GeoEngineers
17425 NE Union Hill Road, Suite 250
Redmond, Washington 98052
425.861.6000

January 16, 2020

Washington State Department of Ecology
Toxics Cleanup Program
3190 160th Ave SE
Bellevue, Washington 98008

Attention: Diane Escobedo

Subject: Groundwater Monitoring Report
Alderwood Laundry and Dry Cleaner Site
Lynnwood, Washington
VCP Project No. NW3066
GEI File No. 17787-001-11

On behalf of the Lynnwood Public Facilities District (PFD), we are submitting a copy of the most recent groundwater monitoring report, dated January 16, 2020, for the former Alderwood Laundry and Dry Cleaners (ALDC) Site. No opinion is requested at this time.

Sincerely,
GeoEngineers, Inc.

Cris J. Watkins
Project Manager

Dana Carlisle, PE
Principal

CJW:DLC:cje

Attachment:
Groundwater Monitoring Report, dated January 16, 2020

cc: Grant Dull, Executive Director, Lynnwood Public Facilities District
Bill Joyce, Joyce Ziker Parkinson PLLC

ATTACHMENT
Groundwater Monitoring Report

GeoEngineers
17425 NE Union Hill Road, Suite 250
Redmond, Washington 98052
425.861.6000

January 16, 2020

Lynnwood Public Utilities District
3815 196th Street SW, Suite 136
Lynnwood, Washington 98036

Attention: Grant Dull

Subject: Groundwater Monitoring Results – November 2019
Former Alderwood Laundry and Dry Cleaner
3815 196th Street SW
Lynnwood, Washington
VCP Number NW3066
GeoEngineers File No. 17787-001-11

INTRODUCTION

This summary letter presents the November 2019 groundwater monitoring results for the former Alderwood Laundry and Dry Cleaner (ALDC) site. The Lynnwood Public Facilities District (PFD) is conducting an independent cleanup action at site under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) (VCP Number NW3066). The current schedule for routine groundwater monitoring at the site is approximately once every 18 months.

GROUNDWATER MONITORING RESULTS – NOVEMBER 2019

GeoEngineers completed groundwater monitoring on November 26 and 27, 2019. Monitoring activities included measuring depths to groundwater and collecting groundwater samples for chemical analyses of dry cleaning-related volatile organic compounds (VOCs), including tetrachloroethene (PCE), trichloroethene (TCE), cis and trans-1,2-dichloroethene (DCE) and vinyl chloride (VC). Groundwater monitoring field procedures are presented in Appendix A. Depth to groundwater and groundwater elevation data are summarized in Table 1. Groundwater elevations and inferred groundwater elevation contours are shown in Figure 1. Groundwater chemical analytical data are summarized in Table 2 and illustrated in Figure 2. The lab data for the November 2019 sampling event is attached in Appendix B.

Groundwater samples were collected from wells MW-1 through MW-3 and MW-5 through MW-17, EMRI-MW-1 and ZZA-MW-3. Well MW-4 was not located during this sampling event and may have been obstructed by a parked vehicle or other hinderance during our site visit. Well ZZA-MW-2 was dry during the monitoring event and, was therefore, not sampled.

A summary of the November 2019 data and data trends for site groundwater are as follows:

- The groundwater gradient is consistently relatively flat as noted in the Remedial Investigation (RI) Report. The groundwater flow direction in November 2019 was generally toward the south with some localized variation (Figure 1). During previous monitoring events, groundwater flow direction has fluctuated between west and south. Groundwater elevations in November 2019 were generally similar to past events (Table 1), with nominal seasonal variation of approximately 2 feet or less in most wells. Groundwater monitoring wells ZZA-2 and ZZA-3, located downgradient to crossgradient, are screened in the shallow perched aquifer; seasonal fluctuations in these wells range between 6 and 8 feet.
- The detected concentrations of PCE, TCE and associated breakdown products in the wells sampled were generally consistent with previous results (Table 2) and are consistent with the updated Conceptual Site Model (CSM) presented in the RI Addendum Report, dated September 27, 2019. Concentrations of PCE, and also concentrations of TCE and cis-1,2-DCE in a few wells, exceeded the Model Toxics Control Act (MTCA) Method A cleanup levels in wells MW-2, MW-3, MW-5 through MW-8, MW-15 through MW-17 and EMRI-MW-1. The PCE and TCE concentrations in most of these wells have consistently exceeded the MTCA Method A cleanup levels since installation. The highest concentrations of dry-cleaning solvents are in the center of the plume at MW-2, MW-3, MW-7 and MW-17, which are located west, south and southwest of the footprint of the former dry cleaner tenant space.
- Groundwater contaminant concentrations do not show any notable increases or decreases, although there are minor fluctuations in detected concentrations. The Site footprint, where dry cleaning-solvent concentrations in groundwater are greater than the MTCA Method A cleanup levels, does not appear to be significantly expanding or shrinking; the plume appears to be stable in size and concentrations.
- Perimeter monitoring wells located upgradient of the apparent dry cleaner source area (MW-1[1], MW-13 and MW-14) and wells located downgradient with respect to groundwater flow (MW-5 and MW-9 through MW-12), are generally non-detect for PCE and related constituents or the detected concentrations are less than MTCA Method A cleanup levels.

CONCLUSIONS

In our opinion, the existing well network appears to be sufficient for monitoring purposes at this time while cleanup planning is ongoing. Groundwater monitoring results based on the existing monitoring well network indicate that the plume is relatively stable and seasonal variations in groundwater elevations and flow directions are generally well documented. The next routine groundwater sampling event is anticipated to occur in Spring 2021.

LIMITATIONS

We have prepared this report for the exclusive use of Lynnwood PFD and their authorized agents for the former ALDC site. This report may be provided to regulatory agencies for review.

[1] PCE concentrations in eight of the nine groundwater sampling events at MW-1 have been below the MTCA cleanup level and no other VOCs have been detected at MW-1. The PCE concentration in May 2018 (5.60 micrograms per liter (µg/L)) was slightly above the MTCA cleanup level (5 µg/L) and within expected analytical or sample handling variability.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgment and experience and based on discrete samples obtained from specific wells sampled. Contaminants may be present in areas of the site not sampled or tested. No warranty or other conditions, express or implied, should be understood.

Please call if you have any questions or require additional information.

Sincerely,
GeoEngineers, Inc.

Cris J. Watkins
Senior Environmental Scientist

Dana L. Carlisle, PE
Principal

DANA L. CARLISLE
STATE OF WASHINGTON
29634
REGISTERED
PROFESSIONAL ENGINEER
1.16.20

CJW:DAC:cje

Attachments:
Table 1. Summary of Groundwater Elevation Data
Table 2. Summary of Groundwater Chemical Analytical Data
Figure 1. Groundwater Elevation Contours – November 2019
Figure 2. Groundwater Chemical Analytical Data
Appendix A. Field Procedures
Appendix B. Laboratory Analytical Reports

