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24 April 2025

Cam Penner-Ash, LG
Cleanup Project Manager
Ecology's Toxics Cleanup Program
Southwest Regional Office
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: Tenth Compliance Groundwater Monitoring Report
Agreed Order No. DE 9514
Frederickson Industrial Park Site, Pierce County, WA
Geosyntec Project: PNR0861

Dear Mr. Penner-Ash:

Geosyntec Consultants has prepared this letter on behalf of Olin Corporation and Mallinckrodt US Holdings LLC (the Companies) to present the results from compliance monitoring completed in June 2024 at what is now the former footprint of the Frederickson Industrial Park Site (Site) in Pierce County, Washington (Figure 1). This compliance monitoring is being performed in accordance with the Washington Department of Ecology's (Ecology's) Agreed Order (AO) No. DE 9514 (Order).

Background

The Site is referred to as the Frederickson Industrial Park and is located south of 176th Street East and east of Canyon Road East in the Fredrickson area of Pierce County, Washington. The Site is situated approximately 10 miles south of Tacoma and 8 miles southwest of Puyallup, and is located in unincorporated County area surrounded by a mixture of industrial, residential and commercial properties. Boeing and Panattoni Development Company (Panattoni) are the current owners of the Frederickson Industrial Center; Olin and Mallinckrodt are the successors of former owners. Panattoni purchased two parcels (Parcels B and C) from Boeing with the property sale close date of September 16, 2021. Figure 1 shows the current property outlines. One active compliance monitoring well (MW-4) is located on the Panattoni property.

The Compliance Monitoring Work Plan (CMWP) outlines the requirements for monitored natural attenuation (MNA) compliance monitoring. As described in the CMWP, compliance monitoring for the Site consists of performance monitoring to track MNA, followed by confirmational monitoring to confirm compliance with applicable cleanup standards. In accordance with procedures outlined in the CMWP, and as defined in WAC 173-340-720(9)(iv), the performance monitoring well network was reduced from the original eleven wells identified in the CMWP to the current eight wells (Table 1) and includes hydrogeologic monitoring and groundwater sampling for carbon tetrachloride (CTC) analysis. Ecology approved the use of passive diffusion bags (PDBs) based on the sampling comparison evaluation results in an email dated 6 April 2018.

Performance Monitoring Groundwater Results

Hydrogeologic Monitoring

Water level data collected during the 2024 groundwater monitoring event are presented in Table 1. Water level contours for Aquifer A are shown in Figure 2 for the June 2024 monitoring event. The groundwater gradient in Aquifer A is to the north-northwest towards Clover Creek, and is consistent with past monitoring events.

Carbon Tetrachloride

Eight monitoring wells were sampled using passive diffusion bags during the June 2024 monitoring event. The samples were analyzed for CTC by ALS laboratory. The CTC data are summarized in Table 2, and the analytical reports are provided in Attachment A. Figure 3 presents the performance monitoring well locations and updated CTC contour based on the 2024 CTC results. Concentration trends for CTC are plotted for the performance monitoring wells in Figures 4a-4c.

Consistent with previous monitoring results, monitoring wells BMW-18, HLA-1, and 11-CL continue to have the highest CTC concentrations ranging between 2.9 µg/L and 3.3 µg/L (Figure 4a). The intermediate concentration wells (e.g., MW-1 and MW-13) ranged between 1.1 µg/L and 1.4 µg/L (Figure 4b). The peripheral monitoring wells, MW-4 on the east and 11-BL on the west, had CTC concentrations of 0.52 µg/L and 0.59 µg/L, respectively (Figure 4c). P2-S on the north was below the laboratory detection limit of 0.096 µg/L. CTC concentrations at monitoring well 11-BL have been below the regulatory limit for four consecutive sampling events. The trends plotted in Figures 4a-4c illustrate declining, low CTC concentrations; the data plotted in Figures 4a-4c are provided in Table 3.

Concentration of CTC remained consistent for all wells, and an evaluation of the monitoring data indicates that MNA continues to be active based on the following observations:

- Declining trends in HLA-1, BMW-18, 11-CL, MW-1, MW-13, MW-4, and 11-BL;
- P2-S, MW-4, and 11-BL remain below the regulatory cleanup limit; and
- Concentrations at MW-1 and MW-13, which bound the upgradient and downgradient extents of the plume, are trending downward.

CTC concentrations at P2-S continue to be below the cleanup level of 0.63 µg/L for the eleventh (11) consecutive monitoring event. In addition, CTC concentrations have been below the cleanup level at 11-BL for the past four consecutive monitoring events. The approved CMWP specifies the statistical method and the representative sampling period to determine when individual monitoring wells can be removed from the Performance Monitoring program. Consistent with WAC 173-340-720 (9)(d)(i)(A), the CMWP states that "an individual compliance monitoring well will be removed from the Performance Monitoring program if the upper one-sided ninety-five percent confidence limit on the true mean groundwater concentration is below the MTCA cleanup level (which is currently 0.63 µg/L)." Per the CMWP, the representative sampling period is specified as being the preceding four (4) sampling events.

Therefore, wells 11-BL and P2-S meet the Ecology-approved criteria, as described in the CMWP, to be removed from the Performance Monitoring program. For P2-S the combination of eleven monitoring events below cleanup criteria with ongoing MNA and reduction of impacted groundwater at the Site indicates this monitoring well is unlikely to exceed cleanup criteria in the future. The Companies request that P2-S and 11-BL be removed from the performance monitoring network because these monitoring wells have met performance criteria.

Future Monitoring Schedule

In 2022 Ecology approved a change in monitoring schedule from annual to every 18 months. This June 2024 event was the second to occur on the 18 month schedule. The next monitoring event is scheduled for the 4th quarter of 2025.

Conclusions and Recommendations

CPA
5/7/25

The ~~twelfth~~ tenth MNA compliance monitoring event confirmed that CTC concentrations continue to be low and are declining. The results of the 2024 sampling event demonstrate that MNA is reducing CTC concentrations at the Site. This effectiveness is demonstrated by monitoring wells

P2-S and 11-BL having met cleanup criteria for the past eleven and four events respectively, and the Companies request removal of these wells from the performance monitoring network.

Please contact Julie Peoples (423-650-2426) if you have questions regarding the information presented herein.

Sincerely,

James J. Deitsch, PhD., P.E. (GA)
Senior Principal

David L. Parkinson, PhD., P.G. (WA)
Principal

Cc: Julie Peoples, Olin Corporation
Karen Kampwerth, Mallinckrodt
Deborah Taege, The Boeing Company
Anne Smith, Tacoma Water

Attachments:
Tables
Figures
Attachment A: Analytical Laboratory Report

PNR0861

Tables

Table 1.
Performance Monitoring for 2024 Groundwater Sampling Event Water Level Data
Brazier Site, Frederickson, Washington

Well	Ground Elevation (ft MSL)	Top of Casing Elevation (MSL)	Top of Screen (MSL)	Bottom of Screen (MSL)	Aquifer	Sample Date	Depth to Water (ft)	Water Level (MSL)
11-BL	395.5	396.08	331.5	321.5	Lower - Aquifer A	06/28/24	40.62	355.46
11-CL	403.69	404.55	329.7	319.7	Lower - Aquifer A	06/28/24	45.78	358.77
BMW-18	409.74	412.09	375.7	345.7	Upper - Aquifer A	06/28/24	44.07	368.02
HLA-1	403.86	405.81	320.9	310.9	Lower - Aquifer A	06/28/24	47.12	358.69
MW-1	413.27	415.79	324.8	314.8	Lower - Aquifer A	06/28/24	43.92	371.87
MW-4	465.5	467.72	317.9	307.9	Aquifer A	06/28/24	118.59	349.13
P2-S	340.55	343.6	320.6	310.6	Upper - Aquifer A	06/28/24	15.95	327.65
MW-13	394.5	394.1	284.5	274.5	Aquifer A	06/28/24	54.58	339.52

Note: The Performance Monitoring Network was revised following the 2017 Annual Sampling Event in accordance with the criteria established in the Compliance Monitoring Work Plan and per Ecology approval dated 27 March 2018; BMW-3, MW-7, and P2-I were removed from the network and are no longer sampled as part of compliance monitoring.

