Remediation Management Services Company

4 Centerpointe Drive, Suite 200
La Palma, CA 90623
Room LPR 4-222
Office: (360) 594-7978
wade.melton@bp.com

February 11, 2022

Washington Department of Ecology
Southwest Regional Office
Attn: Mr. Tim Mullin
300 Desmond Drive SE
Lacey, WA 98503

Dear Mr. Mullin:

Please find the enclosed Semi-Annual Status Report - Second Half of 2021, that documents the results at Olympic Pipe Line Company LLC, Tacoma Junction located at 2660 Frank Albert Road East, Fife, Washington.

Sincerely yours,

Wade Melton
Operations Project Manager
Remediation Management Services Company
An affiliate of Atlantic Richfield Company

cc: File, Antea Group

Semi-Annual Status Report Second Half of 2021

OPLC Tacoma Junction
2660 Frank Albert Road East, Fife, Washington

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED FOR
Remediation Management Services Company
An affiliate of Atlantic Richfield Company
4 Centerpointe Drive, Suite 200
La Palma, CA 90623
and
BP Pipelines and Logistics
Olympic District
600 SW 39th Street, Suite 275
Renton, WA 98057

PREPARED BY
Antea Group - Seattle, WA
February 11, 2022
Project # WATJUAA211

us.anteagroup.com

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Semi-Annual Status Report

Second Half of 2021
OPLC Tacoma Junction
2660 Frank Albert Road East, Fife, Washington

Reporting Period	July 2021 – December 2021
Agency Contact	Tim Mullin, Toxics Cleanup Program +1 360 407 6265
Ecology Facility Site ID No.	24529
RM Contact	Wade Melton, +1 360 594 7978
Olympic Contact	Paula Skryja, +1 425 469 4043
Antea®Group Contact	Megan Richard, +1 206 854 0399

1.0 SITE HISTORY

- This site is an active OPLC (Olympic Pipeline Company) facility that has been operating since 1965. A Site Location Map and Site Map are presented as Figures 1 and 2, respectively.
- In August 2015, OPLC personnel directed an excavation associated with a facility upgrade project. While excavating, OPLC personnel noted petroleum odors and soil staining. Soil and water samples indicated concentrations of petroleum hydrocarbons in excess of the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A Cleanup Levels. Upon completing the planned excavation, over-excavating was performed to remove contaminated soil to the maximum extent without comprising onsite structures. A total of 302.49 tons of petroleum impacted soil was removed from the Site for disposal. A total of 1,200 gallons of water was removed from the excavation and transported off-site for disposal. Additional information regarding soil excavation and sampling activities can be found in Antea Group's October 12, 2015 *Site Discovery and Independent Remedial Action Report*.
- The Site was listed on *Ecology's Confirmed and Suspected Contaminated Sites List* on October 15, 2015.
- In June 2016, monitoring wells MW-1 through MW-5 were installed at the Site. Due to the presence of quarry spalls down to groundwater, only one soil sample was collected during well installation. Groundwater analytical results indicated the presence of total petroleum hydrocarbons as gasoline (TPH-G), total petroleum hydrocarbons as diesel (TPH-D), and benzene in MW- 2 in excess of Ecology's MTCA Method A Cleanup Levels at concentrations of 2,300 µg/L, 810 µg/L, and 100 µg/L, respectively. Additional information can be found in Antea Group's November 17, 2016 *Subsurface Investigation Report.*

2.0 WORK PERFORMED DURING THE REPORTING PERIOD

- Quarterly groundwater monitoring and sampling events were conducted on August 4, 2021 and November 17, 2021. Groundwater samples were collected from monitoring wells MW-1 through MW-5.
- This semi-annual groundwater monitoring report was prepared.

3.0 PROJECT STATUS

- Quarterly groundwater sample collection from MW-1 through MW-5.
- Semi-annual reporting.

4.0 DATA REVIEW AND RECOMMENDATIONS

- Groundwater analytical data from the third and fourth quarter sampling events did not indicate concentrations of petroleum hydrocarbons in excess of MTCA Method A Cleanup Levels in monitoring wells MW-1 and MW-3 through MW-5. MW-2 had concentrations of benzene, TPH-G, and TPH-D in excess of MTCA Method A Cleanup Levels in the third quarter sampling event. In the fourth quarter sampling event, MW-2 had concentrations of benzene and TPH-G in excess of MTCA Method A Cleanup Levels. During the fourth quarter sampling event, the reporting limits for TPH-D and TPH-O were elevated for samples collected from MW-2 and MW-5 due to laboratory dilution, which was done due to the dark color of the samples.
- Groundwater gauging data and analytical data are presented in Tables 1 and 2, respectively. The third and fourth quarter Groundwater Elevation Contour Maps are presented on Figures 3 and 4, respectively. The Groundwater Analytical Data Map is presented on Figure 5. The groundwater laboratory analytical reports are included as Appendix A.
- Antea Group is scheduled to conduct the next quarterly groundwater sampling and monitoring event in January 2022.

5.0 REMARKS

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Nathan Han
Staff Professional

Date: February 11, 2022

Reviewed by:

State of Washington 3157 Licensed Geologist MEGAN RICHARD

Megan Richard, LG
Senior Project Manager

Date: February 11, 2022

cc: Mr. Tim Mullin, Department of Ecology Southwest Regional Office (Hardcopy, Electronic Copy)
Ms. Paula Skryja, OPLC, Renton, WA (Electronic Copy)
Mr. Wade Melton, Remediation Management Services Company (Electronic Copy - RMO Upload)
File, Antea Group File, Antea Group

6.0 CONTACT INFORMATION

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Tables

Table 1
Groundwater Gauging Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-1	6/29/2016	100.00	1.82	NP	--	98.18	--
MW-1	8/4/2021	100.00	1.79	NP	--	98.21	--
MW-1	11/17/2021	100.00	0.60	NP	--	99.40	--
MW-2	8/4/2021	99.59	2.45	NP	--	97.14	--
MW-2	11/17/2021	99.59	0.90	NP	--	98.69	--
MW-3	8/4/2021	99.91	1.80	NP	--	98.11	--
MW-3	11/17/2021	99.91	0.91	NP	--	99.00	--
MW-4	8/4/2021	99.70	2.05	NP	--	97.65	--
MW-4	11/17/2021	99.70	0.84	NP	--	98.86	--
MW-5	8/4/2021	99.60	1.48	NP	--	98.12	--
MW-5	11/17/2021	99.60	0.60	NP	--	99.00	--

Notes:
TOC - Top of Casing
ft - feet
NP - No Product
LNAPL - Light Non-Aqueous Phase Liquid
* - Corrected for LNAPL if present (assumes LNAPL specific gravity = 0.75)
-- No Information Available
NG - Not Gauged
DL - Depth to water was <0.5 feet below TOC
New edits - NH 2/3/22

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

CONSTITUENT		B	T	E	X	TPH-G	TPH-D	TPH-O
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Well ID	**Date**							
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**1000/800***	**500**	**500**
MW-1	6/29/2016	< 20	< 20	< 30	< 30	< 50	160	< 250
MW-1	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	150	< 250
MW-1	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	120	< 250
MW-1	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-1	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	< 100	< 260
MW-1	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	140	330
MW-1	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 100	< 260
MW-1	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0 *	< 250	< 100	< 100
MW-1	8/1/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	180	< 350
MW-1	10/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	2/6/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	6/24/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	130	< 370
MW-1	9/23/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	140	< 350
MW-1	11/11/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	140	< 330
MW-1	2/10/2021	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 360
MW-1	5/6/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	270	< 340
MW-1	8/4/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	310	< 380
MW-1	11/17/2021	< 1.0	< 1.0 *1	< 1.0	< 2.0	< 250	< 110	< 350
MW-2	6/29/2016	**100**	6.9	56	92	**2,300**	**810**	< 250
MW-2	12/1/2016	**170**	8.7	280	250	**7,000**	**1,700**	< 260
MW-2	2/22/2017	**90**	< 20	120	110	**6,500**	**1,300**	< 250
MW-2	5/10/2017	**85**	6.4	220	150	**6,000**	**990**	< 250
MW-2	2/13/2018	**180**	8.3	130	150	**5,000**	**2,100**	< 350
MW-2	5/2/2018	**170 ***	6.3 *	130	110	**4,200**	**1,100**	< 360
MW-2	1/30/2019	**130**	7.2	74	94	**4,500**	**1,800**	< 350
MW-2	8/1/2019	**110**	6.2	25	43	**1,600**	**1,000**	< 350

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

CONSTITUENT UNIT		B ug/L	T ug/L	E ug/L	X ug/L	TPH-G ug/L	TPH-D ug/L	TPH-O ug/L
Well ID	**Date**							
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**1000/800***	**500**	**500**
MW-2	10/30/2019	**140**	6.1	62	51	**3,400**	**2,000**	< 350
MW-2	2/6/2020	**120**	5.4	44	35	**2,300**	**930**	< 360
MW-2	6/24/2020	**13**	< 2.0	9.5	3.0	750	**590**	< 350
MW-2	9/23/2020	**15**	< 2.0	19	10	**1,100**	**590**	< 350
MW-2	11/11/2020	**99**	6.2	31	44	**1,500**	**970**	< 340
MW-2	2/10/2021	**47**	3.5	33	17	**1,700**	**670**	< 350
MW-2	5/6/2021	**35**	3.0	17	12	**1,700**	**670**	< 360
MW-2	8/4/2021	**39**	< 10	30	< 20	**1,800**	**830**	410
MW-2	11/17/2021	**330**	< 50 *1	< 50	< 100	**1,700**	< 2200	< 6900
MW-3	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-3	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-3	12/1/2016	< 2.0	88	< 3.0	< 3.0	100	180	< 260
MW-3	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 260
MW-3	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	< 100	< 250
MW-3	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	< 100	< 250
MW-3	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 100	< 260
MW-3	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	120	< 350
MW-3	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0 *	< 250	< 100	< 100
MW-3	8/1/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	110	< 350
MW-3	10/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	2/6/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	6/24/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 120	< 380
MW-3	9/23/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	110	< 350
MW-3	11/11/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	2/10/2021	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	5/6/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	< 110	< 360
MW-3	8/4/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	270	< 360

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

CONSTITUENT		B	T	E	X	TPH-G	TPH-D	TPH-O
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Well ID	Date							
MTCA METHOD A CLEANUP LEVELS		5	1000	700	1000	1000/800*	500	500
MW-3	11/17/2021	< 1.0	< 1.0 *1	< 1.0	< 2.0	< 250	< 110	< 340
MW-4	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	110	< 250
MW-4	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-4	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	140	< 260
MW-4	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-4	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	120	< 250
MW-4	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	< 100	< 250
MW-4	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	100	< 250
MW-4	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	130	< 350
MW-4	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	200	< 350
MW-4	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	110	< 350
MW-4	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0 *	< 250	< 100	< 100
MW-4	8/1/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	160	< 350
MW-4	10/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	2/6/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	6/24/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 120	< 380
MW-4	9/23/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	140	< 350
MW-4	11/11/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	120	< 350
MW-4	2/10/2021	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	5/6/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	< 110	< 350
MW-4	8/4/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	310	< 370
MW-4	11/17/2021	< 1.0	< 1.0 *1	< 1.0	< 2.0	< 250	< 110	< 340
MW-5	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	300	230	< 250
MW-5	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	270	250	< 250
MW-5	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	89	180	< 250
MW-5	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	97	< 110	< 250
MW-5	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	220	< 250
MW-5	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	240	150	< 250

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

CONSTITUENT		B	T	E	X	TPH-G	TPH-D	TPH-O
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Well ID	**Date**							
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**1000/800***	**500**	**500**
MW-5	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	120	< 260
MW-5	2/13/2018	3.4	< 2.0	7.4	< 3.0	330	250	< 370
MW-5	5/2/2018	< 3.0 *	< 2.0 *	< 3.0	< 3.0	< 250	< 110	< 350
MW-5	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	200	< 350
MW-5	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	150	< 350
MW-5	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0 *	< 250	130	< 100
MW-5	8/1/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	200	< 350
MW-5	10/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	120	< 350
MW-5	2/6/2020	< 3.0	< 2.0	4.2	< 3.0	380	190	< 350
MW-5	6/24/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	210	< 360
MW-5	9/23/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	160	< 360
MW-5	11/11/2020	< 3.0	< 2.0	< 3.0	< 3.0	< 250	120	< 340
MW-5	2/10/2021	3.4	< 2.0	< 3.0	< 3.0	260	150	< 360
MW-5	5/6/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	150	< 340
MW-5	8/4/2021	< 1.0	< 1.0	< 1.0	< 2.0	< 250	290	< 360
MW-5	11/17/2021	< 1.0	< 1.0 *1	< 1.0	< 2.0	< 250	< 2100	< 6800