Table 1

Summary of Groundwater Elevation Data

Former Alderwood Laundry and Dry Cleaners
Lynnwood, Washington

Monitoring Well ID	Date Measured	Top of Casing Elevation[1] (feet)	Depth to Groundwater (feet below top of casing)	Groundwater Elevation[2] (feet)
MW-1	8/9/2013	438.62	38.81	399.81
	3/27/2014		38.85	399.77
	2/11/2016		38.24	400.38
	4/5/2016		37.58	401.04
	8/3/2016		39.07	399.55
	10/3/2016		39.83	398.79
	2/16/2017		36.98	401.64
	8/31/2017		38.71	399.91
	11/29/2017		38.96	399.66
	2/13/2018		37.91	400.71
	5/23/2018		37.79	400.83
	11/26/2019		38.99	399.63
MW-2	8/9/2013	435.90	36.12	399.78
	3/27/2014		36.17	399.73
	2/11/2016		35.54	400.36
	4/5/2016		34.91	400.99
	8/3/2016		36.40	399.50
	10/3/2016		37.16	398.74
	2/17/2017		34.57	401.33
	8/31/2017		36.02	399.88
	11/29/2017		36.28	399.62
	2/13/2018		35.04	400.86
	5/23/2018		35.12	400.78
	11/27/2019		36.24	399.66
MW-3	8/9/2013	435.34	35.58	399.76
	3/27/2014		36.17	399.17
	2/11/2016		34.94	400.40
	4/5/2016		34.35	400.99
	8/3/2016		35.86	399.48
	10/3/2016		36.62	398.72
	2/17/2017		34.04	401.30
	8/31/2017		35.49	399.85
	11/29/2017		35.73	399.61
	2/13/2018		34.56	400.78
	5/23/2018		34.59	400.75
	11/27/2019		35.81	399.53
MW-4	8/9/2013	430.27	30.61	399.66
	3/27/2014		30.58	399.69
	2/11/2016		29.98	400.29
	4/5/2016		29.36	400.91
	8/3/2016		30.90	399.37
	10/3/2016		31.66	398.61
	2/16/2017		28.91	401.36
	8/31/2017		30.47	399.80
	11/28/2017		30.72	399.55
	2/14/2018		29.43	400.84
	5/24/2018		29.63	400.64
	11/26/2019		NM[3]	NM
MW-5	4/5/2016	428.45	27.44	401.01
	8/3/2016		29.06	399.39
	10/3/2016		29.82	398.63
	2/17/2017		27.03	401.42
	8/31/2017		28.70	399.75
	11/29/2017		28.97	399.48
	2/13/2018		27.55	400.90
	5/23/2018		27.80	400.65
	11/26/2019		29.02	399.43
MW-6	4/5/2016	440.96	40.00	400.96
	8/3/2016		41.38	399.58
	10/3/2016		42.12	398.84
	2/17/2017		39.74	401.22
	8/31/2017		41.00	399.96
	11/29/2017		41.26	399.70
	2/13/2018		39.97	400.99
	5/23/2018		40.08	400.88
	11/27/2019		41.28	399.68

Monitoring Well ID	Date Measured	Top of Casing Elevation[1] (feet)	Depth to Groundwater (feet below top of casing)	Groundwater Elevation[2] (feet)
MW-7	4/5/2016	443.15	42.26	400.89
	8/3/2016		43.67	399.48
	10/3/2016		44.43	398.72
	2/16/2017		41.97	401.18
	8/31/2017		43.26	399.89
	11/28/2017		43.51	399.64
	2/14/2018		42.49	400.66
	5/24/2018		42.40	400.75
	11/26/2019		43.57	399.58
MW-8	4/5/2016	442.30	41.43	400.87
	8/3/2016		42.88	399.42
	10/3/2016		43.64	398.66
	2/16/2017		41.08	401.22
	8/31/2017		42.47	399.83
	11/28/2017		42.71	399.59
	2/14/2018		41.60	400.70
	5/24/2018		41.59	400.71
	11/26/2019		42.82	399.48
MW-9	4/5/2016	430.09	29.22	400.87
	8/3/2016		30.74	399.35
	10/3/2016		31.46	398.63
	2/16/2017		28.88	401.21
	8/31/2017		30.32	399.77
	11/28/2017		30.59	399.50
	2/14/2018		29.43	400.66
	5/24/2018		29.43	400.66
	11/26/2019		30.62	399.47
MW-10	10/3/2016	437.38	38.62	398.76
	2/17/2017		36.19	401.19
	8/31/2017		37.50	399.88
	11/28/2017		37.75	399.63
	2/14/2018		36.71	400.67
	5/24/2018		36.65	400.73
	11/26/2019		37.87	399.51
MW-11	10/3/2016	443.18	44.42	398.76
	2/16/2017		42.06	401.12
	8/31/2017		43.24	399.94
	11/28/2017		43.51	399.67
	2/14/2018		42.58	400.60
	5/24/2018		42.40	400.78
	11/26/2019		43.63	399.55
MW-12	10/3/2016	445.21	46.41	398.80
	2/16/2017		44.24	400.97
	8/31/2017		45.22	399.99
	11/28/2017		45.48	399.73
	2/14/2018		44.47	400.74
	5/24/2018		44.29	400.92
	11/26/2019		45.32	399.89
MW-13	10/3/2016	450.32	51.47	398.85
	2/16/2017		49.60	400.72
	8/31/2017		50.29	400.03
	11/28/2017		50.56	399.76
	2/14/2018		49.83	400.49
	5/24/2018		49.43	400.89
	11/26/2019		50.62	399.70
MW-14	10/3/2016	442.98	41.77	401.21
	2/16/2017		40.72	402.26
	8/31/2017		40.66	402.32
	11/28/2017		40.90	402.08
	2/13/2018		40.95	402.03
	5/23/2018		39.74	403.24
	11/27/2019		41.29	401.69
MW-15[2]	2/16/2017	438.60	34.5	404.1
	8/31/2017		36.1	402.5
	11/28/2017		36.3	402.3
	2/13/2018		34.9	403.7
	5/23/2018		34.0	404.6
	11/26/2019		34.9	403.7
MW-16	5/7/2019	444.28	43.40	400.88
	11/26/2019		44.74	393.86
MW-17	5/7/2019	443.14	42.29	400.85
	11/26/2019		43.58	399.56

Monitoring Well ID	Date Measured	Top of Casing Elevation[1] (feet)	Depth to Groundwater (feet below top of casing)	Groundwater Elevation[2] (feet)
EMRI-MW-1	8/3/2016	443.44	43.98	399.46
	10/3/2016		44.72	398.72
	2/16/2017		42.56	400.88
	8/31/2017		43.52	399.92
	11/28/2017		43.78	399.66
	2/14/2018		42.86	400.58
	5/24/2018		41.89	401.55
	11/26/2019		43.10	400.34
ZZA-MW-2	8/3/2016	429.30	12.93	416.37
	10/3/2016		Dry	---
	2/28/2017		6.29	423.01
	8/31/2017		Dry	--
	11/28/2017		12.41	416.89
	2/13/2018		8.16	421.14
	5/23/2018		7.32	421.98
	11/27/2019		Dry	--
ZZA-MW-3	8/3/2016	429.89	11.78	418.11
	10/3/2016		13.10	416.79
	2/28/2017		5.02	424.87
	8/31/2017		11.67	418.22
	11/28/2017		11.90	417.99
	2/13/2018		5.86	424.03
	5/23/2018		5.01	424.88
	11/27/2019		13.26	416.63

Notes:

[1] Elevations in feet (NAV88) as referenced to Arcadis well MW-13 casing rim elevation of 427.80 feet.

[2] MW-15 is an angled monitoring well completed at a 45-degree angle relative to the existing ground surface; distance to water was measured inside the angled well casing. The calculation used to convert to a vertical depth-to-groundwater value for reporting in this table is: measured distance to water multiplied by Cosine 45°. Reported depth to groundwater and groundwater elevation should be considered approximate for this well because the actual drilling angle is approximate. Therefore, values for MW-15 are reported only to the nearest tenth of a foot.

[3] The well could not be located during the November 2019 sampling event and may have been obstructed by a vehicle or other impediment.

NM = Not Measured

Table 2

Summary of Groundwater Chemical Analytical Data[1]

Halogenated Volatile Organic Compounds (HVOCs)