Table 2.
Carbon Tetrachloride Results for 2024
Brazier Site, Frederickson, Washington

Well	PDB Deployment Date	Sample Date	Result (µg/L)	Lab MRL	Lab MDL	Qualifiers	Depth to Water (ft)	Water Level (MSL)
11-BL	06/13/24	06/28/24	0.59	0.50	0.096		40.62	355.46
11-CL	06/13/24	06/28/24	**3.3**	0.50	0.096		45.78	358.77
BMW-18	06/13/24	06/28/24	**2.9**	0.50	0.096		44.07	368.02
HLA-1	06/13/24	06/28/24	**3.3**	0.50	0.096		47.12	358.69
MW-1	06/13/24	06/28/24	**1.1**	0.50	0.096		43.92	371.87
MW-4	06/13/24	06/28/24	0.52	0.50	0.096		118.59	349.13
P2-S	06/13/24	06/28/24	ND	0.50	0.096		15.95	327.65
MW-13	06/13/24	06/28/24	**1.4**	0.50	0.096		54.58	339.52

Notes:

BOLD = CTC value above groundwater cleanup level of 0.63 µg/L

µg/L = micrograms per liter;

MRL = Method Reporting Limit

MDL = Method Detection Limit

Table 3.
2014-2024 Carbon Tetrachloride Groundwater Performance Monitoring Data
Brazier Site, Frederickson, Washington

Wells	11-BL	11-CL	HLA-1	BMW-3	BMW-18	MW-1	MW-4	MW-7	P2-S	P2-I	MW-13
May-14	**0.97**	**5.4**	**5.0**	*0.28*	**5.5**	**1.8**	**0.82**	**2.3**	**0.76**	**0.72**	**2.3**
Oct-14	**0.95**	**4.4**	**4.6**	*0.39*	**4.8**	**1.4**	**0.66**	ND	ND	ND	**1.9**
Mar-15	**0.64**	**4.3**	**4.4**	*0.19*	**4.2**	**1.5**	0.62	*0.22*	*0.29*	ND	**1.9**
Oct-15	**0.72**	**3.8**	**3.9**	0.51	**3.8**	**1.2**	0.53	*0.24*	*0.45*	ND	**1.7**
May-16	0.50	**2.9**	**3.6**	*0.27*	**3.7**	**1.5**	0.51	ND	*0.28*	ND	**1.3**
Jun-17	**0.74**	**3.7**	**4.4**	*0.43*	**4.7**	**1.8**	**0.67**	ND	*0.27*	ND	**1.6**
May-18[1]	0.51	**4.1**	**4.5**	--	**3.4**	**2.1**	**0.67**	--	*0.36*	--	**1.8**
May-19[1]	**0.89**	**4.4**	**4.6**	--	**3.5**	**1.7**	**0.67**	--	*0.37*	--	**2.0**
May-20[1]	*0.38*	**3.2**	**3.8**	--	**2.5**	**1.3**	0.58	--	*0.36*	--	**1.7**
April-21[1]	*0.33*	**4.1**	**4.0**	--	**2.9**	**1.3**	**0.65**	--	*0.35*	--	**1.5**
Nov-22[1]	*0.31*	**3.0**	**3.0**	--	**2.4**	**0.99**	*0.46*	--	*0.17*	--	**1.3**
Jun-24[1]	0.59	**3.3**	**3.3**	--	**2.9**	**1.1**	0.52	--	ND (0.096)	--	**1.4**
95% UCL[2]	0.59	**4.1**	**3.8**	--	**2.9**	**1.3**	**0.65**	--	*0.36*	--	**1.7**

Notes:

1 - Groundwater sampling prior to 2018 was performed by low-flow method; use of passive diffusion bags for sampling began in 2018.

2 - 95% Upper Confidence Limit on true mean, using Ecology's Statistical Guidance for sample sets less than 20 (Example #15, page 97-98)

https://fortress.wa.gov/ecy/publications/documents/9254.pdf

WAC 173-340-720 (9)(e)(iv) **If more than fifty percent of the measurements are below the practical quantitation limit,

the largest value in the data set shall be used in place of an upper confidence limit on the true mean groundwater calculation.

1.5	Bold values are above the CTC cleanup level of 0.63 µg/L
0.5	Estimated Value (i.e., concentration greater than method detection limit but less than method reporting limit)
ND	Non-Detected (Method Detection = 0.096)
--	Monitoring well no longer requires Performance Monitoring

The Performance Monitoring Network was revised following the 2017 Annual Sampling Event in accordance with the criteria established in the Compliance Monitoring Work Plan and per Ecology approval dated 27 March 2018; BMW-3, MW-7, and P2-I were removed from the network and are no longer sampled as part of performance monitoring.

Figures

Legend

Boeing Property

Panattoni Property

Source:
Bing Aerial Photography, May 2022

1,000 500 0 1,000 Feet

Property Location

Frederickson Industrial Park
Frederickson, WA

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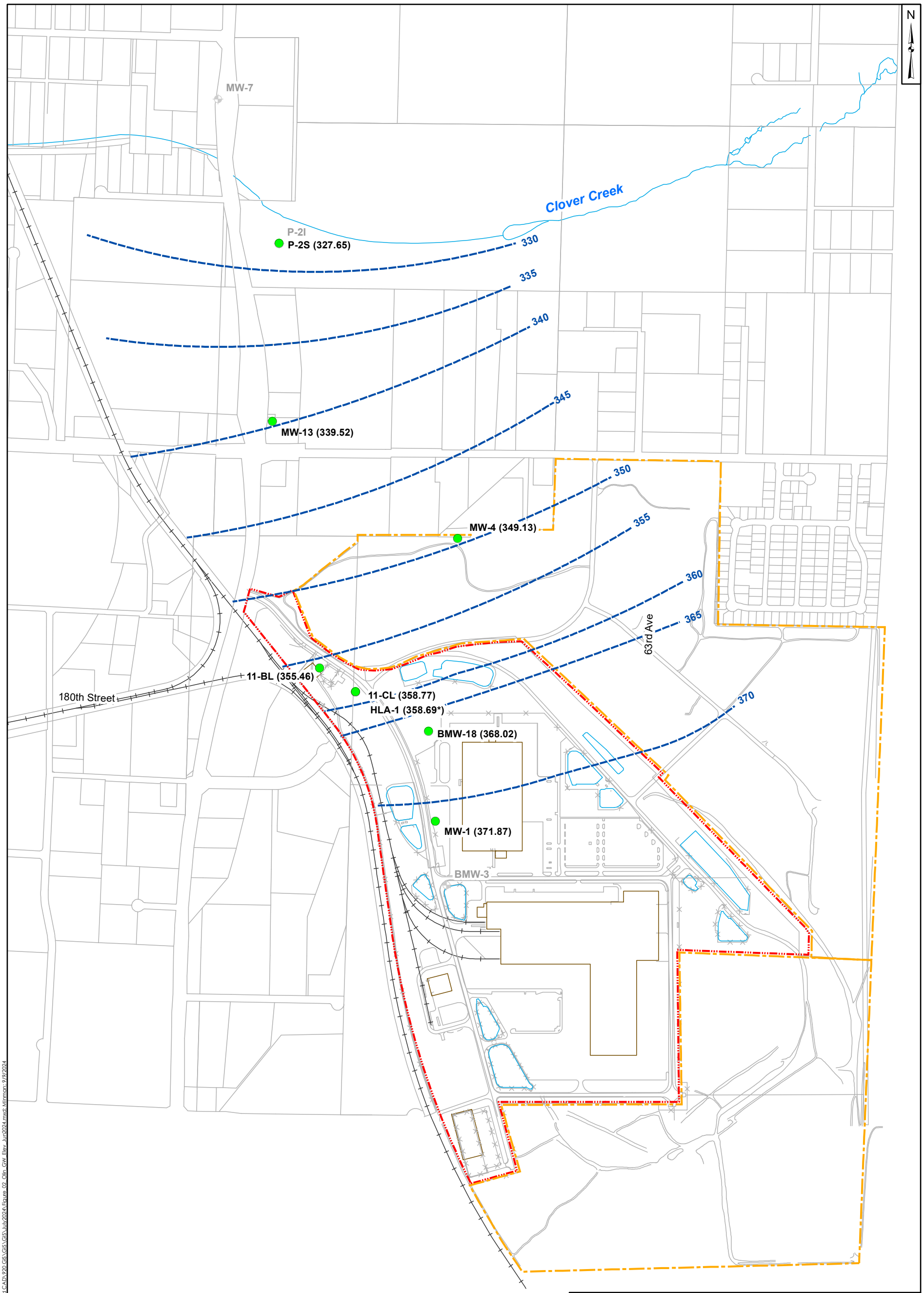
Figure 1

P:\Projects\Olin Frederickson\800 GIS and CAD\920 GIS\GIS\November 2022\MXDs\Figure 01_Property Location.mxd kkhman 2/27/2023



750 375 0 750 Feet

Note:

* - Not used in water level contouring; well is screened in lower level of Aquifer A compared to wells used to develop contours.