Notes:

TPH-G = Total petroleum hydrocarbons as gasoline by Northwest Method NWTPH-Gx

TPH-D = Total petroleum hydrocarbons as diesel by Northwest Method NWTPH-Dx

TPH-O = Total petroleum hydrocarbons as oil by Northwest Method NWTPH-Dx

1,000/800[1] ug/L if no detectable levels of Benzene in the sample - otherwise 800 ug/L

<1.0 = Concentrations were not detected above the laboratory method reporting limit.

ug/L = Micrograms per liter (ppb)

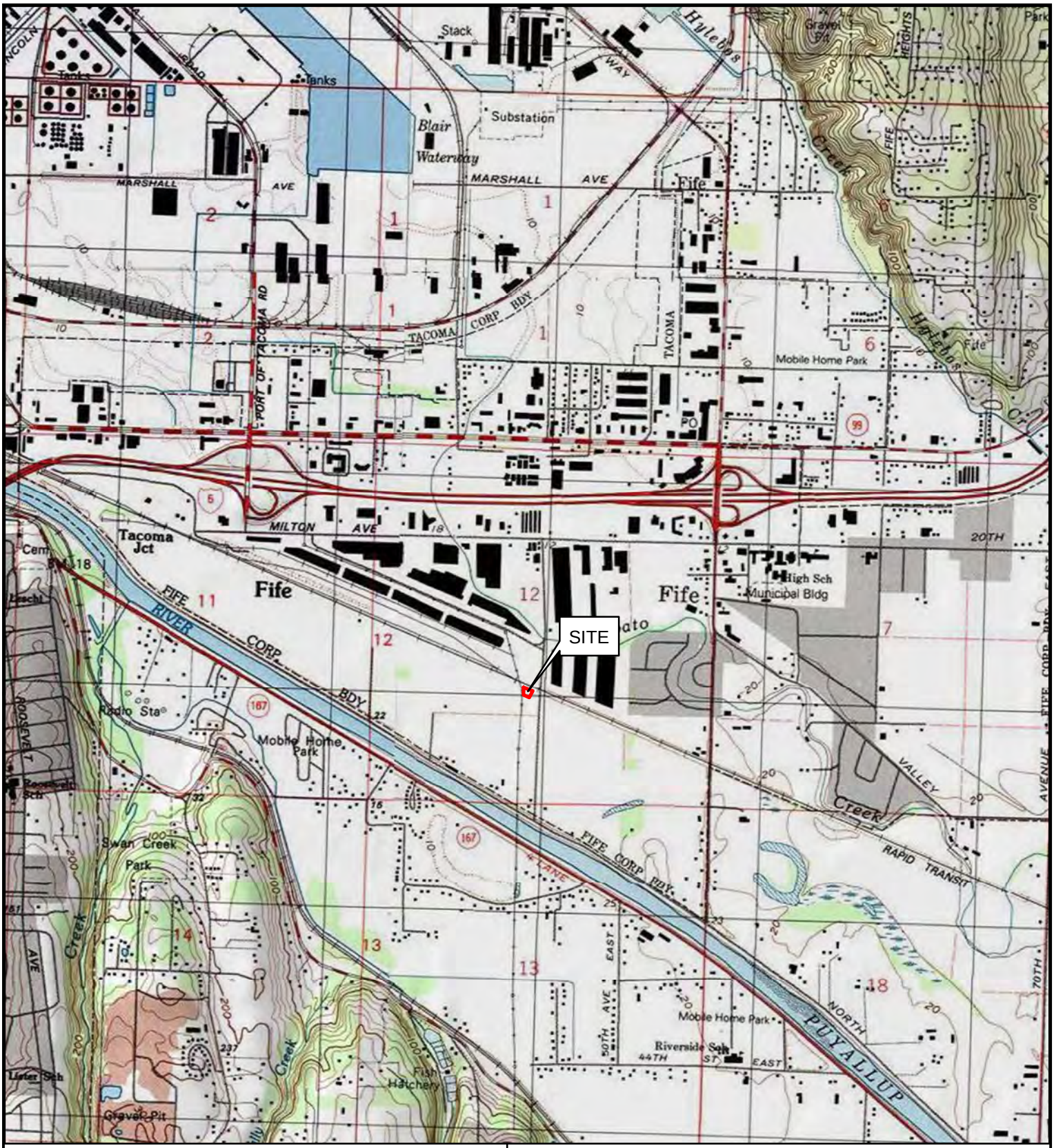
-- = No value given/Not analyzed/Not applicable

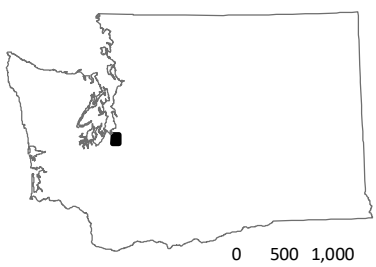
MTCA = Model Toxics Control Act

Results in **bold** indicate concentrations in excess of MTCA Method A Cleanup Levels

* = RPD of the LCS and LCSD exceeds the control limits. LCS or LCSD is outside acceptance limits.

Figures





USGS 7.5-minute Series
Topographic Serioes
Puyallup, WA, 2013

N

0 500 1,000 2,000 3,000 4,000 Feet

FIGURE 1

SITE LOCATION MAP
OLYMPIC PIPE LINE COMPANY - TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WA

PROJECT NO.	PREPARED BY	REF SCALE	
WATJUAA211	MB	1:24,000	
DATE	REVIEWED BY	MAP SCALE	
7/30/2021	FS	1 INCH = 2,000 FEET	anteagroup

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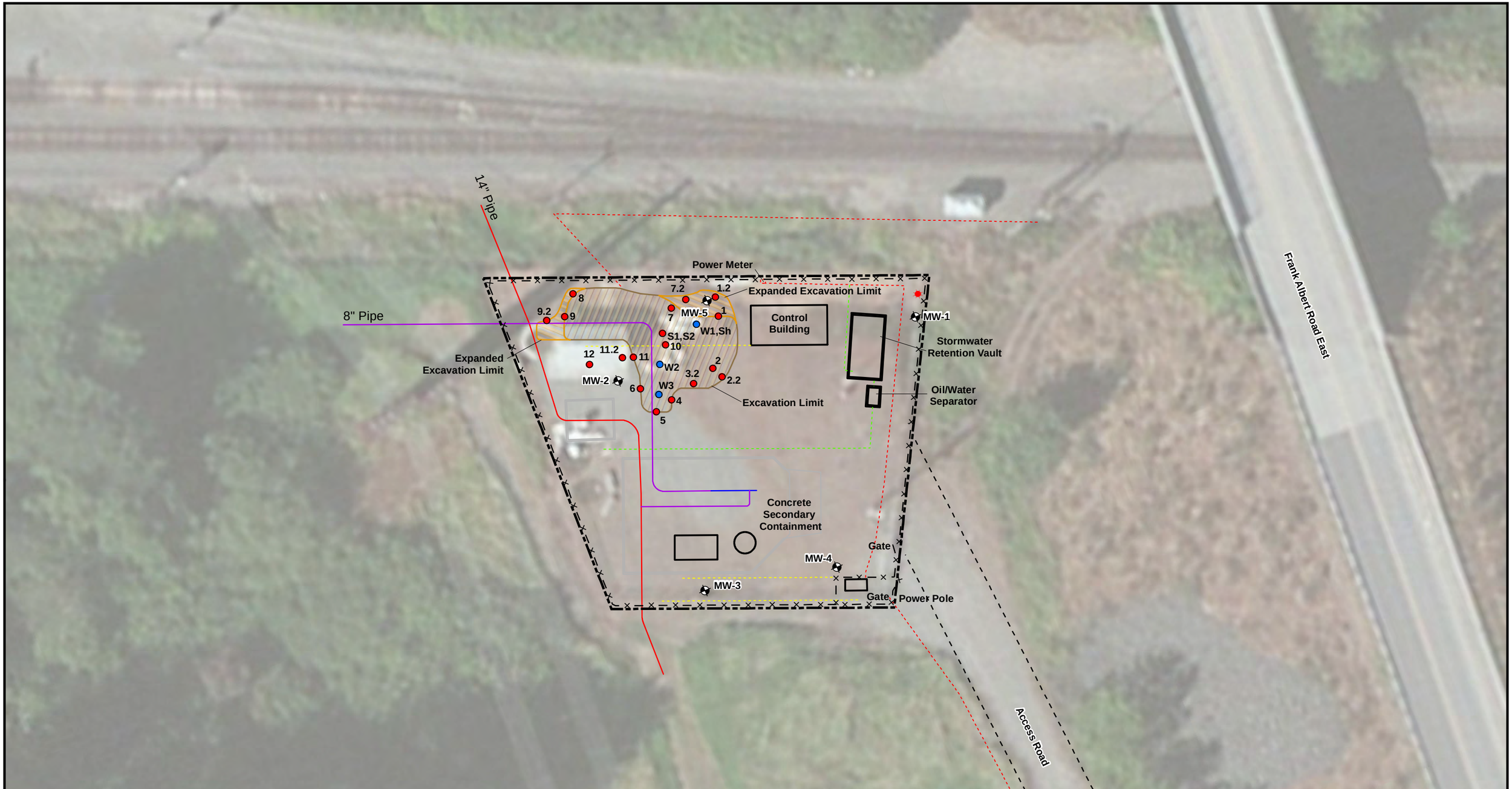


Legend

- Monitoring Well Location
- Light Pole
- Soil Sample Location
- Water Sample Location
- Original Excavation
- Expanded Excavation
- Property Boundary
- Fence
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Utility - Electric
- Utility - Storm Water
- Groundwire

Sources: 2013, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 15 30 60 90 120 Feet

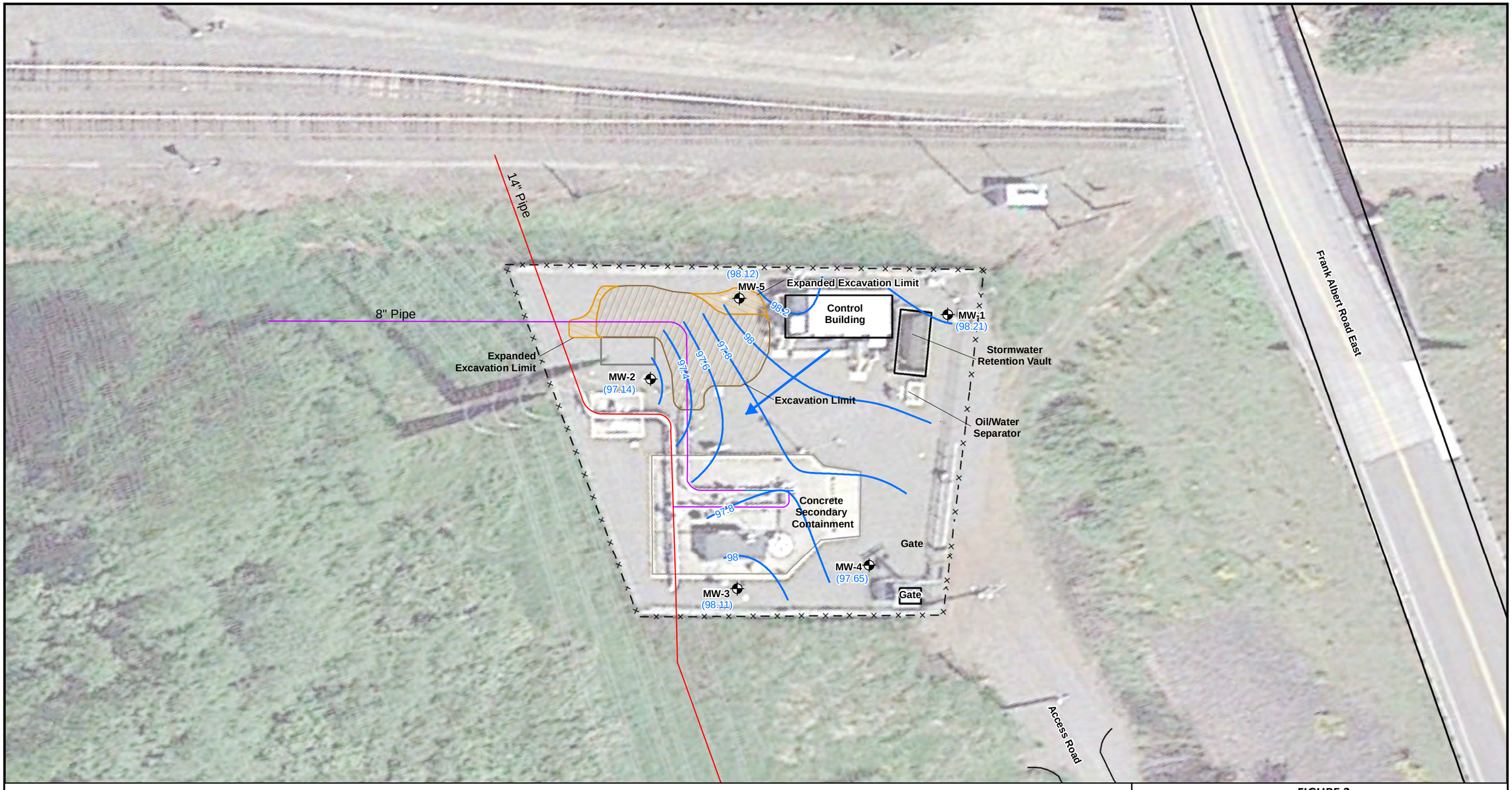
FIGURE 2

SITE MAP
OLYMPIC PIPE LINE COMPANY - TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WA