Former Alderwood Laundry and Dry Cleaners

Lynnwood, Washington

Sample Identification	Sample Date	VOCs[2] (µg/L)				
		Tetrachloro-ethene (PCE)	Trichloro-ethene (TCE)	cis-1,2-Dichloro-ethene (DCE)	trans-1,2-Dichloro-ethene (DCE)	Vinyl Chloride (VC)
Groundwater Samples - Grab						
DP-4-GW	3/28/2013	**28.0**	**1.2**	**0.34**	<0.2	*
DP-5-GW	3/28/2013	**11.0**	**3.2**	**14.0**	**0.39**	*
DP-7-GW	3/29/2013	**8.0**	<0.2	**0.78**	<0.2	*
DP-8-GW	3/29/2013	**0.31**	<0.2	<0.2	<0.2	*
DP-9-GW	3/29/2013	<0.2	<0.2	<0.2	<0.2	*
DP-10-GW	3/29/2013	**33.0**	**5.9**	**6.6**	**0.23**	*
DP-11-GW	3/29/2013	**18.0**	**1.6**	**1.6**	<0.2	*
Groundwater Samples - Monitoring Wells						
MW-1	7/23/2013	**1.3**	<0.2	<0.2	<0.2	*
	3/27/2014	**0.56**	<0.2	<0.2	<0.2	*
	2/11/2016	**1.8**	<0.2	<0.2	<0.2	*
	8/3/2016	**1.4**	<0.2	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/31/2017	**3.23**	<0.153	<0.0933	<0.152	<0.118
	11/29/2017	**3.24**	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	**2.03**	<0.153	<0.0933	<0.152	<0.118
	5/23/2018	**5.60**	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	**0.630**	<0.500	<0.500	<0.500	<0.129
MW-2	7/23/2013	**83**	**3.0**	**1.9**	<0.2	*
	3/27/2014	**98**	**3.5**	**1.6**	<1.0	*
	2/11/2016	**150**	**4.3**	**3.2**	<1.0	*
	8/3/2016[4]	**180**	**5.6**	**3.4**	<1.0	*
	2/16/2017	**210**	**7.7**	**7.3**	<1.0	
	8/31/2017	**196**	**6.60**	**4.17**	**0.246**	<0.118
	11/29/2017	**222**	**8.03**	**4.20**	**0.314**	<0.118
	2/13/2018	**192**	**4.26**	**2.57**	**0.208**	<0.118
	5/23/2018	**307**	**9.54**	**8.38**	**0.393**	<0.118
	11/27/2019	**218**	**8.25**	**5.24**	<0.500	<0.129
MW-3	7/23/2013	**110**	**6.0**	**21.0**	**0.41**	*
	3/27/2014	**48**	**2.1**	**4.3**	**0.20**	*
	2/11/2016	**80**	**2.9**	**7.0**	<0.8	*
	8/3/2016[4]	**110**	**5.2**	**16**	**1.8**	*
	2/16/2017	**84**	**2.9**	**3.5**	<0.4	<0.2
	8/31/2017	**192**	**8.96**	**21.0**	**0.420**	<0.118
	11/29/2017	**129**	**4.43**	**6.45**	**0.204**	<0.118
	2/13/2018	**119**	**2.47**	**3.29**	<0.152	<0.118
	5/23/2018	**129**	**4.60**	**6.65**	<0.152	<0.118
	11/27/2019	**74.3**	**2.61**	**1.88**	<0.500	<0.129
MW-4	7/23/2013	**6.8**	**2.1**	**3.7**	<0.2	*
	3/27/2014	**9.2**	**2.1**	**4.5**	**0.24**	*
	2/11/2016	**13**	**1.8**	**2.3**	<0.2	*
	8/3/2016	**14**	**2.3**	**3.4**	**0.25**	*
	2/16/2017	**10**	**1.3**	**0.98**	<0.2	<0.2
	8/31/2017	**11.8**	**2.47**	**4.06**	<0.152	<0.118
	11/28/2017	**17.1**	**1.88**	**3.68**	<0.152	<0.118
	2/13/2018	**16.6**	**1.13**	**1.63**	<0.152	<0.118
	5/24/2018	**14.0**	**1.62**	**1.63**	<0.152	<0.118
	11/26/2019	-- [6]	-- [6]	-- [6]	-- [6]	-- [6]
MW-5	4/5/2016	**0.55**	<0.2	<0.2	<0.2	*
	8/3/2016	**0.74**	<0.3	<0.2	a	*
	2/16/2017	**1.2**	<0.2	<0.2	<0.2	<0.2
	8/31/2017	**0.815**	<0.153	<0.0933	<0.152	<0.118
	11/29/2017	**0.867**	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	**0.753**	<0.153	<0.0933	<0.152	<0.118
	5/23/2018	**1.05**	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	**0.722**	<0.500	<0.500	<0.500	<0.129
MW-6	4/5/2016	**25**	<0.4	<0.2	<0.2	*
	8/3/2016[4]	**28**	<0.5	<0.2	<0.2	*
	2/16/2017	**33**	<0.2	<0.2	<0.2	<0.2
	8/31/2017	**32.9**	<0.153	<0.0933	<0.152	<0.118
	11/29/2017	**35.2**	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	**38.8**	<0.153	<0.0933	<0.152	<0.118
	5/23/2018	**35.0**	<0.153	<0.0933	<0.152	<0.118
	11/27/2019	**26.6**	<0.500	<0.500	<0.500	<0.129

Sample Identification	Sample Date	VOCs[2] (µg/L)				
		Tetrachloro-ethene (PCE)	Trichloro-ethene (TCE)	cis-1,2-Dichloro-ethene (DCE)	trans-1,2-Dichloro-ethene (DCE)	Vinyl Chloride (VC)
MW-7	4/5/2016	**270**	**3.6**	<2.0	<2.0	*
	8/3/2016	**250**	**4.6**	**5.0**	<2.0	*
	2/16/2017	**230**	**4.0**	**1.1**	<1.0	<0.2
	8/30/2017	**309**	**6.11**	**4.62**	**0.217**	<0.118
	11/28/2017	**296**	**4.88**	**0.893**	<0.152	<0.118
	2/14/2018	**321**	**3.59**	**1.12**	<0.152	<0.118
	5/24/2018	**389**	**7.00**	**5.74**	<0.152	<0.118
	11/26/2019	**258**	**4.13**	**0.554**	<0.500	<0.129
MW-8	4/5/2016	**33**	**1.5**	**14**	<0.2	*
	8/3/2016	**40**	**1.8**	**13**	**0.36**	*
	2/16/2017	**47**	**2.2**	**14**	<0.2	<0.2
	8/30/2017	**46.3**	**3.00**	**16.9**	<0.152	<0.118
	11/28/2017	**35.9**	**3.25**	**17.3**	<0.152	<0.118
	2/14/2018	**50.7**	**2.35**	**16.5**	<0.152	<0.118
	5/24/2018	**57.2**	**4.12**	**16.5**	0.156	<0.118
	11/26/2019	**62.9**	**5.26**	**17.9**	<0.500	<0.129
MW-9	4/5/2016	<0.2	<0.10	**0.86**	<0.2	*
	8/3/2016	<0.2	<0.11	**0.44**	<0.2	*
	2/16/2017	**0.25**	<0.2	**2.0**	<0.2	<0.2
	8/30/2017	**0.224**	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	**0.424**	<0.153	**1.87**	<0.152	<0.118
	2/14/2018	**0.334**	<0.153	**2.02**	<0.152	<0.118
	5/24/2018	<0.199	<0.153	**0.250**	<0.152	<0.118
	11/26/2019	**0.748**	<0.500	**4.27**	<0.500	<0.129
MW-10	10/3/2016	<0.2	<0.12	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/30/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/14/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MW-11	10/3/2016	<0.2	<0.13	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/30/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/14/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MW-12	10/3/2016	<0.2	<0.14	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/30/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/14/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MW-13	10/3/2016	<0.2	<0.15	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/30/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/14/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MW-14	10/3/2016	<0.2	<0.16	<0.2	<0.2	*
	2/16/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/31/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MW-15[3]	2/16/2017	**78**	**2.6**	**0.49**	<0.2	<0.2
	8/31/2017	**55.4**	**1.77**	**0.251**	<0.152	<0.118
	11/28/2017	**65.9**	**1.92**	**0.238**	<0.152	<0.118
	2/13/2018	**83.2**	**1.52**	**0.278**	<0.152	<0.118
	5/24/2018	**75.0**	**1.76**	**0.194**	<0.152	<0.118
	11/26/2019	**26.9**	**0.650**	<0.500	<0.500	<0.129
MW-16	5/7/2019	**93.1**	**0.638**	<0.500	<0.500	<0.500
	11/26/2019	**90.2**	<0.500	<0.500	<0.500	<0.129
MW-17 Perched [5]	5/4/2019	**35.6**	**1.80**	**2.14**	<0.500	<0.500
MW-17	5/7/2019	**339**	**6.09**	**4.48**	<0.500	<0.500
	11/26/2019	**201**	**4.04**	**0.857**	<0.500	<0.129

Sample Identification	Sample Date	VOCs[2] (µg/L)				
		Tetrachloro-ethene (PCE)	Trichloro-ethene (TCE)	cis-1,2-Dichloro-ethene (DCE)	trans-1,2-Dichloro-ethene (DCE)	Vinyl Chloride (VC)
EMRI-MW-1	8/3/2016	**16**	<0.17	<0.2	<0.2	*
	2/16/2017	**15**	<0.2	<0.2	<0.2	<0.2
	8/30/2017	**19.5**	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	**18.0**	<0.153	<0.0933	<0.152	<0.118
	2/14/2018	**32.2**	<0.153	<0.0933	<0.152	<0.118
	5/24/2018	**34.6**	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	**27.2**	<0.500	<0.500	<0.500	<0.129
ZZA-MW-2	8/3/2016	<0.2	<0.18	<0.2	<0.2	*
	2/28/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/31/2017	--	--	--	--	--
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/23/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/26/2019	--	--	--	--	--
ZZA-MW-3	8/3/2016	<0.2	<0.19	<0.2	<0.2	*
	2/28/2017	<0.2	<0.2	<0.2	<0.2	<0.2
	8/31/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/28/2017	<0.199	<0.153	<0.0933	<0.152	<0.118
	2/13/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	5/23/2018	<0.199	<0.153	<0.0933	<0.152	<0.118
	11/27/2019	<0.500	<0.500	<0.500	<0.500	<0.129
MTCA Method A/B Cleanup Levels		5	5	16[4]	160[4]	0.2

Notes:

[1] Chemical analyses performed by OnSite Environmental of Redmond, Washington or ESC Labs of Mt. Juliette, Tennessee. Chemical analytical laboratory reports included in Appendix B.

