Remediation Management Services Company

4 Centerpointe Drive, Suite 200
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wade.melton@bp.com

January 29, 2020

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 2019, 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 2019
OPLC Tacoma Junction
2660 Frank Albert Road East, File, 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

January 29, 2020
Antea Group Project No. WATJUAA191

us.anteagroup.com

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Reporting Period.:	July 2019 – December 2019
Agency Contact:	Tim Mullin, Toxics Cleanup Program (360) 407-6265
Ecology Site ID No.:	24529
RM Contact:	Wade Melton, (360) 594-7978
Olympic Contact:	Alexandria Crooks, (425) 981-2590
Antea Group Contact:	Megan Richard, (425) 498-7711

1.0 Site History

- This site is an active OPLC facility that has been operating since 1965.
- 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 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 1, 2019 and October 30, 2019. 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 and fourth quarter 2019 sampling events.
- Due to the absence of light non-aqueous phase liquid (LNPAL) in MW-2 during the second half of 2019, the absorbent sock was removed during the fourth quarter sampling event.
- 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 February 2020.

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.

Prepared by

Katelyn Younger

Date: January 29, 2020

Katelyn Younger
Staff Professional

Reviewed by:

State of Washington
3157
Licensed Geologist
MEGAN RICHARD

Date: January 29, 2019

Megan Richard, LG
Senior Project Manager

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

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	9/8/2016	100.00	1.95	NP	--	98.05	--
MW-1	12/1/2016	100.00	0.76	NP	--	99.24	--
MW-1	2/22/2017	100.00	0.90	NP	--	99.10	--
MW-1	5/10/2017	100.00	1.52	NP	--	98.48	--
MW-1	8/16/2017	100.00	2.04	NP	--	97.96	--
MW-1	10/31/2017	100.00	1.22	NP	--	98.78	--
MW-1	2/13/2018	100.00	1.05	NP	--	98.95	--
MW-1	5/2/2018	100.00	1.36	NP	--	98.64	--
MW-1	8/8/2018	100.00	2.15	NP	--	97.85	--
MW-1	10/23/2018	100.00	1.87	NP	--	98.13	--
MW-1	1/30/2019	100.00	0.96	NP	--	99.04	--
MW-1	4/24/2019	100.00	1.50	NP	--	98.50	--
MW-1	8/1/2019	100.00	1.90	NP	--	98.10	--
MW-1	10/30/2019	100.00	1.09	NP	--	98.91	--
MW-2	6/29/2016	99.59	2.49	NP	--	97.10	--
MW-2	9/8/2016	99.59	3.44	3.42	0.02	96.17	--
MW-2	12/1/2016	99.59	1.73	NP	--	97.86	--
MW-2	2/22/2017	99.59	1.13	NP	--	98.46	--
MW-2	5/10/2017	99.59	1.39	NP	--	98.20	--
MW-2	8/16/2017	99.59	2.85	2.82	0.03	96.76	--
MW-2	10/31/2017	99.59	1.79	1.70	0.09	97.87	--
MW-2	2/13/2018	99.59	1.63	NP	--	97.96	--
MW-2	5/2/2018	99.59	1.83	NP	--	97.76	--
MW-2	8/8/2018	99.59	3.35	NP	--	96.24	--
MW-2	10/23/2018	99.59	2.96	2.95	0.01	96.64	--
MW-2	1/30/2019	99.59	2.20	NP	--	97.39	--
MW-2	4/24/2019	99.59	1.53	1.52	0.01	98.07	--
MW-2	8/1/2019	99.59	2.87	NP	--	96.72	--
MW-2	10/30/2019	99.59	1.90	NP	--	97.69	--
MW-3	6/29/2016	99.91	1.98	NP	--	97.93	--
MW-3	9/8/2016	99.91	2.61	NP	--	97.30	--
MW-3	12/1/2016	99.91	1.02	NP	--	98.89	--
MW-3	2/22/2017	99.91	1.11	NP	--	98.80	--
MW-3	5/10/2017	99.91	1.32	NP	--	98.59	--
MW-3	8/16/2017	99.91	2.26	NP	--	97.65	--
MW-3	10/31/2017	99.91	1.51	NP	--	98.40	--
MW-3	2/13/2018	99.91	1.00	NP	--	98.91	--
MW-3	5/2/2018	99.91	1.28	NP	--	98.63	--

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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-3	8/8/2018	99.91	2.46	NP	--	97.45	--
MW-3	10/23/2018	99.91	2.11	NP	--	97.80	--
MW-3	1/30/2019	99.91	1.09	NP	--	98.82	--
MW-3	4/24/2019	99.91	1.33	NP	--	98.58	--
MW-3	8/1/2019	99.91	1.84	NP	--	98.07	--
MW-3	10/30/2019	99.91	1.21	NP	--	98.70	--
MW-4	6/29/2016	99.70	2.20	NP	--	97.50	--
MW-4	9/8/2016	99.70	2.75	NP	--	96.95	--
MW-4	12/1/2016	99.70	1.00	NP	--	98.70	--
MW-4	2/22/2017	99.70	1.05	NP	--	98.65	--
MW-4	5/10/2017	99.70	1.34	NP	--	98.36	--
MW-4	8/16/2017	99.70	2.44	NP	--	97.26	--
MW-4	10/31/2017	99.70	1.35	NP	--	98.35	--
MW-4	2/13/2018	99.70	1.02	NP	--	98.68	--
MW-4	5/2/2018	99.70	1.29	NP	--	98.41	--
MW-4	8/8/2018	99.70	3.63	NP	--	96.07	--
MW-4	10/23/2018	99.70	2.20	NP	--	97.50	--
MW-4	1/30/2019	99.70	1.05	NP	--	98.65	--
MW-4	4/24/2019	99.70	1.35	NP	--	98.35	--
MW-4	8/1/2019	99.70	2.16	NP	--	97.54	--
MW-4	10/30/2019	99.70	1.20	NP	--	98.50	--
MW-5	6/29/2016	99.60	1.49	NP	--	98.11	--
MW-5	9/8/2016	99.60	1.57	NP	--	98.03	--
MW-5	12/1/2016	99.60	0.61	NP	--	98.99	--
MW-5	2/22/2017	99.60	0.77	NP	--	98.83	--
MW-5	5/10/2017	99.60	1.27	NP	--	98.33	--
MW-5	8/16/2017	99.60	1.70	NP	--	97.90	--
MW-5	10/31/2017	99.60	1.02	NP	--	98.58	--
MW-5	2/13/2018	99.60	0.82	NP	--	98.78	--
MW-5	5/2/2018	99.60	1.12	NP	--	98.48	--
MW-5	8/8/2018	99.60	1.80	NP	--	97.80	--
MW-5	10/23/2018	99.60	1.52	NP	--	98.08	--
MW-5	1/30/2019	99.60	0.73	NP	--	98.87	--
MW-5	4/24/2019	99.60	1.20	NP	--	98.40	--
MW-5	8/1/2019	99.60	1.55	NP	--	98.05	--
MW-5	10/30/2019	99.60	0.89	NP	--	98.71	--

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

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

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
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**1000/800[1]**	**500**	**500**
Well ID	Date							
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	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	130	< 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-2	6/29/2016	**100**	6.9	56	92	**2300**	**810**	< 250
MW-2	12/1/2016	**170**	8.7	280	250	**7000**	**1700**	< 260
MW-2	2/22/2017	**90**	< 20	120	110	**6500**	**1300**	< 250
MW-2	5/10/2017	**85**	6.4	220	150	**6000**	**990**	< 250
MW-2	2/13/2018	**180**	8.3	130	150	**5000**	**2100**	< 350
MW-2	5/2/2018	**170 ***	6.3 *	130	110	**4200**	**1100**	< 360
MW-2	8/8/2018	**63**	5.0	140	120	**4400**	**4900**	350
MW-2	1/30/2019	**130**	7.2	74	94	**4500**	**1800**	< 350
MW-2	8/1/2019	**110**	6.2	25	43	**1600**	**1000**	< 350
MW-2	10/30/2019	**140**	6.1	62	51	**3400**	**2000**	< 350
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	8/8/2018	< 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

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

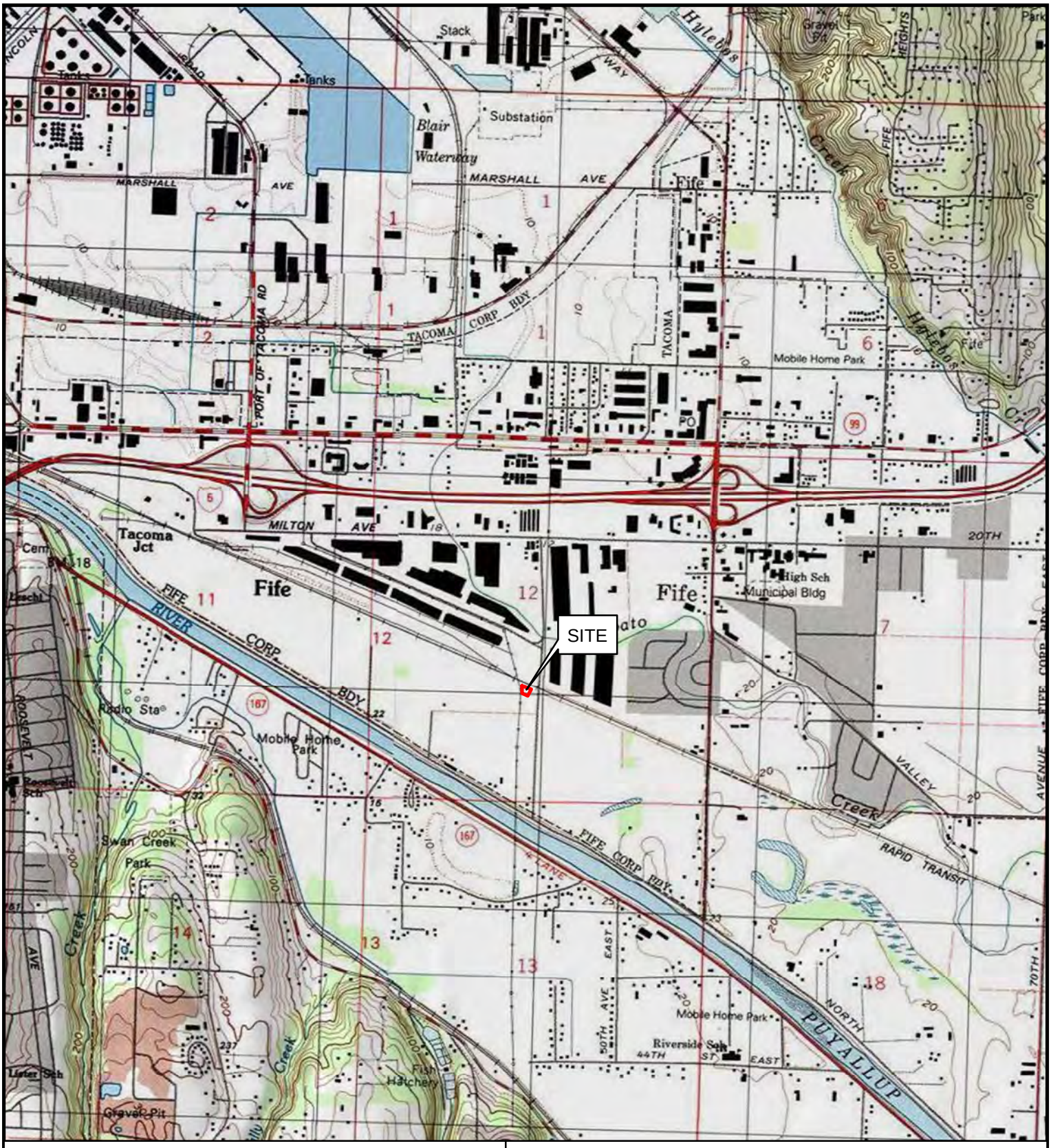
	CONSTITUENT	B	T	E	X	TPH-G	TPH-D	TPH-O
	UNIT	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**1000/800[1]**	**500**	**500**
MW-3	10/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	110	< 250
MW-4	9/8/2016	< 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	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	130	< 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-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
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	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	210	< 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

