24/23	
Benz(a)anthracene	ND U	0.020	0.00097	1	04/12/23 13:23	3/24/23	
Benzo(a)pyrene	ND U	0.020	0.0011	1	04/12/23 13:23	3/24/23	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	04/12/23 13:23	3/24/23	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	04/12/23 13:23	3/24/23	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	04/12/23 13:23	3/24/23	
Carbazole	ND U	0.020	0.0011	1	04/12/23 13:23	3/24/23	
Chrysene	ND U	0.020	0.00076	1	04/12/23 13:23	3/24/23	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	04/12/23 13:23	3/24/23	
Dibenzofuran	<b>0.0016 J</b>	0.020	0.00096	1	04/12/23 13:23	3/24/23	
Fluoranthene	ND U	0.020	0.00082	1	04/12/23 13:23	3/24/23	
Fluorene	ND U	0.020	0.0011	1	04/12/23 13:23	3/24/23	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	04/12/23 13:23	3/24/23	
Naphthalene	<b>0.0018 J</b>	0.020	0.0014	1	04/12/23 13:23	3/24/23	
Phenanthrene	<b>0.0049 J</b>	0.020	0.0011	1	04/12/23 13:23	3/24/23	
Pyrene	ND U	0.020	0.0010	1	04/12/23 13:23	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	90	42 - 133	04/12/23 13:23	
Fluorene-d10	84	42 - 131	04/12/23 13:23	
Terphenyl-d14	87	32 - 129	04/12/23 13:23	

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QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Analyzed:** 04/12/23  
**Date Extracted:** 03/24/23

**Lab Control Sample Summary**  
**Polycyclic Aromatic Hydrocarbons by GC/MS SIM**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3511

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 800752

**Lab Control Sample**  
**KQ2305384-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1-Methylnaphthalene	2.48	2.78	89	47-119
2-Methylnaphthalene	2.41	2.78	87	48-120
Acenaphthene	2.32	2.78	84	63-121
Acenaphthylene	2.44	2.78	88	58-124
Anthracene	2.62	2.78	94	68-127
Benz(a)anthracene	2.68	2.78	96	74-124
Benzo(a)pyrene	2.96	2.78	106	75-131
Benzo(b)fluoranthene	2.60	2.78	94	73-136
Benzo(g,h,i)perylene	2.49	2.78	90	63-127
Benzo(k)fluoranthene	2.45	2.78	88	74-134
Carbazole	1.36	2.78	49 *	68-135
Chrysene	2.59	2.78	93	74-132
Dibenz(a,h)anthracene	2.64	2.78	95	59-135
Dibenzofuran	2.38	2.78	86	56-132
Fluoranthene	2.14	2.78	77	70-127
Fluorene	2.43	2.78	87	68-121
Indeno(1,2,3-cd)pyrene	2.91	2.78	105	63-136
Naphthalene	2.30	2.78	83	52-115
Phenanthrene	2.45	2.78	88	64-126
Pyrene	2.75	2.78	99	72-127



## Semivolatile Organic Compounds by GC

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QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471

**SURROGATE RECOVERY SUMMARY**  
**Semi-Volatile Petroleum Products by GC/FID**

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

Sample Name	Lab Code	o-Terphenyl	n-Triacontane
		50-150	50-150
MW-01	K2303471-001	59	67
MW-02	K2303471-002	55	63
MW-03	K2303471-003	64	73
MW-04	K2303471-004	61	70
MW-05	K2303471-005	56	64
MW-03	KQ2305378-03	50	56
Method Blank	KQ2305378-01	78	92
Lab Control Sample	KQ2305378-02	76	82

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## QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471**Date Collected:** 03/23/23**Date Received:** 03/23/23**Date Analyzed:** 04/11/23

**Replicate Sample Summary**  
**Semi-Volatile Petroleum Products by GC/FID**

**Sample Name:** MW-03  
**Lab Code:** K2303471-003

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

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2305378-03 Result	Average	RPD	RPD Limit
Diesel Range Organics (C12 - C25 DRO)	NWTPH-Dx	270	12	44 J	46 J	45.0	5	30
Residual Range Organics (C25 - C36 RRO)	NWTPH-Dx	540	21	120 J	110 J	117	9	30

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Analytical Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water  
  
**Sample Name:** Method Blank  
**Lab Code:** KQ2305378-01

**Service Request:** K2303471  
**Date Collected:** NA  
**Date Received:** NA  
  
**Units:** ug/L  
**Basis:** NA

Semi-Volatile Petroleum Products by GC/FID

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

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	22 J	250	11	1	04/11/23 13:04	3/24/23	
Residual Range Organics (C25 - C36 RRO)	55 J	500	19	1	04/11/23 13:04	3/24/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	78	50 - 150	04/11/23 13:04	
n-Triacontane	92	50 - 150	04/11/23 13:04	

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QA/QC Report

**Client:** Tetra Tech, Inc.  
**Project:** Lumen Longview/103P778706  
**Sample Matrix:** Ground Water

**Service Request:** K2303471  
**Date Analyzed:** 04/11/23  
**Date Extracted:** 03/24/23

**Lab Control Sample Summary**  
**Semi-Volatile Petroleum Products by GC/FID**

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

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 800597

**Lab Control Sample**  
**KQ2305378-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Diesel Range Organics (C12 - C25 DRO)	2490	3200	78	46-140
Residual Range Organics (C25 - C36 RRO)	1390	1600	87	45-159