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA211	MB	1:360
DATE	REVIEWED BY	MAP SCALE
7/31/2021	FS	1 INCH = 30 FEET

anteagroup

\\gis-s3\GIS_Data\Sandbox\!Projects\L-P\OPLC\Tacoma\Project Number\Layout\Fig2Update.mxd



Legend

- Property Boundary
- Fence
- Monitoring Well Location
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Original Excavation
- Expanded Excavation
- Groundwater Elevation Contour (ft)
- Inferred Groundwater Flow Direction
- (98.11) Groundwater Elevation Contour (ft)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 7.5 15 30 Feet

FIGURE 3

GROUNDWATER ELEVATION CONTOUR MAP
AUGUST 4, 2021
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA201	GP	1:360
DATE	REVIEWED BY	MAP SCALE
11/1/2021	SH	1 INCH = 30 FEET

anteagroup

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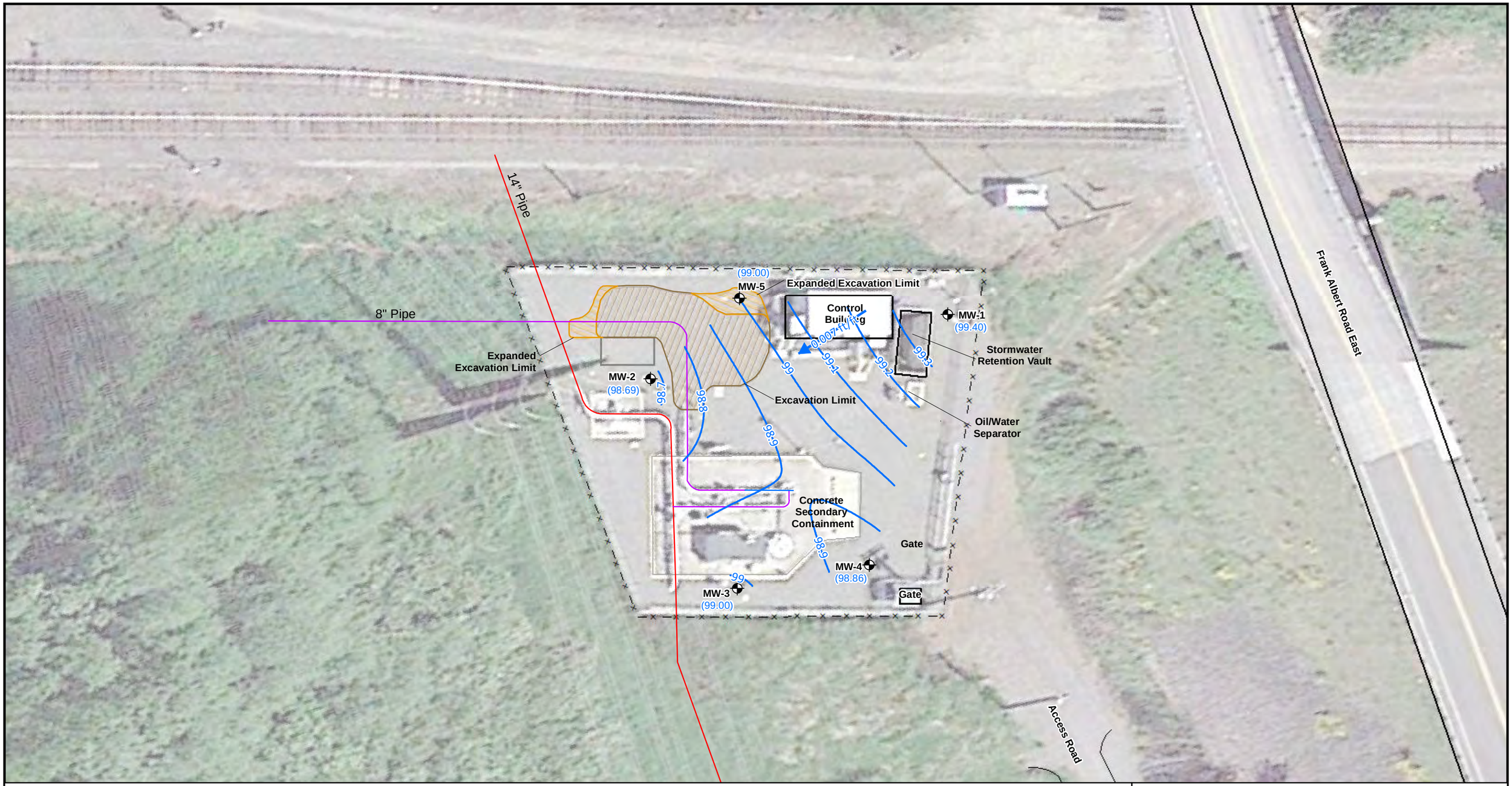

Legend

- Property Boundary
- Fence
- Monitoring Well Location
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Original Excavation
- Expanded Excavation
- Groundwater Elevation Contour (ft)
- Inferred Groundwater Flow Direction
- (98.11) Groundwater Elevation Contour (ft)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 7.5 15 30 Feet

FIGURE 4

GROUNDWATER ELEVATION CONTOUR MAP
NOVEMBER 17, 2021
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA211	MB	1:360
DATE	REVIEWED BY	MAP SCALE
2/3/2022	KY	1 INCH = 30 FEET

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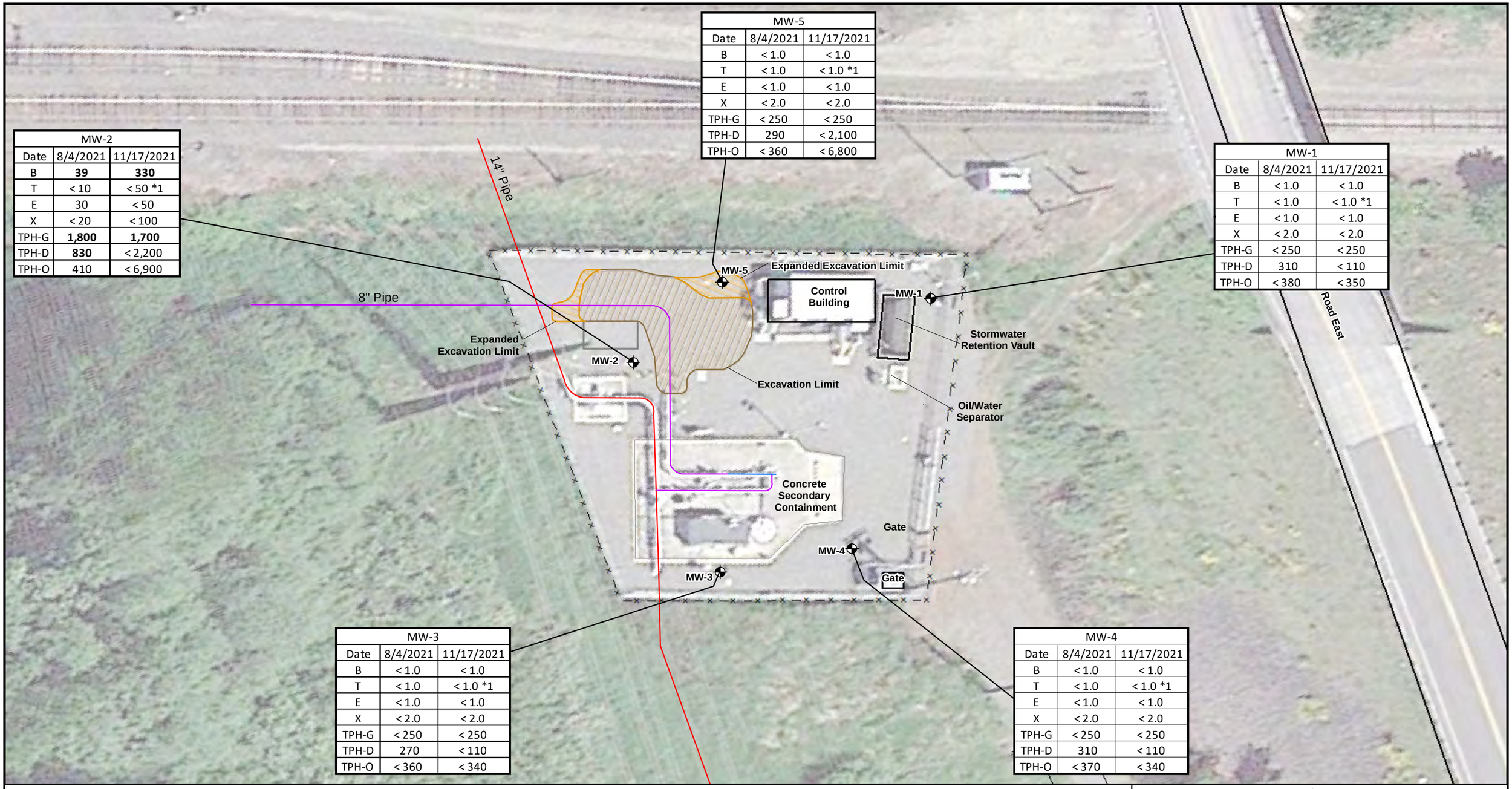
MW-5		
Date	8/4/2021	11/17/2021
B	< 1.0	< 1.0
T	< 1.0	< 1.0 *1
E	< 1.0	< 1.0
X	< 2.0	< 2.0
TPH-G	< 250	< 250
TPH-D	290	< 2,100
TPH-O	< 360	< 6,800

MW-2		
Date	8/4/2021	11/17/2021
B	**39**	**330**
T	< 10	< 50 *1
E	30	< 50
X	< 20	< 100
TPH-G	**1,800**	**1,700**
TPH-D	**830**	< 2,200
TPH-O	410	< 6,900

MW-1		
Date	8/4/2021	11/17/2021
B	< 1.0	< 1.0
T	< 1.0	< 1.0 *1
E	< 1.0	< 1.0
X	< 2.0	< 2.0
TPH-G	< 250	< 250
TPH-D	310	< 110
TPH-O	< 380	< 350

MW-3		
Date	8/4/2021	11/17/2021
B	< 1.0	< 1.0
T	< 1.0	< 1.0 *1
E	< 1.0	< 1.0
X	< 2.0	< 2.0
TPH-G	< 250	< 250
TPH-D	270	< 110
TPH-O	< 360	< 340

MW-4		
Date	8/4/2021	11/17/2021
B	< 1.0	< 1.0
T	< 1.0	< 1.0 *1
E	< 1.0	< 1.0
X	< 2.0	< 2.0
TPH-G	< 250	< 250
TPH-D	310	< 110
TPH-O	< 370	< 340



Legend

- Property Boundary
- Fence
- Monitoring Well Location
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Original Excavation
- Expanded Excavation

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes
TPH-G - Total petroleum hydrocarbons as gasoline
TPH-D - Total petroleum hydrocarbons as diesel
TPH-O - Total petroleum hydrocarbons as oil
Bold - Concentration above MTCA Method A Cleanup Levels
< - Concentrations were not detected above the laboratory reporting limit
All values in micrograms per liter (µg/L)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 7.5 15 30 Feet

FIGURE 5
GROUNDWATER ANALYTICAL DATA MAP
AUGUST 4, 2021 AND NOVEMBER 17, 2021
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA211	*MB*	*1:360*
DATE	**REVIEWED BY**	**MAP SCALE**
1/16/2022	*KY/MG*	*1 INCH = 30 FEET*

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Appendix A - Analytical Lab Reports and Chain-of-Custody Documentation

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins FGS, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-104978-1
Client Project/Site: BP - OPLC - Tacoma Junction
Sampling Event: OPLC-Tacoma Junction

For:
Antea USA Inc.
4006 148th Ave NE
Redmond, Washington 98052

Attn: Megan Richard

Authorized for release by:
8/24/2021 4:21:14 PM
Pauline Matlock, Project Manager
(253)922-2310
pauline.matlock@eurofinset.com

Designee for

Elaine Walker, Project Manager II
(253)248-4972
m.elaine.walker@eurofinset.com

Table of Contents

Definitions/Glossary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Job ID: 580-104978-1

Laboratory: Eurofins FGS, Seattle

Narrative

Job Narrative
580-104978-1

Comments
No additional comments.