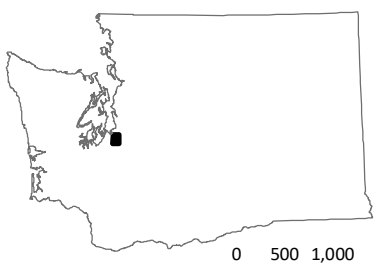
Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E, Fife, WA

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
MTCA METHOD A CLEANUP LEVELS	**5**	**1000**	**700**	**1000**	**1000/800[1]**	**500**	**500**

Notes:
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes, Total
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
WATACIUSA181	*MB*	*1:24,000*
DATE	**REVIEWED BY**	**MAP SCALE**
1/24/2019	*FS*	*1 INCH = 2,000 FEET*

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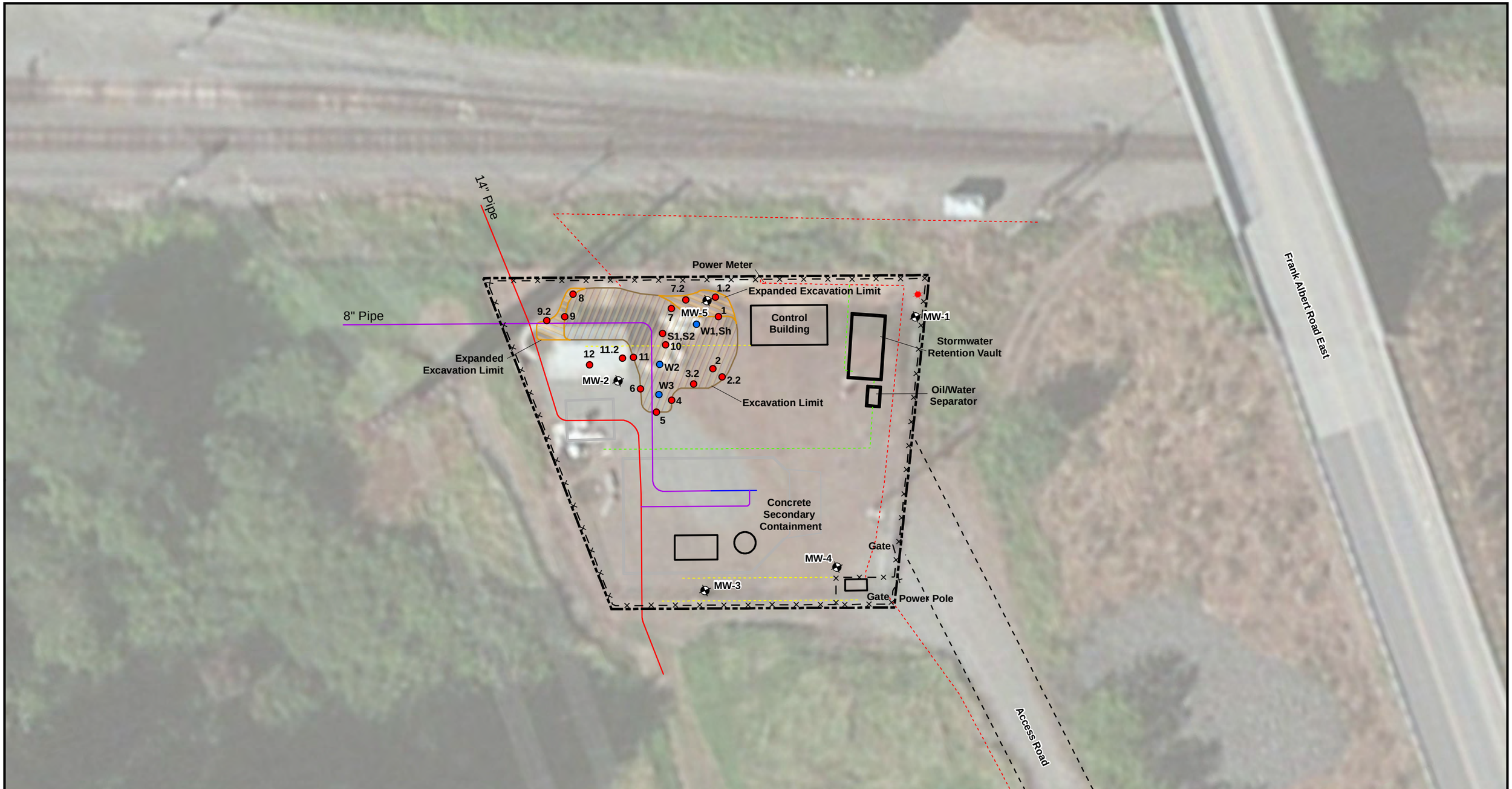
\\gis-s3\GIS_Data\Sandbox\!Projects\L-P\OPLC\Tacoma\Project Number\Layout\Fig1Update.mxd



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

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
WATACJUSA181	MB	1:360
DATE	REVIEWED BY	MAP SCALE
1/24/2019	FS	1 INCH = 30 FEET

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14" Pipe
8" Pipe
(98.05)
MW-5
Expanded Excavation Limit
Control Building
MW-1
(98.10)
Stormwater Retention Vault
Expanded Excavation Limit
96.8
97
97.2
97.4
97.6
97.8
98
MW-2
(96.72)
Excavation Limit
Oil/Water Separator
Concrete Secondary Containment
97.8
98
Gate
MW-4
(97.54)
MW-3
(98.07)
Gate
Frank Albert Road East
Access Road

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
- (98.07) 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

N

0 7.5 15 30 Feet

FIGURE 3

GROUNDWATER ELEVATION CONTOUR MAP
AUGUST 1, 2019
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA191	MSS	1:360
DATE	REVIEWED BY	MAP SCALE
1/28/2020	JS	1 INCH = 30 FEET

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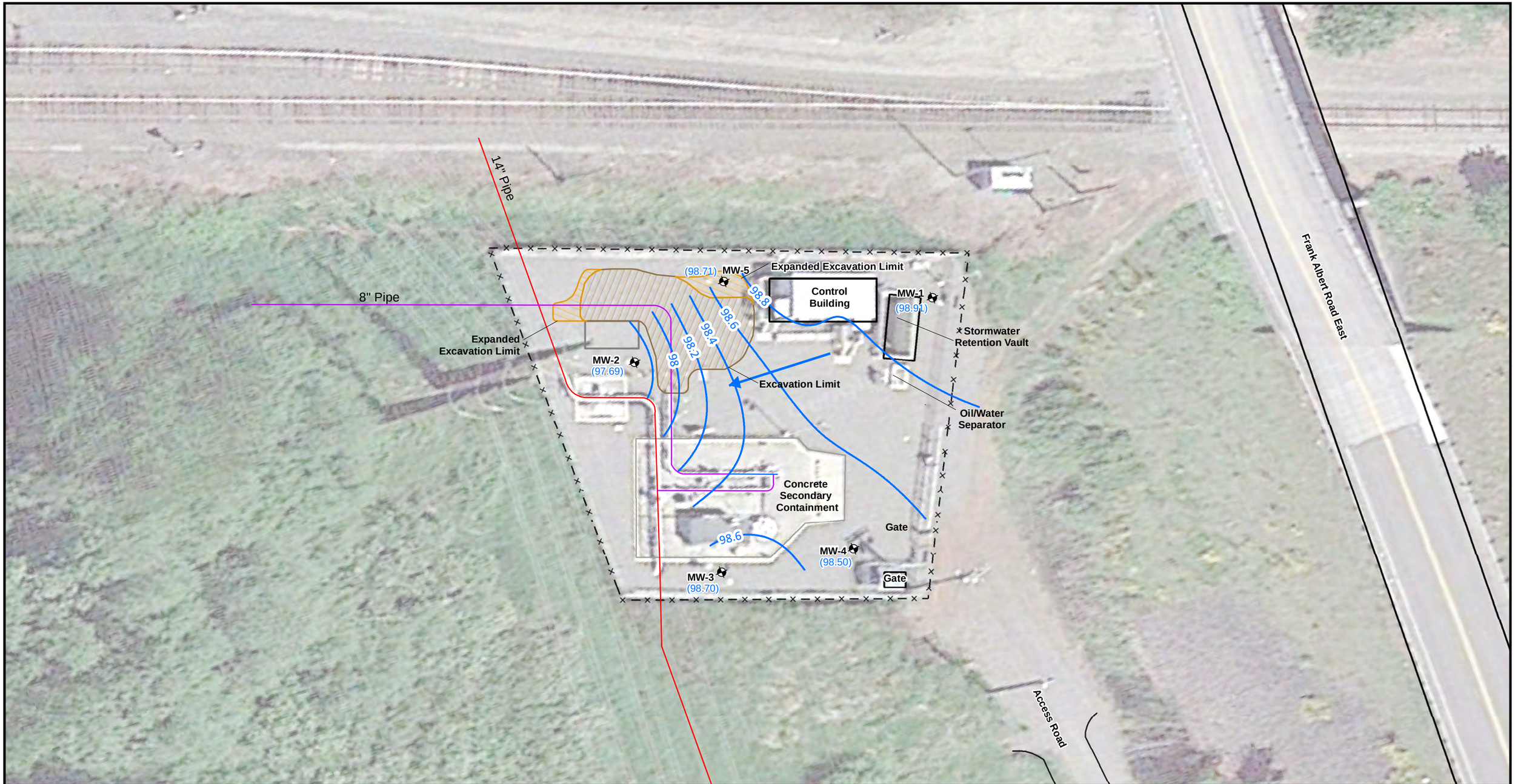