Legend

- June 2024 Water Level Contours (ft masl)
- Aquifer A Compliance Monitoring Network Well (June 2024 Water Level (ft masl))
- Monitoring Wells
- Boeing Property
- Panattoni Property

Aquifer A Groundwater Levels
June 2024

Frederickson Industrial Park
Frederickson, WA

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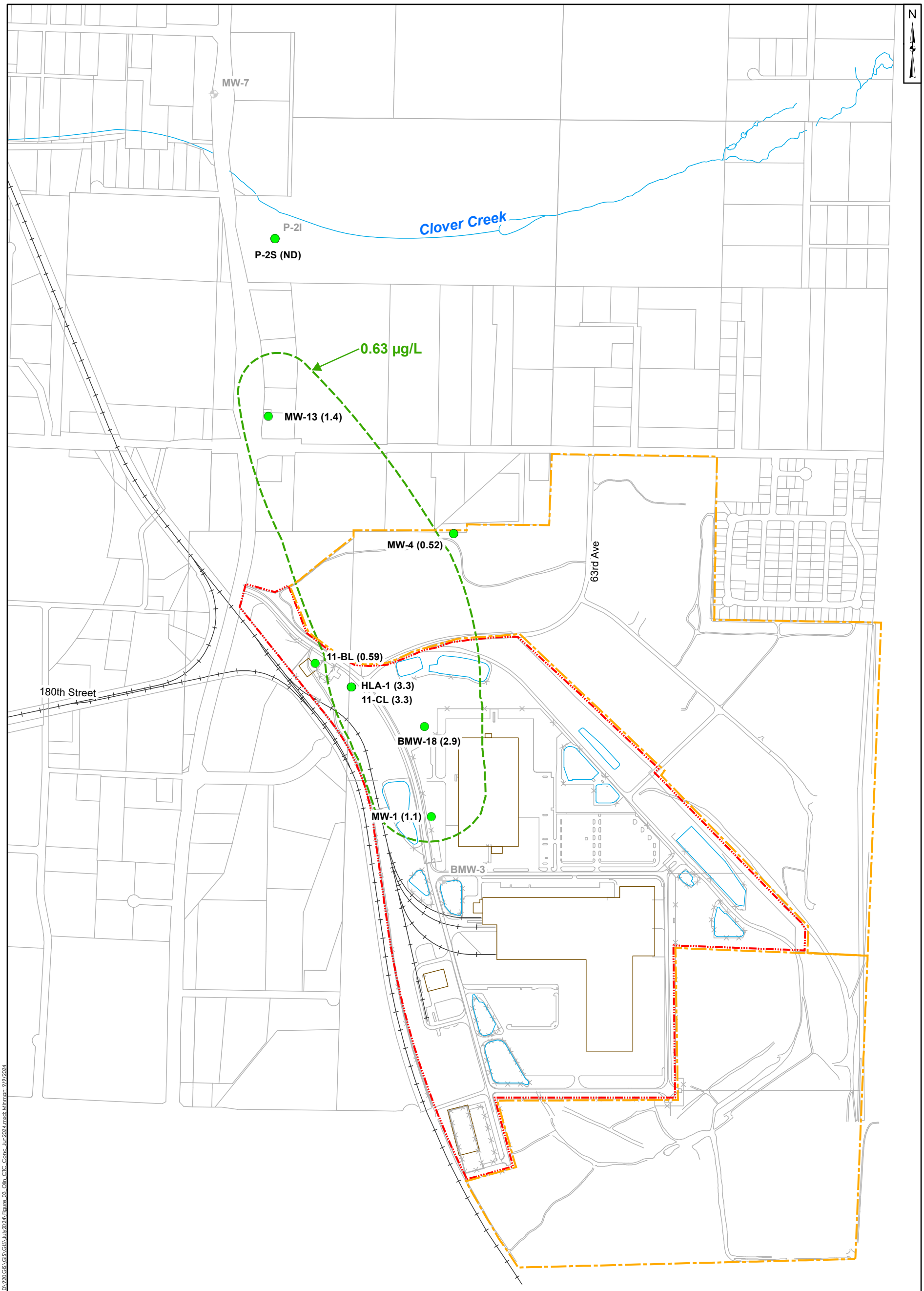
Figure **2**

P:\Projects\Olin Corporation\PNR0861 Brazier GW Frederickson WA\800 GIS and CAD\920 GIS\GIS\GIS\July2024\Figure 02_Olin_GW_Elev_Jun2024.mxd; MInmon; 9/9/2024



Legend

- Aquifer A Monitoring Well (CTC Concentration (µg/L))
- Monitoring Wells
- CTC Contour for June 2024 data set
- Boeing Property
- Panattoni Property

Notes:

1. (0.33 J) The results were above the Method Detection Limit (MDL), but below the Method Reporting Limit (MRL) and thus the values are estimated (i.e., J - flagged).

750 375 0 750 Feet

Aquifer A Carbon Tetrachloride Groundwater Results June 2024

Frederickson Industrial Park
Frederickson, WA

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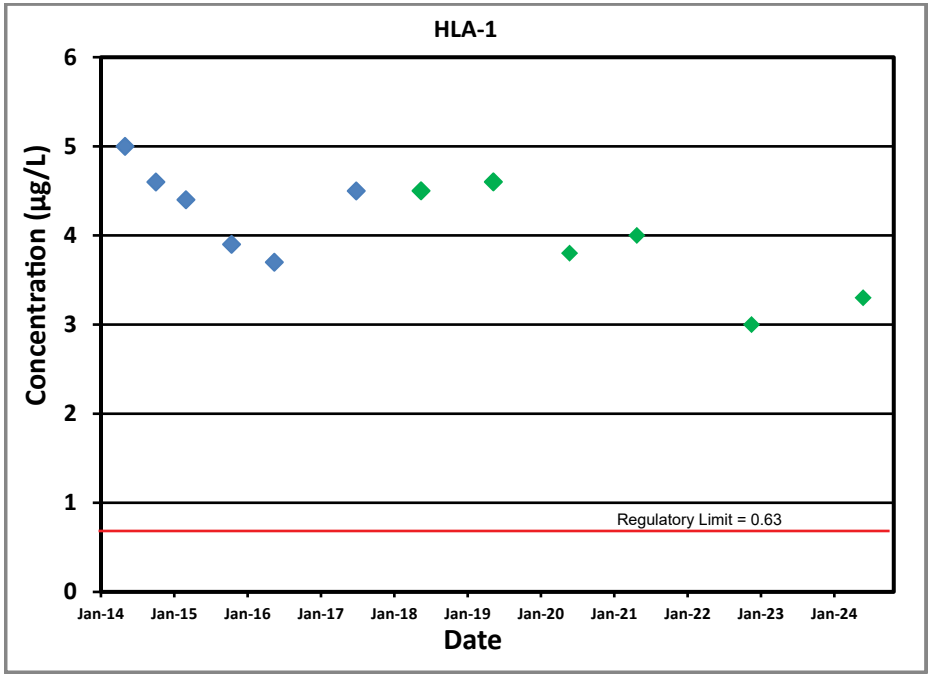
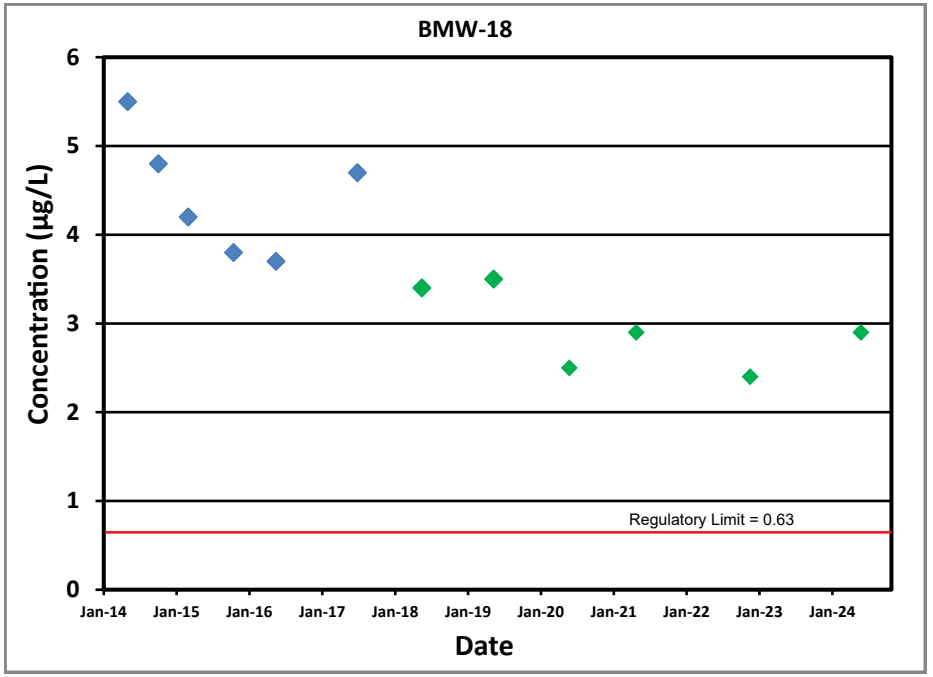
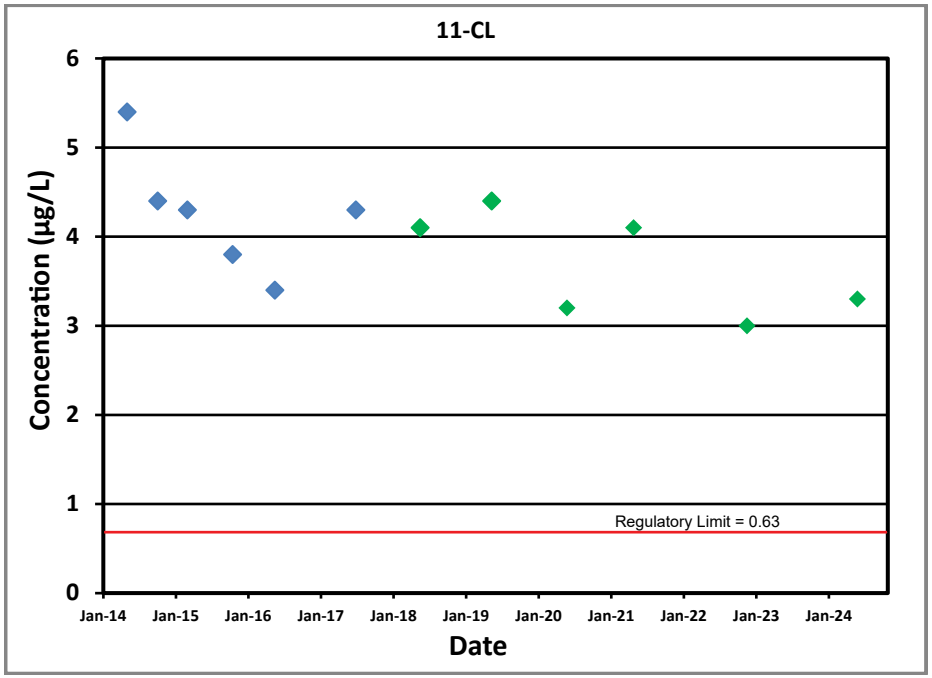
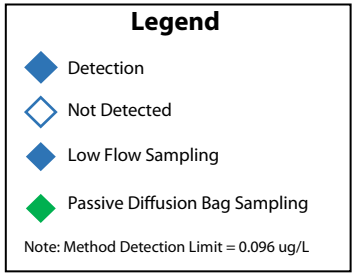
Figure 3