[2] Select VOCs (PCE, TCE, cis - and trans DCE and VC were analyzed by U.S. Environmental Protection Agency (EPA) Method 8260C.

[3] Monitoring well was completed at a 45 degrees angle relative to the existing ground surface. The groundwater sample represents groundwater beneath the northeast portion of the former Alderwood Laundry and Dry Cleaner facility's footprint.

[4] MTCA Method B Cleanup Level

[5] The May 4th sample was collected during drilling from the perched groundwater.

[6] Well MW-4 could not be located during the November 2019 sampling event and may have been obstructed by a vehicle or other impediment.

MTCA = Model Toxics Control Act

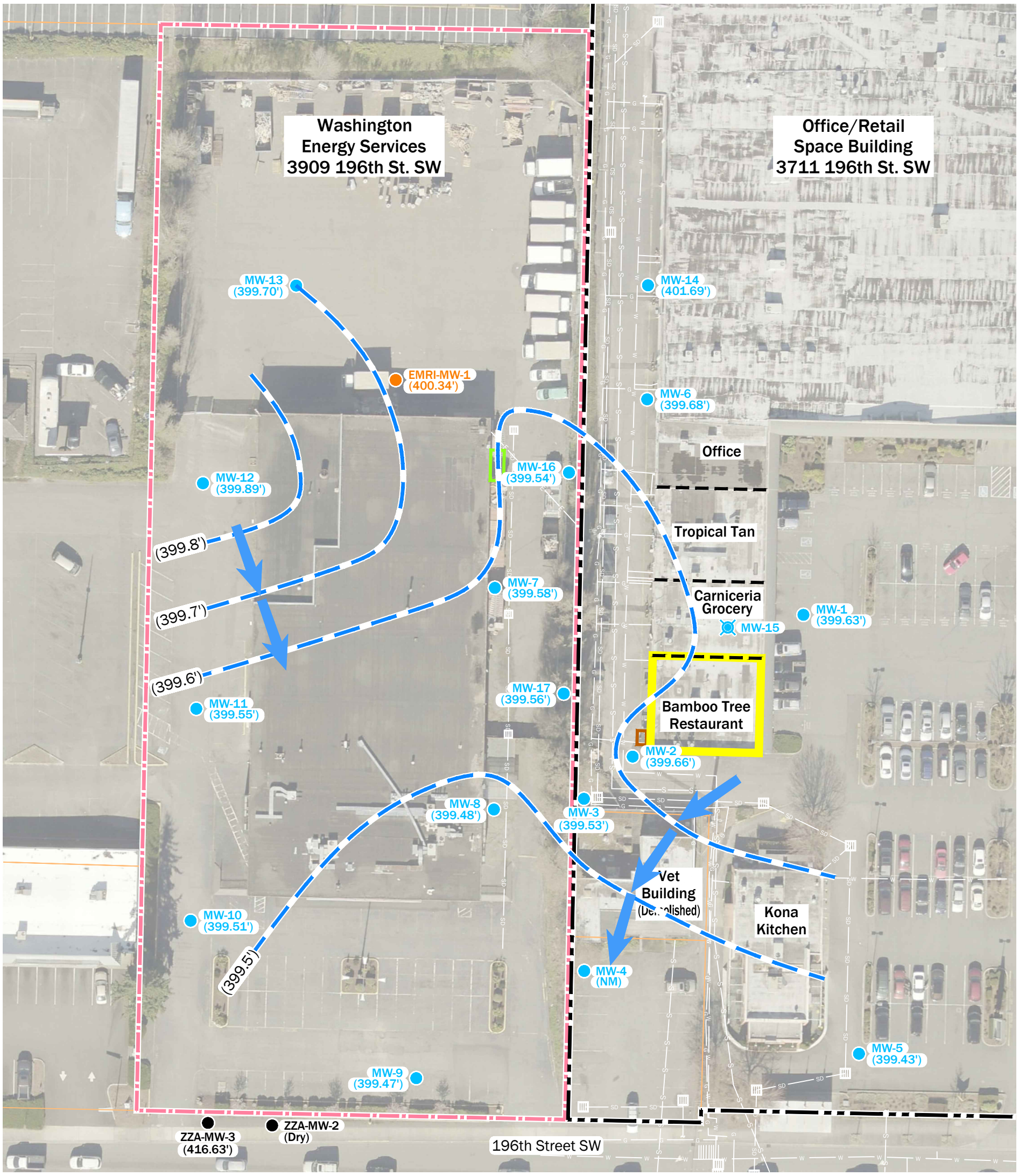
µg/L = micrograms per liter

Bolded value indicates analyte detected at the listed concentration.

Shaded value represents concentration greater than the MTCA cleanup level.

-- = not analyzed

* = not tabulated prior to 2017



Legend

- MW-1 (399.63') — Groundwater Monitoring Well by GeoEngineers, Inc. (2013 - 2019) and Groundwater Elevation
- EMRI-MW-1 (400.34') — Groundwater Monitoring Well by EMRI (1999) and Groundwater Elevation
- ZZA-MW-3 (416.63') — Groundwater Monitoring Well by Zipper Zeman Associates (2002) and Groundwater Elevation
- MW-15 — Angled Groundwater Monitoring Well by GeoEngineers, Inc. (February 2017)
- Groundwater Elevation Contour (Dashed Where Inferred)
- Approximate Groundwater Flow Direction
- Lynnwood Public Facilities District Property Boundary
- West Adjoining Property Boundary
- Parcel Boundary
- Approximate Footprint of Former Alderwood Laundry & Dry Cleaners
- Former Waste Oil UST Excavation
- Existing Concrete Grease Trap
- Existing Catch Basin
- Existing Storm Drain
- Existing Gas Line
- Existing Sewer Line
- Existing Water Line
- Electric Utility

N W E S

50 0 50
Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. Groundwater elevations for MW-4, MW-14, MW-15, ZZA-MW-2, and ZZA-MW-3 not used for groundwater contours.
4. Groundwater contours generated by creating a TIN (Triangular Irregular Network) surface in Autodesk Civil3D using groundwater elevations and manually adjusted.

Data Source: Aerial from King County dated 2015. Vertical Datum: NAVD 88. Projection: NAD83 Washington State Planes, North Zone, US Foot.