Legend

- Property Boundary
- Fence
- Monitoring Well Location
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Original Excavation
- Expanded Excavation
- Groundwater Elevation Contour (ft)
- Inferred Groundwater Flow Direction
- (97.69) 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
OCTOBER 30, 2019
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATJUAA191	MSS	1:360
DATE	REVIEWED BY	MAP SCALE
1/29/2020	JS	1 INCH = 30 FEET

anteagroup

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MW-2		
Date	8/1/2019	10/30/2019
B	**110**	**140**
T	6.2	6.1
E	25	62
X	43	51
TPH-G	**1600**	**3400**
TPH-D	**1000**	**2000**
TPH-O	< 350	<350

MW-5		
Date	8/1/2019	10/30/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0
TPH-G	< 250	< 250
TPH-D	200	120
TPH-O	< 350	< 100

MW-1		
Date	8/1/2019	10/30/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0
TPH-G	< 250	< 250
TPH-D	180	< 100
TPH-O	< 350	<350

MW-3		
Date	8/1/2019	10/30/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0
TPH-G	< 250	< 250
TPH-D	110	< 110
TPH-O	< 350	< 350

MW-4		
Date	8/1/2019	10/30/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0
TPH-G	< 250	< 250
TPH-D	160	< 110
TPH-O	< 350	< 350

14" Pipe
8" Pipe
MW-5
Expanded Excavation Limit
Control Building
MW-1
Stormwater Retention Vault
Expanded Excavation Limit
MW-2
Excavation Limit
Oil/Water Separator
Concrete Secondary Containment
Gate
MW-4
MW-3
Gate
Frank Albert Road East
Access Road

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
< - 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 1, 2019 AND OCTOBER 30, 2019
OLYMPIC PIPELINE COMPANY
TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WASHINGTON

PROJECT NO.	PREPARED BY	REF SCALE
WATACDF191	*MSS*	*1:360*
DATE	REVIEWED BY	MAP SCALE
1/28/2020	*JS*	*1 INCH = 30 FEET*

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Appendix A

Analytical Lab Reports and Chain-of-Custody Documentation

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 580-88108-1
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

M. Elaine Walker

Authorized for release by:
8/19/2019 5:08:55 PM

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

Table of Contents

Definitions/Glossary

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

Job ID: 580-88108-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Case Narrative

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

Job ID: 580-88108-1

Job ID: 580-88108-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-88108-1

Receipt
Six samples were received on 8/2/2019 11:04 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.0º C.

GC/MS VOA
Method(s) 8260C: Surrogate 1,2-Dichloroethane-d4 (Surr) recovery for the following samples were outside control limits: MW-2_20190801 (580-88108-2), MW-3_20190801 (580-88108-3), MW-4_20190801 (580-88108-4) and MW-5_20190801 (580-88108-5). 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 VOA
Method(s) NWTPH-Gx: Surrogate 4-Bromofluorobenzene (Surr) recovery for the following sample was outside control limits: MW-2_20190801 (580-88108-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. Surrogate Trifluorotoluene (Surr) recovered within the limits.

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

GC Semi VOA
Method(s) NWTPH-Dx: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: MW-2_20190801 (580-88108-2).

Method(s) NWTPH-Dx: The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: MW-1_20190801 (580-88108-1), MW-3_20190801 (580-88108-3), MW-4_20190801 (580-88108-4) and MW-5_20190801 (580-88108-5).

Method(s) NWTPH-Dx: Surrogate recovery for the following sample was outside control limits: MW-2_20190801 (580-88108-2). 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.

Detection Summary

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

Job ID: 580-88108-1

Client Sample ID: MW-1_20190801 — Lab Sample ID: 580-88108-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	180		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-2_20190801 — Lab Sample ID: 580-88108-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	110		3.0		ug/L	1		8260C	Total/NA
Toluene	6.2		2.0		ug/L	1		8260C	Total/NA
Ethylbenzene	25		3.0		ug/L	1		8260C	Total/NA
Xylenes, Total	43		3.0		ug/L	1		8260C	Total/NA
Gasoline	1600		250		ug/L	1		NWTPH-Gx	Total/NA
#2 Diesel (C10-C24)	1000		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-3_20190801 — Lab Sample ID: 580-88108-3

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

Client Sample ID: MW-4_20190801 — Lab Sample ID: 580-88108-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	160		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-5_20190801 — Lab Sample ID: 580-88108-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	200		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: Trip Blank_20190801 — Lab Sample ID: 580-88108-6

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Seattle

Client Sample ID: MW-1_20190801

Lab Sample ID: 580-88108-1

Date Collected: 08/01/19 11:15

Matrix: Water

Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 20:29	1
Toluene	ND		2.0		ug/L			08/05/19 20:29	1
Ethylbenzene	ND		3.0		ug/L			08/05/19 20:29	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*105*		*80 - 120*		*08/05/19 20:29*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*08/05/19 20:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*80 - 126*		*08/05/19 20:29*	*1*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*		*08/05/19 20:29*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*08/05/19 20:29*	*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			08/11/19 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*50 - 150*		*08/11/19 16:31*	*1*
Trifluorotoluene (Surr)	*105*		*50 - 150*		*08/11/19 16:31*	*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)	**180**		110		ug/L		08/08/19 10:12	08/10/19 15:32	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 15:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*101*		*50 - 150*	*08/08/19 10:12*	*08/10/19 15:32*	*1*

Client Sample ID: MW-2_20190801

Lab Sample ID: 580-88108-2

Date Collected: 08/01/19 10:30

Matrix: Water

Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**110**		3.0		ug/L			08/05/19 21:18	1
Toluene	**6.2**		2.0		ug/L			08/05/19 21:18	1
Ethylbenzene	**25**		3.0		ug/L			08/05/19 21:18	1
Xylenes, Total	**43**		3.0		ug/L			08/05/19 21:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*114*		*80 - 120*		*08/05/19 21:18*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*08/05/19 21:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*76*	*X*	*80 - 126*		*08/05/19 21:18*	*1*
4-Bromofluorobenzene (Surr)	*118*		*80 - 120*		*08/05/19 21:18*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*08/05/19 21:18*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**1600**		250		ug/L			08/11/19 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*163*	*X*	*50 - 150*		*08/11/19 17:01*	*1*

Client Sample ID: MW-2_20190801

Lab Sample ID: 580-88108-2
Date Collected: 08/01/19 10:30
Matrix: Water
Date Received: 08/02/19 11:04

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*105*		*50 - 150*		*08/11/19 17:01*	*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)	**1000**		110		ug/L		08/08/19 10:12	08/10/19 15:55	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 15:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*87*		*50 - 150*	*08/08/19 10:12*	*08/10/19 15:55*	*1*

Client Sample ID: MW-3_20190801

Lab Sample ID: 580-88108-3
Date Collected: 08/01/19 10:00
Matrix: Water
Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 21:42	1
Toluene	ND		2.0		ug/L			08/05/19 21:42	1
Ethylbenzene	ND		3.0		ug/L			08/05/19 21:42	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 21:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*116*		*80 - 120*		*08/05/19 21:42*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*08/05/19 21:42*	*1*
1,2-Dichloroethane-d4 (Surr)	*74*	*X*	*80 - 126*		*08/05/19 21:42*	*1*
4-Bromofluorobenzene (Surr)	*117*		*80 - 120*		*08/05/19 21:42*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*08/05/19 21:42*	*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			08/11/19 18:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*97*		*50 - 150*		*08/11/19 18:02*	*1*
Trifluorotoluene (Surr)	*106*		*50 - 150*		*08/11/19 18:02*	*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)	**110**		110		ug/L		08/08/19 10:12	08/10/19 16:18	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 16:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*102*		*50 - 150*	*08/08/19 10:12*	*08/10/19 16:18*	*1*

Client Sample ID: MW-4_20190801

Lab Sample ID: 580-88108-4
Date Collected: 08/01/19 09:35
Matrix: Water
Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 22:06	1
Toluene	ND		2.0		ug/L			08/05/19 22:06	1

Client Sample ID: MW-4_20190801

Lab Sample ID: 580-88108-4

Date Collected: 08/01/19 09:35

Matrix: Water

Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		3.0		ug/L			08/05/19 22:06	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 22:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*117*		*80 - 120*		*08/05/19 22:06*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*08/05/19 22:06*	*1*
1,2-Dichloroethane-d4 (Surr)	*74*	*X*	*80 - 126*		*08/05/19 22:06*	*1*
4-Bromofluorobenzene (Surr)	*120*		*80 - 120*		*08/05/19 22:06*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*08/05/19 22:06*	*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			08/11/19 18:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*50 - 150*		*08/11/19 18:32*	*1*
Trifluorotoluene (Surr)	*104*		*50 - 150*		*08/11/19 18:32*	*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)	**160**		110		ug/L		08/08/19 10:12	08/10/19 16:40	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*98*		*50 - 150*	*08/08/19 10:12*	*08/10/19 16:40*	*1*

Client Sample ID: MW-5_20190801

Lab Sample ID: 580-88108-5

Date Collected: 08/01/19 11:00

Matrix: Water

Date Received: 08/02/19 11:04

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 22:31	1
Toluene	ND		2.0		ug/L			08/05/19 22:31	1
Ethylbenzene	ND		3.0		ug/L			08/05/19 22:31	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 22:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*115*		*80 - 120*		*08/05/19 22:31*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*08/05/19 22:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*76*	*X*	*80 - 126*		*08/05/19 22:31*	*1*
4-Bromofluorobenzene (Surr)	*118*		*80 - 120*		*08/05/19 22:31*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*08/05/19 22:31*	*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			08/11/19 19:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*		*08/11/19 19:03*	*1*
Trifluorotoluene (Surr)	*105*		*50 - 150*		*08/11/19 19:03*	*1*

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

Job ID: 580-88108-1

Client Sample ID: MW-5_20190801

Lab Sample ID: 580-88108-5

Date Collected: 08/01/19 11:00
Date Received: 08/02/19 11:04

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)	**200**		110		ug/L		08/08/19 10:12	08/10/19 17:02	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*08/08/19 10:12*	*08/10/19 17:02*	*1*