P:\Projects\Olin Corporation\PNR0861 Brotzler GW Frederickson WA\800 GIS and CAD\820 GIS\GIS\July2024\Figure_03_Olin_CTC_Conc_Jun2024.mxd; Mlmmon; 9/9/2024









Carbon Tetrachloride
Groundwater Monitoring Well Data
Frederickson Industrial Park, Frederickson, WA

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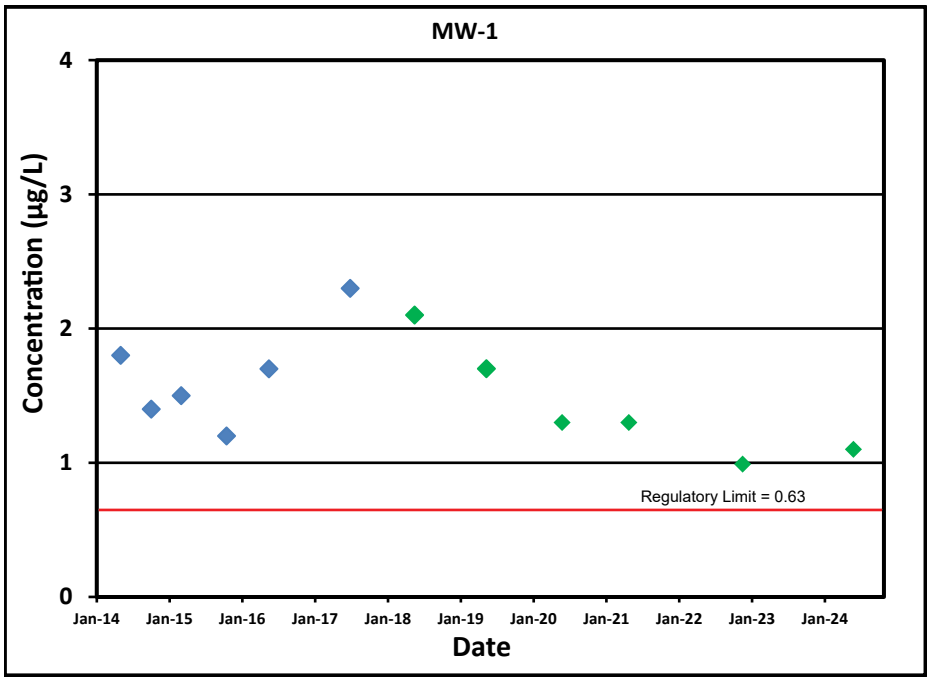
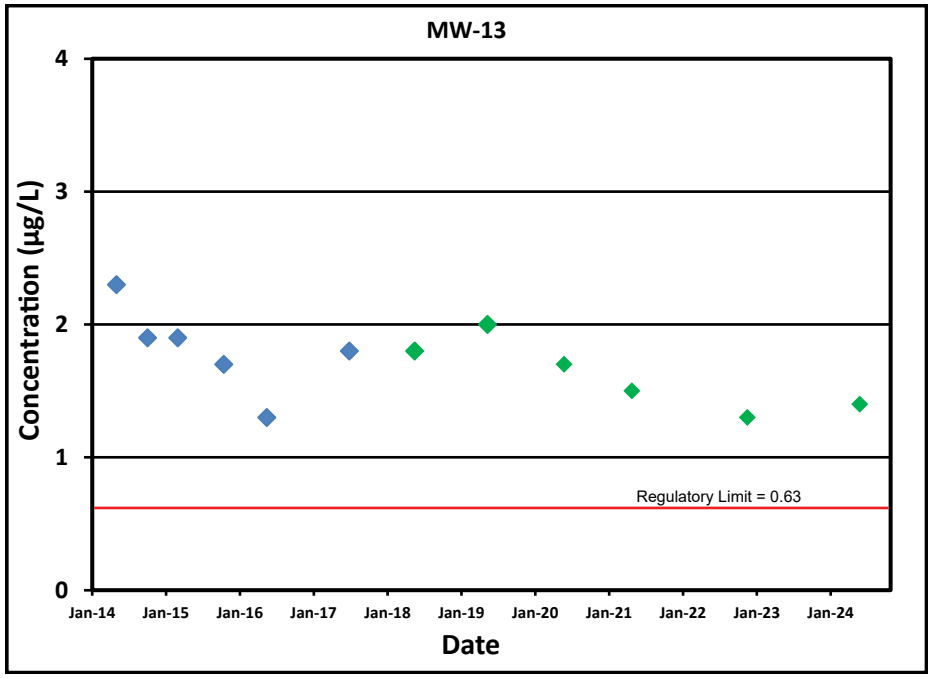
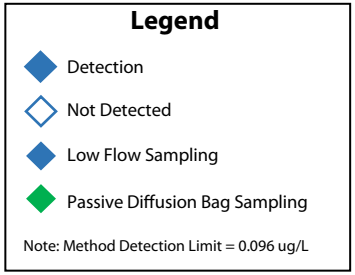
Figure **4a**