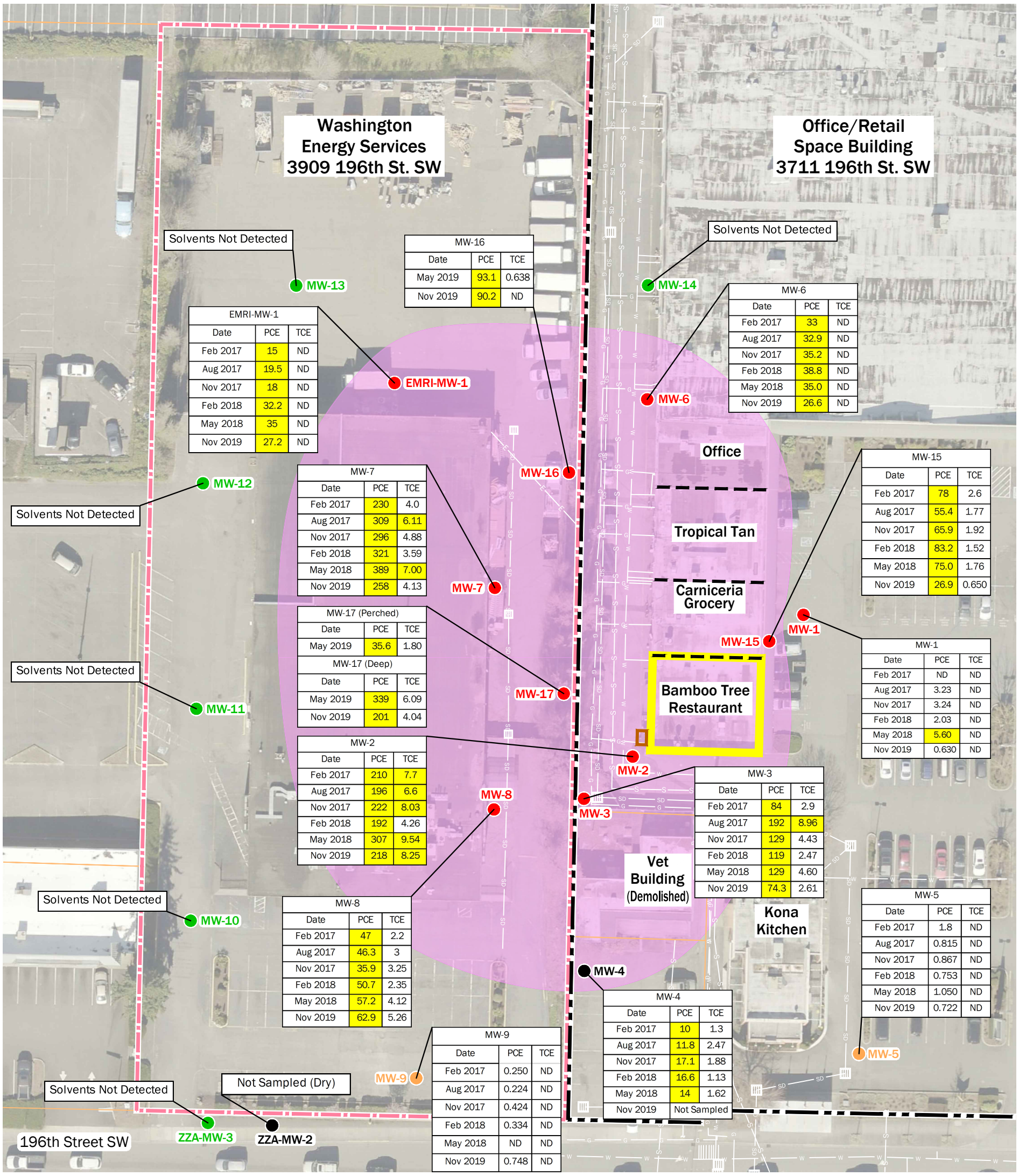
Groundwater Elevation Contours - November 2019

Former Alderwood Laundry and Dry Cleaners
3815 196th Street SW, Lynnwood, Washington

GeoEngineers

Figure 1

P:\17\17787001\CAD\11\2019 Groundwater Monitoring Report\17787001111_F01_GW Elevation Contours (November 2019).dwg TAB:F01 Date Exported: 01/07/20 - 15:22 by hmara



MW-16		
Date	PCE	TCE
May 2019	93.1	0.638
Nov 2019	90.2	ND

MW-6		
Date	PCE	TCE
Feb 2017	33	ND
Aug 2017	32.9	ND
Nov 2017	35.2	ND
Feb 2018	38.8	ND
May 2018	35.0	ND
Nov 2019	26.6	ND

EMRI-MW-1		
Date	PCE	TCE
Feb 2017	15	ND
Aug 2017	19.5	ND
Nov 2017	18	ND
Feb 2018	32.2	ND
May 2018	35	ND
Nov 2019	27.2	ND

MW-15		
Date	PCE	TCE
Feb 2017	78	2.6
Aug 2017	55.4	1.77
Nov 2017	65.9	1.92
Feb 2018	83.2	1.52
May 2018	75.0	1.76
Nov 2019	26.9	0.650

MW-7		
Date	PCE	TCE
Feb 2017	230	4.0
Aug 2017	309	6.11
Nov 2017	296	4.88
Feb 2018	321	3.59
May 2018	389	7.00
Nov 2019	258	4.13

MW-1		
Date	PCE	TCE
Feb 2017	ND	ND
Aug 2017	3.23	ND
Nov 2017	3.24	ND
Feb 2018	2.03	ND
May 2018	5.60	ND
Nov 2019	0.630	ND

MW-17 (Perched)		
Date	PCE	TCE
May 2019	35.6	1.80
MW-17 (Deep)		
Date	PCE	TCE
May 2019	339	6.09
Nov 2019	201	4.04

MW-2		
Date	PCE	TCE
Feb 2017	210	7.7
Aug 2017	196	6.6
Nov 2017	222	8.03
Feb 2018	192	4.26
May 2018	307	9.54
Nov 2019	218	8.25

MW-3		
Date	PCE	TCE
Feb 2017	84	2.9
Aug 2017	192	8.96
Nov 2017	129	4.43
Feb 2018	119	2.47
May 2018	129	4.60
Nov 2019	74.3	2.61

MW-8		
Date	PCE	TCE
Feb 2017	47	2.2
Aug 2017	46.3	3
Nov 2017	35.9	3.25
Feb 2018	50.7	2.35
May 2018	57.2	4.12
Nov 2019	62.9	5.26

MW-5		
Date	PCE	TCE
Feb 2017	1.8	ND
Aug 2017	0.815	ND
Nov 2017	0.867	ND
Feb 2018	0.753	ND
May 2018	1.050	ND
Nov 2019	0.722	ND

MW-4		
Date	PCE	TCE
Feb 2017	10	1.3
Aug 2017	11.8	2.47
Nov 2017	17.1	1.88
Feb 2018	16.6	1.13
May 2018	14	1.62
Nov 2019	Not Sampled	

MW-9		
Date	PCE	TCE
Feb 2017	0.250	ND
Aug 2017	0.224	ND
Nov 2017	0.424	ND
Feb 2018	0.334	ND
May 2018	ND	ND
Nov 2019	0.748	ND

Legend

- MW-2: Groundwater Sample with MTCA Method A Cleanup Level Exceedance for PCE/TCE
- MW-1: Groundwater Sample with PCE/TCE less than MTCA Method A or B Cleanup Levels
- MW-9: Groundwater Sample - Solvents Not Detected
- MTCA: Model Toxics Control Act
- HVOC: Halogenated Volatile Organic Compounds
- Interpreted PCE > 5 ug/L in Groundwater
- Lynnwood Public Facilities District Property Boundary
- West Adjoining Property Boundary
- Parcel Boundary
- Approximate Footprint of Former Alderwood Laundry & Dry Cleaners
- Existing Concrete Grease Trap
- Existing Catch Basin
- Existing Storm Drain
- Existing Gas Line
- Existing Sewer Line
- Existing Water Line
- Electric Utility

Data Box Explanation:

- PCE: Tetrachloroethylene
- TCE: Trichloroethylene
- ND: Not Detected
- ug/L: micrograms per liter

Data boxes are provided for monitoring wells with detections of PCE/TCE.

Shading indicates concentration greater than MTCA.

All concentrations are in micrograms per liter.

N W E S

50 0 50
Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from King County dated 2015. Vertical Datum: NAVD 88. Projection: NAD83 Washington State Planes, North Zone, US Foot.

Groundwater Chemical Analytical Data

Former Alderwood Laundry and Dry Cleaners
3815 196th Street SW, Lynnwood, Washington

GeoEngineers

Figure 2

P:\17\17787001\CAD\11\2019 Groundwater Monitoring Report\17787001111_F02_Groundwater Chemical Analytical Data.dwg TAB:F02 Date Exported: 12/31/19 - 8:17 by hmara

APPENDIX A
Field Procedures

APPENDIX A
FIELD PROCEDURES

Depth to Groundwater

Depths to groundwater were measured prior to well purging. Depths to groundwater were measured to the nearest 0.01 foot relative to the notch in the monitoring well casing rim using an electronic water level indicator. Groundwater elevations for surveyed wells were calculated by subtracting the depth-to-water measurement from the surveyed casing rim elevation. The electronic water level indicator was decontaminated with LiquiNox® solution wash and a distilled water rinse prior to use in each well.