Client Sample ID: Trip Blank_20190801

Lab Sample ID: 580-88108-6

Date Collected: 08/01/19 00:00
Date Received: 08/02/19 11:04

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 20:05	1
Toluene	ND		2.0		ug/L			08/05/19 20:05	1
Ethylbenzene	ND		3.0		ug/L			08/05/19 20:05	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 20:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*106*		*80 - 120*		*08/05/19 20:05*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*08/05/19 20:05*	*1*
1,2-Dichloroethane-d4 (Surr)	*82*		*80 - 126*		*08/05/19 20:05*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*08/05/19 20:05*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*08/05/19 20:05*	*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			08/08/19 17:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*50 - 150*		*08/08/19 17:23*	*1*
Trifluorotoluene (Surr)	*95*		*50 - 150*		*08/08/19 17:23*	*1*

Surrogate Summary

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

Job ID: 580-88108-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	TFT (80-120)	TOL (80-120)	DCA (80-126)	BFB (80-120)	DBFM (80-120)
580-88108-1	MW-1_20190801	105	100	85	109	104
580-88108-2	MW-2_20190801	114	96	76 X	118	99
580-88108-3	MW-3_20190801	116	97	74 X	117	97
580-88108-4	MW-4_20190801	117	97	74 X	120	102
580-88108-5	MW-5_20190801	115	98	76 X	118	100
580-88108-6	Trip Blank_20190801	106	98	82	107	95
LCS 580-307544/4	Lab Control Sample	113	93	80	110	102
LCSD 580-307544/5	Lab Control Sample Dup	114	94	81	111	101
MB 580-307544/7	Method Blank	111	97	82	113	100

Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	BFB1 (50-150)	TFT1 (50-150)
580-88108-1	MW-1_20190801	98	105
580-88108-2	MW-2_20190801	163 X	105
580-88108-3	MW-3_20190801	97	106
580-88108-4	MW-4_20190801	95	104
580-88108-5	MW-5_20190801	99	105
580-88108-6	Trip Blank_20190801	92	95
LCS 580-307916/9	Lab Control Sample	98	104
LCS 580-308054/7	Lab Control Sample	99	105
LCSD 580-307916/10	Lab Control Sample Dup	101	104
LCSD 580-308054/8	Lab Control Sample Dup	101	106
MB 580-307916/8	Method Blank	95	111
MB 580-308054/6	Method Blank	97	109

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
TFT = Trifluorotoluene (Surr)

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	OTPH (50-150)
580-88108-1	MW-1_20190801	101
580-88108-2	MW-2_20190801	87
580-88108-3	MW-3_20190801	102
580-88108-4	MW-4_20190801	98
580-88108-5	MW-5_20190801	95

Surrogate Summary

Client: Antea USA Inc. Job ID: 580-88108-1
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)								
LCS 580-307850/2-A	Lab Control Sample	102								
LCSD 580-307850/3-A	Lab Control Sample Dup	108								
MB 580-307850/1-A	Method Blank	94								

Surrogate Legend

OTPH = o-Terphenyl

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

Lab Sample ID: MB 580-307544/7
Matrix: Water
Analysis Batch: 307544

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			08/05/19 18:03	1
Toluene	ND		2.0		ug/L			08/05/19 18:03	1
Ethylbenzene	ND		3.0		ug/L			08/05/19 18:03	1
Xylenes, Total	ND		3.0		ug/L			08/05/19 18:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*111*		*80 - 120*		*08/05/19 18:03*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*08/05/19 18:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*82*		*80 - 126*		*08/05/19 18:03*	*1*
4-Bromofluorobenzene (Surr)	*113*		*80 - 120*		*08/05/19 18:03*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*08/05/19 18:03*	*1*

Lab Sample ID: LCS 580-307544/4
Matrix: Water
Analysis Batch: 307544

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	9.96		ug/L		100	75 - 121
Toluene	10.0	9.86		ug/L		99	80 - 120
Ethylbenzene	10.0	9.55		ug/L		95	80 - 120
m-Xylene & p-Xylene	10.0	9.44		ug/L		94	80 - 120
o-Xylene	10.0	9.53		ug/L		95	80 - 120
Xylenes, Total	20.0	19.0		ug/L		95	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Trifluorotoluene (Surr)	*113*		*80 - 120*
Toluene-d8 (Surr)	*93*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*80*		*80 - 126*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*

Lab Sample ID: LCSD 580-307544/5
Matrix: Water
Analysis Batch: 307544

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	9.49		ug/L		95	75 - 121	5	14
Toluene	10.0	9.75		ug/L		97	80 - 120	1	19
Ethylbenzene	10.0	9.65		ug/L		96	80 - 120	1	14
m-Xylene & p-Xylene	10.0	9.22		ug/L		92	80 - 120	2	14
o-Xylene	10.0	9.36		ug/L		94	80 - 120	2	16
Xylenes, Total	20.0	18.6		ug/L		93	80 - 120	2	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Trifluorotoluene (Surr)	*114*		*80 - 120*
Toluene-d8 (Surr)	*94*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*81*		*80 - 126*

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

Lab Sample ID: LCSD 580-307544/5
Matrix: Water
Analysis Batch: 307544

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

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	111		80 - 120
Dibromofluoromethane (Surr)	101		80 - 120

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

Lab Sample ID: MB 580-307916/8
Matrix: Water
Analysis Batch: 307916

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			08/08/19 15:11	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		50 - 150		08/08/19 15:11	1
Trifluorotoluene (Surr)	111		50 - 150		08/08/19 15:11	1

Lab Sample ID: LCS 580-307916/9
Matrix: Water
Analysis Batch: 307916

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	874		ug/L		87	79 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		50 - 150
Trifluorotoluene (Surr)	104		50 - 150

Lab Sample ID: LCSD 580-307916/10
Matrix: Water
Analysis Batch: 307916

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	877		ug/L		88	79 - 120	0	10

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		50 - 150
Trifluorotoluene (Surr)	104		50 - 150

Lab Sample ID: MB 580-308054/6
Matrix: Water
Analysis Batch: 308054

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			08/11/19 12:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		50 - 150		08/11/19 12:28	1

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

Lab Sample ID: MB 580-308054/6
Matrix: Water
Analysis Batch: 308054

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

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*109*		*50 - 150*		*08/11/19 12:28*	*1*

Lab Sample ID: LCS 580-308054/7
Matrix: Water
Analysis Batch: 308054

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	878		ug/L		88	79 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*50 - 150*
Trifluorotoluene (Surr)	*105*		*50 - 150*

Lab Sample ID: LCSD 580-308054/8
Matrix: Water
Analysis Batch: 308054

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	2	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*50 - 150*
Trifluorotoluene (Surr)	*106*		*50 - 150*

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

Lab Sample ID: MB 580-307850/1-A
Matrix: Water
Analysis Batch: 308022

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 307850

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		08/08/19 10:12	08/10/19 14:24	1
Motor Oil (>C24-C36)	ND		350		ug/L		08/08/19 10:12	08/10/19 14:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*08/08/19 10:12*	*08/10/19 14:24*	*1*

Lab Sample ID: LCS 580-307850/2-A
Matrix: Water
Analysis Batch: 308022

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 307850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	2000	1850		ug/L		93	50 - 120
Motor Oil (>C24-C36)	2000	2220		ug/L		111	64 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*102*		*50 - 150*

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

Lab Sample ID: LCSD 580-307850/3-A
Matrix: Water
Analysis Batch: 308022

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 307850

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2000	1730		ug/L		87	50 - 120	7	26
Motor Oil (>C24-C36)			2000	2110		ug/L		105	64 - 120	5	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*108*		*50 - 150*

QC Association Summary

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

Job ID: 580-88108-1

GC/MS VOA

Analysis Batch: 307544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-88108-1	MW-1_20190801	Total/NA	Water	8260C	
580-88108-2	MW-2_20190801	Total/NA	Water	8260C	
580-88108-3	MW-3_20190801	Total/NA	Water	8260C	
580-88108-4	MW-4_20190801	Total/NA	Water	8260C	
580-88108-5	MW-5_20190801	Total/NA	Water	8260C	
580-88108-6	Trip Blank_20190801	Total/NA	Water	8260C	
MB 580-307544/7	Method Blank	Total/NA	Water	8260C	
LCS 580-307544/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 580-307544/5	Lab Control Sample Dup	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 307916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-88108-6	Trip Blank_20190801	Total/NA	Water	NWTPH-Gx	
MB 580-307916/8	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-307916/9	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-307916/10	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

Analysis Batch: 308054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-88108-1	MW-1_20190801	Total/NA	Water	NWTPH-Gx	
580-88108-2	MW-2_20190801	Total/NA	Water	NWTPH-Gx	
580-88108-3	MW-3_20190801	Total/NA	Water	NWTPH-Gx	
580-88108-4	MW-4_20190801	Total/NA	Water	NWTPH-Gx	
580-88108-5	MW-5_20190801	Total/NA	Water	NWTPH-Gx	
MB 580-308054/6	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-308054/7	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-308054/8	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC Semi VOA

Prep Batch: 307850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-88108-1	MW-1_20190801	Total/NA	Water	3510C	
580-88108-2	MW-2_20190801	Total/NA	Water	3510C	
580-88108-3	MW-3_20190801	Total/NA	Water	3510C	
580-88108-4	MW-4_20190801	Total/NA	Water	3510C	
580-88108-5	MW-5_20190801	Total/NA	Water	3510C	
MB 580-307850/1-A	Method Blank	Total/NA	Water	3510C	
LCS 580-307850/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-307850/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 308022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-88108-1	MW-1_20190801	Total/NA	Water	NWTPH-Dx	307850
580-88108-2	MW-2_20190801	Total/NA	Water	NWTPH-Dx	307850
580-88108-3	MW-3_20190801	Total/NA	Water	NWTPH-Dx	307850
580-88108-4	MW-4_20190801	Total/NA	Water	NWTPH-Dx	307850
580-88108-5	MW-5_20190801	Total/NA	Water	NWTPH-Dx	307850
MB 580-307850/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	307850
LCS 580-307850/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	307850

GC Semi VOA (Continued)

Analysis Batch: 308022 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 580-307850/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	307850

Lab Chronicle

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

Job ID: 580-88108-1

Client Sample ID: MW-1_20190801
Date Collected: 08/01/19 11:15
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 20:29	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	308054	08/11/19 16:31	JSM	TAL SEA
Total/NA	Prep	3510C			307850	08/08/19 10:12	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	308022	08/10/19 15:32	CJ	TAL SEA