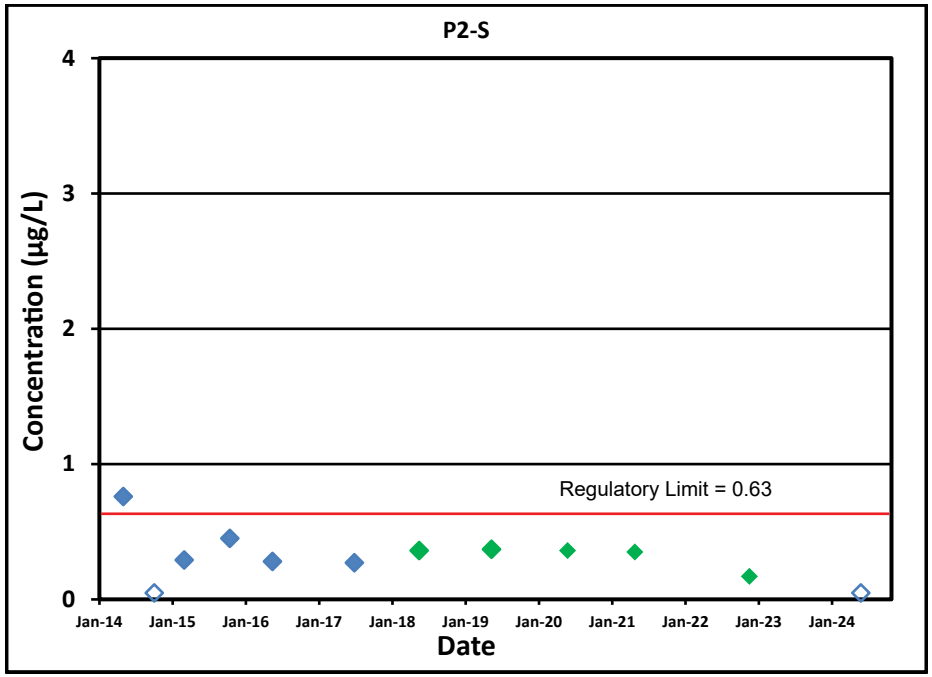


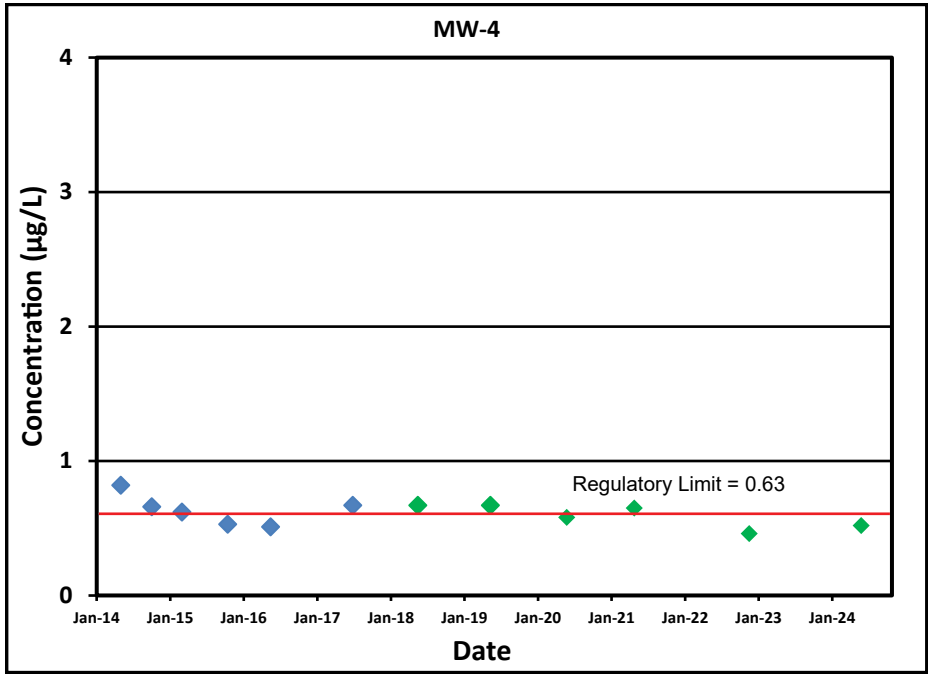
Carbon Tetrachloride
Groundwater Monitoring Well Data
Frederickson Industrial Park, Frederickson, WA

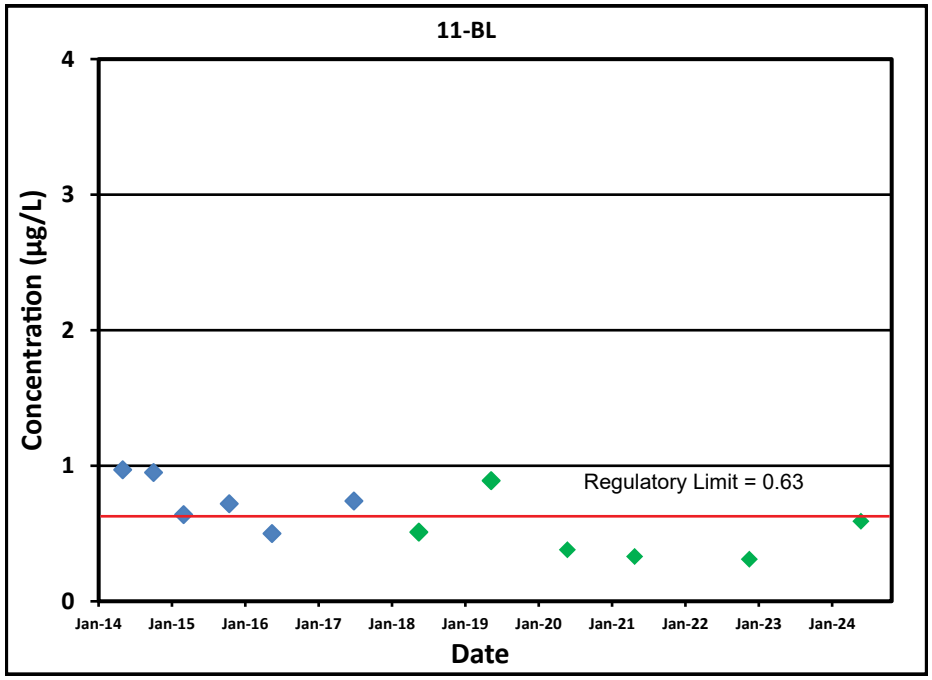
Geosyntec consultants

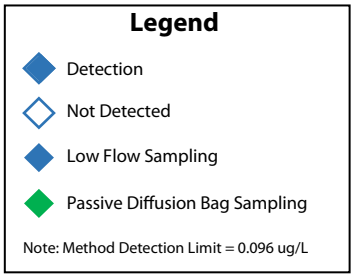
Seattle, WA | August 2024

Figure **4b**









Carbon Tetrachloride
Groundwater Monitoring Well Data
Frederickson Industrial Park, Frederickson, WA

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Figure **4c**

Attachment A

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

July 12, 2024

Analytical Report for Service Request No: K2406776

Dave Parkinson
Geosyntec Consultants
520 Pike Street, Suite 2600
Seattle, WA 98101

RE: Olin Frederickson / PNR0861

Dear Dave,

Enclosed are the results of the sample(s) submitted to our laboratory July 01, 2024
For your reference, these analyses have been assigned our service request number **K2406776.**

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 3350. You may also contact me via email at shari.endy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Shari Endy
Project Manager

ALS Environmental
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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.
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

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	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	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	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/EnvironmentalLabCertification/	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
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
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

Client: Geosyntec Consultants
Project: Olin Frederickson
Sample Matrix: Water

Service Request: K2406776
Date Received: 07/01/2024

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 III level requested by the client.

Sample Receipt:

Eleven water samples were received for analysis at ALS Environmental on 07/01/2024. 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.

Volatiles by GC/MS:

No significant anomalies were noted with this analysis.

Approved by Sydney A Wolf Date 07/12/2024

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

Laboratory 1317 South 13th Avenue, Kelso, WA 98626 USA | +1 360 577 7222

(If viewing electronically, this is a drop down list - click on the address above - a drop down arrow will appear to the right of the address)

Work Order No.: KZ406776

Project Manager:	Dave Parkinson			**Bill to:**	Dave Parkinson		
Client Name:	Geusytnec			**Company:**	Geosyntec		
Address:	520 Pike St, Sutie 2600			**Address:**	520 Pike St, Suite 2600		
City, State ZIP:	Seattle, WA 98101			**City, State ZIP:**	Seattle ,WA 98101		
Email:	DParkinson@geosyntec.com	**Phone:**	(206) 618-0350	**Email:**	DParkeinson@geosyntec.com	**PO#**	
Project Site:	18001 Canyon Rd E, Puyallup	**State:**	WA				
Project Name:	Olin Fredrickson						
Project Number:	PNR0861						
P.O. Number:							
Sampler's Name:							

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 10 Day
- [ ] 24 hours * 100%
- [ ] 48 hours* 80%
- [ ] 3 Day* 60%
- [ ] 5 day* 50%

* Please call for availability

Due Date:

Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID	No. of Containers	CTC (Carbon Tetrachloride)	Comments
GW-062824-MW-1	GW	6/28/24	0740		3	X	
GW-062824-MW-4			0930		3	X	
GW-062824-MW-13			0950		3	X	
GW-062824-11-BL			0750		3	X	
GW-062824-11-CL			0810		3	X	
GW-062824-BMW-18			0845		9	X	MS/MSD
GW-062824-HLA-1			0825		3	X	
GW-062824-PZ-5			1020		3	X	
GW-062824-DUP			—		3	X	
PDB-BLANK			1025		3	X	
GW-062824-TB			0800		2	X	

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, Tl, V, Zn, Zr
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, Tl, V, Zn, Zr

Additional Methods Available Upon Request

RELINQUISHED BY			RECEIVED BY		
Print Name	Signature	Date/Time	Print Name	Signature	Date/Time
LEE BUZES		7/1/24 0942	Hayleigh Smith	Hayleigh Smith	7/1/24 0942

PM SE

Cooler Receipt and Preservation Form

Client GeoSyntec Service Request K24 06776

Received: 7/1/24 Opened: 7/1/24 By: VM Unloaded: 7/1/24 By: VM

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
	2.8	IR02					

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
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: _____

Volatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 07:40
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-MW-1	**Units:**	ug/L
Lab Code:	K2406776-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**1.1**	0.50	0.096	1	07/05/24 17:38	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	07/05/24 17:38	
Dibromofluoromethane	97	73 - 122	07/05/24 17:38	
Toluene-d8	106	65 - 144	07/05/24 17:38	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 09:30
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-MW-4	**Units:**	ug/L
Lab Code:	K2406776-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**0.52**	0.50	0.096	1	07/05/24 18:03	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 18:03	
Dibromofluoromethane	98	73 - 122	07/05/24 18:03	
Toluene-d8	104	65 - 144	07/05/24 18:03	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 09:50
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-MW-13	**Units:**	ug/L
Lab Code:	K2406776-003	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**1.4**	0.50	0.096	1	07/05/24 18:28	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	68 - 117	07/05/24 18:28	
Dibromofluoromethane	98	73 - 122	07/05/24 18:28	
Toluene-d8	104	65 - 144	07/05/24 18:28	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 07:50
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-11-BL	**Units:**	ug/L
Lab Code:	K2406776-004	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**0.59**	0.50	0.096	1	07/05/24 18:53	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 18:53	
Dibromofluoromethane	94	73 - 122	07/05/24 18:53	
Toluene-d8	105	65 - 144	07/05/24 18:53	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 08:10
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-11-CL	**Units:**	ug/L
Lab Code:	K2406776-005	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**3.3**	0.50	0.096	1	07/05/24 19:18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 19:18	
Dibromofluoromethane	96	73 - 122	07/05/24 19:18	
Toluene-d8	105	65 - 144	07/05/24 19:18	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 08:45
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-BMW-18	**Units:**	ug/L
Lab Code:	K2406776-006	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**2.9**	0.50	0.096	1	07/05/24 19:42	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 19:42	
Dibromofluoromethane	98	73 - 122	07/05/24 19:42	
Toluene-d8	105	65 - 144	07/05/24 19:42	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 08:25
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-HLA-1	**Units:**	ug/L
Lab Code:	K2406776-007	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**3.3**	0.50	0.096	1	07/05/24 20:07	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 20:07	
Dibromofluoromethane	99	73 - 122	07/05/24 20:07	
Toluene-d8	108	65 - 144	07/05/24 20:07	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 10:20
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-P2-S	**Units:**	ug/L
Lab Code:	K2406776-008	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	ND U	0.50	0.096	1	07/05/24 20:32	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	68 - 117	07/05/24 20:32	
Dibromofluoromethane	99	73 - 122	07/05/24 20:32	
Toluene-d8	105	65 - 144	07/05/24 20:32	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-DUP	**Units:**	ug/L
Lab Code:	K2406776-009	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	**1.4**	0.50	0.096	1	07/05/24 20:57	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	07/05/24 20:57	
Dibromofluoromethane	96	73 - 122	07/05/24 20:57	
Toluene-d8	103	65 - 144	07/05/24 20:57	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 10:25
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	PDB-BLANK	**Units:**	ug/L
Lab Code:	K2406776-010	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	ND U	0.50	0.096	1	07/05/24 21:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	07/05/24 21:21	
Dibromofluoromethane	97	73 - 122	07/05/24 21:21	
Toluene-d8	105	65 - 144	07/05/24 21:21	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24 08:00
Sample Matrix:	Water	**Date Received:**	07/01/24 09:42
Sample Name:	GW-062824-TB	**Units:**	ug/L
Lab Code:	K2406776-011	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	ND U	0.50	0.096	1	07/05/24 21:46	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	07/05/24 21:46	
Dibromofluoromethane	97	73 - 122	07/05/24 21:46	
Toluene-d8	103	65 - 144	07/05/24 21:46	

Analytical Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2410573-05	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Carbon Tetrachloride	ND U	0.50	0.096	1	07/05/24 13:55	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	68 - 117	07/05/24 13:55	
Dibromofluoromethane	96	73 - 122	07/05/24 13:55	
Toluene-d8	104	65 - 144	07/05/24 13:55	

Client: Geosyntec Consultants **Service Request:** K2406776
Project: Olin Frederickson/PNR0861
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: None

Sample Name	Lab Code	4-Bromofluorobenzene 68 - 117	Dibromofluoromethane 73 - 122	Toluene-d8 65 - 144
GW-062824-MW-1	K2406776-001	98	97	106
GW-062824-MW-4	K2406776-002	100	98	104
GW-062824-MW-13	K2406776-003	97	98	104
GW-062824-11-BL	K2406776-004	100	94	105
GW-062824-11-CL	K2406776-005	100	96	105
GW-062824-BMW-18	K2406776-006	100	98	105
GW-062824-HLA-1	K2406776-007	100	99	108
GW-062824-P2-S	K2406776-008	102	99	105
GW-062824-DUP	K2406776-009	98	96	103
PDB-BLANK	K2406776-010	98	97	105
GW-062824-TB	K2406776-011	100	97	103
Lab Control Sample	KQ2410573-03	99	100	105
Duplicate Lab Control Sample	KQ2410573-04	99	100	107
Method Blank	KQ2410573-05	95	96	104
GW-062824-BMW-18 MS	KQ2410573-06	99	102	106
GW-062824-BMW-18 DMS	KQ2410573-07	99	100	106

QA/QC Report

Client: Geosyntec Consultants **Service Request:**K2406776
Project: Olin Frederickson/PNR0861 **Date Analyzed:**07/05/24 10:55

Internal Standard Area and RT SUMMARY
Volatile Organic Compounds by GC/MS

File ID: J:\MS18\DATA\070524\0705F004.D\ **Lab Code:**KQ2410573-02
Instrument ID: K-MS-18 **Analysis Lot:**846473
Analysis Method: 8260C **Signal ID:**1

		Chlorobenzene-d5		1,4-Dichlorobenzene-d4		Fluorobenzene	
		Area	**RT**	**Area**	**RT**	**Area**	**RT**
	Result ==>	105,742	9.43	85,360	11.84	258,115	6.04
	Upper Limit ==>	211,484	9.93	170,720	12.34	516,230	6.54
	Lower Limit ==>	52,871	8.93	42,680	11.34	129,058	5.54
Associated Analyses							
Lab Control Sample	KQ2410573-03	108911	9.43	89108	11.84	264461	6.04
Duplicate Lab Control Sample	KQ2410573-04	107706	9.43	88873	11.85	260479	6.04
GW-062824-BMW-18MS	KQ2410573-06	106192	9.43	85615	11.84	257155	6.04
GW-062824-BMW-18DMS	KQ2410573-07	105096	9.43	84820	11.84	255101	6.04
Method Blank	KQ2410573-05	104113	9.43	83063	11.84	252463	6.04
GW-062824-MW-1	K2406776-001	101013	9.43	80272	11.84	246307	6.04
GW-062824-MW-4	K2406776-002	99861	9.43	82715	11.84	248742	6.04
GW-062824-MW-13	K2406776-003	101563	9.43	81752	11.84	249822	6.04
GW-062824-11-BL	K2406776-004	99411	9.43	81626	11.84	247195	6.04
GW-062824-11-CL	K2406776-005	99283	9.43	80508	11.84	243100	6.04
GW-062824-BMW-18	K2406776-006	101313	9.43	83274	11.85	245990	6.04
GW-062824-HLA-1	K2406776-007	99853	9.43	81528	11.85	237729	6.04
GW-062824-P2-S	K2406776-008	99821	9.43	81819	11.85	244435	6.04
GW-062824-DUP	K2406776-009	101156	9.43	81039	11.85	250678	6.04
PDB-BLANK	K2406776-010	101290	9.43	80155	11.85	247886	6.04
GW-062824-TB	K2406776-011	98673	9.43	80400	11.84	243426	6.04

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Collected:**	06/28/24
Sample Matrix:	Water	**Date Received:**	07/01/24
		Date Analyzed:	07/5/24
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Volatile Organic Compounds by GC/MS

Sample Name:	GW-062824-BMW-18	**Units:**	ug/L
Lab Code:	K2406776-006	**Basis:**	NA
Analysis Method:	8260C		
Prep Method:	None		

		Matrix Spike KQ2410573-06			Duplicate Matrix Spike KQ2410573-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon Tetrachloride	2.9	13.5	10.0	107	13.1	10.0	102	53-161	3	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.
dba ALS Environmental

QA/QC Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Analyzed:**	07/05/24
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Units:**	ug/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	846473

	Lab Control Sample KQ2410573-03			Duplicate Lab Control Sample KQ2410573-04					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon Tetrachloride	9.46	10.0	95	9.40	10.0	94	55-140	<1	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Analyzed:**	07/05/24 13:55
Sample Matrix:	Water	**Date Extracted:**	

Method Blank Summary
Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KQ2410573-05
Instrument ID: K-MS-18
File ID: J:\MS18\DATA\070524\0705F011.D\

Analysis Method: 8260C
Prep Method: None
Analysis Lot: 846473

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ2410573-03	J:\MS18\DATA\070524\0705F005.D\	07/05/24 11:27
Duplicate Lab Control Sample	KQ2410573-04	J:\MS18\DATA\070524\0705F006.D\	07/05/24 11:51
GW-062824-BMW-18MS	KQ2410573-06	J:\MS18\DATA\070524\0705F007.D\	07/05/24 12:16
GW-062824-BMW-18DMS	KQ2410573-07	J:\MS18\DATA\070524\0705F008.D\	07/05/24 12:41
GW-062824-MW-1	K2406776-001	J:\MS18\DATA\070524\0705F020.D\	07/05/24 17:38
GW-062824-MW-4	K2406776-002	J:\MS18\DATA\070524\0705F021.D\	07/05/24 18:03
GW-062824-MW-13	K2406776-003	J:\MS18\DATA\070524\0705F022.D\	07/05/24 18:28
GW-062824-11-BL	K2406776-004	J:\MS18\DATA\070524\0705F023.D\	07/05/24 18:53
GW-062824-11-CL	K2406776-005	J:\MS18\DATA\070524\0705F024.D\	07/05/24 19:18
GW-062824-BMW-18	K2406776-006	J:\MS18\DATA\070524\0705F025.D\	07/05/24 19:42
GW-062824-HLA-1	K2406776-007	J:\MS18\DATA\070524\0705F026.D\	07/05/24 20:07
GW-062824-P2-S	K2406776-008	J:\MS18\DATA\070524\0705F027.D\	07/05/24 20:32
GW-062824-DUP	K2406776-009	J:\MS18\DATA\070524\0705F028.D\	07/05/24 20:57
PDB-BLANK	K2406776-010	J:\MS18\DATA\070524\0705F029.D\	07/05/24 21:21
GW-062824-TB	K2406776-011	J:\MS18\DATA\070524\0705F030.D\	07/05/24 21:46

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Analyzed:**	07/05/24 11:27
Sample Matrix:	Water	**Date Extracted:**	

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Sample Name:	Lab Control Sample	**Instrument ID:**	K-MS-18
Lab Code:	KQ2410573-03	**File ID:**	J:\MS18\DATA\070524\0705F005.D\
Analysis Method:	8260C	**Analysis Lot:**	846473
Prep Method:	None		

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Duplicate Lab Control Sample	KQ2410573-04	J:\MS18\DATA\070524\0705F006.D\	07/05/24 11:51
GW-062824-BMW-18MS	KQ2410573-06	J:\MS18\DATA\070524\0705F007.D\	07/05/24 12:16
GW-062824-BMW-18DMS	KQ2410573-07	J:\MS18\DATA\070524\0705F008.D\	07/05/24 12:41
Method Blank	KQ2410573-05	J:\MS18\DATA\070524\0705F011.D\	07/05/24 13:55
GW-062824-MW-1	K2406776-001	J:\MS18\DATA\070524\0705F020.D\	07/05/24 17:38
GW-062824-MW-4	K2406776-002	J:\MS18\DATA\070524\0705F021.D\	07/05/24 18:03
GW-062824-MW-13	K2406776-003	J:\MS18\DATA\070524\0705F022.D\	07/05/24 18:28
GW-062824-11-BL	K2406776-004	J:\MS18\DATA\070524\0705F023.D\	07/05/24 18:53
GW-062824-11-CL	K2406776-005	J:\MS18\DATA\070524\0705F024.D\	07/05/24 19:18
GW-062824-BMW-18	K2406776-006	J:\MS18\DATA\070524\0705F025.D\	07/05/24 19:42
GW-062824-HLA-1	K2406776-007	J:\MS18\DATA\070524\0705F026.D\	07/05/24 20:07
GW-062824-P2-S	K2406776-008	J:\MS18\DATA\070524\0705F027.D\	07/05/24 20:32
GW-062824-DUP	K2406776-009	J:\MS18\DATA\070524\0705F028.D\	07/05/24 20:57
PDB-BLANK	K2406776-010	J:\MS18\DATA\070524\0705F029.D\	07/05/24 21:21
GW-062824-TB	K2406776-011	J:\MS18\DATA\070524\0705F030.D\	07/05/24 21:46

Client: Geosyntec Consultants **Service Request:**K2406776
Project: Olin Frederickson/PNR0861 **Date Analyzed:**07/05/24 10:25

Tune Summary
Volatile Organic Compounds by GC/MS

File ID: J:\MS18\DATA\070524\0705F003.D\ **Analytical Method:** 8260C
Instrument ID: K-MS-18 **Analysis Lot:** 846473

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	19.5	4545	Pass
75	95	30	60	50.3	11720	Pass
95	95	100	100	100.0	23301	Pass
96	95	5	9	7.8	1816	Pass
173	174	0	2	0.9	168	Pass
174	95	50	120	76.5	17832	Pass
175	174	5	9	7.3	1303	Pass
176	174	95	101	98.7	17593	Pass
177	176	5	9	6.7	1178	Pass

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ2410573-02	J:\MS18\DATA\070524\0705F004.D\	07/05/24 10:55	
Lab Control Sample	KQ2410573-03	J:\MS18\DATA\070524\0705F005.D\	07/05/24 11:27	
Duplicate Lab Control Sample	KQ2410573-04	J:\MS18\DATA\070524\0705F006.D\	07/05/24 11:51	
GW-062824-BMW-18	KQ2410573-06	J:\MS18\DATA\070524\0705F007.D\	07/05/24 12:16	
GW-062824-BMW-18	KQ2410573-07	J:\MS18\DATA\070524\0705F008.D\	07/05/24 12:41	
Method Blank	KQ2410573-05	J:\MS18\DATA\070524\0705F011.D\	07/05/24 13:55	
GW-062824-MW-1	K2406776-001	J:\MS18\DATA\070524\0705F020.D\	07/05/24 17:38	
GW-062824-MW-4	K2406776-002	J:\MS18\DATA\070524\0705F021.D\	07/05/24 18:03	
GW-062824-MW-13	K2406776-003	J:\MS18\DATA\070524\0705F022.D\	07/05/24 18:28	
GW-062824-11-BL	K2406776-004	J:\MS18\DATA\070524\0705F023.D\	07/05/24 18:53	
GW-062824-11-CL	K2406776-005	J:\MS18\DATA\070524\0705F024.D\	07/05/24 19:18	
GW-062824-BMW-18	K2406776-006	J:\MS18\DATA\070524\0705F025.D\	07/05/24 19:42	
GW-062824-HLA-1	K2406776-007	J:\MS18\DATA\070524\0705F026.D\	07/05/24 20:07	
GW-062824-P2-S	K2406776-008	J:\MS18\DATA\070524\0705F027.D\	07/05/24 20:32	
GW-062824-DUP	K2406776-009	J:\MS18\DATA\070524\0705F028.D\	07/05/24 20:57	
PDB-BLANK	K2406776-010	J:\MS18\DATA\070524\0705F029.D\	07/05/24 21:21	
GW-062824-TB	K2406776-011	J:\MS18\DATA\070524\0705F030.D\	07/05/24 21:46	

Client: Geosyntec Consultants **Service Request:** K2406776
Project: Olin Frederickson **Calibration Date:** 5/10/2024

Initial Calibration Summary
Volatile Organic Compounds by GC/MS

Calibration ID: KC2400236 **Signal ID:** 1
Instrument ID: K-MS-18

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC2400236-01	ICAL 0.1 PPB	J:\MS18\DATA\051024_ICAL\0510F009.D	05/10/2024 16:27
02	KC2400236-02	ICAL 0.2 PPB	J:\MS18\DATA\051024_ICAL\0510F010.D	05/10/2024 16:52
03	KC2400236-03	ICAL 0.5 PPB	J:\MS18\DATA\051024_ICAL\0510F011.D	05/10/2024 17:17
04	KC2400236-04	ICAL 1.0 PPB	J:\MS18\DATA\051024_ICAL\0510F012.D	05/10/2024 17:42
05	KC2400236-05	ICAL 2.0 PPB	J:\MS18\DATA\051024_ICAL\0510F013.D	05/10/2024 18:07
06	KC2400236-06	ICAL 5.0 PPB	J:\MS18\DATA\051024_ICAL\0510F014.D	05/10/2024 18:32
07	KC2400236-07	ICAL 10 PPB	J:\MS18\DATA\051024_ICAL\0510F015.D	05/10/2024 18:57
08	KC2400236-08	ICAL 20 PPB	J:\MS18\DATA\051024_ICAL\0510F016.D	05/10/2024 19:22
09	KC2400236-09	ICAL 40 PPB	J:\MS18\DATA\051024_ICAL\0510F017.D	05/10/2024 19:47
10	KC2400236-10	ICAL 60 PPB	J:\MS18\DATA\051024_ICAL\0510F018.D	05/10/2024 20:12
11	KC2400236-11	ICAL 80 PPB	J:\MS18\DATA\051024_ICAL\0510F019.D	05/10/2024 20:36

Analyte

4-Bromofluorobenzene

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
04	4.000	0.8299	05	6.000	0.738	06	8.000	0.8374	07	10.000	0.7795
08	12.000	0.8019	09	14.000	0.8535	10	16.000	0.8488	11	20.000	0.8158

Carbon Tetrachloride

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	0.200	0.4008	03	0.500	0.3949	04	1.000	0.3912	05	2.000	0.4032
06	5.000	0.4133	07	10.000	0.3887	08	20.000	0.339	09	40.000	0.3772
10	60.000	0.3979	11	80.000	0.404						

Dibromofluoromethane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
04	4.000	0.2403	05	6.000	0.2044	06	8.000	0.2396	07	10.000	0.2198
08	12.000	0.2292	09	14.000	0.2338	10	16.000	0.2412	11	20.000	0.2356

Toluene-d8

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
04	4.000	0.9746	05	6.000	0.8327	06	8.000	1.014	07	10.000	0.8905
08	12.000	0.9332	09	14.000	0.9652	10	16.000	1	11	20.000	0.974

Client: Geosyntec Consultants
Project: Olin Frederickson

Service Request: K2406776
Calibration Date: 5/10/2024

Initial Calibration Summary
Volatile Organic Compounds by GC/MS

Calibration ID: KC2400236
Instrument ID: K-MS-18

Signal ID: 1

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
4-Bromofluorobenzene	SURR	Average RF	% RSD	4.8	≤20	0.8131	0.01
Carbon Tetrachloride	TRG	Average RF	% RSD	5.3	≤20	0.391	0.100
Dibromofluoromethane	SURR	Average RF	% RSD	5.5	≤20	0.2305	0.01
Toluene-d8	SURR	Average RF	% RSD	6.4	≤20	0.9481	0.01

Client: Geosyntec Consultants **Service Request:** K2406776
Project: Olin Frederickson **Calibration Date:** 5/10/2024

Initial Calibration Verification Summary
Volatile Organic Compounds by GC/MS

Calibration ID: KC2400236 **Signal ID:** 1
Instrument ID: K-MS-18

#	Lab Code	Sample Name	File Location	Acquisition Date
12	KC2400236-12	ICV	J:\MS18\DATA\051024_ICAL\0510F025.D	05/10/2024 23:06
13	KC2400236-13	ICV	J:\MS18\DATA\051024_ICAL\0510F026.D	05/10/2024 23:31
14	KC2400236-14	ICV ACRO/112TRI	J:\MS18\DATA\051024_ICAL\0510F031.D	05/13/2024 14:38

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Carbon Tetrachloride	10.0	9.80	3.91E-1	3.831E-1	-2.025	±30	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
4-Bromofluorobenzene	10.0	9.07	8.131E-1	7.376E-1	-9.283	±30	Average RF
Dibromofluoromethane	10.0	9.08	2.305E-1	2.092E-1	-9.230	±30	Average RF
Toluene-d8	10.0	8.91	9.481E-1	8.447E-1	-10.901	±30	Average RF

Client:	Geosyntec Consultants	**Service Request:**	K2406776
Project:	Olin Frederickson/PNR0861	**Date Analyzed:**	07/05/24 10:55

Continuing Calibration Verification (CCV) Summary
Volatile Organic Compounds by GC/MS

Analysis Method:	8260C	**Calibration Date:**	5/10/2024
File ID:	J:\MS18\DATA\070524\0705F004.D\	**Calibration ID:**	KC2400236
Signal ID:	1	**Analysis Lot:**	846473
		Units:	ppb

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Carbon Tetrachloride	10.0	10.4	0.391	0.406	3.8	NA	±20	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
4-Bromofluorobenzene	10.0	9.73	0.8131	0.7913	-2.7	NA	±20	Average RF
Dibromofluoromethane	10.0	10.1	0.2305	0.2317	0.5	NA	±20	Average RF
Toluene-d8	10.0	10.6	0.9481	1.0064	6.2	NA	±20	Average RF

Client: Geosyntec Consultants **Service Request:**K2406776
Project: Olin Frederickson/PNR0861

Analysis Run Log
Volatile Organic Compounds by GC/MS

Analysis Method: **Analysis Lot:**846473
Instrument ID:K-MS-18

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS18\DATA\070524\0705F003.D\	ZZZZZZZ	ZZZZZZZ	7/5/2024	10:25:00	
J:\MS18\DATA\070524\0705F004.D\	Continuing Calibration Verification	KQ2410573-02	7/5/2024	10:55:00	
J:\MS18\DATA\070524\0705F005.D\	Lab Control Sample	KQ2410573-03	7/5/2024	11:27:00	
J:\MS18\DATA\070524\0705F006.D\	Duplicate Lab Control Sample	KQ2410573-04	7/5/2024	11:51:00	
J:\MS18\DATA\070524\0705F007.D\	GW-062824-BMW-18 MS	KQ2410573-06	7/5/2024	12:16:00	
J:\MS18\DATA\070524\0705F008.D\	GW-062824-BMW-18 DMS	KQ2410573-07	7/5/2024	12:41:00	
J:\MS18\DATA\070524\0705F011.D\	Method Blank	KQ2410573-05	7/5/2024	13:55:00	
J:\MS18\DATA\070524\0705F020.D\	GW-062824-MW-1	K2406776-001	7/5/2024	17:38:00	
J:\MS18\DATA\070524\0705F021.D\	GW-062824-MW-4	K2406776-002	7/5/2024	18:03:00	
J:\MS18\DATA\070524\0705F022.D\	GW-062824-MW-13	K2406776-003	7/5/2024	18:28:00	
J:\MS18\DATA\070524\0705F023.D\	GW-062824-11-BL	K2406776-004	7/5/2024	18:53:00	
J:\MS18\DATA\070524\0705F024.D\	GW-062824-11-CL	K2406776-005	7/5/2024	19:18:00	
J:\MS18\DATA\070524\0705F025.D\	GW-062824-BMW-18	K2406776-006	7/5/2024	19:42:00	
J:\MS18\DATA\070524\0705F026.D\	GW-062824-HLA-1	K2406776-007	7/5/2024	20:07:00	
J:\MS18\DATA\070524\0705F027.D\	GW-062824-P2-S	K2406776-008	7/5/2024	20:32:00	
J:\MS18\DATA\070524\0705F028.D\	GW-062824-DUP	K2406776-009	7/5/2024	20:57:00	
J:\MS18\DATA\070524\0705F029.D\	PDB-BLANK	K2406776-010	7/5/2024	21:21:00	
J:\MS18\DATA\070524\0705F030.D\	GW-062824-TB	K2406776-011	7/5/2024	21:46:00	