Groundwater Sampling

Following depth to groundwater measurements, groundwater samples were collected from the monitoring wells consistent with the U.S. Environmental Protection Agency's (EPA) low-flow groundwater sampling procedure, as described in EPA (1996) and Puls and Barcelona (1996). Disposable polyethylene tubing and a down-well bladder pump were used for groundwater purging and sampling. During purging activities, water quality parameters, including pH, temperature, conductivity, dissolved oxygen and turbidity were measured using a multi-parameter meter equipped with a flow-through cell. Groundwater samples were collected after either: (1) water quality parameters stabilized; or (2) a maximum purge time of 60 minutes, whichever occurred first. If the well went dry during purging, it was allowed to recharge as long as possible during the sampling day before collecting a grab groundwater sample using the peristaltic pump and tubing. Water quality parameter stabilization criteria included the following:

- Turbidity: ±10 percent for values greater than 5 nephelometric turbidity units (NTU)
- Conductivity: ±3 percent
- pH: ±0.1 unit
- Temperature: ±3 percent
- Dissolved oxygen: ±10 percent

Field water quality measurements were recorded on a Well Purging-Field Water Quality Measurement Form. The groundwater samples were transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed from the time of sample collection to delivery to the testing laboratory.

Decontamination Procedures

The objective of the decontamination procedure was to minimize the potential for cross contamination. A designated decontamination area was established for decontamination of reusable sampling equipment. Sampling or measurement equipment was decontaminated in accordance with the following procedures before each sampling attempt or measurement:

- Brush equipment with a wire brush, if necessary, to remove large particulate matter.
- Rinse with potable tap water.
- Wash with non-phosphate detergent solution (LiquiNox® and potable tap water).

- Rinse with potable tap water.
- Rinse with distilled water.

Handling of Investigation-Derived Waste (IDW)

IDW (purge water) was placed in U.S. Department of Transportation (DOT) approved 55-gallon drums. The drums were labeled with the exploration number, general contents and date. All IDW generated on site to date was placed in drums and is pending pickup for disposal at an appropriate facility.

Disposable items, such as sample tubing, gloves and paper towels, etc., were placed in plastic bags after use and deposited in trash receptacles for disposal.

REFERENCES

Puls, Robert W. and Michael J. Barcelona. 1996. Low Flow (Minimal Drawdown) Ground-Water Sampling Procedures. U.S. Environmental Protection Agency, EPA/540/S-95/504.

U.S. Environmental Protection Agency (EPA). 1996. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. Quality Assurance Unit, EPA-Region 1, North Chelmsford, MA. July 30, 1996, revised January 19, 2010.

APPENDIX B
Laboratory Analytical Reports

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 10, 2019

GeoEngineers- Portland, OR

Sample Delivery Group:	L1165816
Samples Received:	11/29/2019
Project Number:	17787-001-11
Description:	Lynnwood PFD - Former Alpine Dry Cleaners

Report To:

Cris J. Watkins
4000 Kruse Way Place
Bldg. 3, Suite 200
Lake Oswego, OR 97035

Entire Report Reviewed By:

Brian Ford
Project Manager

TABLE OF CONTENTS

MW-1 L1165816-01 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 08:50 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 12:11	12/05/19 12:11	JCP	Sacramento, CA

MW-2 L1165816-02 GW

Collected by: Brian Anderson | Collected date/time: 11/27/19 08:12 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 12:37	12/05/19 12:37	JCP	Sacramento, CA

MW-3 L1165816-03 GW

Collected by: Brian Anderson | Collected date/time: 11/27/19 07:38 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 13:04	12/05/19 13:04	JCP	Sacramento, CA

MW-5 L1165816-04 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 09:45 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 13:31	12/05/19 13:31	JCP	Sacramento, CA

MW-6 L1165816-05 GW

Collected by: Brian Anderson | Collected date/time: 11/27/19 09:00 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 13:58	12/05/19 13:58	JCP	Sacramento, CA

MW-7 L1165816-06 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 12:18 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 14:24	12/05/19 14:24	JCP	Sacramento, CA

MW-8 L1165816-07 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 10:35 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 14:51	12/05/19 14:51	JCP	Sacramento, CA

MW-9 L1165816-08 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 07:00 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 15:17	12/05/19 15:17	JCP	Sacramento, CA

MW-10 L1165816-09 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 15:48 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 15:44	12/05/19 15:44	JCP	Sacramento, CA

MW-11 L1165816-10 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 16:35 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 16:10	12/05/19 16:10	JCP	Sacramento, CA

MW-12 L1165816-11 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 17:15 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 16:37	12/05/19 16:37	JCP	Sacramento, CA

MW-13 L1165816-12 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 14:55 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 17:04	12/05/19 17:04	JCP	Sacramento, CA

MW-14 L1165816-13 GW

Collected by: Brian Anderson | Collected date/time: 11/27/19 09:58 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 17:31	12/05/19 17:31	JCP	Sacramento, CA

MW-15 L1165816-14 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 08:00 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 17:57	12/05/19 17:57	JCP	Sacramento, CA

MW-16 L1165816-15 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 13:10 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 18:24	12/05/19 18:24	JCP	Sacramento, CA

MW-17 L1165816-16 GW

Collected by: Brian Anderson | Collected date/time: 11/26/19 11:30 | Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 18:51	12/05/19 18:51	JCP	Sacramento, CA

EMRI-MW-1 L1165816-17 GW

Collected by: Brian Anderson
Collected date/time: 11/26/19 14:09
Received date/time: 11/29/19 09:40

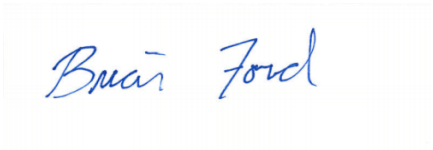
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 19:17	12/05/19 19:17	JCP	Sacramento, CA

ZZA-MW-3 L1165816-18 GW

Collected by: Brian Anderson
Collected date/time: 11/27/19 07:00
Received date/time: 11/29/19 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1391027	1	12/05/19 19:43	12/05/19 19:43	JCP	Sacramento, CA