Client Sample ID: MW-2_20190801
Date Collected: 08/01/19 10:30
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 21:18	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	308054	08/11/19 17:01	JSM	TAL SEA
Total/NA	Prep	3510C			307850	08/08/19 10:12	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	308022	08/10/19 15:55	CJ	TAL SEA

Client Sample ID: MW-3_20190801
Date Collected: 08/01/19 10:00
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 21:42	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	308054	08/11/19 18:02	JSM	TAL SEA
Total/NA	Prep	3510C			307850	08/08/19 10:12	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	308022	08/10/19 16:18	CJ	TAL SEA

Client Sample ID: MW-4_20190801
Date Collected: 08/01/19 09:35
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 22:06	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	308054	08/11/19 18:32	JSM	TAL SEA
Total/NA	Prep	3510C			307850	08/08/19 10:12	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	308022	08/10/19 16:40	CJ	TAL SEA

Client Sample ID: MW-5_20190801
Date Collected: 08/01/19 11:00
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 22:31	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	308054	08/11/19 19:03	JSM	TAL SEA
Total/NA	Prep	3510C			307850	08/08/19 10:12	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	308022	08/10/19 17:02	CJ	TAL SEA

Lab Chronicle

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

Job ID: 580-88108-1

Client Sample ID: Trip Blank_20190801

Date Collected: 08/01/19 00:00
Date Received: 08/02/19 11:04

Lab Sample ID: 580-88108-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	307544	08/05/19 20:05	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	307916	08/08/19 17:23	JSM	TAL SEA

Laboratory References:

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

Accreditation/Certification Summary

Client: Antea USA Inc. Job ID: 580-88108-1
Project/Site: BP - OPLC - Tacoma Junction

Laboratory: Eurofins TestAmerica, Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

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

Job ID: 580-88108-1

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

TAL SEA = Eurofins TestAmerica, 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: 580-88108-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-88108-1	MW-1_20190801	Water	08/01/19 11:15	08/02/19 11:04	
580-88108-2	MW-2_20190801	Water	08/01/19 10:30	08/02/19 11:04	
580-88108-3	MW-3_20190801	Water	08/01/19 10:00	08/02/19 11:04	
580-88108-4	MW-4_20190801	Water	08/01/19 09:35	08/02/19 11:04	
580-88108-5	MW-5_20190801	Water	08/01/19 11:00	08/02/19 11:04	
580-88108-6	Trip Blank_20190801	Water	08/01/19 00:00	08/02/19 11:04	

Loc: 580
88108

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

Page 1 of 1

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:	WATJUAA[illegible]1.10123
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 Acct:	NA	Enfos Proposal No:	WR329536/00BPT-0007	Phone: 425-498-7711	Email: Megan.Richard@anteagroup.com
Lab Bottle Order No:	NA	Accounting Mode:	Provision __X__ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Megan.Richard@anteagroup.com
Other Info:	elaine.walker@testamericainc.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

Sample Details | **Requested Analyses** | **Report Type & QC Level**

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	B260BTEX	NWTPH-Gx	NWTPH-DX
	MW-1_20190801	8-1-19	1115	W				G					X	X	X
	MW-2_20190801	8-1-19	1030	W				G					X	X	X
	MW-3_20190801	8-1-19	1000	W				G					X	X	X
	MW-4_20190801	8-1-19	0935	W				G					X	X	X
	MW-5_20190801	8-1-19	1100	W				G					X	X	X
	Trip Blank	8-1-19	0000	W				G					X	X	

580-88108 Chain of Custody

Therm. ID: M2 Cor: 0.0 ° Unc: 0.3 °
Cooler Dsc: Ivy Blue
Packing: Bubble
Cust. Seal: Yes X No ____
Blue Ice, Wet, Dry, None
FedEx: ____
UPS: ____
Lab Cour: X
Other: ____

Sampler's Name: Marissa Bernard / Jonah Leurquin
Sampler's Company: Antea Group
Ship Method: Courier Ship Date:
Shipment Tracking No:

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Marissa Bernard / Antea	8-2-19	0940	Katelyn Younger	8-2-19	940
Katelyn Younger	8-2-19	1104	B. Dall SRM TA	8-2-19	1104

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

8/19/2019

Login Container Summary Report

580-88108

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
MW-1_20190801	580-88108-A-1	Amber Glass 250mL - hydrochloric	<2		0312801D-580
MW-1_20190801	580-88108-B-1	Amber Glass 250mL - hydrochloric			0312801D-580
MW-2_20190801	580-88108-A-2	Amber Glass 250mL - hydrochloric			0312801D-580
MW-2_20190801	580-88108-B-2	Amber Glass 250mL - hydrochloric			0312801D-580
MW-3_20190801	580-88108-A-3	Amber Glass 250mL - hydrochloric			0312801D-580
MW-3_20190801	580-88108-B-3	Amber Glass 250mL - hydrochloric			0312801D-580
MW-4_20190801	580-88108-A-4	Amber Glass 250mL - hydrochloric			0312801D-580
MW-4_20190801	580-88108-B-4	Amber Glass 250mL - hydrochloric			0312801D-580
MW-5_20190801	580-88108-A-5	Amber Glass 250mL - hydrochloric			0312801D-580
MW-5_20190801	580-88108-B-5	Amber Glass 250mL - hydrochloric			0312801D-580

Login Sample Receipt Checklist

Client: Antea USA Inc.

Job Number: 580-88108-1

Login Number: 88108
List Number: 1
Creator: Hobbs, Kenneth F

List Source: Eurofins TestAmerica, 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.	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	
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 TestAmerica, Seattle Job No.: 580-88108-1

SDG No.:

Batch Number: 307544 Batch Start Date: 08/05/19 16:02 Batch Analyst: Limwiroj, Thanyawan 1

Batch Method: 8260C Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS/TFT 00010	VOAMasterMix 00041	
LCS 580-307544/4		8260C		5 mL	5 mL		2 uL	10 uL	
LCSD 580-307544/5		8260C		5 mL	5 mL		2 uL	10 uL	
MB 580-307544/7		8260C		5 mL	5 mL		2 uL		
580-88108-A-6	Trip Blank 20190801	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-88108-C-1	MW-1_20190801	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-88108-C-2	MW-2_20190801	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-88108-C-3	MW-3_20190801	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-88108-C-4	MW-4_20190801	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-88108-C-5	MW-5_20190801	8260C	T	5 mL	5 mL	<2 SU	2 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 TestAmerica, Seattle Job No.: 580-88108-1

SDG No.:

Batch Number: 307916 Batch Start Date: 08/08/19 14:10 Batch Analyst: McKell, Justin S

Batch Method: NWTPH-Gx Batch End Date: 08/14/19 15:27

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00034	GRO_LCS 00054	TFT Spike 00036
MB 580-307916/8		NWTPH-Gx		5 mL	5 mL		1 uL		10.75 uL
LCS 580-307916/9		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
LCSD 580-307916/10		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
580-88108-C-6	Trip Blank 20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	V2.4TFT-EX 00037
MB 580-307916/8		NWTPH-Gx		
LCS 580-307916/9		NWTPH-Gx		1250 uL
LCSD 580-307916/10		NWTPH-Gx		1250 uL
580-88108-C-6	Trip Blank 20190801	NWTPH-Gx	T	

Batch Notes	
pH Indicator ID	pH0.0.-6.0 Lot#6901002
Pipette/Syringe/Dispenser ID	B50M, C25i, C2550J
Vial Lot Number	0103701E

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 TestAmerica, Seattle Job No.: 580-88108-1

SDG No.:

Batch Number: 308054 Batch Start Date: 08/11/19 11:11 Batch Analyst: McKell, Justin S

Batch Method: NWTPH-Gx Batch End Date: 08/14/19 13:24

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00034	GRO_LCS 00054	TFT Spike 00036
MB 580-308054/6		NWTPH-Gx		5 mL	5 mL		1 uL		10.75 uL
LCS 580-308054/7		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
LCSD 580-308054/8		NWTPH-Gx		5 mL	5 mL		1 uL	25 uL	
580-88108-E-1	MW-1_20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL
580-88108-E-2	MW-2_20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL
580-88108-E-3	MW-3_20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL
580-88108-E-4	MW-4_20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL
580-88108-E-5	MW-5_20190801	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	1 uL		10.75 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	V2.4TFT-EX 00037
MB 580-308054/6		NWTPH-Gx		
LCS 580-308054/7		NWTPH-Gx		1250 uL
LCSD 580-308054/8		NWTPH-Gx		1250 uL
580-88108-E-1	MW-1_20190801	NWTPH-Gx	T	
580-88108-E-2	MW-2_20190801	NWTPH-Gx	T	
580-88108-E-3	MW-3_20190801	NWTPH-Gx	T	
580-88108-E-4	MW-4_20190801	NWTPH-Gx	T	
580-88108-E-5	MW-5_20190801	NWTPH-Gx	T	

Batch Notes	
pH Indicator ID	pH0.0-6.0 LOT#6901002
Pipette/Syringe/Dispenser ID	B50M, C25I, C2500J
Vial Lot Number	0103701E

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 TestAmerica, Seattle Job No.: 580-88108-1

SDG No.:

Batch Number: 307850 Batch Start Date: 08/08/19 10:12 Batch Analyst: Linna, Troy 1

Batch Method: 3510C Batch End Date: 08/08/19 15:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ResidualChloCheck	ReceivedpH
MB 580-307850/1		3510C, NWTPH-Dx				250 mL	1 mL	no	7.0 SU
LCS 580-307850/2		3510C, NWTPH-Dx				250 mL	1 mL	no	7.0 SU
LCSD 580-307850/3		3510C, NWTPH-Dx				250 mL	1 mL	no	7.0 SU
580-88108-A-1	MW-1_20190801	3510C, NWTPH-Dx	T	00434.35 g	00185.85 g	248.5 mL	1 mL	no	2.0 SU
580-88108-B-2	MW-2_20190801	3510C, NWTPH-Dx	T	00435.52 g	00185.16 g	250.4 mL	1 mL	no	2.0 SU
580-88108-A-3	MW-3_20190801	3510C, NWTPH-Dx	T	00435.88 g	00185.36 g	250.5 mL	1 mL	no	2.0 SU
580-88108-A-4	MW-4_20190801	3510C, NWTPH-Dx	T	00434.43 g	00185.05 g	249.4 mL	1 mL	no	2.0 SU
580-88108-A-5	MW-5_20190801	3510C, NWTPH-Dx	T	00435.07 g	00183.86 g	251.2 mL	1 mL	no	2.0 SU