Receipt
The samples were received on 8/4/2021 12:45 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 21.9º C.

GC/MS VOA
Method 8260D: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-2_20210804 (580-104978-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method NWTPH-Gx: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 580-365094 recovered outside control limits for the following analytes: Gasoline.

Method NWTPH-Gx: Surrogate recovery for the following sample was outside control limits: MW-2_20210804 (580-104978-2). Evidence of matrix interference is present; Sample was re-analyzed and surrogate recovery was still outside control limits biased high. Original data set is reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Client Sample ID: MW-1_20210804 — Lab Sample ID: 580-104978-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	310		120		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-2_20210804 — Lab Sample ID: 580-104978-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	39		10		ug/L	10		8260D	Total/NA
Ethylbenzene	30		10		ug/L	10		8260D	Total/NA
Gasoline	1800		250		ug/L	1		NWTPH-Gx	Total/NA
#2 Diesel (C10-C24)	830		110		ug/L	1		NWTPH-Dx	Total/NA
Motor Oil (>C24-C36)	410		360		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-3_20210804 — Lab Sample ID: 580-104978-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	270		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-4_20210804 — Lab Sample ID: 580-104978-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	310		120		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-5_20210804 — Lab Sample ID: 580-104978-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	290		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: Trip Blank_20210804 — Lab Sample ID: 580-104978-6

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins FGS, Seattle

Client Sample ID: MW-1_20210804

Lab Sample ID: 580-104978-1

Date Collected: 08/04/21 12:00

Matrix: Water

Date Received: 08/04/21 12:45

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/16/21 23:23	1
Ethylbenzene	ND		1.0		ug/L			08/16/21 23:23	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/16/21 23:23	1
o-Xylene	ND		1.0		ug/L			08/16/21 23:23	1
Toluene	ND		1.0		ug/L			08/16/21 23:23	1
Xylenes, Total	ND		2.0		ug/L			08/16/21 23:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*08/16/21 23:23*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*08/16/21 23:23*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*08/16/21 23:23*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*08/16/21 23:23*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*50 - 150*		*08/13/21 20:08*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**310**		120		ug/L		08/17/21 10:28	08/18/21 22:38	1
Motor Oil (>C24-C36)	ND		380		ug/L		08/17/21 10:28	08/18/21 22:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*61*		*50 - 150*	*08/17/21 10:28*	*08/18/21 22:38*	*1*

Client Sample ID: MW-2_20210804

Lab Sample ID: 580-104978-2

Date Collected: 08/04/21 11:00

Matrix: Water

Date Received: 08/04/21 12:45

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**39**		10		ug/L			08/16/21 23:48	10
Ethylbenzene	**30**		10		ug/L			08/16/21 23:48	10
m-Xylene & p-Xylene	ND		20		ug/L			08/16/21 23:48	10
o-Xylene	ND		10		ug/L			08/16/21 23:48	10
Toluene	ND		10		ug/L			08/16/21 23:48	10
Xylenes, Total	ND		20		ug/L			08/16/21 23:48	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*80 - 120*		*08/16/21 23:48*	*10*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*08/16/21 23:48*	*10*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*08/16/21 23:48*	*10*
Toluene-d8 (Surr)	*100*		*80 - 120*		*08/16/21 23:48*	*10*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**1800**		250		ug/L			08/13/21 20:34	1

Client Sample ID: MW-2_20210804

Date Collected: 08/04/21 11:00
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-2

Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	172	S1+	50 - 150		08/13/21 20:34	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	830		110		ug/L		08/17/21 10:28	08/18/21 22:58	1
Motor Oil (>C24-C36)	410		360		ug/L		08/17/21 10:28	08/18/21 22:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	60		50 - 150	08/17/21 10:28	08/18/21 22:58	1

Client Sample ID: MW-3_20210804

Date Collected: 08/04/21 10:30
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-3

Matrix: Water

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/18/21 16:13	1
Ethylbenzene	ND		1.0		ug/L			08/18/21 16:13	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/18/21 16:13	1
o-Xylene	ND		1.0		ug/L			08/18/21 16:13	1
Toluene	ND		1.0		ug/L			08/18/21 16:13	1
Xylenes, Total	ND		2.0		ug/L			08/18/21 16:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		80 - 120		08/18/21 16:13	1
4-Bromofluorobenzene (Surr)	97		80 - 120		08/18/21 16:13	1
Dibromofluoromethane (Surr)	99		80 - 120		08/18/21 16:13	1
Toluene-d8 (Surr)	101		80 - 120		08/18/21 16:13	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 21:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	110		50 - 150		08/13/21 21:00	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	270		110		ug/L		08/17/21 10:28	08/18/21 23:18	1
Motor Oil (>C24-C36)	ND		360		ug/L		08/17/21 10:28	08/18/21 23:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	54		50 - 150	08/17/21 10:28	08/18/21 23:18	1

Client Sample ID: MW-4_20210804

Date Collected: 08/04/21 09:25
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-4

Matrix: Water

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/18/21 16:38	1
Ethylbenzene	ND		1.0		ug/L			08/18/21 16:38	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/18/21 16:38	1

Client Sample ID: MW-4_20210804

Lab Sample ID: 580-104978-4

Date Collected: 08/04/21 09:25

Matrix: Water

Date Received: 08/04/21 12:45

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		1.0		ug/L			08/18/21 16:38	1
Toluene	ND		1.0		ug/L			08/18/21 16:38	1
Xylenes, Total	ND		2.0		ug/L			08/18/21 16:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*80 - 120*		*08/18/21 16:38*	*1*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*08/18/21 16:38*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*08/18/21 16:38*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*08/18/21 16:38*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 21:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*50 - 150*		*08/13/21 21:26*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**310**		120		ug/L		08/17/21 10:28	08/18/21 23:38	1
Motor Oil (>C24-C36)	ND		370		ug/L		08/17/21 10:28	08/18/21 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*63*		*50 - 150*	*08/17/21 10:28*	*08/18/21 23:38*	*1*

Client Sample ID: MW-5_20210804

Lab Sample ID: 580-104978-5

Date Collected: 08/04/21 11:40

Matrix: Water

Date Received: 08/04/21 12:45

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/18/21 17:03	1
Ethylbenzene	ND		1.0		ug/L			08/18/21 17:03	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/18/21 17:03	1
o-Xylene	ND		1.0		ug/L			08/18/21 17:03	1
Toluene	ND		1.0		ug/L			08/18/21 17:03	1
Xylenes, Total	ND		2.0		ug/L			08/18/21 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*08/18/21 17:03*	*1*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*08/18/21 17:03*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*08/18/21 17:03*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*08/18/21 17:03*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 21:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*50 - 150*		*08/13/21 21:51*	*1*

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Client Sample ID: MW-5_20210804

Lab Sample ID: 580-104978-5

Date Collected: 08/04/21 11:40
Matrix: Water
Date Received: 08/04/21 12:45

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**290**		110		ug/L		08/17/21 10:28	08/18/21 23:58	1
Motor Oil (>C24-C36)	ND		360		ug/L		08/17/21 10:28	08/18/21 23:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*63*		*50 - 150*	*08/17/21 10:28*	*08/18/21 23:58*	*1*

Client Sample ID: Trip Blank_20210804

Lab Sample ID: 580-104978-6

Date Collected: 08/04/21 00:01
Matrix: Water
Date Received: 08/04/21 12:45

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/18/21 17:29	1
Ethylbenzene	ND		1.0		ug/L			08/18/21 17:29	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/18/21 17:29	1
o-Xylene	ND		1.0		ug/L			08/18/21 17:29	1
Toluene	ND		1.0		ug/L			08/18/21 17:29	1
Xylenes, Total	ND		2.0		ug/L			08/18/21 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*08/18/21 17:29*	*1*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*08/18/21 17:29*	*1*
Dibromofluoromethane (Surr)	*110*		*80 - 120*		*08/18/21 17:29*	*1*
Toluene-d8 (Surr)	*91*		*80 - 120*		*08/18/21 17:29*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 22:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*50 - 150*		*08/13/21 22:17*	*1*

Surrogate Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
580-104978-1	MW-1_20210804	96	93	98	100
580-104978-2	MW-2_20210804	95	98	102	100
580-104978-3	MW-3_20210804	92	97	99	101
580-104978-4	MW-4_20210804	95	95	100	102
580-104978-5	MW-5_20210804	96	95	100	103
580-104978-6	Trip Blank_20210804	98	101	110	91
LCS 580-365222/4	Lab Control Sample	96	100	101	101
LCS 580-365383/4	Lab Control Sample	93	107	112	92
LCSD 580-365222/5	Lab Control Sample Dup	96	99	101	101
LCSD 580-365383/5	Lab Control Sample Dup	92	98	101	102
MB 580-365222/7	Method Blank	97	98	101	100
MB 580-365383/7	Method Blank	96	98	100	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BFB1
Lab Sample ID	Client Sample ID	(50-150)
580-104978-1	MW-1_20210804	110
580-104978-2	MW-2_20210804	172 S1+
580-104978-3	MW-3_20210804	110
580-104978-4	MW-4_20210804	106
580-104978-5	MW-5_20210804	111
580-104978-6	Trip Blank_20210804	110
LCS 580-364971/4	Lab Control Sample	101
LCSD 580-364971/5	Lab Control Sample Dup	98
MB 580-364971/3	Method Blank	87

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTPH
Lab Sample ID	Client Sample ID	(50-150)
580-104978-1	MW-1_20210804	61
580-104978-2	MW-2_20210804	60
580-104978-3	MW-3_20210804	54
580-104978-4	MW-4_20210804	63
580-104978-5	MW-5_20210804	63
LCS 580-365293/2-A	Lab Control Sample	73
LCSD 580-365293/3-A	Lab Control Sample Dup	73

Surrogate Summary

Client: Antea USA Inc. Job ID: 580-104978-1
Project/Site: BP - OPLC - Tacoma Junction

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	OTPH (50-150)							
MB 580-365293/1-A	Method Blank	71							

Surrogate Legend

OTPH = o-Terphenyl

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-365222/7
Matrix: Water
Analysis Batch: 365222

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/16/21 22:33	1
Ethylbenzene	ND		1.0		ug/L			08/16/21 22:33	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/16/21 22:33	1
o-Xylene	ND		1.0		ug/L			08/16/21 22:33	1
Toluene	ND		1.0		ug/L			08/16/21 22:33	1
Xylenes, Total	ND		2.0		ug/L			08/16/21 22:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 120*		*08/16/21 22:33*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*08/16/21 22:33*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*08/16/21 22:33*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*08/16/21 22:33*	*1*

Lab Sample ID: LCS 580-365222/4
Matrix: Water
Analysis Batch: 365222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			10.0	10.4		ug/L		104	80 - 122		
Ethylbenzene			10.0	11.2		ug/L		112	80 - 120		
m-Xylene & p-Xylene			10.0	10.6		ug/L		106	80 - 120		
o-Xylene			10.0	11.4		ug/L		114	80 - 120		
Toluene			10.0	10.5		ug/L		105	80 - 120		
Xylenes, Total			20.0	22.0		ug/L		110	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: LCSD 580-365222/5
Matrix: Water
Analysis Batch: 365222

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			10.0	9.22		ug/L		92	80 - 122	12	14
Ethylbenzene			10.0	9.78		ug/L		98	80 - 120	13	14
m-Xylene & p-Xylene			10.0	9.25		ug/L		92	80 - 120	13	14
o-Xylene			10.0	9.92		ug/L		99	80 - 120	14	16
Toluene			10.0	9.25		ug/L		92	80 - 120	13	13
Xylenes, Total			20.0	19.2		ug/L		96	80 - 120	14	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-365222/5
Matrix: Water
Analysis Batch: 365222

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: MB 580-365383/7
Matrix: Water
Analysis Batch: 365383

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			08/18/21 11:17	1
Ethylbenzene	ND		1.0		ug/L			08/18/21 11:17	1
m-Xylene & p-Xylene	ND		2.0		ug/L			08/18/21 11:17	1
o-Xylene	ND		1.0		ug/L			08/18/21 11:17	1
Toluene	ND		1.0		ug/L			08/18/21 11:17	1
Xylenes, Total	ND		2.0		ug/L			08/18/21 11:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 120*		*08/18/21 11:17*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*08/18/21 11:17*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*08/18/21 11:17*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*08/18/21 11:17*	*1*

Lab Sample ID: LCS 580-365383/4
Matrix: Water
Analysis Batch: 365383

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.72		ug/L		97	80 - 122
Ethylbenzene	10.0	10.9		ug/L		109	80 - 120
m-Xylene & p-Xylene	10.0	10.5		ug/L		105	80 - 120
o-Xylene	10.0	11.9		ug/L		119	80 - 120
Toluene	10.0	9.07		ug/L		91	80 - 120
Xylenes, Total	20.0	22.4		ug/L		112	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*80 - 120*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*
Dibromofluoromethane (Surr)	*112*		*80 - 120*
Toluene-d8 (Surr)	*92*		*80 - 120*

Lab Sample ID: LCSD 580-365383/5
Matrix: Water
Analysis Batch: 365383

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	9.92		ug/L		99	80 - 122	2	14
Ethylbenzene	10.0	10.8		ug/L		108	80 - 120	1	14
m-Xylene & p-Xylene	10.0	10.3		ug/L		103	80 - 120	2	14
o-Xylene	10.0	11.0		ug/L		110	80 - 120	8	16
Toluene	10.0	10.1		ug/L		101	80 - 120	11	13

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-365383/5
Matrix: Water
Analysis Batch: 365383

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Xylenes, Total			20.0	21.3		ug/L		107	80 - 120	5	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*102*		*80 - 120*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-364971/3
Matrix: Water
Analysis Batch: 364971

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			08/13/21 12:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*50 - 150*		*08/13/21 12:19*	*1*

Lab Sample ID: LCS 580-364971/4
Matrix: Water
Analysis Batch: 364971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	945		ug/L		94	79 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*50 - 150*

Lab Sample ID: LCSD 580-364971/5
Matrix: Water
Analysis Batch: 364971

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	898		ug/L		90	79 - 120	5	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*50 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-365293/1-A
Matrix: Water
Analysis Batch: 365684

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 365293

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		08/17/21 10:28	08/20/21 13:45	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: MB 580-365293/1-A
Matrix: Water
Analysis Batch: 365684

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 365293

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	ND		350		ug/L		08/17/21 10:28	08/20/21 13:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*08/17/21 10:28*	*08/20/21 13:45*	*1*

Lab Sample ID: LCS 580-365293/2-A
Matrix: Water
Analysis Batch: 365484

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 365293

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			2000	1650		ug/L		83	50 - 120		
Motor Oil (>C24-C36)			2000	1800		ug/L		90	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*73*		*50 - 150*

Lab Sample ID: LCSD 580-365293/3-A
Matrix: Water
Analysis Batch: 365484

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 365293

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2000	1590		ug/L		80	50 - 120	4	26
Motor Oil (>C24-C36)			2000	1780		ug/L		89	64 - 120	1	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*73*		*50 - 150*

QC Association Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

GC/MS VOA

Analysis Batch: 365222

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-104978-1	MW-1_20210804	Total/NA	Water	8260D	
580-104978-2	MW-2_20210804	Total/NA	Water	8260D	
MB 580-365222/7	Method Blank	Total/NA	Water	8260D	
LCS 580-365222/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 580-365222/5	Lab Control Sample Dup	Total/NA	Water	8260D	

Analysis Batch: 365383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-104978-3	MW-3_20210804	Total/NA	Water	8260D	
580-104978-4	MW-4_20210804	Total/NA	Water	8260D	
580-104978-5	MW-5_20210804	Total/NA	Water	8260D	
580-104978-6	Trip Blank_20210804	Total/NA	Water	8260D	
MB 580-365383/7	Method Blank	Total/NA	Water	8260D	
LCS 580-365383/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 580-365383/5	Lab Control Sample Dup	Total/NA	Water	8260D	

GC VOA

Analysis Batch: 364971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-104978-1	MW-1_20210804	Total/NA	Water	NWTPH-Gx	
580-104978-2	MW-2_20210804	Total/NA	Water	NWTPH-Gx	
580-104978-3	MW-3_20210804	Total/NA	Water	NWTPH-Gx	
580-104978-4	MW-4_20210804	Total/NA	Water	NWTPH-Gx	
580-104978-5	MW-5_20210804	Total/NA	Water	NWTPH-Gx	
580-104978-6	Trip Blank_20210804	Total/NA	Water	NWTPH-Gx	
MB 580-364971/3	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-364971/4	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-364971/5	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC Semi VOA

Prep Batch: 365293

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-104978-1	MW-1_20210804	Total/NA	Water	3510C	
580-104978-2	MW-2_20210804	Total/NA	Water	3510C	
580-104978-3	MW-3_20210804	Total/NA	Water	3510C	
580-104978-4	MW-4_20210804	Total/NA	Water	3510C	
580-104978-5	MW-5_20210804	Total/NA	Water	3510C	
MB 580-365293/1-A	Method Blank	Total/NA	Water	3510C	
LCS 580-365293/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-365293/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 365484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-104978-1	MW-1_20210804	Total/NA	Water	NWTPH-Dx	365293
580-104978-2	MW-2_20210804	Total/NA	Water	NWTPH-Dx	365293
580-104978-3	MW-3_20210804	Total/NA	Water	NWTPH-Dx	365293
580-104978-4	MW-4_20210804	Total/NA	Water	NWTPH-Dx	365293
580-104978-5	MW-5_20210804	Total/NA	Water	NWTPH-Dx	365293
LCS 580-365293/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	365293
LCSD 580-365293/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	365293

QC Association Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

GC Semi VOA

Analysis Batch: 365684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 580-365293/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	365293

Lab Chronicle

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Client Sample ID: MW-1_20210804
Date Collected: 08/04/21 12:00
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	365222	08/16/21 23:23	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 20:08	JBT	FGS SEA
Total/NA	Prep	3510C			365293	08/17/21 10:28	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	365484	08/18/21 22:38	RJL	FGS SEA

Client Sample ID: MW-2_20210804
Date Collected: 08/04/21 11:00
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		10	365222	08/16/21 23:48	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 20:34	JBT	FGS SEA
Total/NA	Prep	3510C			365293	08/17/21 10:28	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	365484	08/18/21 22:58	RJL	FGS SEA

Client Sample ID: MW-3_20210804
Date Collected: 08/04/21 10:30
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	365383	08/18/21 16:13	CJ	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 21:00	JBT	FGS SEA
Total/NA	Prep	3510C			365293	08/17/21 10:28	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	365484	08/18/21 23:18	RJL	FGS SEA

Client Sample ID: MW-4_20210804
Date Collected: 08/04/21 09:25
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	365383	08/18/21 16:38	CJ	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 21:26	JBT	FGS SEA
Total/NA	Prep	3510C			365293	08/17/21 10:28	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	365484	08/18/21 23:38	RJL	FGS SEA

Client Sample ID: MW-5_20210804
Date Collected: 08/04/21 11:40
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	365383	08/18/21 17:03	CJ	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 21:51	JBT	FGS SEA
Total/NA	Prep	3510C			365293	08/17/21 10:28	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	365484	08/18/21 23:58	RJL	FGS SEA

Lab Chronicle

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Client Sample ID: Trip Blank_20210804

Date Collected: 08/04/21 00:01
Date Received: 08/04/21 12:45

Lab Sample ID: 580-104978-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	365383	08/18/21 17:29	CJ	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	364971	08/13/21 22:17	JBT	FGS SEA

Laboratory References:

FGS SEA = Eurofins FGS, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Antea USA Inc.
Job ID: 580-104978-1
Project/Site: BP - OPLC - Tacoma Junction

Laboratory: Eurofins FGS, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

Method Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	FGS SEA
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	FGS SEA
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	FGS SEA
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	FGS SEA
5030B	Purge and Trap	SW846	FGS SEA

Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

FGS SEA = Eurofins FGS, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Sample Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-104978-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-104978-1	MW-1_20210804	Water	08/04/21 12:00	08/04/21 12:45
580-104978-2	MW-2_20210804	Water	08/04/21 11:00	08/04/21 12:45
580-104978-3	MW-3_20210804	Water	08/04/21 10:30	08/04/21 12:45
580-104978-4	MW-4_20210804	Water	08/04/21 09:25	08/04/21 12:45
580-104978-5	MW-5_20210804	Water	08/04/21 11:40	08/04/21 12:45
580-104978-6	Trip Blank_20210804	Water	08/04/21 00:01	08/04/21 12:45

bp rm Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP Site Node Path: Olympic Pipeline Company | Req Due Date (mm/dd/yy): Standard TAT | Rush TAT Yes ____ No X

BP/RM Facility No: Tacoma Junction | Lab Work Order Number:

Lab Name: Test America	BP/ARC Facility Address: 2660 Frank Albert Road East	Consultant/Contractor: Antea Group	
Lab Address: Tacoma, WA	City, State, ZIP Code: Fife, Washington 98424	Consultant/Contractor Project No: WATJUAA211.10123	
Lab PM: Elaine Walker	Lead Regulatory Agency: Washington Department of Ecology	Address: 4006 148th Ave NE, Redmond, WA 98052	
Lab Phone: 253.248.4972	California Global ID No.: NA	Consultant/Contractor PM: Megan Richard	
Lab Shipping Accnt: NA	Enfos Proposal No: WR849990/00BPT-0009	Phone: 425-498-7711	Email: Megan.Richard@anteagroup.us
Lab Bottle Order No: NA	Accounting Mode: Provision __X__ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Megan.Richard@anteagroup.us
Other Info: m.elaine.walker@eurofinset.com	Stage 1_Appraise (10)	Activity Interim Measures (123)	Invoice To: BP-RM ____ BP/ARC ___X___
BP/RM PM: Wade Melton			
PM Phone: 360-594-7978			
PM Email: wade.melton@bp.com			

Report Type & QC Level: Limited (Standard) Package ____ | Limited Plus Package ____ | Full Package ____

Lab No.	Sample Description	Date	Time	Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Fill	Pres	Analysis: B260BTEX	NWTPH-Gx	NWTPH-DX	Comments
	MW-1_20210804	8/4/21	1200	W				G				X	X	X	
	MW-2_20210804	8/4/21	1100	W				G				X	X	X	
	MW-3_20210804	8/4/21	1030	W				G				X	X	X	
	MW-4_20210804	8/4/21	0925	W				G				X	X	X	
	MW-5_20210804	8/4/21	1140	W				G				X	X	X	
	Trip Blank_20210804	8/4/21	0000	W				G				X	X		

Sampler's Name: Kate Younger + Sam Hinze	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Antea Group	Katelyn Younger Antea Group	8/4/21	1245	[signature] Kates EGS	8/4/21	1245
Ship Method: Courier Ship Date: 8/4/21	Samantha Hinz Antea Group	8/4/21	1245			
Shipment Tracking No:						

Special Instructions:

Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Y

Therm. ID: IR8 Cor: 21.9° Unc: 22.1°
Cooler Dsc: MQR
Packing: Bub
Cust. Seal: Yes ___ No ✓
Blue Ice (Wet) Dry, None
FedEx: ____
UPS: ____
Lab Cour: ____
Other: Client

580-104978 Chain of Custody

8/24/2021

Login Container Summary Report

580-104978

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW-1_20210804	580-104978-A-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-B-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-C-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-D-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-E-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-F-1	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-1_20210804	580-104978-G-1	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-1_20210804	580-104978-H-1	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-2_20210804	580-104978-A-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-B-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-C-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-D-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-E-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-F-2	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-2_20210804	580-104978-G-2	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-2_20210804	580-104978-H-2	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-3_20210804	580-104978-A-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-B-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-C-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-D-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-E-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-F-3	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-3_20210804	580-104978-G-3	Amber Glass 250mL - hydrochloric acid	1.6			0303501G/603
MW-3_20210804	580-104978-H-3	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-4_20210804	580-104978-A-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-B-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-C-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-D-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-E-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-F-4	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-4_20210804	580-104978-G-4	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-4_20210804	580-104978-H-4	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-5_20210804	580-104978-A-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-5_20210804	580-104978-B-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-5_20210804	580-104978-C-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW-5_20210804	580-104978-D-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-5_20210804	580-104978-E-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-5_20210804	580-104978-F-5	Voa Vial 40ml - HCL/rubber septa				0304201G/602
MW-5_20210804	580-104978-G-5	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
MW-5_20210804	580-104978-H-5	Amber Glass 250mL - hydrochloric acid	1.3			0303501G/603
Trip Blank_20210804	580-104978-A-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602
Trip Blank_20210804	580-104978-B-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602
Trip Blank_20210804	580-104978-C-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602
Trip Blank_20210804	580-104978-D-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602
Trip Blank_20210804	580-104978-E-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602
Trip Blank_20210804	580-104978-F-6	Voa Vial 40ml - HCL/rubber septa				0304201G/602

Login Sample Receipt Checklist

Client: Antea USA Inc.

Job Number: 580-104978-1

Login Number: 104978
List Number: 1
Creator: Blankinship, Tom X

List Source: Eurofins FGS, Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

GC/MS VOA BATCH WORKSHEET

Lab Name: Eurofins FGS, Seattle Job No.: 580-104978-1

SDG No.:

Batch Number: 365222 Batch Start Date: 08/16/21 20:30 Batch Analyst: Mautz, Brady 1

Batch Method: 8260D Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS 00003	VOAMasterMix 00072	VOASTDGASweek 00081
LCS 580-365222/4		8260D		5 mL	5 mL		1 uL	10 uL	10 uL
LCSD 580-365222/5		8260D		5 mL	5 mL		1 uL	10 uL	10 uL
MB 580-365222/7		8260D		5 mL	5 mL		1 uL		
580-104978-A-1	MW-1_20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-A-2	MW-2_20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		

Batch Notes	

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: Eurofins FGS, Seattle Job No.: 580-104978-1

SDG No.:

Batch Number: 365383 Batch Start Date: 08/18/21 09:14 Batch Analyst: Jantanu, Charinporn

Batch Method: 8260D Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS 00003	VOAMasterMix 00072	VOASTDGASweek 00081
LCS 580-365383/4		8260D		5 mL	5 mL		1 uL	10 uL	10 uL
LCSD 580-365383/5		8260D		5 mL	5 mL		1 uL	10 uL	10 uL
MB 580-365383/7		8260D		5 mL	5 mL		1 uL		
580-104978-A-3	MW-3_20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-A-4	MW-4_20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-A-5	MW-5_20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-A-6	Trip Blank 20210804	8260D	T	5 mL	5 mL	<2 SU	1 uL		

Batch Notes	

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC VOA BATCH WORKSHEET

Lab Name: Eurofins FGS, Seattle Job No.: 580-104978-1

SDG No.:

Batch Number: 364971 Batch Start Date: 08/13/21 11:27 Batch Analyst: Tucker, Jonathon B

Batch Method: NWTPH-Gx Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00046	GRO_LCS 00067	V2.4TFT-EX 00067
MB 580-364971/3		NWTPH-Gx		5 mL	5 mL		1 uL		
LCS 580-364971/4		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	1250 uL
LCSD 580-364971/5		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	1250 uL
580-104978-F-1	MW-1_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-E-2	MW-2_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-F-3	MW-3_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-E-4	MW-4_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-E-5	MW-5_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-104978-D-6	Trip Blank_20210804	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		

Batch Notes	

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins FGS, Seattle Job No.: 580-104978-1

SDG No.:

Batch Number: 365293 Batch Start Date: 08/17/21 10:28 Batch Analyst: Roberts, Jacob H

Batch Method: 3510C Batch End Date: 08/17/21 17:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	FirstAdjustpH
MB 580-365293/1		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
LCS 580-365293/2		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
LCSD 580-365293/3		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
580-104978-G-1	MW-1_20210804	3510C, NWTPH-Dx	T	00395.04 g	00166.94 g	228.1 mL	1 mL	2 SU	2 SU
580-104978-H-2	MW-2_20210804	3510C, NWTPH-Dx	T	00409.43 g	00168.15 g	241.3 mL	1 mL	2 SU	2 SU
580-104978-H-3	MW-3_20210804	3510C, NWTPH-Dx	T	00410.59 g	00168.30 g	242.3 mL	1 mL	2 SU	2 SU
580-104978-H-4	MW-4_20210804	3510C, NWTPH-Dx	T	00403.84 g	00167.62 g	236.2 mL	1 mL	2 SU	2 SU
580-104978-H-5	MW-5_20210804	3510C, NWTPH-Dx	T	00407.84 g	00167.16 g	240.7 mL	1 mL	2 SU	2 SU

Lab Sample ID	Client Sample ID	Method Chain	Basis	SecondAdjustpH	TPH_Water_Spk 00028	TPH_WaterSurr 00069			
MB 580-365293/1		3510C, NWTPH-Dx		n/a SU		100 uL			
LCS 580-365293/2		3510C, NWTPH-Dx		n/a SU	100 uL	100 uL			
LCSD 580-365293/3		3510C, NWTPH-Dx		n/a SU	100 uL	100 uL			
580-104978-G-1	MW-1_20210804	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-104978-H-2	MW-2_20210804	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-104978-H-3	MW-3_20210804	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-104978-H-4	MW-4_20210804	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-104978-H-5	MW-5_20210804	3510C, NWTPH-Dx	T	n/a SU		100 uL			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins FGS, Seattle Job No.: 580-104978-1

SDG No.:

Batch Number: 365293 Batch Start Date: 08/17/21 10:28 Batch Analyst: Roberts, Jacob H

Batch Method: 3510C Batch End Date: 08/17/21 17:20

Batch Notes	
Acid Used for pH Adjustment ID	2815022
Balance ID	Sea225
Batch Comment	Vialed by: AP
Analyst ID - Concentration	PS
Concentration 1 Corrected Temperature	70.3-75.3 Degrees C
Concentration 2 Corrected Temperature	20.4 Degrees C
Equipment ID - Concentration 1	SteamBath 1
Equipment ID - Concentration 2	TurboVap 5
Analyst ID - Extraction	BM
Filter ID	2815023
Method/Fraction	3510C_LVI / NWTPH / AK102
Na2SO4 ID	2854614
pH Indicator ID	6911002/6007004
Pipette/Syringe/Dispenser ID	MP4
Prep Solvent ID	2842479
Prep Solvent Volume Used	100 mL
Analyst ID - Spike Analyst	BM
Analyst ID - Spike Witness Analyst	JR
Sufficient Volume for Batch QC	no
Thermometer ID - Concentration 1	61013-040-1
Thermometer ID - Concentration 2	DIGITALREADOUT
Concentration 1 Uncorrected Temperature	70-75 Degrees C
Concentration 2 Uncorrected Temperature	22.0 Degrees C
Vial Lot Number	24162054
Reagent Water ID	DI

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-107686-1
Client Project/Site: BP - OPLC - Tacoma Junction
Revision: 1

For:
Antea USA Inc.
4006 148th Ave NE
Redmond, Washington 98052

Attn: Megan Richard

M. Elaine Walker

Authorized for release by:
2/11/2022 11:27:52 AM

Elaine Walker, Project Manager II
(253)248-4972
m.elaine.walker@eurofinset.com

Table of Contents

Definitions/Glossary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.

GC VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 580-107686-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative
580-107686-1

Revision 1: February 11, 2022
The DRO section of the narrative has been revsied to add statement regarding the DRO dilutions.

Receipt
Six samples were received on 11/19/2021 12:27 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

GC/MS VOA
Method 8260D: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 580-374647 recovered outside control limits for the following analytes: o-Xylene and Toluene. The LCS and LCSD recoveries were in control.

Method 8260D: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-2_20211117 (580-107686-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method NWTPH-Gx: Surrogate recovery for the following sample was outside control limits: MW-2_20211117 (580-107686-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method NWTPH-Dx: Samples MW-2_20211117 (580-107686-2) and MW-5_20211117 (580-107686-5) were diluted due to the dark color of the samples. The samples were ND at those dilutions and the laboratory has been instructed to not dilute these samples going forward as historically, no dilutions have been performed and the samples have been ND in past events.

No additinal analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Client Sample ID: MW-1_20211117 — Lab Sample ID: 580-107686-1

No Detections.

Client Sample ID: MW-2_20211117 — Lab Sample ID: 580-107686-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	330		50		ug/L	50		8260D	Total/NA
Gasoline	1700		250		ug/L	1		NWTPH-Gx	Total/NA

Client Sample ID: MW-3_20211117 — Lab Sample ID: 580-107686-3

No Detections.

Client Sample ID: MW-4_20211117 — Lab Sample ID: 580-107686-4

No Detections.

Client Sample ID: MW-5_20211117 — Lab Sample ID: 580-107686-5

No Detections.

Client Sample ID: Trip Blank_20211117 — Lab Sample ID: 580-107686-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1_20211117

Lab Sample ID: 580-107686-1

Date Collected: 11/17/21 13:15

Matrix: Water

Date Received: 11/19/21 12:27

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 06:04	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 06:04	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 06:04	1
o-Xylene	ND	*1	1.0		ug/L			12/01/21 06:04	1
Toluene	ND	*1	1.0		ug/L			12/01/21 06:04	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 06:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*12/01/21 06:04*	*1*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*12/01/21 06:04*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*12/01/21 06:04*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*12/01/21 06:04*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/27/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*50 - 150*		*11/27/21 21:35*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		11/30/21 09:38	12/03/21 04:17	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/30/21 09:38	12/03/21 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*50 - 150*	*11/30/21 09:38*	*12/03/21 04:17*	*1*

Client Sample ID: MW-2_20211117

Lab Sample ID: 580-107686-2

Date Collected: 11/17/21 12:02

Matrix: Water

Date Received: 11/19/21 12:27

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**330**		50		ug/L			12/01/21 06:28	50
Ethylbenzene	ND		50		ug/L			12/01/21 06:28	50
m-Xylene & p-Xylene	ND		100		ug/L			12/01/21 06:28	50
o-Xylene	ND	*1	50		ug/L			12/01/21 06:28	50
Toluene	ND	*1	50		ug/L			12/01/21 06:28	50
Xylenes, Total	ND		100		ug/L			12/01/21 06:28	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*12/01/21 06:28*	*50*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*12/01/21 06:28*	*50*
Dibromofluoromethane (Surr)	*94*		*80 - 120*		*12/01/21 06:28*	*50*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/21 06:28*	*50*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**1700**		250		ug/L			11/27/21 22:00	1

Client Sample ID: MW-2_20211117

Date Collected: 11/17/21 12:02
Date Received: 11/19/21 12:27

Lab Sample ID: 580-107686-2
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*172*	*S1+*	*50 - 150*		*11/27/21 22:00*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		2200		ug/L		11/30/21 09:38	12/03/21 04:36	20
Motor Oil (>C24-C36)	ND		6900		ug/L		11/30/21 09:38	12/03/21 04:36	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*87*		*50 - 150*	*11/30/21 09:38*	*12/03/21 04:36*	*20*

Client Sample ID: MW-3_20211117

Date Collected: 11/17/21 11:23
Date Received: 11/19/21 12:27

Lab Sample ID: 580-107686-3
Matrix: Water

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 06:52	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 06:52	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 06:52	1
o-Xylene	ND	*1	1.0		ug/L			12/01/21 06:52	1
Toluene	ND	*1	1.0		ug/L			12/01/21 06:52	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 06:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*		*12/01/21 06:52*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*12/01/21 06:52*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/21 06:52*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*12/01/21 06:52*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/27/21 22:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*50 - 150*		*11/27/21 22:24*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		11/30/21 09:38	12/03/21 04:56	1
Motor Oil (>C24-C36)	ND		340		ug/L		11/30/21 09:38	12/03/21 04:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*11/30/21 09:38*	*12/03/21 04:56*	*1*

Client Sample ID: MW-4_20211117

Date Collected: 11/17/21 10:48
Date Received: 11/19/21 12:27

Lab Sample ID: 580-107686-4
Matrix: Water

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 07:17	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 07:17	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 07:17	1

Client Sample ID: MW-4_20211117

Lab Sample ID: 580-107686-4

Date Collected: 11/17/21 10:48

Matrix: Water

Date Received: 11/19/21 12:27

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND	*1	1.0		ug/L			12/01/21 07:17	1
Toluene	ND	*1	1.0		ug/L			12/01/21 07:17	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 07:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*12/01/21 07:17*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*12/01/21 07:17*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*12/01/21 07:17*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*12/01/21 07:17*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/27/21 23:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*50 - 150*		*11/27/21 23:37*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		11/30/21 09:38	12/03/21 05:16	1
Motor Oil (>C24-C36)	ND		340		ug/L		11/30/21 09:38	12/03/21 05:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*50 - 150*	*11/30/21 09:38*	*12/03/21 05:16*	*1*

Client Sample ID: MW-5_20211117

Lab Sample ID: 580-107686-5

Date Collected: 11/17/21 12:40

Matrix: Water

Date Received: 11/19/21 12:27

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 07:42	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 07:42	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 07:42	1
o-Xylene	ND	*1	1.0		ug/L			12/01/21 07:42	1
Toluene	ND	*1	1.0		ug/L			12/01/21 07:42	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 07:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*12/01/21 07:42*	*1*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*12/01/21 07:42*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*12/01/21 07:42*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/21 07:42*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/28/21 00:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*50 - 150*		*11/28/21 00:01*	*1*

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Client Sample ID: MW-5_20211117

Lab Sample ID: 580-107686-5

Date Collected: 11/17/21 12:40
Date Received: 11/19/21 12:27

Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		2100		ug/L		11/30/21 09:38	12/03/21 05:36	20
Motor Oil (>C24-C36)	ND		6800		ug/L		11/30/21 09:38	12/03/21 05:36	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*62*		*50 - 150*	*11/30/21 09:38*	*12/03/21 05:36*	*20*

Client Sample ID: Trip Blank_20211117

Lab Sample ID: 580-107686-6

Date Collected: 11/17/21 00:01
Date Received: 11/19/21 12:27

Matrix: Water

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 02:00	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 02:00	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 02:00	1
o-Xylene	ND	*1	1.0		ug/L			12/01/21 02:00	1
Toluene	ND	*1	1.0		ug/L			12/01/21 02:00	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 02:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*12/01/21 02:00*	*1*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*12/01/21 02:00*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*12/01/21 02:00*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*12/01/21 02:00*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/28/21 18:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*50 - 150*		*11/28/21 18:32*	*1*

Surrogate Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
580-107686-1	MW-1_20211117	104	94	98	103
580-107686-2	MW-2_20211117	98	95	94	105
580-107686-3	MW-3_20211117	105	93	96	103
580-107686-4	MW-4_20211117	104	92	93	104
580-107686-5	MW-5_20211117	102	95	95	105
580-107686-6	Trip Blank_20211117	106	95	99	102
LCS 580-374647/3	Lab Control Sample	110	101	103	103
LCSD 580-374647/4	Lab Control Sample Dup	101	97	98	104
MB 580-374647/6	Method Blank	104	92	96	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BFB2
Lab Sample ID	Client Sample ID	(50-150)
580-107686-1	MW-1_20211117	96
580-107686-2	MW-2_20211117	172 S1+
580-107686-3	MW-3_20211117	102
580-107686-4	MW-4_20211117	94
580-107686-5	MW-5_20211117	102
580-107686-6	Trip Blank_20211117	89
LCS 580-374395/4	Lab Control Sample	102
LCS 580-374421/4	Lab Control Sample	103
LCSD 580-374395/5	Lab Control Sample Dup	103
LCSD 580-374421/5	Lab Control Sample Dup	98
MB 580-374395/3	Method Blank	92
MB 580-374421/3	Method Blank	91

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTPH
Lab Sample ID	Client Sample ID	(50-150)
580-107686-1	MW-1_20211117	84
580-107686-2	MW-2_20211117	87
580-107686-3	MW-3_20211117	81
580-107686-4	MW-4_20211117	84
580-107686-5	MW-5_20211117	62
LCS 580-374572/2-A	Lab Control Sample	111
LCSD 580-374572/3-A	Lab Control Sample Dup	109

Surrogate Summary

Client: Antea USA Inc. Job ID: 580-107686-1
Project/Site: BP - OPLC - Tacoma Junction

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)								
Lab Sample ID	Client Sample ID	OTPH (50-150)								
MB 580-374572/1-A	Method Blank	81								

Surrogate Legend

OTPH = o-Terphenyl

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-374647/6
Matrix: Water
Analysis Batch: 374647

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			12/01/21 01:11	1
Ethylbenzene	ND		1.0		ug/L			12/01/21 01:11	1
m-Xylene & p-Xylene	ND		2.0		ug/L			12/01/21 01:11	1
o-Xylene	ND		1.0		ug/L			12/01/21 01:11	1
Toluene	ND		1.0		ug/L			12/01/21 01:11	1
Xylenes, Total	ND		2.0		ug/L			12/01/21 01:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*12/01/21 01:11*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*12/01/21 01:11*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*12/01/21 01:11*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/01/21 01:11*	*1*

Lab Sample ID: LCS 580-374647/3
Matrix: Water
Analysis Batch: 374647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			5.00	4.61		ug/L		92	80 - 122		
Ethylbenzene			5.00	4.62		ug/L		92	80 - 120		
m-Xylene & p-Xylene			5.00	4.79		ug/L		96	80 - 120		
o-Xylene			5.00	4.48		ug/L		90	80 - 120		
Toluene			5.00	4.31		ug/L		86	80 - 120		
Xylenes, Total			10.0	9.27		ug/L		93	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*80 - 120*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*
Dibromofluoromethane (Surr)	*103*		*80 - 120*
Toluene-d8 (Surr)	*103*		*80 - 120*

Lab Sample ID: LCSD 580-374647/4
Matrix: Water
Analysis Batch: 374647

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			5.00	5.16		ug/L		103	80 - 122	11	14
Ethylbenzene			5.00	5.33		ug/L		107	80 - 120	14	14
m-Xylene & p-Xylene			5.00	5.42		ug/L		108	80 - 120	12	14
o-Xylene			5.00	5.28	*1	ug/L		106	80 - 120	17	16
Toluene			5.00	5.11	*1	ug/L		102	80 - 120	17	13
Xylenes, Total			10.0	10.7		ug/L		107	80 - 120	14	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-374647/4
Matrix: Water
Analysis Batch: 374647

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	104		80 - 120

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-374395/3
Matrix: Water
Analysis Batch: 374395

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/27/21 13:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		50 - 150		11/27/21 13:52	1

Lab Sample ID: LCS 580-374395/4
Matrix: Water
Analysis Batch: 374395

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	943		ug/L		94	79 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	102		50 - 150

Lab Sample ID: LCSD 580-374395/5
Matrix: Water
Analysis Batch: 374395

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	945		ug/L		94	79 - 120	0	10

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	103		50 - 150

Lab Sample ID: MB 580-374421/3
Matrix: Water
Analysis Batch: 374421

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			11/28/21 17:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		50 - 150		11/28/21 17:19	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 580-374421/4
Matrix: Water
Analysis Batch: 374421

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	928		ug/L		93	79 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*50 - 150*

Lab Sample ID: LCSD 580-374421/5
Matrix: Water
Analysis Batch: 374421

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	880		ug/L		88	79 - 120	5	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*50 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-374572/1-A
Matrix: Water
Analysis Batch: 374831

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 374572

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		11/30/21 09:38	12/03/21 02:58	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/30/21 09:38	12/03/21 02:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*11/30/21 09:38*	*12/03/21 02:58*	*1*

Lab Sample ID: LCS 580-374572/2-A
Matrix: Water
Analysis Batch: 374831

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 374572

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			2000	1930		ug/L		96	50 - 120		
Motor Oil (>C24-C36)			2000	2070		ug/L		104	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*111*		*50 - 150*

Lab Sample ID: LCSD 580-374572/3-A
Matrix: Water
Analysis Batch: 374831

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 374572

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2000	1850		ug/L		92	50 - 120	4	26
Motor Oil (>C24-C36)			2000	1910		ug/L		96	64 - 120	8	24

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 580-374572/3-A
Matrix: Water
Analysis Batch: 374831

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 374572

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	109		50 - 150

QC Association Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

GC/MS VOA

Analysis Batch: 374647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-107686-1	MW-1_20211117	Total/NA	Water	8260D	
580-107686-2	MW-2_20211117	Total/NA	Water	8260D	
580-107686-3	MW-3_20211117	Total/NA	Water	8260D	
580-107686-4	MW-4_20211117	Total/NA	Water	8260D	
580-107686-5	MW-5_20211117	Total/NA	Water	8260D	
580-107686-6	Trip Blank_20211117	Total/NA	Water	8260D	
MB 580-374647/6	Method Blank	Total/NA	Water	8260D	
LCS 580-374647/3	Lab Control Sample	Total/NA	Water	8260D	
LCSD 580-374647/4	Lab Control Sample Dup	Total/NA	Water	8260D	

GC VOA

Analysis Batch: 374395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-107686-1	MW-1_20211117	Total/NA	Water	NWTPH-Gx	
580-107686-2	MW-2_20211117	Total/NA	Water	NWTPH-Gx	
580-107686-3	MW-3_20211117	Total/NA	Water	NWTPH-Gx	
580-107686-4	MW-4_20211117	Total/NA	Water	NWTPH-Gx	
580-107686-5	MW-5_20211117	Total/NA	Water	NWTPH-Gx	
MB 580-374395/3	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-374395/4	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-374395/5	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

Analysis Batch: 374421

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-107686-6	Trip Blank_20211117	Total/NA	Water	NWTPH-Gx	
MB 580-374421/3	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-374421/4	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-374421/5	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC Semi VOA

Prep Batch: 374572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-107686-1	MW-1_20211117	Total/NA	Water	3510C	
580-107686-2	MW-2_20211117	Total/NA	Water	3510C	
580-107686-3	MW-3_20211117	Total/NA	Water	3510C	
580-107686-4	MW-4_20211117	Total/NA	Water	3510C	
580-107686-5	MW-5_20211117	Total/NA	Water	3510C	
MB 580-374572/1-A	Method Blank	Total/NA	Water	3510C	
LCS 580-374572/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-374572/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 374831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-107686-1	MW-1_20211117	Total/NA	Water	NWTPH-Dx	374572
580-107686-2	MW-2_20211117	Total/NA	Water	NWTPH-Dx	374572
580-107686-3	MW-3_20211117	Total/NA	Water	NWTPH-Dx	374572
580-107686-4	MW-4_20211117	Total/NA	Water	NWTPH-Dx	374572
580-107686-5	MW-5_20211117	Total/NA	Water	NWTPH-Dx	374572
MB 580-374572/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	374572
LCS 580-374572/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	374572

GC Semi VOA (Continued)

Analysis Batch: 374831 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 580-374572/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	374572

Lab Chronicle

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Client Sample ID: MW-1_20211117
Lab Sample ID: 580-107686-1
Date Collected: 11/17/21 13:15
Matrix: Water
Date Received: 11/19/21 12:27

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	374647	12/01/21 06:04	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374395	11/27/21 21:35	JBT	FGS SEA
Total/NA	Prep	3510C			374572	11/30/21 09:38	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	374831	12/03/21 04:17	JAE	FGS SEA

Client Sample ID: MW-2_20211117
Lab Sample ID: 580-107686-2
Date Collected: 11/17/21 12:02
Matrix: Water
Date Received: 11/19/21 12:27

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		50	374647	12/01/21 06:28	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374395	11/27/21 22:00	JBT	FGS SEA
Total/NA	Prep	3510C			374572	11/30/21 09:38	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		20	374831	12/03/21 04:36	JAE	FGS SEA

Client Sample ID: MW-3_20211117
Lab Sample ID: 580-107686-3
Date Collected: 11/17/21 11:23
Matrix: Water
Date Received: 11/19/21 12:27

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	374647	12/01/21 06:52	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374395	11/27/21 22:24	JBT	FGS SEA
Total/NA	Prep	3510C			374572	11/30/21 09:38	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	374831	12/03/21 04:56	JAE	FGS SEA

Client Sample ID: MW-4_20211117
Lab Sample ID: 580-107686-4
Date Collected: 11/17/21 10:48
Matrix: Water
Date Received: 11/19/21 12:27

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	374647	12/01/21 07:17	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374395	11/27/21 23:37	JBT	FGS SEA
Total/NA	Prep	3510C			374572	11/30/21 09:38	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	374831	12/03/21 05:16	JAE	FGS SEA

Client Sample ID: MW-5_20211117
Lab Sample ID: 580-107686-5
Date Collected: 11/17/21 12:40
Matrix: Water
Date Received: 11/19/21 12:27

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	374647	12/01/21 07:42	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374395	11/28/21 00:01	JBT	FGS SEA
Total/NA	Prep	3510C			374572	11/30/21 09:38	JHR	FGS SEA
Total/NA	Analysis	NWTPH-Dx		20	374831	12/03/21 05:36	JAE	FGS SEA

Lab Chronicle

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Client Sample ID: Trip Blank_20211117

Date Collected: 11/17/21 00:01
Date Received: 11/19/21 12:27

Lab Sample ID: 580-107686-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	374647	12/01/21 02:00	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	374421	11/28/21 18:32	W1T	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Antea USA Inc. Job ID: 580-107686-1
Project/Site: BP - OPLC - Tacoma Junction

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

Method Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	FGS SEA
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	FGS SEA
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	FGS SEA
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	FGS SEA
5030B	Purge and Trap	SW846	FGS SEA

Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Sample Summary

Client: Antea USA Inc.
Project/Site: BP - OPLC - Tacoma Junction

Job ID: 580-107686-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-107686-1	MW-1_20211117	Water	11/17/21 13:15	11/19/21 12:27
580-107686-2	MW-2_20211117	Water	11/17/21 12:02	11/19/21 12:27
580-107686-3	MW-3_20211117	Water	11/17/21 11:23	11/19/21 12:27
580-107686-4	MW-4_20211117	Water	11/17/21 10:48	11/19/21 12:27
580-107686-5	MW-5_20211117	Water	11/17/21 12:40	11/19/21 12:27
580-107686-6	Trip Blank_20211117	Water	11/17/21 00:01	11/19/21 12:27

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

BP Site Node Path: Olympic Pipeline Company | **Req Due Date (mm/dd/yy):** Standard TAT | Rush TAT Yes _____ No X

BP/RM Facility No: Tacoma Junction | **Lab Work Order Number:**

Lab Name:	Test America	BP/ARC Facility Address:	2660 Frank Albert Road East	Consultant/Contractor:	Antea Group
Lab Address:	Tacoma, WA	City, State, ZIP Code:	Fife, Washington 98424	Consultant/Contractor Project No:	WATJUAA211.10123
Lab PM:	Elaine Walker	Lead Regulatory Agency:	Washington Department of Ecology	Address:	4006 148th Ave NE, Redmond, WA 98052
Lab Phone:	253.248.4972	California Global ID No.:	NA	Consultant/Contractor PM:	Megan Richard
Lab Shipping Accnt:	NA	Enfos Proposal No:	WR849990/00BPT-0009	Phone: 425-498-7711	Email: Megan.Richard@anteagroup.us
Lab Bottle Order No:	NA	Accounting Mode:	Provision __X___ OOC-BU _____ OOC-RM _____	Send/Submit EDD to:	Megan.Richard@anteagroup.us
Other Info:	m.elaine.walker@eurofinset.com	Stage	1_Appraise (10) Activity Interim Measures (123)	Invoice To:	BP-RM _____ BP/ARC ____X____
BP/RM PM:	Wade Melton				
PM Phone:	360-594-7978				
PM Email:	wade.melton@bp.com				

Report Type & QC Level

Limited (Standard) Package ____

Limited Plus Package ____

Full Package ——

Lab No.	Sample Description	Date	Time	Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total Number of Containers	Filt	Pres	Analysis	8260BTEX	NWTPH-Gx	NWTPH-Dx
	MW-1_20211117	11/17/21	1315	W				G	8				X	X	X
	MW-2_20211117	11/17/21	1202	W				G	8				X	X	X
	MW-3_20211117	11/17/21	1123	W				G	8				X	X	X
	MW-4_20211117	11/17/21	1048	W				G	8				X	X	X
	MW-5_20211117	11/17/21	1240	W				G	8				X	X	X
	Trip Blank	11/17/21	0000	W				G	4				X	X	

580-107686 Chain of Custody

Sampler's Name: Sam Hinze, Nathan Han	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Antea Group	Samantha Hinze Antea Group	11/19/21	1227	Michael A. Erickson	11/19/21	1227
Ship Method: Courier Ship Date: 11/19/21						
Shipment Tracking No:						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____°F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP LaMP Soil/H2O COC July 2018

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW-1_20211117	580-107686-G-1	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-1_20211117	580-107686-H-1	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-2_20211117	580-107686-G-2	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-2_20211117	580-107686-H-2	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-3_20211117	580-107686-G-3	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-3_20211117	580-107686-H-3	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-4_20211117	580-107686-G-4	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-4_20211117	580-107686-H-4	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-5_20211117	580-107686-G-5	Amber Glass 250mL - hydrochloric acid	<2			60358/052030
MW-5_20211117	580-107686-H-5	Amber Glass 250mL - hydrochloric acid	<2			60358/052030

TACOMA Junction

Therm. ID: A1 Cor: 1.6 ° Unc: 1.9 °
Cooler Dsc: S Blu
Packing: Bub
Cust. Seal: Yes ___ No ✓
Blue Ice: (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: ✓
Other: ___

Cooler for Renton Station

Therm. ID: A1 Cor: 2.6 ° Unc: 2.9 °
Cooler Dsc: Lg Blu
Packing: Bub
Cust. Seal: Yes ✓ No ___
Blue Ice: (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: ✓
Other: ___

Therm. ID: IR9 Cor: 1.9 ° Unc: 1.6 °
Cooler Dsc: L Blu
Packing: Bub
Cust. Seal: Yes ✓ No ___
Blue Ice: (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: ✓
Other: ___

Therm. ID: A1 Cor: 3.4 ° Unc: 3.7 °
Cooler Dsc: L Blu
Packing: Bub
Cust. Seal: Yes ✓ No ___
Blue Ice: (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: ✓
Other: ___

Therm. ID: IR9 Cor: 0.9 ° Unc: 0.7 °
Cooler Dsc: L Blu
Packing: Bub
Cust. Seal: Yes ✓ No ___
Blue Ice: (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: ✓
Other: ___

Login Sample Receipt Checklist

Client: Antea USA Inc.

Job Number: 580-107686-1

Login Number: 107686
List Number: 1
Creator: Vallelunga, Diana L

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

GC/MS VOA BATCH WORKSHEET

Lab Name: Eurofins Seattle Job No.: 580-107686-1

SDG No.:

Batch Number: 374647 Batch Start Date: 11/30/21 23:09 Batch Analyst: Mautz, Brady 1

Batch Method: 8260D Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS 00007	VOAMasterMix 00075	VOASTDGASweek 00084
LCS 580-374647/3		8260D		10 mL	10 mL		2 uL	5 uL	5 uL
LCSD 580-374647/4		8260D		10 mL	10 mL		2 uL	5 uL	5 uL
MB 580-374647/6		8260D		10 mL	10 mL		2 uL		
580-107686-A-1	MW-1_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		
580-107686-A-2	MW-2_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		
580-107686-A-3	MW-3_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		
580-107686-A-4	MW-4_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		
580-107686-A-5	MW-5_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		
580-107686-A-6	Trip Blank_20211117	8260D	T	10 mL	10 mL	<2 SU	2 uL		

Batch Notes	
pH Indicator ID	6003004
Vial Lot Number	0204201G

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC VOA BATCH WORKSHEET

Lab Name: Eurofins Seattle Job No.: 580-107686-1

SDG No.:

Batch Number: 374395 Batch Start Date: 11/27/21 13:03 Batch Analyst: Tucker, Jonathon B

Batch Method: NWTPH-Gx Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00048	GRO_LCS 00070	
MB 580-374395/3		NWTPH-Gx		5 mL	5 mL		1 uL		
LCS 580-374395/4		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
LCSD 580-374395/5		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
580-107686-B-1	MW-1_20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-107686-B-2	MW-2_20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-107686-B-3	MW-3_20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-107686-A-4	MW-4_20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		
580-107686-B-5	MW-5_20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		

Batch Notes	
pH Indicator ID	6908005

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC VOA BATCH WORKSHEET

Lab Name: Eurofins Seattle Job No.: 580-107686-1

SDG No.:

Batch Number: 374421 Batch Start Date: 11/28/21 16:30 Batch Analyst: Thaneerat, Wijittra 1

Batch Method: NWTPH-Gx Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00048	GRO_LCS 00070	
MB 580-374421/3		NWTPH-Gx		5 mL	5 mL		1 uL		
LCS 580-374421/4		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
LCSD 580-374421/5		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
580-107686-A-6	Trip Blank 20211117	NWTPH-Gx	T	5 mL	5 mL	<2 SU	1 uL		

Batch Notes	
pH Indicator ID	6908005

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Seattle Job No.: 580-107686-1

SDG No.:

Batch Number: 374572 Batch Start Date: 11/30/21 09:38 Batch Analyst: Roberts, Jacob H

Batch Method: 3510C Batch End Date: 11/30/21 18:51

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	FirstAdjustpH
MB 580-374572/1		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
LCS 580-374572/2		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
LCSD 580-374572/3		3510C, NWTPH-Dx				250 mL	1 mL	7 SU	2 SU
580-107686-H-1	MW-1_20211117	3510C, NWTPH-Dx	T	00425.65 g	00172.13 g	253.5 mL	1 mL	2 SU	n/a SU
580-107686-H-2	MW-2_20211117	3510C, NWTPH-Dx	T	00426.55 g	00173.47 g	253.1 mL	1 mL	2 SU	n/a SU
580-107686-H-3	MW-3_20211117	3510C, NWTPH-Dx	T	00430.39 g	00172.10 g	258.3 mL	1 mL	2 SU	n/a SU
580-107686-G-4	MW-4_20211117	3510C, NWTPH-Dx	T	00430.33 g	00174.50 g	255.8 mL	1 mL	2 SU	n/a SU
580-107686-G-5	MW-5_20211117	3510C, NWTPH-Dx	T	00428.91 g	00172.21 g	256.7 mL	1 mL	2 SU	n/a SU

Lab Sample ID	Client Sample ID	Method Chain	Basis	SecondAdjustpH	TPH_Water_Spk 00030	TPH_WaterSurr 00074	AnalysisComment		
MB 580-374572/1		3510C, NWTPH-Dx		n/a SU		100 uL			
LCS 580-374572/2		3510C, NWTPH-Dx		n/a SU	100 uL	100 uL			
LCSD 580-374572/3		3510C, NWTPH-Dx		n/a SU	100 uL	100 uL			
580-107686-H-1	MW-1_20211117	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-107686-H-2	MW-2_20211117	3510C, NWTPH-Dx	T	n/a SU		100 uL	Strong petroleum byproduct odor		
580-107686-H-3	MW-3_20211117	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-107686-G-4	MW-4_20211117	3510C, NWTPH-Dx	T	n/a SU		100 uL			
580-107686-G-5	MW-5_20211117	3510C, NWTPH-Dx	T	n/a SU		100 uL	Strong petroleum byproduct odor		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Seattle Job No.: 580-107686-1

SDG No.:

Batch Number: 374572 Batch Start Date: 11/30/21 09:38 Batch Analyst: Roberts, Jacob H

Batch Method: 3510C Batch End Date: 11/30/21 18:51

Batch Notes	
Method/Fraction	3510C_LVI / NWTPH
Balance ID	SEA225
pH Indicator ID	6003004 / 6003005
Pipette/Syringe/Dispenser ID	MP4
Analyst ID - Extraction	JHR/RBL/RJL
Reagent Water ID	DI
Analyst ID - Spike Analyst	RBL
Analyst ID - Spike Witness Analyst	JHR
Sufficient Volume for Batch QC	no
Acid Used for pH Adjustment ID	2815022
Prep Solvent ID	3004678
Prep Solvent Volume Used	100 mL
Filter ID	2815023
Na2SO4 ID	288067
Analyst ID - Concentration	RJL
Equipment ID - Concentration 1	Steambath 1
Thermometer ID - Concentration 1	61013-040-1
Concentration 1 Uncorrected Temperature	70.0-75.0 Degrees C
Concentration 1 Corrected Temperature	70.3-75.3 Degrees C
Equipment ID - Concentration 2	Turbovap 5
Thermometer ID - Concentration 2	DIGITALREADOUT
Concentration 2 Uncorrected Temperature	20.0 Degrees C
Concentration 2 Corrected Temperature	18.2 Degrees C
Vial Lot Number	24162054
Analyst ID - Clean Up	RJL
Sulfur Removal Reagent ID	3018964
Batch Comment	Vialed by: RJL

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.