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 12:11	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 12:11	WG1391027
Tetrachloroethene	0.630		0.500	1	12/05/2019 12:11	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 12:11	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 12:11	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 12:11	WG1391027
(S) 1,2-Dichloroethane-d4	*95.9*		*80.0-125*		*12/05/2019 12:11*	WG1391027
(S) 4-Bromofluorobenzene	*99.2*		*75.0-120*		*12/05/2019 12:11*	WG1391027
(S) Toluene-d8	*99.6*		*80.0-120*		*12/05/2019 12:11*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 12:37	WG1391027
Cis-1,2-Dichloroethene	5.24		0.500	1	12/05/2019 12:37	WG1391027
Tetrachloroethene	218		0.500	1	12/05/2019 12:37	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 12:37	WG1391027
Trichloroethene	8.25		0.500	1	12/05/2019 12:37	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 12:37	WG1391027
(S) 1,2-Dichloroethane-d4	*96.0*		*80.0-125*		*12/05/2019 12:37*	WG1391027
(S) 4-Bromofluorobenzene	*97.4*		*75.0-120*		*12/05/2019 12:37*	WG1391027
(S) Toluene-d8	*98.4*		*80.0-120*		*12/05/2019 12:37*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 13:04	WG1391027
Cis-1,2-Dichloroethene	1.88		0.500	1	12/05/2019 13:04	WG1391027
Tetrachloroethene	74.3		0.500	1	12/05/2019 13:04	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 13:04	WG1391027
Trichloroethene	2.61		0.500	1	12/05/2019 13:04	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 13:04	WG1391027
(S) 1,2-Dichloroethane-d4	*95.9*		*80.0-125*		*12/05/2019 13:04*	WG1391027
(S) 4-Bromofluorobenzene	*98.1*		*75.0-120*		*12/05/2019 13:04*	WG1391027
(S) Toluene-d8	*98.4*		*80.0-120*		*12/05/2019 13:04*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 13:31	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 13:31	WG1391027
Tetrachloroethene	0.722		0.500	1	12/05/2019 13:31	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 13:31	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 13:31	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 13:31	WG1391027
(S) 1,2-Dichloroethane-d4	*96.1*		*80.0-125*		*12/05/2019 13:31*	WG1391027
(S) 4-Bromofluorobenzene	*99.2*		*75.0-120*		*12/05/2019 13:31*	WG1391027
(S) Toluene-d8	*98.5*		*80.0-120*		*12/05/2019 13:31*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 13:58	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 13:58	WG1391027
Tetrachloroethene	26.6		0.500	1	12/05/2019 13:58	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 13:58	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 13:58	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 13:58	WG1391027
(S) 1,2-Dichloroethane-d4	*96.2*		*80.0-125*		*12/05/2019 13:58*	WG1391027
(S) 4-Bromofluorobenzene	*99.4*		*75.0-120*		*12/05/2019 13:58*	WG1391027
(S) Toluene-d8	*99.4*		*80.0-120*		*12/05/2019 13:58*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 14:24	WG1391027
Cis-1,2-Dichloroethene	0.554		0.500	1	12/05/2019 14:24	WG1391027
Tetrachloroethene	258		0.500	1	12/05/2019 14:24	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 14:24	WG1391027
Trichloroethene	4.13		0.500	1	12/05/2019 14:24	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 14:24	WG1391027
(S) 1,2-Dichloroethane-d4	*96.0*		*80.0-125*		*12/05/2019 14:24*	WG1391027
(S) 4-Bromofluorobenzene	*97.3*		*75.0-120*		*12/05/2019 14:24*	WG1391027
(S) Toluene-d8	*99.9*		*80.0-120*		*12/05/2019 14:24*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 14:51	WG1391027
Cis-1,2-Dichloroethene	17.9		0.500	1	12/05/2019 14:51	WG1391027
Tetrachloroethene	62.9		0.500	1	12/05/2019 14:51	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 14:51	WG1391027
Trichloroethene	5.26		0.500	1	12/05/2019 14:51	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 14:51	WG1391027
(S) 1,2-Dichloroethane-d4	*95.9*		*80.0-125*		*12/05/2019 14:51*	WG1391027
(S) 4-Bromofluorobenzene	*98.8*		*75.0-120*		*12/05/2019 14:51*	WG1391027
(S) Toluene-d8	*99.1*		*80.0-120*		*12/05/2019 14:51*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 15:17	WG1391027
Cis-1,2-Dichloroethene	4.27		0.500	1	12/05/2019 15:17	WG1391027
Tetrachloroethene	0.748		0.500	1	12/05/2019 15:17	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 15:17	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 15:17	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 15:17	WG1391027
(S) 1,2-Dichloroethane-d4	*95.8*		*80.0-125*		*12/05/2019 15:17*	WG1391027
(S) 4-Bromofluorobenzene	*97.6*		*75.0-120*		*12/05/2019 15:17*	WG1391027
(S) Toluene-d8	*98.7*		*80.0-120*		*12/05/2019 15:17*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 15:44	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 15:44	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 15:44	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 15:44	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 15:44	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 15:44	WG1391027
(S) 1,2-Dichloroethane-d4	*96.5*		*80.0-125*		*12/05/2019 15:44*	WG1391027
(S) 4-Bromofluorobenzene	*96.3*		*75.0-120*		*12/05/2019 15:44*	WG1391027
(S) Toluene-d8	*98.9*		*80.0-120*		*12/05/2019 15:44*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 16:10	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 16:10	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 16:10	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 16:10	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 16:10	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 16:10	WG1391027
(S) 1,2-Dichloroethane-d4	*95.5*		*80.0-125*		*12/05/2019 16:10*	WG1391027
(S) 4-Bromofluorobenzene	*96.8*		*75.0-120*		*12/05/2019 16:10*	WG1391027
(S) Toluene-d8	*98.2*		*80.0-120*		*12/05/2019 16:10*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 16:37	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 16:37	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 16:37	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 16:37	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 16:37	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 16:37	WG1391027
(S) 1,2-Dichloroethane-d4	*96.0*		*80.0-125*		*12/05/2019 16:37*	WG1391027
(S) 4-Bromofluorobenzene	*97.8*		*75.0-120*		*12/05/2019 16:37*	WG1391027
(S) Toluene-d8	*98.0*		*80.0-120*		*12/05/2019 16:37*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 17:04	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:04	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 17:04	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:04	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 17:04	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 17:04	WG1391027
(S) 1,2-Dichloroethane-d4	*95.9*		*80.0-125*		*12/05/2019 17:04*	WG1391027
(S) 4-Bromofluorobenzene	*96.6*		*75.0-120*		*12/05/2019 17:04*	WG1391027
(S) Toluene-d8	*98.4*		*80.0-120*		*12/05/2019 17:04*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 17:31	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:31	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 17:31	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:31	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 17:31	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 17:31	WG1391027
(S) 1,2-Dichloroethane-d4	*95.7*		*80.0-125*		*12/05/2019 17:31*	WG1391027
(S) 4-Bromofluorobenzene	*97.5*		*75.0-120*		*12/05/2019 17:31*	WG1391027
(S) Toluene-d8	*99.3*		*80.0-120*		*12/05/2019 17:31*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 17:57	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:57	WG1391027
Tetrachloroethene	26.9		0.500	1	12/05/2019 17:57	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 17:57	WG1391027
Trichloroethene	0.650		0.500	1	12/05/2019 17:57	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 17:57	WG1391027
(S) 1,2-Dichloroethane-d4	*95.4*		*80.0-125*		*12/05/2019 17:57*	WG1391027
(S) 4-Bromofluorobenzene	*98.1*		*75.0-120*		*12/05/2019 17:57*	WG1391027
(S) Toluene-d8	*98.5*		*80.0-120*		*12/05/2019 17:57*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 18:24	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 18:24	WG1391027
Tetrachloroethene	90.2		0.500	1	12/05/2019 18:24	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 18:24	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 18:24	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 18:24	WG1391027
(S) 1,2-Dichloroethane-d4	*95.1*		*80.0-125*		*12/05/2019 18:24*	WG1391027
(S) 4-Bromofluorobenzene	*98.3*		*75.0-120*		*12/05/2019 18:24*	WG1391027
(S) Toluene-d8	*98.5*		*80.0-120*		*12/05/2019 18:24*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 18:51	WG1391027
Cis-1,2-Dichloroethene	0.857		0.500	1	12/05/2019 18:51	WG1391027
Tetrachloroethene	201		0.500	1	12/05/2019 18:51	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 18:51	WG1391027
Trichloroethene	4.04		0.500	1	12/05/2019 18:51	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 18:51	WG1391027
(S) 1,2-Dichloroethane-d4	*96.4*		*80.0-125*		*12/05/2019 18:51*	WG1391027
(S) 4-Bromofluorobenzene	*97.8*		*75.0-120*		*12/05/2019 18:51*	WG1391027
(S) Toluene-d8	*99.7*		*80.0-120*		*12/05/2019 18:51*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 19:17	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 19:17	WG1391027
Tetrachloroethene	27.2		0.500	1	12/05/2019 19:17	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 19:17	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 19:17	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 19:17	WG1391027
(S) 1,2-Dichloroethane-d4	*97.7*		*80.0-125*		*12/05/2019 19:17*	WG1391027
(S) 4-Bromofluorobenzene	*99.6*		*75.0-120*		*12/05/2019 19:17*	WG1391027
(S) Toluene-d8	*98.5*		*80.0-120*		*12/05/2019 19:17*	WG1391027

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
1,1-Dichloroethene	ND		0.500	1	12/05/2019 19:43	WG1391027
Cis-1,2-Dichloroethene	ND		0.500	1	12/05/2019 19:43	WG1391027
Tetrachloroethene	ND		0.500	1	12/05/2019 19:43	WG1391027
trans-1,2-Dichloroethene	ND		0.500	1	12/05/2019 19:43	WG1391027
Trichloroethene	ND		0.500	1	12/05/2019 19:43	WG1391027
Vinyl Chloride	ND		0.500	1	12/05/2019 19:43	WG1391027
(S) 1,2-Dichloroethane-d4	*96.2*		*80.0-125*		*12/05/2019 19:43*	WG1391027
(S) 4-Bromofluorobenzene	*97.8*		*75.0-120*		*12/05/2019 19:43*	WG1391027
(S) Toluene-d8	*97.9*		*80.0-120*		*12/05/2019 19:43*	WG1391027

Method Blank (MB)