Lab Sample ID	Client Sample ID	Method Chain	Basis	FirstAdjustpH	TPH_Water_Spk 00022	TPH_WaterSurr 00048			
MB 580-307850/1		3510C, NWTPH-Dx		2.0 SU		100 uL			
LCS 580-307850/2		3510C, NWTPH-Dx		2.0 SU	100 uL	100 uL			
LCSD 580-307850/3		3510C, NWTPH-Dx		2.0 SU	100 uL	100 uL			
580-88108-A-1	MW-1_20190801	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-88108-B-2	MW-2_20190801	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-88108-A-3	MW-3_20190801	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-88108-A-4	MW-4_20190801	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-88108-A-5	MW-5_20190801	3510C, NWTPH-Dx	T	2.0 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 TestAmerica, Seattle Job No.: 580-88108-1

SDG No.:

Batch Number: 307850 Batch Start Date: 08/08/19 10:12 Batch Analyst: Linna, Troy 1

Batch Method: 3510C Batch End Date: 08/08/19 15:00

Batch Notes	
Acid Used for pH Adjustment ID	2407340
Balance ID	SEA225
Batch Comment	Vialed by: TL
Analyst ID - Concentration	TL/NDC
Concentration 1 Corrected Temperature	69.8-74.8 Degrees C
Concentration 2 Corrected Temperature	ambient Degrees C
Equipment ID - Concentration 1	Steam Bath 2
Equipment ID - Concentration 2	NEVAP 2
Analyst ID - Extraction	TL/NDC
Filter ID	2416954
Method/Fraction	3510C_LVI/ AK102_103/NWTPH_Dx
Na2SO4 ID	2368669
pH Indicator ID	6901002 pH 0.0-6.0/6901003 pH 4.0-10.0
Pipette/Syringe/Dispenser ID	MP2
Prep Solvent ID	2438981 DCM
Prep Solvent Volume Used	120 mL
Residual Chlorine Indicator ID	fisher cat#14-860
Analyst ID - Spike Analyst	TL
Analyst ID - Spike Witness Analyst	NDC
Sufficient Volume for Batch QC	MB, LCS, LCSD
Thermometer ID - Concentration 1	661200
Thermometer ID - Concentration 2	TAC002
Concentration 1 Uncorrected Temperature	70-75 Degrees C
Concentration 2 Uncorrected Temperature	ambient Degrees C
Vial Lot Number	18170251

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 TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 580-90495-1
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

M. Elaine Walker

Authorized for release by:
11/13/2019 2:43:42 PM

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

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

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

Job ID: 580-90495-1

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Job ID: 580-90495-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-90495-1

Receipt
Six samples were received on 10/31/2019 11:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

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

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

GC Semi VOA
Method NWTPH-Dx: The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern were later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: MW-5_20191030 (580-90495-5).

Method NWTPH-Dx: The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern were earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: MW-2_20191030 (580-90495-2).

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

Detection Summary

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

Job ID: 580-90495-1

Client Sample ID: MW-1_20191030 — Lab Sample ID: 580-90495-1

No Detections.

Client Sample ID: MW-2_20191030 — Lab Sample ID: 580-90495-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	140		3.0		ug/L	1		8260C	Total/NA
Ethylbenzene	62		3.0		ug/L	1		8260C	Total/NA
Toluene	6.1		2.0		ug/L	1		8260C	Total/NA
Xylenes, Total	51		3.0		ug/L	1		8260C	Total/NA
Gasoline	3400		250		ug/L	1		NWTPH-Gx	Total/NA
#2 Diesel (C10-C24)	2000		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: MW-3_20191030 — Lab Sample ID: 580-90495-3

No Detections.

Client Sample ID: MW-4_20191030 — Lab Sample ID: 580-90495-4

No Detections.

Client Sample ID: MW-5_20191030 — Lab Sample ID: 580-90495-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
#2 Diesel (C10-C24)	120		110		ug/L	1		NWTPH-Dx	Total/NA

Client Sample ID: Trip Blank_20191030 — Lab Sample ID: 580-90495-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1_20191030

Lab Sample ID: 580-90495-1

Date Collected: 10/30/19 10:50

Matrix: Water

Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/05/19 13:42	1
Ethylbenzene	ND		3.0		ug/L			11/05/19 13:42	1
Toluene	ND		2.0		ug/L			11/05/19 13:42	1
Xylenes, Total	ND		3.0		ug/L			11/05/19 13:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*89*		*80 - 120*		*11/05/19 13:42*	*1*
Toluene-d8 (Surr)	*108*		*80 - 120*		*11/05/19 13:42*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*		*11/05/19 13:42*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*11/05/19 13:42*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*11/05/19 13:42*	*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			11/05/19 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*116*		*50 - 150*		*11/05/19 17:25*	*1*
Trifluorotoluene (Surr)	*117*		*50 - 150*		*11/05/19 17:25*	*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		11/09/19 11:28	11/12/19 19:07	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*11/09/19 11:28*	*11/12/19 19:07*	*1*

Client Sample ID: MW-2_20191030

Lab Sample ID: 580-90495-2

Date Collected: 10/30/19 10:15

Matrix: Water

Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**140**		3.0		ug/L			11/05/19 14:06	1
Ethylbenzene	**62**		3.0		ug/L			11/05/19 14:06	1
Toluene	**6.1**		2.0		ug/L			11/05/19 14:06	1
Xylenes, Total	**51**		3.0		ug/L			11/05/19 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*91*		*80 - 120*		*11/05/19 14:06*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*11/05/19 14:06*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*80 - 126*		*11/05/19 14:06*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*11/05/19 14:06*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*11/05/19 14:06*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**3400**		250		ug/L			11/05/19 19:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*137*		*50 - 150*		*11/05/19 19:25*	*1*

Client Sample ID: MW-2_20191030

Lab Sample ID: 580-90495-2
Matrix: Water
Date Collected: 10/30/19 10:15
Date Received: 10/31/19 11:55

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*123*		*50 - 150*		*11/05/19 19:25*	*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)	**2000**		110		ug/L		11/09/19 11:28	11/12/19 19:27	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 19:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*80*		*50 - 150*	*11/09/19 11:28*	*11/12/19 19:27*	*1*

Client Sample ID: MW-3_20191030

Lab Sample ID: 580-90495-3
Matrix: Water
Date Collected: 10/30/19 09:50
Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/05/19 14:31	1
Ethylbenzene	ND		3.0		ug/L			11/05/19 14:31	1
Toluene	ND		2.0		ug/L			11/05/19 14:31	1
Xylenes, Total	ND		3.0		ug/L			11/05/19 14:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	*94*		*80 - 120*		*11/05/19 14:31*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*11/05/19 14:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 126*		*11/05/19 14:31*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*11/05/19 14:31*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*11/05/19 14:31*	*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			11/05/19 17:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*106*		*50 - 150*		*11/05/19 17:49*	*1*
Trifluorotoluene (Surr)	*92*		*50 - 150*		*11/05/19 17:49*	*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		11/09/19 11:28	11/12/19 20:07	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 20:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*88*		*50 - 150*	*11/09/19 11:28*	*11/12/19 20:07*	*1*

Client Sample ID: MW-4_20191030

Lab Sample ID: 580-90495-4
Matrix: Water
Date Collected: 10/30/19 09:30
Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/06/19 13:11	1
Ethylbenzene	ND		3.0		ug/L			11/06/19 13:11	1

Client Sample ID: MW-4_20191030

Lab Sample ID: 580-90495-4

Date Collected: 10/30/19 09:30

Matrix: Water

Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		2.0		ug/L			11/06/19 13:11	1
Xylenes, Total	ND		3.0		ug/L			11/06/19 13:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*92*		*80 - 120*		*11/06/19 13:11*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*11/06/19 13:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*		*11/06/19 13:11*	*1*
4-Bromofluorobenzene (Surr)	*90*		*80 - 120*		*11/06/19 13:11*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*11/06/19 13:11*	*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			11/05/19 18:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*50 - 150*		*11/05/19 18:37*	*1*
Trifluorotoluene (Surr)	*91*		*50 - 150*		*11/05/19 18:37*	*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		11/09/19 11:28	11/12/19 20:27	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*11/09/19 11:28*	*11/12/19 20:27*	*1*

Client Sample ID: MW-5_20191030

Lab Sample ID: 580-90495-5

Date Collected: 10/30/19 10:30

Matrix: Water

Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/06/19 12:47	1
Ethylbenzene	ND		3.0		ug/L			11/06/19 12:47	1
Toluene	ND		2.0		ug/L			11/06/19 12:47	1
Xylenes, Total	ND		3.0		ug/L			11/06/19 12:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*91*		*80 - 120*		*11/06/19 12:47*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*11/06/19 12:47*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 126*		*11/06/19 12:47*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*11/06/19 12:47*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*11/06/19 12:47*	*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			11/05/19 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*50 - 150*		*11/05/19 19:01*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*11/05/19 19:01*	*1*

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

Job ID: 580-90495-1

Client Sample ID: MW-5_20191030

Lab Sample ID: 580-90495-5

Date Collected: 10/30/19 10:30
Matrix: Water
Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**120**		110		ug/L		11/09/19 11:28	11/12/19 20:48	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 20:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*50 - 150*	*11/09/19 11:28*	*11/12/19 20:48*	*1*

Client Sample ID: Trip Blank_20191030

Lab Sample ID: 580-90495-6

Date Collected: 10/30/19 00:01
Matrix: Water
Date Received: 10/31/19 11:55

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/05/19 12:51	1
Ethylbenzene	ND		3.0		ug/L			11/05/19 12:51	1
Toluene	ND		2.0		ug/L			11/05/19 12:51	1
Xylenes, Total	ND		3.0		ug/L			11/05/19 12:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*88*		*80 - 120*		*11/05/19 12:51*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*11/05/19 12:51*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 126*		*11/05/19 12:51*	*1*
4-Bromofluorobenzene (Surr)	*90*		*80 - 120*		*11/05/19 12:51*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*11/05/19 12:51*	*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			11/05/19 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*50 - 150*		*11/05/19 15:25*	*1*
Trifluorotoluene (Surr)	*70*		*50 - 150*		*11/05/19 15:25*	*1*

Surrogate Summary

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

Job ID: 580-90495-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	TFT (80-120)	TOL (80-120)	DCA (80-126)	BFB (80-120)	DBFM (80-120)
580-90495-1	MW-1_20191030	89	108	102	92	95
580-90495-2	MW-2_20191030	91	107	95	100	95
580-90495-3	MW-3_20191030	94	106	99	92	96
580-90495-4	MW-4_20191030	92	103	101	90	98
580-90495-5	MW-5_20191030	91	106	98	89	95
580-90495-6	Trip Blank_20191030	88	105	97	90	97
LCS 580-315985/4	Lab Control Sample	91	107	95	92	92
LCS 580-316107/4	Lab Control Sample	89	105	97	94	96
LCSD 580-315985/5	Lab Control Sample Dup	91	104	100	96	97
LCSD 580-316107/5	Lab Control Sample Dup	89	104	96	93	94
MB 580-315985/7	Method Blank	94	102	99	91	97
MB 580-316107/7	Method Blank	92	107	101	89	99

Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	BFB1 (50-150)	TFT1 (50-150)
580-90495-1	MW-1_20191030	116	117
580-90495-2	MW-2_20191030	137	123
580-90495-3	MW-3_20191030	106	92
580-90495-4	MW-4_20191030	102	91
580-90495-5	MW-5_20191030	111	102
580-90495-6	Trip Blank_20191030	111	70
LCS 580-316029/8	Lab Control Sample	105	90
LCSD 580-316029/9	Lab Control Sample Dup	101	96
MB 580-316029/7	Method Blank	103	94

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
TFT = Trifluorotoluene (Surr)

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	OTPH (50-150)
580-90495-1	MW-1_20191030	81
580-90495-2	MW-2_20191030	80
580-90495-3	MW-3_20191030	88
580-90495-4	MW-4_20191030	86
580-90495-5	MW-5_20191030	84

Surrogate Summary

Client: Antea USA Inc. Job ID: 580-90495-1
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)								
LCS 580-316413/2-A	Lab Control Sample	76								
LCSD 580-316413/3-A	Lab Control Sample Dup	83								
MB 580-316413/1-A	Method Blank	101								

Surrogate Legend

OTPH = o-Terphenyl

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

Lab Sample ID: MB 580-315985/7
Matrix: Water
Analysis Batch: 315985

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/05/19 12:26	1
Ethylbenzene	ND		3.0		ug/L			11/05/19 12:26	1
Toluene	ND		2.0		ug/L			11/05/19 12:26	1
Xylenes, Total	ND		3.0		ug/L			11/05/19 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*94*		*80 - 120*		*11/05/19 12:26*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*11/05/19 12:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 126*		*11/05/19 12:26*	*1*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*		*11/05/19 12:26*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*11/05/19 12:26*	*1*

Lab Sample ID: LCS 580-315985/4
Matrix: Water
Analysis Batch: 315985

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	9.50		ug/L		95	75 - 121
Ethylbenzene	10.0	10.8		ug/L		108	80 - 120
Toluene	10.0	11.0		ug/L		110	80 - 120
Xylenes, Total	20.0	20.4		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Trifluorotoluene (Surr)	*91*		*80 - 120*
Toluene-d8 (Surr)	*107*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*80 - 126*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*
Dibromofluoromethane (Surr)	*92*		*80 - 120*

Lab Sample ID: LCSD 580-315985/5
Matrix: Water
Analysis Batch: 315985

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	9.46		ug/L		95	75 - 121	0	14
Ethylbenzene	10.0	10.1		ug/L		101	80 - 120	7	14
Toluene	10.0	10.1		ug/L		101	80 - 120	8	19
Xylenes, Total	20.0	19.4		ug/L		97	80 - 120	5	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Trifluorotoluene (Surr)	*91*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 126*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*
Dibromofluoromethane (Surr)	*97*		*80 - 120*

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

Lab Sample ID: MB 580-316107/7
Matrix: Water
Analysis Batch: 316107

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			11/06/19 12:22	1
Ethylbenzene	ND		3.0		ug/L			11/06/19 12:22	1
Toluene	ND		2.0		ug/L			11/06/19 12:22	1
Xylenes, Total	ND		3.0		ug/L			11/06/19 12:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*92*		*80 - 120*		*11/06/19 12:22*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*11/06/19 12:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*		*11/06/19 12:22*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*11/06/19 12:22*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*11/06/19 12:22*	*1*

Lab Sample ID: LCS 580-316107/4
Matrix: Water
Analysis Batch: 316107

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	9.64		ug/L		96	75 - 121		
Ethylbenzene			10.0	10.7		ug/L		107	80 - 120		
Toluene			10.0	10.5		ug/L		105	80 - 120		
Xylenes, Total			20.0	19.8		ug/L		99	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Trifluorotoluene (Surr)	*89*		*80 - 120*
Toluene-d8 (Surr)	*105*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 126*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*
Dibromofluoromethane (Surr)	*96*		*80 - 120*

Lab Sample ID: LCSD 580-316107/5
Matrix: Water
Analysis Batch: 316107

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	9.40		ug/L		94	75 - 121	3	14
Ethylbenzene			10.0	10.1		ug/L		101	80 - 120	6	14
Toluene			10.0	10.2		ug/L		102	80 - 120	2	19
Xylenes, Total			20.0	19.3		ug/L		96	80 - 120	3	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Trifluorotoluene (Surr)	*89*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*96*		*80 - 126*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*
Dibromofluoromethane (Surr)	*94*		*80 - 120*

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

Lab Sample ID: MB 580-316029/7
Matrix: Water
Analysis Batch: 316029

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			11/05/19 14:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*50 - 150*		*11/05/19 14:12*	*1*
Trifluorotoluene (Surr)	*94*		*50 - 150*		*11/05/19 14:12*	*1*

Lab Sample ID: LCS 580-316029/8
Matrix: Water
Analysis Batch: 316029

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)	*105*		*50 - 150*
Trifluorotoluene (Surr)	*90*		*50 - 150*

Lab Sample ID: LCSD 580-316029/9
Matrix: Water
Analysis Batch: 316029

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	938		ug/L		94	79 - 120	1	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*50 - 150*
Trifluorotoluene (Surr)	*96*		*50 - 150*

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

Lab Sample ID: MB 580-316413/1-A
Matrix: Water
Analysis Batch: 316604

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 316413

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		11/09/19 11:28	11/12/19 12:44	1
Motor Oil (>C24-C36)	ND		350		ug/L		11/09/19 11:28	11/12/19 12:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*101*		*50 - 150*	*11/09/19 11:28*	*11/12/19 12:44*	*1*

Lab Sample ID: LCS 580-316413/2-A
Matrix: Water
Analysis Batch: 316604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 316413

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			2000	1510		ug/L		76	50 - 120		
Motor Oil (>C24-C36)			2000	1720		ug/L		86	64 - 120		

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

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	*76*		*50 - 150*

Lab Sample ID: LCSD 580-316413/3-A
Matrix: Water
Analysis Batch: 316604

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 316413

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2000	1720		ug/L		86	50 - 120	13	26
Motor Oil (>C24-C36)			2000	1810		ug/L		90	64 - 120	5	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	*83*		*50 - 150*

GC/MS VOA

Analysis Batch: 315985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-90495-1	MW-1_20191030	Total/NA	Water	8260C	
580-90495-2	MW-2_20191030	Total/NA	Water	8260C	
580-90495-3	MW-3_20191030	Total/NA	Water	8260C	
580-90495-6	Trip Blank_20191030	Total/NA	Water	8260C	
MB 580-315985/7	Method Blank	Total/NA	Water	8260C	
LCS 580-315985/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 580-315985/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 316107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-90495-4	MW-4_20191030	Total/NA	Water	8260C	
580-90495-5	MW-5_20191030	Total/NA	Water	8260C	
MB 580-316107/7	Method Blank	Total/NA	Water	8260C	
LCS 580-316107/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 580-316107/5	Lab Control Sample Dup	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 316029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-90495-1	MW-1_20191030	Total/NA	Water	NWTPH-Gx	
580-90495-2	MW-2_20191030	Total/NA	Water	NWTPH-Gx	
580-90495-3	MW-3_20191030	Total/NA	Water	NWTPH-Gx	
580-90495-4	MW-4_20191030	Total/NA	Water	NWTPH-Gx	
580-90495-5	MW-5_20191030	Total/NA	Water	NWTPH-Gx	
580-90495-6	Trip Blank_20191030	Total/NA	Water	NWTPH-Gx	
MB 580-316029/7	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 580-316029/8	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 580-316029/9	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC Semi VOA

Prep Batch: 316413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-90495-1	MW-1_20191030	Total/NA	Water	3510C	
580-90495-2	MW-2_20191030	Total/NA	Water	3510C	
580-90495-3	MW-3_20191030	Total/NA	Water	3510C	
580-90495-4	MW-4_20191030	Total/NA	Water	3510C	
580-90495-5	MW-5_20191030	Total/NA	Water	3510C	
MB 580-316413/1-A	Method Blank	Total/NA	Water	3510C	
LCS 580-316413/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-316413/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 316604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
580-90495-1	MW-1_20191030	Total/NA	Water	NWTPH-Dx	316413
580-90495-2	MW-2_20191030	Total/NA	Water	NWTPH-Dx	316413
580-90495-3	MW-3_20191030	Total/NA	Water	NWTPH-Dx	316413
580-90495-4	MW-4_20191030	Total/NA	Water	NWTPH-Dx	316413
580-90495-5	MW-5_20191030	Total/NA	Water	NWTPH-Dx	316413
MB 580-316413/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	316413
LCS 580-316413/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	316413

GC Semi VOA (Continued)

Analysis Batch: 316604 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 580-316413/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	316413

Lab Chronicle

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

Job ID: 580-90495-1

Client Sample ID: MW-1_20191030
Date Collected: 10/30/19 10:50
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	315985	11/05/19 13:42	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 17:25	T1W	TAL SEA
Total/NA	Prep	3510C			316413	11/09/19 11:28	CJB	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	316604	11/12/19 19:07	T1W	TAL SEA

Client Sample ID: MW-2_20191030
Date Collected: 10/30/19 10:15
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	315985	11/05/19 14:06	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 19:25	T1W	TAL SEA
Total/NA	Prep	3510C			316413	11/09/19 11:28	CJB	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	316604	11/12/19 19:27	T1W	TAL SEA

Client Sample ID: MW-3_20191030
Date Collected: 10/30/19 09:50
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	315985	11/05/19 14:31	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 17:49	T1W	TAL SEA
Total/NA	Prep	3510C			316413	11/09/19 11:28	CJB	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	316604	11/12/19 20:07	T1W	TAL SEA

Client Sample ID: MW-4_20191030
Date Collected: 10/30/19 09:30
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	316107	11/06/19 13:11	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 18:37	T1W	TAL SEA
Total/NA	Prep	3510C			316413	11/09/19 11:28	CJB	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	316604	11/12/19 20:27	T1W	TAL SEA

Client Sample ID: MW-5_20191030
Date Collected: 10/30/19 10:30
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	316107	11/06/19 12:47	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 19:01	T1W	TAL SEA
Total/NA	Prep	3510C			316413	11/09/19 11:28	CJB	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	316604	11/12/19 20:48	T1W	TAL SEA

Lab Chronicle

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

Job ID: 580-90495-1

Client Sample ID: Trip Blank_20191030

Date Collected: 10/30/19 00:01
Date Received: 10/31/19 11:55

Lab Sample ID: 580-90495-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	315985	11/05/19 12:51	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	316029	11/05/19 15:25	T1W	TAL SEA

Laboratory References:

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

Accreditation/Certification Summary

Client: Antea USA Inc.
Job ID: 580-90495-1
Project/Site: BP - OPLC - Tacoma Junction

Laboratory: Eurofins TestAmerica, Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State Program	C553	02-17-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

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

Job ID: 580-90495-1

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

TAL SEA = Eurofins TestAmerica, 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: 580-90495-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-90495-1	MW-1_20191030	Water	10/30/19 10:50	10/31/19 11:55	
580-90495-2	MW-2_20191030	Water	10/30/19 10:15	10/31/19 11:55	
580-90495-3	MW-3_20191030	Water	10/30/19 09:50	10/31/19 11:55	
580-90495-4	MW-4_20191030	Water	10/30/19 09:30	10/31/19 11:55	
580-90495-5	MW-5_20191030	Water	10/30/19 10:30	10/31/19 11:55	
580-90495-6	Trip Blank_20191030	Water	10/30/19 00:01	10/31/19 11:55	

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

Page 1 of 1

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:	WATJUAA181.10123
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 Acct:	NA	Enfos Proposal No:	WR329536/008PT-0007	Phone: 425-498-7711 Email:	Megan.Richard@anteagroup.com
Lab Bottle Order No:	NA	Accounting Mode:	Provision __X__ OOC-BU ____ OOC-RM ____	Send/Submit EDD to:	Megan.Richard@anteagroup.com
Other Info:	elaine.walker@testamericainc.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: B260BTEX	NWTPH-Gx	NWTPH-DX	Comments
	MW-1_20191030	10-30-19	1050	W				G	8			X	X	X	
	MW-2_20191030	10-30-19	1015	W				G	8			X	X	X	
	MW-3_20191030	10-30-19	0950	W				G	8			X	X	X	
	MW-4_20191030	10-30-19	0930	W				G	8			X	X	X	
	MW-5_20191030	10-30-19	1030	W				G	8			X	X	X	
	Trip Blank	—	—	W				G	6			X	X		

580-90495 Chain of Custody

Therm. ID: M Cor: 1.6 ° Unc: 1.7 °
Cooler Dsc: Ice Blue
Packing: Bub
Cust. Seal: Yes ___ No X
Blue Ice (Wet) Dry, None

FedEx: ____
UPS: ____
Lab Cour: X
Other: ____

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name: Kate Younger + B. Erickson						
Sampler's Company: Antea Group	Kate Younger / Antea	10/31	1155	B. Hall SEA TA	10.31.19	1155
Ship Method: Courier Ship Date: 10/31						
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 Sample Receipt Checklist

Client: Antea USA Inc.

Job Number: 580-90495-1

Login Number: 90495
List Number: 1
Creator: Vallelunga, Diana L

List Source: Eurofins TestAmerica, 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.	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	
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.	True	

GC/MS VOA BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 315985 Batch Start Date: 11/05/19 10:22 Batch Analyst: Limwiroj, Thanyawan 1

Batch Method: 8260C Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS/TFT 00011	VOAMasterMix 00045	
LCS 580-315985/4		8260C		5 mL	5 mL		2 uL	10 uL	
LCSD 580-315985/5		8260C		5 mL	5 mL		2 uL	10 uL	
MB 580-315985/7		8260C		5 mL	5 mL		2 uL		
580-90495-B-6	Trip Blank	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-90495-B-1	MW-1_20191030	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-90495-B-2	MW-2_20191030	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-90495-B-3	MW-3_20191030	8260C	T	5 mL	5 mL	<2 SU	2 uL		

Batch Notes	
Vial Lot Number	0217701E

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 TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 316107 Batch Start Date: 11/06/19 10:18 Batch Analyst: Jantanu, Charinporn

Batch Method: 8260C Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	5X SUR/IS/TFT 00011	VOAMasterMix 00045	
LCS 580-316107/4		8260C		5 mL	5 mL		2 uL	10 uL	
LCSD 580-316107/5		8260C		5 mL	5 mL		2 uL	10 uL	
MB 580-316107/7		8260C		5 mL	5 mL		2 uL		
580-90495-B-4	MW-4_20191030	8260C	T	5 mL	5 mL	<2 SU	2 uL		
580-90495-B-5	MW-5_20191030	8260C	T	5 mL	5 mL	<2 SU	2 uL		

Batch Notes	
Vial Lot Number	0217701E

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 TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 316029 Batch Start Date: 11/05/19 13:24 Batch Analyst: Wongsakul, Thanaporn 1

Batch Method: NWTPH-Gx Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Initial pH	BFBGRO ARCHON 00040	GRO_LCS 00057	TFT Spike 00038
MB 580-316029/7		NWTPH-Gx		5 mL	5 mL		2 uL		10.75 uL
LCS 580-316029/8		NWTPH-Gx		5 mL	5 mL		2 uL	50 uL	
LCSD 580-316029/9		NWTPH-Gx		5 mL	5 mL		2 uL	50 uL	
580-90495-A-6	Trip Blank	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL
580-90495-A-1	MW-1_20191030	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL
580-90495-A-3	MW-3_20191030	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL
580-90495-A-4	MW-4_20191030	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL
580-90495-A-5	MW-5_20191030	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL
580-90495-A-2	MW-2_20191030	NWTPH-Gx	T	5 mL	5 mL	<2.0 SU	2 uL		10.75 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	V2.4TFT-EX 00043					
MB 580-316029/7		NWTPH-Gx							
LCS 580-316029/8		NWTPH-Gx		2500 uL					
LCSD 580-316029/9		NWTPH-Gx		2500 uL					
580-90495-A-6	Trip Blank	NWTPH-Gx	T						
580-90495-A-1	MW-1_20191030	NWTPH-Gx	T						
580-90495-A-3	MW-3_20191030	NWTPH-Gx	T						
580-90495-A-4	MW-4_20191030	NWTPH-Gx	T						
580-90495-A-5	MW-5_20191030	NWTPH-Gx	T						
580-90495-A-2	MW-2_20191030	NWTPH-Gx	T						

Batch Notes	
pH Indicator ID	pH 0.0-6.0 Lot#6901002
Pipette/Syringe/Dispenser ID	B50N, C25P, C2500Q
Vial Lot Number	#0103701E

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 TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 316029 Batch Start Date: 11/05/19 13:24 Batch Analyst: Wongsakul, Thanaporn 1

Batch Method: NWTPH-Gx Batch End Date:

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 TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 316413 Batch Start Date: 11/09/19 11:28 Batch Analyst: Bohn, Christina J

Batch Method: 3510C Batch End Date: 11/09/19 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ResidualChloCheck	ReceivedpH
MB 580-316413/1		3510C, NWTPH-Dx				250 mL	1.0 mL	no	7.0 SU
LCS 580-316413/2		3510C, NWTPH-Dx				250 mL	1.0 mL	no	7.0 SU
LCSD 580-316413/3		3510C, NWTPH-Dx				250 mL	1.0 mL	no	7.0 SU
580-90495-H-1	MW-1_20191030	3510C, NWTPH-Dx	T	00414.30 g	00166.59 g	247.7 mL	1.0 mL	no	2.0 SU
580-90495-H-2	MW-2_20191030	3510C, NWTPH-Dx	T	00413.62 g	00166.70 g	246.9 mL	1.0 mL	no	2.0 SU
580-90495-H-3	MW-3_20191030	3510C, NWTPH-Dx	T	00415.68 g	00168.80 g	246.9 mL	1.0 mL	no	2.0 SU
580-90495-H-4	MW-4_20191030	3510C, NWTPH-Dx	T	00415.66 g	00168.44 g	247.2 mL	1.0 mL	no	2.0 SU
580-90495-H-5	MW-5_20191030	3510C, NWTPH-Dx	T	00415.18 g	00166.22 g	249 mL	1.0 mL	no	2.0 SU

Lab Sample ID	Client Sample ID	Method Chain	Basis	FirstAdjustpH	TPH_Water_Spk 00023	TPH_WaterSurr 00050			
MB 580-316413/1		3510C, NWTPH-Dx		2.0 SU		100 uL			
LCS 580-316413/2		3510C, NWTPH-Dx		2.0 SU	100 uL	100 uL			
LCSD 580-316413/3		3510C, NWTPH-Dx		2.0 SU	100 uL	100 uL			
580-90495-H-1	MW-1_20191030	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-90495-H-2	MW-2_20191030	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-90495-H-3	MW-3_20191030	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-90495-H-4	MW-4_20191030	3510C, NWTPH-Dx	T	2.0 SU		100 uL			
580-90495-H-5	MW-5_20191030	3510C, NWTPH-Dx	T	2.0 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 TestAmerica, Seattle Job No.: 580-90495-1

SDG No.:

Batch Number: 316413 Batch Start Date: 11/09/19 11:28 Batch Analyst: Bohn, Christina J

Batch Method: 3510C Batch End Date: 11/09/19 17:30

Batch Notes	
Acid Used for pH Adjustment ID	2407340
Balance ID	SEA225
Batch Comment	Vialed By: TL
Analyst ID - Concentration	TL
Concentration 1 Corrected Temperature	70-75 Degrees C
Concentration 2 Corrected Temperature	18.9 Degrees C
Equipment ID - Concentration 1	Steam Bath 1
Equipment ID - Concentration 2	TurboVap 5
Analyst ID - Extraction	TL
Method/Fraction	3510C_LVI/AK102/103
pH Indicator ID	6901002
Pipette/Syringe/Dispenser ID	MP3
Prep Solvent ID	2517426
Prep Solvent Volume Used	120 mL
Analyst ID - Spike Analyst	TL
Sufficient Volume for Batch QC	MB, LCS, LCSD
Thermometer ID - Concentration 1	61013-040-1
Thermometer ID - Concentration 2	Digital Readout
Concentration 1 Uncorrected Temperature	70-75 Degrees C
Concentration 2 Uncorrected Temperature	20.0 Degrees C
Vial Lot Number	19103141

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.