(MB) R3479948-3 12/05/19 11:15

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
1,1-Dichloroethene	U		0.108	0.500
Cis-1,2-Dichloroethene	U		0.114	0.500
Tetrachloroethene	U		0.157	0.500
trans-1,2-Dichloroethene	U		0.104	0.500
Trichloroethene	U		0.101	0.500
Vinyl Chloride	U		0.129	0.500
(S) 1,2-Dichloroethane-d4	*96.6*			*80.0-125*
(S) 4-Bromofluorobenzene	*98.8*			*75.0-120*
(S) Toluene-d8	*100*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3479948-1 12/05/19 09:56 • (LCSD) R3479948-2 12/05/19 10:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,1-Dichloroethene	40.0	40.9	41.8	102	105	78.0-121			2.18	20
Cis-1,2-Dichloroethene	40.0	39.7	39.9	99.3	99.8	80.0-120			0.503	20
Tetrachloroethene	40.0	35.0	34.9	87.5	87.3	78.0-122			0.286	20
trans-1,2-Dichloroethene	40.0	40.0	40.4	100	101	80.0-121			0.995	20
Trichloroethene	40.0	38.1	38.2	95.3	95.5	78.0-121			0.262	20
Vinyl Chloride	40.0	45.3	45.0	113	113	72.0-124			0.664	20
(S) 1,2-Dichloroethane-d4				*96.3*	*96.4*	*80.0-125*				
(S) 4-Bromofluorobenzene				*102*	*99.6*	*75.0-120*				
(S) Toluene-d8				*103*	*103*	*80.0-120*				

L1165816-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165816-01 12/05/19 12:11 • (MS) R3479948-4 12/05/19 20:10 • (MSD) R3479948-5 12/05/19 20:36

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,1-Dichloroethene	40.0	ND	41.7	42.2	104	106	1	69.0-136			1.19	30
Cis-1,2-Dichloroethene	40.0	ND	39.8	39.4	99.5	98.5	1	75.0-125			1.01	30
Tetrachloroethene	40.0	0.630	36.2	36.1	88.9	88.7	1	68.0-126			0.277	30
trans-1,2-Dichloroethene	40.0	ND	39.9	40.1	99.8	100	1	73.0-127			0.500	30
Trichloroethene	40.0	ND	38.3	37.8	95.8	94.5	1	71.0-125			1.31	30
Vinyl Chloride	40.0	ND	46.7	46.2	117	116	1	72.0-129			1.08	30
(S) 1,2-Dichloroethane-d4					*96.4*	*95.7*		*80.0-125*				
(S) 4-Bromofluorobenzene					*98.9*	*100*		*75.0-120*				
(S) Toluene-d8					*102*	*103*		*80.0-120*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

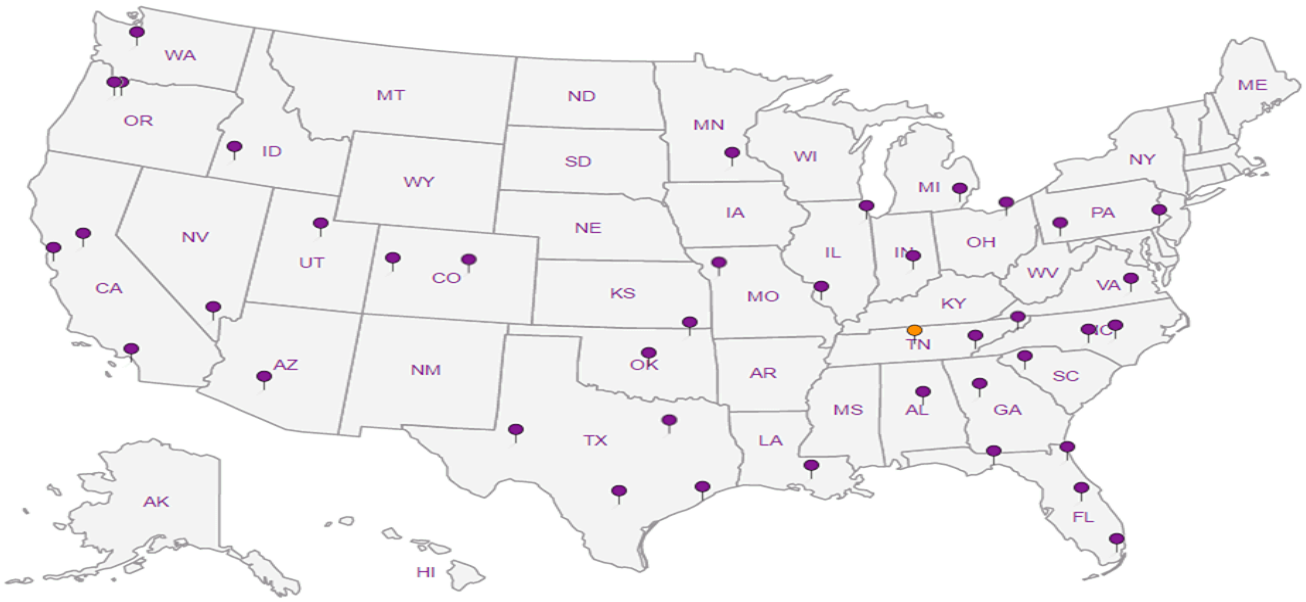
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GeoEngineers- Portland, OR

4000 Kruse Way Place
Bldg. 3, Suite 200
Lake Oswego, OR 97035

Billing Information:
Accounts Payable (Marlee Johnston)
17425 NE Union Hill Rd, Suite 250
Redmond, WA 98052

Pres Chk

Report to: Cris J. Watkins

Email To: cwatkins@geoengineers.com

Project Description: Lynnwood PFD - Former Alpine

City/State Collected:

Please Circle: PT MT CT ET

Phone: 503-603-6661
Fax: 503-620-5940

Client Project # 17787-001-11

Lab Project # GEOENGPOR-1778700111

Collected by (print): BRIAN ANDERSON

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1165816

F168

Acctnum: GEOENGPOR
Template: T159468
Prelogin: P741808
PM: 110 - Brian Ford
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOCs (V8260LLC) 40mlAmb-HCl	Remarks	Sample # (lab only)
MW-1		GW		11-26-19	0850	3	X		-01
MW-2		GW		11-27-19	0812	3	X		-02
MW-3		GW		11-27-19	0738	3	X		-03
MW-5		GW		11-26-19	0945	3	X		-04
MW-6		GW		11-27-19	0900	3	X		-05
MW-7		GW		11-26-19	1218	3	X		-06
MW-8		GW		11-26-19	1035	3	X		-07
MW-9		GW		11-26-19	0700	3	X		-08
MW-10		GW		11-26-19	1548	3	X		-09
MW-11		GW		11-26-19	1635	3	X		-10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: PCE,TCE,11-DCE,cis-12-DCE,trans-12-DCE,VC only.

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 4196 3255 6968

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

	Date:	Time:	
Relinquished by: (Signature)	11-27-19	1211	Received by: (Signature) 11/27/19
Relinquished by: (Signature)			Received by: (Signature)
Relinquished by: (Signature)			Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR

Temp: 3.3 °C Bottles Received: 54

Date: 11/29/19 Time: 940

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

GeoEngineers- Portland, OR

4000 Kruse Way Place
Bldg. 3, Suite 200
Lake Oswego, OR 97035

Billing Information:
Accounts Payable (Marlee Johnston)
17425 NE Union Hill Rd, Suite 250
Redmond, WA 98052

Pres Chk

Report to: Cris J. Watkins

Email To: cwatkins@geoengineers.com

Project Description: Lynnwood PFD - Former Alpine

City/State Collected:

Please Circle: PT MT CT ET

Phone: 503-603-6661
Fax: 503-620-5940

Client Project # 17787-001-11

Lab Project # GEOENGPOR-1778700111

Collected by (print): BRIAN ANDERSON

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1165816

Table #

Acctnum: GEOENGPOR

Template: T159468

Prelogin: P741808

PM: 110 - Brian Ford

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOCs (V8260LLC) 40ml Amb-HCl	Remarks	Sample # (lab only)
MW-12		GW		11-26-19	1715	3	Y		-11
MW-13		GW		11-26-19	1455	3	Y		-12
MW-14		GW		11-27-19	0958	3	Y		-13
MW-15		GW		11-26-19	0800	3	Y		-14
MW-16		GW		11-26-19	1310	3	Y		-15
MW-17		GW		11-26-19	1130	3	Y		-16
EMRI-MW-2		GW		11-26-19	1405	3	Y		-17
IZA-MW-3		GW		11-27-19	0700	3	Y		-18
		GW							
		GW							

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: PCE,TCE,11-DCE,cis-12-DCE,trans-12-DCE,VC only.

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	11-27-19	1211	11/27/19
Relinquished by : (Signature)			Received by: (Signature)
Relinquished by : (Signature)			Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR

Temp: 1.2 °C Bottles Received: 54

Date: 11/29/19 Time: 940

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK