Groundwater Compliance Monitoring Data Summary Report – July 2017

318 State Avenue NE Property
Olympia, Washington

for
City of Olympia

October 19, 2017

GeoEngineers
Earth Science + Technology

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318 State Avenue NE Property
Olympia, Washington

File No. 0415-049-07

October 19, 2017

Prepared for:

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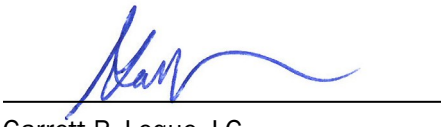

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INTRODUCTION

This data summary report presents the results of groundwater compliance monitoring performed by the City of Olympia (City) in July 2017 at the 318 State Avenue NE property in Olympia, Washington (Property) (Figure 1). Groundwater compliance monitoring at the Property is intended to monitor the natural attenuation of chlorinated organic solvents and associated degradation products identified as chemicals of concern (COCs) in groundwater after completion of the soil remedial action performed in September and October 2009. Remediation of soil and groundwater at the Property is being performed to support the goal of achieving a No Further Action (NFA) determination for the entire Property under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP). An NFA determination was provided by Ecology in February 2016 for the southeast portion of the Property to support redevelopment activities by the Low Income Housing Institute (LIHI) (Ecology 2016). Groundwater compliance monitoring is being performed at the Property to support achieving an NFA determination for the remaining portion of the Property as well as to fulfill monitoring requirements associated with the NFA for the southeast portion of the Property.

The chlorinated solvents being monitored for natural attenuation as part of groundwater compliance monitoring include tetrachloroethene (PCE) and trichloroethene (TCE) as well as associated degradation products. Monitoring also includes measurement of water quality parameters that are indicators of the natural attenuation. Monitoring of chlorinated solvents, degradation products and natural attenuation parameters is being performed in accordance with the Groundwater Compliance Monitoring Plan prepared for the Property (GeoEngineers 2010a) as well as a groundwater monitoring plan prepared for the southeast portion of the Property (GeoEngineers 2015).

Groundwater samples were collected on July 19, 2017 from four monitoring wells that included MW-03, MW-16, MW-18 and MW-19 (Figure 2). These samples were submitted for analysis to TestAmerica Laboratory in Fife, Washington. Groundwater samples and groundwater levels were collected from selected monitoring wells in accordance with the groundwater monitoring plans for the Property (GeoEngineers 2010a and 2015).

The following sections summarize the background for compliance monitoring, field sampling activities, groundwater gradients at the Property and results of groundwater sampling and analysis.

BACKGROUND

Remedial actions were performed in September and October 2009 to remove soil and fill material containing volatile organic compounds (VOCs) including chlorinated solvents, metals and carcinogenic polycyclic aromatic compounds (cPAHs) at concentrations greater than the Model Toxics Control Act (MTCA) cleanup levels (CULs). Soil samples were subsequently collected from the boundary of remedial action areas to confirm that soil and fill with contaminant concentrations greater than cleanup levels were removed from the remedial excavations. The results of the soil remedial action are presented in the Remedial Action Construction Report prepared for the Property (GeoEngineers 2010b).

Compliance monitoring is being performed after completion of soil remedial actions to evaluate the concentrations and natural attenuation of chlorinated organic solvents in groundwater at the Property. The

natural attenuation of chlorinated organic solvents has been monitored via quarterly monitoring through February 2012 and semi-annual monitoring starting in August 2012. Monitoring has included the following:

- Installation of two new monitoring wells in May 2010 during the first compliance groundwater monitoring event. Monitoring well MW-17 was installed within Contaminated Soil Zone 1 (CSZ 1) where soil remediation was performed in September and October 2009 and MW-18 was installed north of the CSZ 1 (Figure 2).
- Quarterly groundwater sampling at eight monitoring wells including MW-03, MW-04, MW-08, MW-09, MW-13 and MW-16 through MW-18 in May 2010, August 2010, November 2010 and February 2011.
- Quarterly groundwater sampling at five monitoring wells including MW-03, MW-08 and MW-16 through MW-18 in May 2011, August 2011, November 2011 and February 2012.
- Semi-annual groundwater sampling at five monitoring wells including MW-03, MW-08 and MW-16 through MW-18 in August 2012, February 2013 and August 2013.
- Semi-annual groundwater sampling at three monitoring wells including MW-03, MW-16 and MW-18 in February 2014, August 2014, February 2015, July 2015, and February 2016.
- Installation of monitoring well MW-19 on the northern boundary of the southeast portion of the Property in July 2015 to fulfill one of Ecology's requirements to establish an Environmental Covenant and obtain an NFA determination for the southeast portion of the Property (Figure 2).
- Quarterly groundwater sampling at one monitoring well, MW-19, in July 2015, October 2015, February 2016, and May 2016.
- Inclusion of MW-19 in semi-annual monitoring performed in July 2016.
- Semi-annual groundwater sampling at four monitoring wells including MW-03, MW-16, MW-18 and MW19 in July 2016, February 2017, and July 2017.
- Analysis for chlorinated organic solvents and associated degradation products including PCE, TCE, 1,1-dichloroethene (1,1-DCE), cis-dichloroethene (cis-DCE), trans-dichloroethene (trans-DCE) and vinyl chloride (VC).
- Monitoring for indicators of natural attenuation including ferrous iron, sulfate, dissolved oxygen (DO), pH, electrical conductivity and oxidation-reduction potential (ORP).
- Monitoring of groundwater gradients by measuring water levels at all existing monitoring wells at the Property through February 2012. Groundwater level measurements have been collected from each well undergoing groundwater sampling after February 2012.
- Groundwater monitoring wells MW-04 and MW-17 were decommissioned by the LIHI on March 2, 2016 to accommodate redevelopment of the SE portion of the Property.

Additionally, analysis for arsenic was performed in accordance with the CMP between May 2010 and February 2011 to provide additional information concerning arsenic concentrations in the area. Arsenic analysis was discontinued after the February 2011 groundwater compliance monitoring event because the arsenic results for sampling performed between May 2010 and February 2011 indicate that arsenic concentrations are less than the MTCA Method A CUL in groundwater on the Property. Arsenic concentrations were detected at concentrations greater than the MTCA CUL in locations upgradient of the Property that are likely related to area-wide groundwater conditions or an upgradient source. Ecology's

concurrence for discontinuing arsenic analysis was provided in an email from the former Voluntary Cleanup Program (VCP) site manager, Eugene Radcliff to the GeoEngineers project manager, Iain Wingard dated May 16, 2011.

Ecology also previously requested that groundwater be analyzed for constituents associated with a petroleum hydrocarbon release during the May 2010 groundwater compliance monitoring event to evaluate the potential impacts from a UST encountered at the Property during the remedial action for soil. The sampling and analysis requirements to assess potential impacts from the former UST were documented in an email from Iain Wingard, GeoEngineers to Eugene Radcliff, Ecology dated May 11, 2010. The additional analyses requested by Ecology were performed during the May 2010 compliance monitoring event (GeoEngineers 2010c). Only benzene was detected in two samples at concentrations well below the MTCA Method A groundwater CUL. Based on the May 2010 sample results, no additional monitoring was necessary to assess potential impacts from the UST for petroleum hydrocarbons at the Property. However, Ecology requested in an email from Eugene Radcliff of Ecology to Iain Wingard of GeoEngineers dated July 19, 2010 that compliance groundwater monitoring include benzene analysis. Therefore, groundwater compliance monitoring performed between May 2010 and February 2011 continued to include analysis for benzene. Benzene analysis was discontinued after the February 2011 compliance monitoring event because the results for sampling performed between May 2010 and February 2011 indicated that benzene is not present at concentrations greater than the MTCA Method A CUL. Ecology concurrence for discontinuing benzene analysis was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 16, 2011.

Eight groundwater wells were sampled during the May 2010, August 2010, November 2010 and February 2011 groundwater compliance monitoring events. The number of groundwater monitoring locations were reduced from eight to five during the May 2011 compliance monitoring event as the results of groundwater compliance monitoring performed between May 2010 and February 2011 indicate that the concentrations of chlorinated organic solvents and associated degradation products are less than the MTCA CULs at monitoring well locations MW-13, MW-04, MW-17 and MW-09. Ecology concurrence for discontinuing groundwater monitoring at monitoring well locations MW-13, MW-04 and MW-09 was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 16, 2011. Groundwater compliance monitoring continued to be performed at MW-17 to monitor upgradient/background conditions on the Property.

Quarterly groundwater compliance monitoring was implemented between May 2010 and February 2012. The frequency of groundwater monitoring was reduced from quarterly to semi-annually during the August 2012 compliance monitoring event after the results of previous groundwater compliance monitoring events indicated that the highest and lowest concentrations of chlorinated organic solvents and associated degradation products were detected during the month of February and August. Groundwater gradient mapping has also been discontinued as part of reporting and is not included in this compliance groundwater report because groundwater gradient patterns have generally been established through groundwater measurements collected between May 2010 and February 2012. Ecology concurrence for reducing compliance monitoring frequency and discontinuing groundwater gradient mapping was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 8, 2012.

Five groundwater wells were sampled during the August and February 2011, August and February 2012 and August and February 2013 groundwater compliance monitoring events. The number of groundwater

monitoring locations were reduced from five to three during the February 2014 compliance monitoring event as the results of groundwater compliance monitoring performed between February 2011 and August 2013 indicate that the concentrations of chlorinated organic solvents and associated degradation products are less than the MTCA CULs at monitoring well locations MW-08 and MW-17. Ecology concurrence for discontinuing groundwater monitoring at monitoring well locations MW-08 and MW-17 were provided in two emails from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated October 3, 2013 and November 4, 2013, respectively.

An additional monitoring well, MW-19, was installed at the Property in July 2015 on the eastern portion of the property to support the redevelopment of the southeast portion of the property (Figure 2). The City sold the southeastern portion of the Property for redevelopment by LIHI. LIHI constructed a multistory, low income residential housing structure with vapor intrusion mitigation controls in accordance with the environmental covenant established as part of the NFA determination by Ecology (Ecology 2016). Monitoring well MW-19 is located adjacent to northern boundary of the southeast portion of the Property to characterize groundwater from the southeast portion of the Property. A groundwater monitoring plan was prepared that identifies the monitoring approach and schedule for groundwater from MW-19 (GeoEngineers 2015).

FIELD ACTIVITIES

Groundwater monitoring samples were collected from MW-03, MW-16, MW-18 and MW-19 on July 19, 2017 (Figure 2). Groundwater samples were collected using low-flow/low-turbidity sampling techniques to minimize the suspension of particulates in the samples. Groundwater samples were obtained from the wells using dedicated submersible electric pumps (Whale Pump Brand) with dedicated flexible vinyl tubing. Groundwater was pumped at approximately 0.5 liters per minute from the approximate mid-point of the screened interval to collect the samples.

Water quality parameters were measured during purging using a calibrated YSI 556 MPS water quality meter with a flow-through cell. The measured water quality parameters included electrical conductivity, dissolved oxygen (DO), potential hydrogen (pH), oxidation/reduction potential (ORP), salinity, total dissolved solids (TDS) and temperature. Turbidity was monitored using a Hach turbidimeter. Groundwater samples were collected once the water quality parameters generally varied by less than 10 percent on three consecutive measurements. All field measurements were documented on the field logs.

Following well purging, the flow-through cell was disconnected and the groundwater samples were collected in appropriate laboratory-prepared and -provided containers. The samples were protected and placed into a cooler with ice and delivered to TestAmerica Laboratory in Fife, Washington, for analysis following appropriate chain-of-custody procedures. Purge water was stored in labeled 55-gallon drums for future permitted off-site disposal. The groundwater samples were submitted for the following analyses to provide results for chlorinated organic solvents and associated degradation products as well as water quality parameters as specified in the CMP:

- VOCs by Environmental Protection Agency (EPA) Method 8260
- Sulfate by EPA Method 300.0

Ferrous iron concentrations were measured in the field using a Hach field test kit and the results were recorded on the field logs prior to collection of samples for laboratory analysis.

ANALYTICAL RESULTS

The results from semi-annual groundwater sample collection and analysis from MW-03, MW-16 and MW-18 performed in July 2017 are described in the following sections. Table 1 presents the results for the chemical analyses performed as part of semi-annual groundwater compliance monitoring in July 2017. Table 1 also includes the results from previous groundwater compliance monitoring for comparison purposes.

The results from monitoring MW-19 installed in July 2015 are also described below and presented in Table 1. MW-19 is being monitored in accordance with a separate groundwater monitoring plan that was prepared for monitoring groundwater from the southeast portion of the Property and that identifies the monitoring approach and schedule for sampling and analysis of groundwater from MW-19 (GeoEngineers 2015).

The results for groundwater samples from MW-03, MW-16, MW-18 and MW-19 are compared to MTCA groundwater CULs protective of the highest beneficial use for groundwater. Ecology does not consider groundwater at the Property as a likely potable water source (Ecology 2015). Therefore, the highest beneficial use for groundwater is as marine surface water. The results were also compared to the MTCA Method B groundwater screening level protective of soil vapor intrusion provided in Ecology's Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State (Ecology 2009) as updated in April 2015 to revise the soil gas screening levels provided in Appendix B of the guidance document (Ecology 2015). The CULs and screening levels are presented in Table 1. Table 2 summarizes water quality and natural attenuation parameter measurements collected in July 2017 and includes the results from previous groundwater compliance monitoring for comparison. Finally, Appendix A contains the laboratory analytical reports and Appendix B contains the Data Quality Assessment Report presenting the results of data validation of the chemical analyses performed in July 2017.

Groundwater Compliance Monitoring Analyses

Natural Attenuation Parameters

The geochemical indicators of natural attenuation measured in July 2017 generally fit the historical pattern for the Property. Historically, summer measurements indicate a lower water table and more reducing conditions compared to winter (Table 2).

Chlorinated Organic Solvents and Associated Degradation Products

PCE, 1,1-DCE and cis 1,2-DCE were not detected in samples collected in July 2017. TCE was detected in monitoring wells MW-03, MW-16, MW-18 and MW-19 at concentrations less than the screening levels for soil vapor intrusion and CULs for protection of surface water (Table 1). Trans 1,2-DCE was also detected in monitoring wells MW-03, MW-16 and MW-18 at concentrations less than the CULs for protection of surface water (Table 1). VC was detected in groundwater from MW-03, MW-18 and MW-19 at a concentration greater than the MTCA Method B screening level for soil vapor intrusion but was less than the CUL for protection of surface water (Table 1 and Figure 3). VC was detected at a concentration less than the CUL for protection of surface water and screening level for soil vapor intrusion in groundwater from monitoring well MW-16.

Natural Attenuation of Chlorinated Solvents and Associated Degradation Products in Groundwater

Temporal analysis of the detected concentrations of chlorinated compounds in groundwater at the Property is being performed to assess trends in the natural attenuation of the chlorinated compounds at the Property. The detected chlorinated compound concentrations plotted through time are presented in Figures 4 through 7. The data presented for monitoring wells MW-03 and MW-16 include the results of the groundwater monitoring event performed prior to remedial actions for soil (i.e., March 2009) as well as the groundwater monitoring events that have been performed after the completion of soil remediation. The data presented for monitoring well MW-18 include the groundwater monitoring events performed after the soil remedial actions as this well was installed after completion of the soil remedial actions. Sampling has been performed at Monitoring well MW-19 since it was installed in July 2015.

The following summarizes the results of the trend analysis for MW-03, MW-16, MW-18 and MW-19:

- MW-03 – Monitoring well MW-03 is located downgradient/crossgradient of the soil remedial action area on the southeast portion of the Property (CSZ 1) (Figure 3). The concentrations of chlorinated compounds have fluctuated (i.e., increased and decreased) in groundwater at MW-03 between the soil remedial action and 2017 (Figure 4 and Table 1). Higher concentrations of chlorinated compounds are generally present in groundwater at MW-03 in the winter when groundwater levels are higher (Figure 4 and Tables 1 and 2). The concentration of TCE has generally been detected at concentrations greater than the MTCA screening level for soil vapor intrusion (1.55 micrograms per liter [µg/L]) during sampling events performed in the winter (i.e., February 2017, February 2016, February 2014 and February November 2011) but is less than the cleanup level for protection of surface water (7 µg/L). The concentration of TCE has generally been below the MTCA screening level for soil vapor intrusion during monitoring events occurring in the summer (i.e., July 2017, July 2015, August 2014, August 2013, and August 2012). However, the concentration of TCE detected in groundwater from MW-03 during the July 2016 monitoring event was greater than the screening level for soil vapor intrusion (Figure 4 and Table 1). The results for TCE at MW-03 in July 2016 may be attributed to groundwater conditions from infiltration of firefighting water at or near the Property on July 5, 2016. The concentration of VC was periodically greater than the MTCA screening level for soil vapor intrusion (0.347 µg/L) during sampling events performed in the winter until 2015 (i.e., February 2015 through February 2012). The concentration of VC was greater than the cleanup level for protection of surface water (1.6 µg/L) during one event (i.e., February 2015). The concentration of VC has been below both screening levels since the summer sampling event in 2015, however, the VC concentration increased to above the MTCA screening level for soil vapor intrusion during this most recent sampling event. Similar to TCE, VC has generally been below the MTCA screening level for soil vapor intrusion during monitoring events occurring in the summer (i.e., July 2016, July 2015, August 2014, August 2013, and August 2012). PCE and DCE are either not detected or are detected at concentrations less than the MTCA cleanup levels for protection of surface water and screening level for soil vapor intrusion in groundwater from MW-03 (Table 1).
- MW-16 – Monitoring well MW-16 is located downgradient of the soil remedial action area on the southeast portion of the Property (Figure 3). The concentration of VC in groundwater from MW-16 as well as other chlorinated compounds decreased after completion of soil remedial actions (Figure 5 and Table 1). Higher VC concentrations and concentrations greater than the screening level for soil vapor intrusion were generally present in groundwater in MW-16 during the summer monitoring events

(i.e., July 2015, August 2014, August 2013, and August 2012), which is likely attributed to the degradation of TCE and DCE in groundwater flowing from the upgradient area in proximity to MW-03. A lower VC concentration and a concentration less than the screening level was observed during the July 2016 sampling event, which may be attributed to infiltration of firefighting water at or near the Property. PCE, TCE, and DCE have been either not detected or detected at concentrations less than the MTCA cleanup level for protection of surface water and screening level for soil vapor intrusion in groundwater from MW-16. The concentration of TCE increased during the July 2016 monitoring event, which may also be attributed to infiltration of firefighting water at or near the Property. The concentration of TCE remained below the cleanup and screening levels in February 2017 and July 2017.

- MW-18 – Monitoring well MW-18 is located downgradient of soil remedial action area on the southeast portion of the Property (Figure 3). The VC concentrations in groundwater at monitoring well MW-18 have fluctuated during the time between the soil remedial action and July 2017 (Figure 6 and Table 1). Similar to MW-16, higher concentrations of VC are generally present in groundwater in MW-18 during summer monitoring events which is likely attributed to the degradation of TCE and DCE in groundwater flowing from the upgradient area in proximity to MW-03. Also similar to MW-16, a lower VC concentration was observed during the July 2016 sampling event which may be attributed to infiltration of firefighting water at or near the Property. The concentration of VC in groundwater from MW-18 was greater than the screening level for soil vapor instruction but was less than the cleanup level for protection of surface water in February 2017 and July 2017. PCE, TCE, and DCE at MW-18 are consistently either not detected or are detected at concentrations less than the MTCA cleanup and vapor intrusion screening levels.
- MW-19 – Monitoring well MW-19 was installed in July 2015 to monitor groundwater from the southeast portion of the Property (Figure 3). VC has been detected in groundwater from MW-19 at concentrations greater than the screening level for soil vapor intrusion but less than the cleanup level for protection of surface water (Figure 7 and Table 1). TCE has been detected at concentrations less than the CUL for protection of surface water and the MTCA screening level for soil vapor intrusion with the exception of the February 2016 monitoring event. PCE and DCE at MW-19 are either not detected or are detected at concentrations less than the cleanup and screening levels.

Overview of Groundwater Compliance Monitoring Results

TCE was detected at concentrations less than the MTCA cleanup level for protection of surface water and screening level for soil vapor intrusion from groundwater, during the July 2017 monitoring event (Table 1). VC was detected at a concentration greater than the MTCA screening level for soil vapor intrusion at three locations, MW-03, MW-18 and MW-19, during the July 2017 monitoring event. Other chlorinated compounds were either not detected or less than the MTCA cleanup level for protection of surface water and screening level for soil vapor intrusion from groundwater during the July 2017 monitoring event.

Geochemical indicators of natural attenuation have fluctuated seasonally between reducing and oxidative conditions during compliance monitoring events performed at the Property. The groundwater conditions observed in July 2017 (summer) were reducing due to decreased precipitation and lower groundwater levels.

Future Groundwater Compliance Monitoring

The next round of semi-annual groundwater compliance monitoring is scheduled to be performed in February 2018. Groundwater monitoring will be performed at groundwater monitoring wells MW-03, MW-16, MW-18, and MW-19.

REFERENCES

Ecology, 2016, No Further Action at a Property associated with a Site: 318 State Ave NE, Olympia, WA 98501, Opinion Letter, dated February 23, 2016.

Email from Iain Wingard, GeoEngineers to Eugene Radcliff, Ecology "Subject: City of Olympia Groundwater Compliance Monitoring," dated May 11, 2010.

Email from Eugene Radcliff of Ecology to Iain Wingard of GeoEngineers, "Subject: State Avenue Property May 2010 Groundwater Compliance Monitoring Report," dated July 19, 2010.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Ecology response to the February 2011 Groundwater Monitoring Report," dated May 16, 2011.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Monitoring and Reporting at the City of Olympia 318 State Avenue Property," dated May 8, 2012.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Groundwater Monitoring Report for City of Olympia 318 S State Street Property," dated October 3, 2013.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Groundwater Monitoring Report for City of Olympia 318 S State Street Property," dated November 4, 2013.

GeoEngineers, 2010a, "Groundwater Compliance Monitoring Plan, 318 State Avenue NE, Olympia, Washington," April 16, 2010.

GeoEngineers, 2010b, "Remedial Action Construction Report, 318 State Avenue NE, Olympia, Washington," January 5, 2010.

GeoEngineers, 2010c, "Groundwater Compliance Monitoring Data Summary Report – May 2010, 318 State Avenue NE, Olympia, Washington," July 16, 2010.

GeoEngineers, 2015, "Groundwater Monitoring Plan, Southeast Portion of the 318 State Avenue NE Property, Olympia, Washington," October 1, 2015.

LIMITATIONS

This Groundwater Monitoring Report has been prepared for use by the City of Olympia. GeoEngineers has performed these services in general accordance with the scope and limitations of our proposal.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted environmental science practices for groundwater monitoring in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

TABLE 1

SUMMARY OF GROUNDWATER MONITORING PARAMETERS[1] - JULY 2017

318 STATE AVENUE NE

OLYMPIA, WASHINGTON

			Volatile Organic Compounds					
		Analyte	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**1,1-Dichloroethene (1,1-DCE)**	**Cis-1,2-Dichloroethene (cis 1,2-DCE)**	**Trans-1,2-Dichloroethene (trans 1,2-DCE)**	**Vinyl Chloride (VC)**
		Unit	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
		MTCA Groundwater Cleanup Levels[2]	8.85	7	3.2	NE	4,000	1.6
		Groundwater Screening Level for Soil Vapor Intrusion[3]	22.9	1.55	130	NE	NE	0.347
Location	**Sample ID**	**Sample Date**						
MW-03	MW3-052410-W	05/24/10	0.1 U	**0.48**	0.1 U	**0.14**	0.1 U	**0.48**
	MW3-082510-W	08/25/10	0.1 U	**0.26**	0.1 U	**0.11**	0.1 U	**0.12**
	MW3-112410-W	11/24/10	0.1 U	**1.3**	0.1 U	**0.28**	0.1 U	**1.1**
	MW3-022311-W	02/23/11	0.1 U	**1.6**	0.1 U	**0.59**	0.1 U	**0.92**
	MW3-052511-W	05/25/11	0.1 U	**1.5**	0.1 U	**0.60**	**0.15**	**0.83**
	DUP-052511-W[4]	05/25/11	0.1 U	**1.2**	0.1 U	**0.36**	**0.12**	**0.69**
	MW3-082411-W	08/24/11	0.1 U	**0.64 J**	0.1 U	**0.31**	**0.11**	**0.37 J**
	DUP-082411-W[5]	08/24/11	0.1 U	**0.49 J**	0.1 U	**0.23**	0.1 U	**0.27 J**
	MW3-112911-W	11/29/11	0.1 U	**2.6**	0.1 U	**0.39**	**0.11**	**0.45**
	DUP-112911-W[6]	11/29/11	0.1 U	**2.7**	0.1 U	**0.41**	**0.10**	**0.52**
	MW3-022812-W	02/28/12	0.1 U	**0.99**	0.1 U	**0.63**	**0.18**	**1.4**
	DUP-022812-W[7]	02/28/12	0.1 U	**1.3**	0.1 U	**0.84**	**0.19**	**1.9**
	MW3-082312-W	08/23/12	0.1 U	**0.11**	0.1 U	**0.36**	**0.30**	**0.27**
	DUP-082312-W[8]	08/23/12	0.1 U	**0.11**	0.1 U	**0.34**	**0.33**	**0.26**
	MW3-022813-W	02/28/13	0.1 U	**0.70**	0.1 U	**0.34**	**0.14**	**0.72**
	DUP-022813-W[9]	02/28/13	0.1 U	**0.68**	0.1 U	**0.32**	**0.12**	**0.69**
	MW03-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	**0.24**	**0.28**	**0.15**
	DUP01-82213-W[10]	08/22/13	0.1 U	0.1 U	0.1 U	**0.23**	**0.32**	**0.16**
	MW3-140227-W	02/27/14	0.1 U	**2.5**	0.1 U	**0.75**	**0.12**	**0.79**
	MW03-140825-W	08/25/14	0.1 U	0.1 U	0.1 U	**0.35**	**0.36**	**0.25**
	MW03-150225-W	02/25/15	0.5 U	**0.58**	0.1 U	**1.8**	0.2 U	**3.6**
	MW03-150723-W	07/23/15	0.5 U	0.2 U	0.1 U	**0.34**	**0.34**	**0.28**
	MW3-160217-W	02/17/16	0.5 U	**4.0**	0.1 U	**0.41**	0.2 U	**0.19**
	MW-3-160705-W	07/05/16	0.5 U	**2.2**	0.1 U	**0.84**	0.2 U	**0.34**
	MW-3-170222-W	02/22/17	0.5 U	**2.8**	0.1 U	**0.31**	0.2 U	**0.27**
	MW-03-170719-W	07/19/17	0.5 U	**0.17 J**	0.1 U	1.3 U	**0.40**	**0.48**
MW-16	MW16-052410-W	05/24/10	0.1 U	**0.44**	0.1 U	**0.20**	**0.18**	**0.76**
	MW16-082510-W	08/25/10	0.1 U	**0.46**	0.1 U	**0.32**	**0.34**	**1.0**
	MW16-112410-W	11/24/10	0.1 U	**0.49**	0.1 U	**0.17**	**0.19**	**0.33**
	DUP-1-112410-W[11]	11/24/10	0.1 U	**0.50**	0.1 U	**0.16**	**0.21**	**0.38**
	MW16-022311-W	02/23/11	0.1 U	**0.42**	0.1 U	**0.13**	**0.13**	**0.22**
	DUP-1-022311-W[12]	02/23/11	0.1 U	**0.43**	0.1 U	**0.11**	**0.15**	**0.23**
	MW16-052511-W	05/25/11	0.1 U	**0.47**	0.1 U	0.1 U	**0.16**	**0.18**
	MW16-082411-W	08/24/11	0.1 U	**0.41**	0.1 U	**0.26**	**0.24**	**0.70**
	MW16-112911-W	11/29/11	0.1 U	**0.35**	0.1 U	**0.10**	**0.12**	**0.15**
	MW16-022812-W	02/28/12	0.1 U	**0.40**	0.1 U	0.1 U	**0.13**	**0.17**
	MW16-082312-W	08/23/12	0.1 U	**0.52**	0.1 U	**0.21**	**0.20**	**0.47**
	MW16-022813-W	02/28/13	0.1 U	**0.28**	0.1 U	0.1 U	0.1 U	**0.086**
	MW16-82213-W	08/22/13	0.1 U	**0.26**	0.1 U	**0.22**	**0.13**	**0.44**
	MW16-140227-W	02/27/14	0.1 U	**0.24**	0.1 U	0.1 U	0.1 U	**0.093**
	DUP01-140227-W[13]	02/27/14	0.1 U	**0.26**	0.1 U	0.1 U	0.1 U	**0.090**
	MW16-140825-W	08/25/14	0.1 U	**0.37**	0.1 U	**0.25**	**0.18**	**0.52**
	DUP01-140825-W[14]	08/25/14	0.1 U	**0.36**	0.1 U	**0.25**	**0.19**	**0.51**
	MW16-150225-W	02/25/15	0.5 U	**0.24**	0.1 U	0.2 U	0.2 U	**0.16**
	DUP01-150225-W[15]	02/25/15	0.5 U	**0.23**	0.1 U	0.2 U	0.2 U	**0.15**
	MW16-150712-W	07/23/15	0.5 U	**0.23**	0.1 U	**0.27**	0.2 U	**0.60**
	DUP01-150723-W[16]	07/23/15	0.5 U	**0.24**	0.1 U	**0.28**	0.2 U	**0.54**
	MW16-160217-W	02/17/16	0.5 U	**0.23**	0.1 U	0.2 U	0.2 U	0.02 U
	DUP1-160217-W[17]	02/17/16	0.5 U	**0.25**	0.1 U	0.2 U	0.2 U	0.02 U
	MW-16-160705-W	07/05/16	0.5 U	**0.78**	0.1 U	0.2 U	0.2 U	0.02 U
	DUP01-160705-W[19]	07/05/16	0.5 U	**0.96**	0.1 U	0.2 U	0.2 U	0.02 U
	MW-16-170222-W	02/22/17	0.5 U	**0.21**	0.1 U	**0.098 J**	0.2 U	**0.084**
	MW-16-170719-W	07/19/17	0.5 U	**0.22**	0.1 U	1.0 U	**0.077 J**	**0.29**
MW-18	MW18-052410-W	05/24/10	0.1 U	**0.62**	0.1 U	**0.28**	**0.16**	**2.3**
	MW18-082510-W	08/25/10	0.1 U	**0.25**	0.1 U	**0.22**	**0.13**	**1.9**
	MW18-112410-W	11/24/10	0.1 U	**0.81**	0.1 U	**0.34**	**0.23**	**1.7**
	MW18-022311-W	02/23/11	0.1 U	**0.72**	0.1 U	**0.30**	**0.16**	**0.90**
	MW18-052511-W	05/25/11	0.1 U	**0.63**	0.1 U	**0.21**	**0.14**	**1.2**
	MW18-082411-W	08/24/11	0.1 U	**0.40**	0.1 U	**0.39**	**0.24**	**2.3**
	MW18-112911-W	11/29/11	0.1 U	**0.57**	0.1 U	**0.30**	**0.15**	**0.86**
	MW18-022812-W	02/28/12	0.1 U	**0.49**	0.1 U	**0.20**	**0.16**	**1.20**
	MW18-082312-W	08/23/12	0.1 U	**0.62**	0.1 U	**0.43**	**0.29**	**2.7**
	MW18-022813-W	02/28/13	0.1 U	**0.34**	0.1 U	0.1 U	0.1 U	**0.15**
	MW18-82213-W	08/22/13	0.1 U	**0.61**	0.1 U	**0.45**	**0.28**	**2.1**
	MW18-140227-W	02/27/14	0.1 U	**0.57**	0.1 U	**0.26**	**0.26**	**1.3**
	MW18-140825-W	08/25/14	0.1 U	**0.48**	0.1 U	**0.51**	**0.43**	**2.7**
	MW18-150225-W	02/25/15	0.5 U	**0.68**	0.1 U	**0.23**	**0.20**	**1.5**
	MW18-150723-W	07/23/15	0.5 U	**0.29**	0.1 U	**0.34**	**0.27**	**2.0**
	MW18-160217-W	02/17/16	0.5 U	**0.48**	0.1 U	**0.26**	**0.26**	**1.5**
	MW18-160705-W	07/05/16	**0.13 J**	**0.16 J**	0.1 U	0.2 U	0.2 U	**0.060**
	MW-18-170222-W	02/22/17	0.5 U	**0.41**	0.1 U	**0.24**	**0.14 J**	**0.87**
	MW-18-170719-W	07/19/17	0.5 U	**0.12 J**	0.1 U	1.2 U	**0.28**	**1.5**

Analyte			Tetrachloroethene (PCE)	Trichloroethene (TCE)	1,1-Dichloroethene (1,1-DCE)	Cis-1,2-Dichloroethene (cis 1,2-DCE)	Trans-1,2-Dichloroethene (trans 1,2-DCE)	Vinyl Chloride (VC)
Unit			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MTCA Groundwater Cleanup Levels[2]			8.85	7	3.2	NE	4,000	1.6
Groundwater Screening Level for Soil Vapor Intrusion[3]			22.9	1.55	130	NE	NE	0.347
Location	**Sample ID**	**Sample Date**						
MW-19	MW-19-150723-W	07/23/15	0.5 U	**0.47**	0.1 U	0.2 U	0.2 U	**0.89**
	MW-19-151027-W	10/27/15	0.5 U	**0.91**	0.1 U	0.2 U	0.2 U	**0.41**
	MW19-160217-W	02/17/16	0.5 U	**1.7**	0.1 U	0.2 U	0.2 U	0.02 U
	MW19-160503-W	05/03/16	0.5 U	**1.2**	0.1 U	**0.1 J**	0.2 U	**0.51**
	DUP1-160503-W[18]	05/03/16	0.5 U	**1.5**	0.1 U	0.2 U	0.2 U	**0.41**
	MW-19-160705-W	07/05/16	0.5 U	**1.5**	0.1 U	**0.31**	**0.18 J**	**1.4**
	MW-19-170222-W	02/22/17	0.5 U	**1.4**	0.1 U	**0.082 J**	0.2 U	**0.078 J**
	DUP 1-170222[20]	02/22/17	0.5 U	**1.4**	0.1 U	**0.037 J**	0.2 U	**0.053 J**
	MW-19-170719-W	07/19/17	**0.12 J**	**1.3**	0.1 U	0.95 U	0.2 U	**0.56 J**
	DUP-170719[21]	07/19/17	**0.11 J**	**1.4**	0.1 U	0.88 U	0.2 U	**0.44 J**

Notes:

[1] The parameters presented are the groundwater compliance monitoring parameters specified in the Groundwater Compliance Monitoring Plan (GeoEngineers, 2010) for the property and groundwater monitoring plan for the southeast portion of the property (GeoEngineers, 2015).

[2] MTCA groundwater cleanup levels based on the highest beneficial use of groundwater as marine surface water. The cleanup levels provided are the lowest of the available marine surface water criteria including MTCA Method B surface water (Chapter 173-340 WAC). Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC), National Recommended Water Quality Criteria (Clean Water Act Section 304) and National Toxics Rule (40 CFR 131).

[3] Groundwater Screening Level based on Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation on Remedial Action (Ecology, 2009) as updated in 2015 (Ecology, 2015) to revise screening levels in Appendix B.

[4] Sample DUP-052511-W is a field duplicate of sample MW3-052511-W.

[5] Sample DUP-082411-W is a field duplicate of sample MW3-082411-W.

[6] Sample DUP-112911-W is a field duplicate of sample MW3-112911-W.

[7] Sample DUP-022812-W is a field duplicate of sample MW3-022812-W.

[8] Sample DUP-082312-W is a field duplicate of sample MW3-082312-W.

[9] Sample DUP-022813-W is a field duplicate of sample MW3-022813-W.

[10] Sample DUP01-82213-W is a field duplicate of sample MW03-82213-W.

[11] Sample DUP-1-112410-W is a field duplicate of sample MW16-112410-W.

[12] Sample DUP-1-022311-W is a field duplicate of sample MW16-022311-W.

[13] Sample DUP01-140227-W is a field duplicate of sample MW16-140227-W.

[14] Sample DUP01-140825-W is a field duplicate of sample MW16-140825-W.

[15] Sample DUP01-150225-W is a field duplicate of sample MW16-150225-W.

[16] Sample DUP01-150723-W is a field duplicate of sample MW16-150723-W.

[17] Sample DUP1-160217-W is a field duplicate of sample MW16-160217-W.

[18] Sample DUP-1-160503-W is a field duplicate of sample MW19-160503-W.

[19] Sample DUP01-160507-W is a field duplicate of sample MW16-160507-W.

[20] Sample DUP 1-170222-W is a field duplicate of sample MW19-170222-W.

[21] Sample DUP-170719 is a field duplicate of sample MW19-170719-W.

MTCA = Model Toxics Control Act
µg/l = microgram per liter
mg/l = milligram per liter
J = The analyte concentration is estimated
U = The analyte was not detected at a concentration greater than the identified reporting limit
UJ = The analyte was not detected at a concentration greater than the identified reporting limit and the reporting limit concentration is estimated
NE = Not Established
Bold indicates analyte was detected.
Green shading indicates sample results for the current monitoring event.
Gray shading indicates concentration is greater than groundwater cleanup and/or screening level.

TABLE 2

SUMMARY OF GROUNDWATER QUALITY PARAMETERS[1] - JULY 2017

318 STATE AVENUE NE
OLYMPIA, WASHINGTON

Location ID	Sample Date	Ferrous Iron (mg/l)	Sulfate (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (mS/m)	Salinity (ppt)	Total Dissolved Solids (g/l)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)	Water Level (ft btoc)
MW-03	05/24/10	0.9	7.5	4.38	9.79	27.2	0.1	1.4	0.89	16.2	-211	4.27
	08/25/10	1.4	1.2 U	0.31	6.96	75.0	0	0.48	0.94	21.32	-133	4.99
	11/24/10	0.8	6.6	0.00	7.04	66.7	0	0.43	0.84	15.53	-94	3.80
	02/23/11	0.6	2.5	0.01	7.10	46.3	0	0.3	2.51	11.26	-117	4.05
	05/25/11	0.8	2.4	0.01	7.07	46.7	NC	NC	0.59	15.12	-130	4.10
	08/24/11	1.1	1 U	0.40	7.20	72.3	0	0.46	0.44	21.02	-90	4.82
	11/29/11	0.6	11	5.00	7.10	59.0	0	0.38	3.06	13.67	89	3.49
	02/28/12	0.8	40 UJ	2.60	7.25	41.5	0	0.27	5.45	10.99	-59	3.75
	08/23/12	1.0	1.2 U	7.14	6.87	53.0	0	0.34	0.59	21.3	-117	4.92
	02/28/13	1.5	2.1	0.78	6.53	48.0	0	0.31	17.6	11.52	-48	3.98
	08/22/13	1.6	1.2 U	0.10	7.61	61.7	0	0.40	37.4[3]	23.2	-156	4.98
	02/27/14	0.0	11	3.80	7.30	33.2	0	0.31	0.63	10.3	204.4	3.44
	08/25/14	1.8	1.2 U	0.68	7.25	52.0	0.26	0.35	2.48	22.99	-108.6	4.78
	02/25/15	0.5	2.1	1.25	7.31	31.9	0.2	0.26	1.56	12.21	-70.3	4.14
	07/23/15	0.5	1.2 U	0.09	7.11	48.8	0.25	0.34	0.81	22.6	-150	5.04
	02/17/16	0.0	12	4.94	7.50	30.0	0.19	0.25	2.3	12.7	46.5	3.41
	07/05/16	0.7	8.2	2.58	7.04	46.1	0.23	0.32	3.18	22.1	-133.8	3.50
	02/22/17	0.0	99.0	3.69	7.40	42.2	0.29	0.39	1.21	9.6	1.9	3.35
	07/19/17	1.6	99.0	0.20	7.08	64.6	0.35	0.46	2.25	20.1	-199.2	4.66
MW-16	05/24/10	0.0	20.0	2.44	8.19	26.6	0	0.17	2.9	15.1	-116	4.24
	08/25/10	0.4	42.0	0.04	7.26	69.8	0	0.44	1.2	21.91	-106	5.02
	11/24/10	0.0	28	1.93	7.54	49.8	0	0.36	1.16	15.42	-34	3.68
	02/23/11	0.0	17	5.08	7.53	37.5	0	0.24	2.58	11.53	-9	4.04
	05/25/11	0.0	11	1.02	7.55	33.1	NC	NC	2.28	13.87	64	4.06
	08/24/11	1.2	4.9	1.00	7.66	51.0	0	0.33	1.28	20.26	-56	4.86
	11/29/11	0.4	19	6.20	7.60	35.3	0	0.23	4.00	13.82	96	3.33
	02/28/12	0.0	54 UJ	6.80	7.70	29.8	0	0.19	1.87	10.89	87	3.72
	08/23/12	0.0	3.9	3.21	7.02	31.4	0	0.2	1.22	19.7	-109	4.91
	02/28/13	0.0	7.7	5.86	6.84	29.4	0	0.19	0.40	11.36	115	3.86
	08/22/13	0.0	3.5	0.11	7.93	46.5	0	0.3	62[3]	22.9	-177	4.91
	02/27/14	0.0	7.3	2.61	7.24	23.6	0	0.21	0.31	10.9	206.2	3.33
	08/25/14	0.5	3.1	0.72	7.59	42.1	0.21	0.28	0.42	22.35	-30.8	4.73
	02/25/15	0.0	5.7	3.07	7.64	23.1	0.15	0.2	1.39	11.51	-52.2	4.09
	07/23/15	0.5	1.2 U	0.11	7.41	42.6	0.22	0.31	0.91	20.6	-168.8	4.93
	02/17/16	0.0	8.5	3.32	7.66	21.3	0.13	0.18	2.65	12.6	40.1	3.28
	07/05/16	0.0	23	5.10	7.23	38.9	0.21	0.28	3.4	19.4	3.2	1.85
	02/22/17	0.0	24	2.74	7.49	32.7	0.23	0.30	4.38	9.4	2.3	3.23
	07/19/17	0.5	36	0.22	7.23	42.0	0.24	0.31	2.86	17.6	-167.2	4.62
MW-18	05/24/10	0.0	34.0	3.92	9.16	9.0	0	0.5	1.9	14.3	-194	4.39
	08/25/10	0.2	11.0	0.00	6.81	71.9	0	0.46	4.12	21.82	-75	5.09
	11/24/10	0.0	38	0.01	7.11	47.9	0	0.31	0.61	15.52	39	3.87
	02/23/11	0.0	23	0.17	7.22	40.3	0	0.26	0.99	11.7	55	4.15
	05/25/11	0.0	17	0.00	7.15	40.8	NC	NC	1.07	12.8	31	4.21
	08/24/11	0.2	18.5	0.50	7.33	74.1	0	0.47	0.48	19.54	-48	4.97
	11/29/11	0.4	23	3.50	6.81	34.3	0	0.22	2.82	13.18	183	3.53
	02/28/12	0.0	67 UJ	8.20	7.21	32.9	0	0.21	1.56	10.33	93	3.87
	08/23/12	1.0	7.5	4.03	7.08	53.4	0	0.34	3	18.2	-110	5.02
	02/28/13	0.0	7.4	5.68	6.05	21.1	0	0.14	7	10.94	182	4.02
	08/22/13	1.1	4.1	1.90	7.72	59.3	0	0.38	54.8[3]	20.9	-153	5.04
	02/27/14	0.0	11	3.00	7.1	22.2	0	0.2	0.48	10.6	201.3	3.52
	08/25/14	0.8	1.2 U	2.02	9.23	46.7	0.25	0.33	2.79	20.37	-102.9	4.85
	02/25/15	0.0	5.9	1.71	7.37	25.4	0.17	0.23	1.81	11.2	-35.2	4.21
	07/23/15	0.6	1.2 U	0.07	7.06	44.2	0.24	0.31	3.67	20.4	-102.6	5.08
	02/17/16	0.0	6.7	1.56	7.23	20.8	0.13	0.18	3.2	11.9	-5.2	3.53
	07/05/16	0.0	140 J	3.47	6.05	48.4	0.25	0.343	3.4	20.9	31.4	2.26
	02/22/17	0.0	47 J	2.69	7.17	34.1	0.23	0.317	3.26	9.4	1.0	3.43
	07/19/17	0.7	87 J	0.22	7.13	60.7	0.35	0.461	2.32	17.3	-165.4	4.78
MW-19	07/23/15	0.5	1.2 U	0.11	7.36	47.6	0.34	0.33	5.02	21.6	-144.5	4.66
	10/27/15	1.0	5.0	0.24	7.07	37.8	0.21	0.28	12.9	18.3	-136.7	3.47
	02/17/16	0.0	8.1	6.85	7.69	15.4	0.10	0.13	5.2	12.3	23.4	2.85
	05/03/16	0.0	11.0	0.28	7.02	290	0.17	0.23	4.54	15.5	-46.2	3.99
	07/05/16	0.02	13	0.61	7.21	47	0.26	0.35	4.62	18.5	-103.1	1.78
	02/22/17	0.00	350	4.59	7.62	61.9	0.44	0.58	1.62	8.7	-7.0	2.78
	07/19/17	0.00	25	0.29	7.02	42.0	0.26	0.34	2.9	16	-181.2	4.22

Notes:

[1] Groundwater quality parameters include the analytes ferrous iron and sulfate to evaluate and monitor natural attenuation.

[2] ORP field readings are considered to be an estimate.

[3] Turbidity measurements collected at this compliance monitoring location are considered to be biased high due to a water quality equipment malfunction. Visual observation made at the time of sampling identified that the sample was clear and free of particulates.

U = The analyte was not detected at a concentration greater than the identified reporting limit

J = The analyte concentration is estimated

ORP = Oxidation/reduction potential

mg/l = milligrams per liter

g/l = grams per liter

ppt = parts per thousand

mv = millivolts

mS/m = milliSiemens per meter

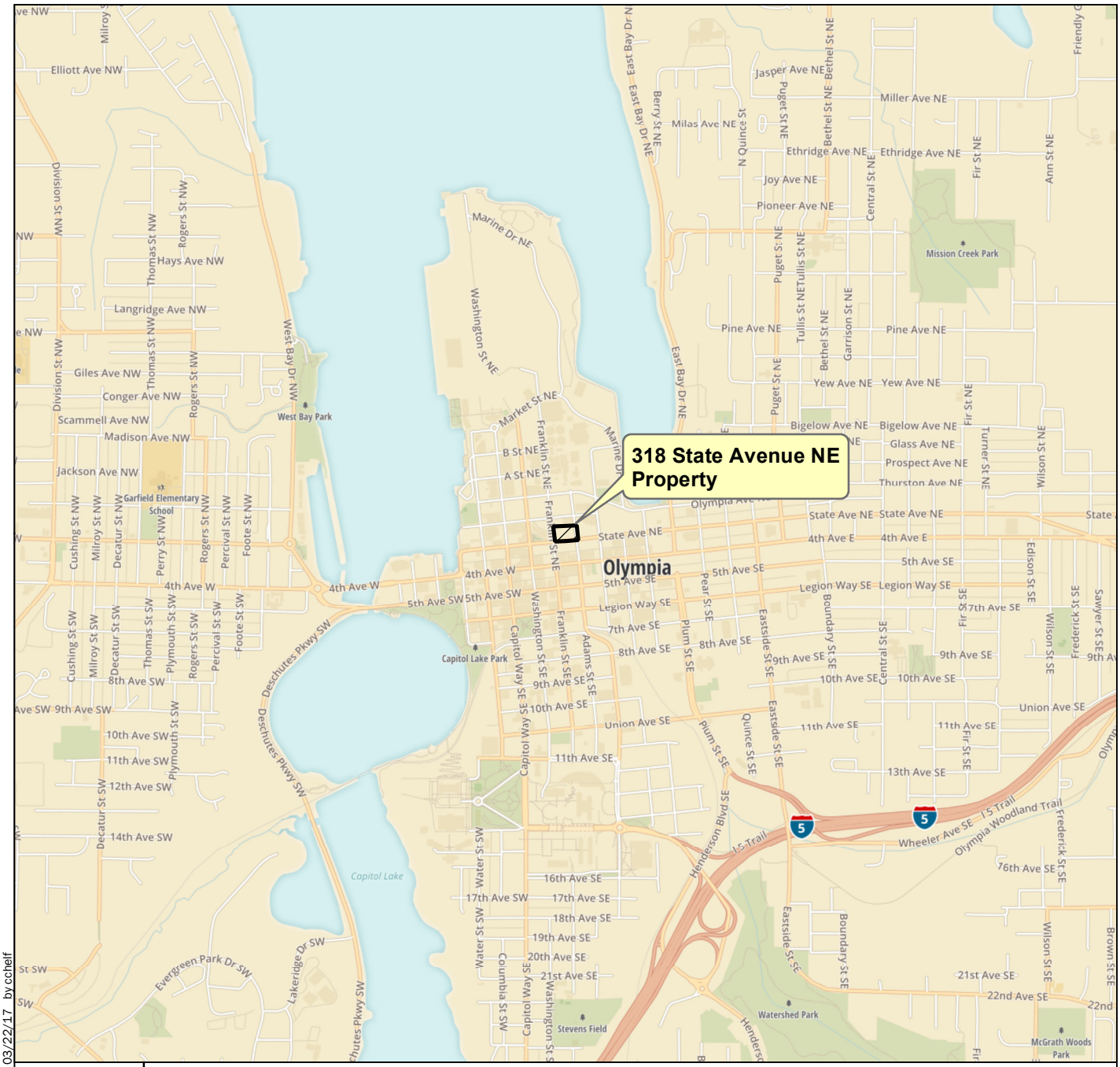
C = Celsius

NTU = nephelometric turbidity unit

NC = Not collected

ft btoc = feet below the top of monitoring well casing

Green shading indicates sample results for the current monitoring event.



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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: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

318 State Avenue NE Property
Olympia, Washington

GeoEngineers

Figure 1

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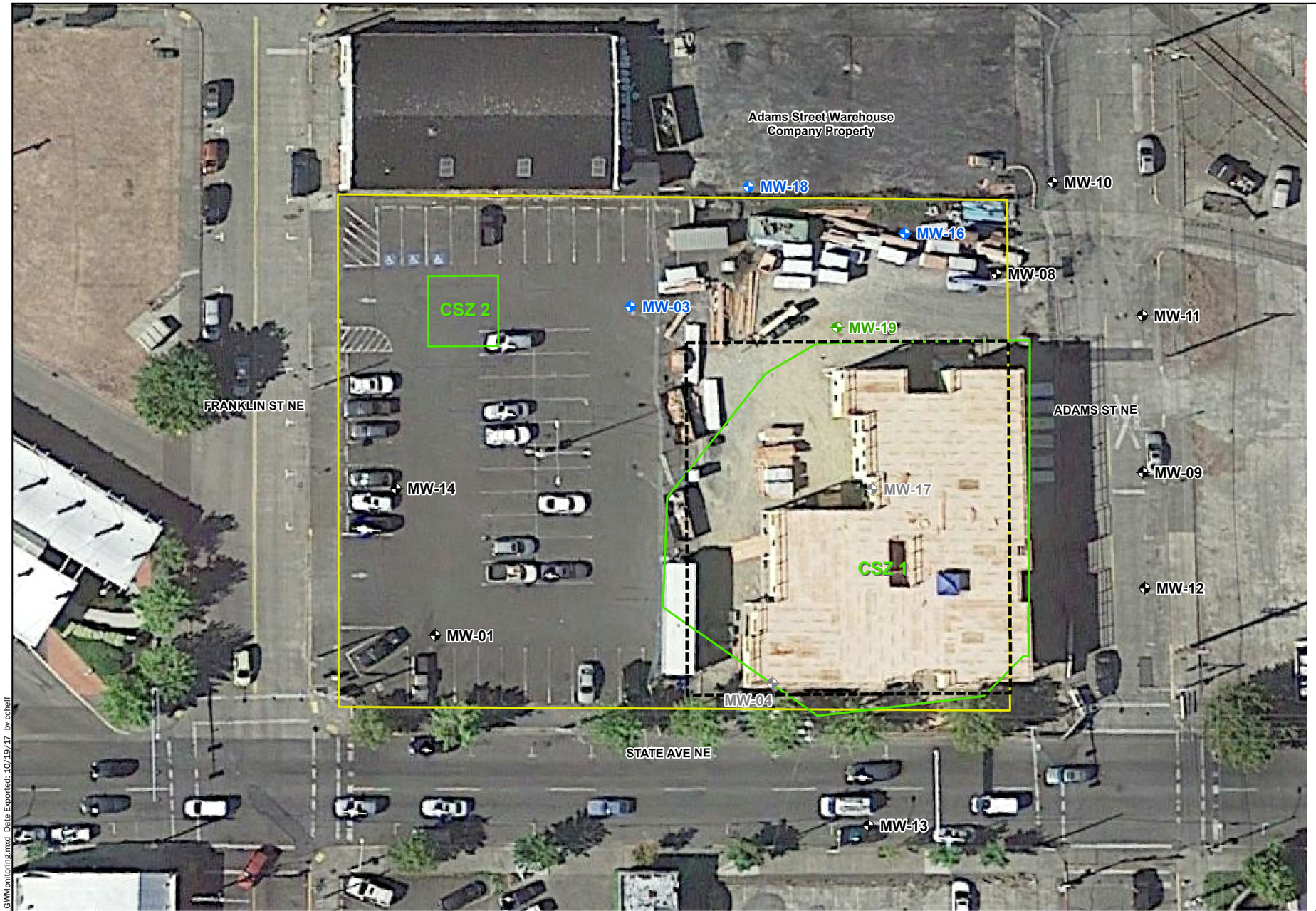

Legend

CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009

Approximate 318 State Avenue NE Property Boundary

Southeast portion of property redeveloped by LIHI

MW-03 — Monitoring well currently being monitored as part of semi-annual monitoring events

MW-19 — Monitoring well installed to monitor groundwater from the southeast portion of the property that is currently being monitored as part of Semi-annual monitoring events.

MW-01 — Monitoring well that was previously monitored as part of quarterly or semi-annual monitoring events

MW-04 — Decommissioned Monitoring Well

N W E S

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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 Sources: Approximate Property Boundary from Thurston County parcels (revised by GeoEngineers). Aerial photograph 2016 from GoogleEarth Pro. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

Groundwater Monitoring Locations

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 2

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Legend

CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009

Approximate 318 State Avenue NE Property Boundary

Southeast portion of property redeveloped by LIHI

MW-03 — Monitoring well currently being monitored as part of semi-annual monitoring events

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MW-04 — Decommissioned Monitoring Well

MW-01 — Monitoring well that was previously monitored as part of quarterly or semi-annual monitoring events

Vinyl Chloride (VC) at concentration greater than the screening level based on Guidance for Evaluating Soil Vapor Intrusion in Washington State (0.347 ug/L)

Well	Event	Result
MW-03		
Vinyl Chloride	July 2017	0.48 µg/L
MW-18		
Vinyl Chloride	July 2017	1.5 µg/L
MW-19		
Vinyl Chloride	July 2017	0.56 J µg/L
MW-19 DUP		
Vinyl Chloride	July 2017	0.44 J µg/L

N W E S

35 0 35

Feet

Notes:
1. MTCA = Model Toxics Control Act, µg/L = micrograms per liter.
2. The locations of all features shown are approximate.
3. 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 Sources: Approximate Property Boundary from Thurston County parcels (revised by GeoEngineers). Aerial photograph 2016 from GoogleEarth Pro. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

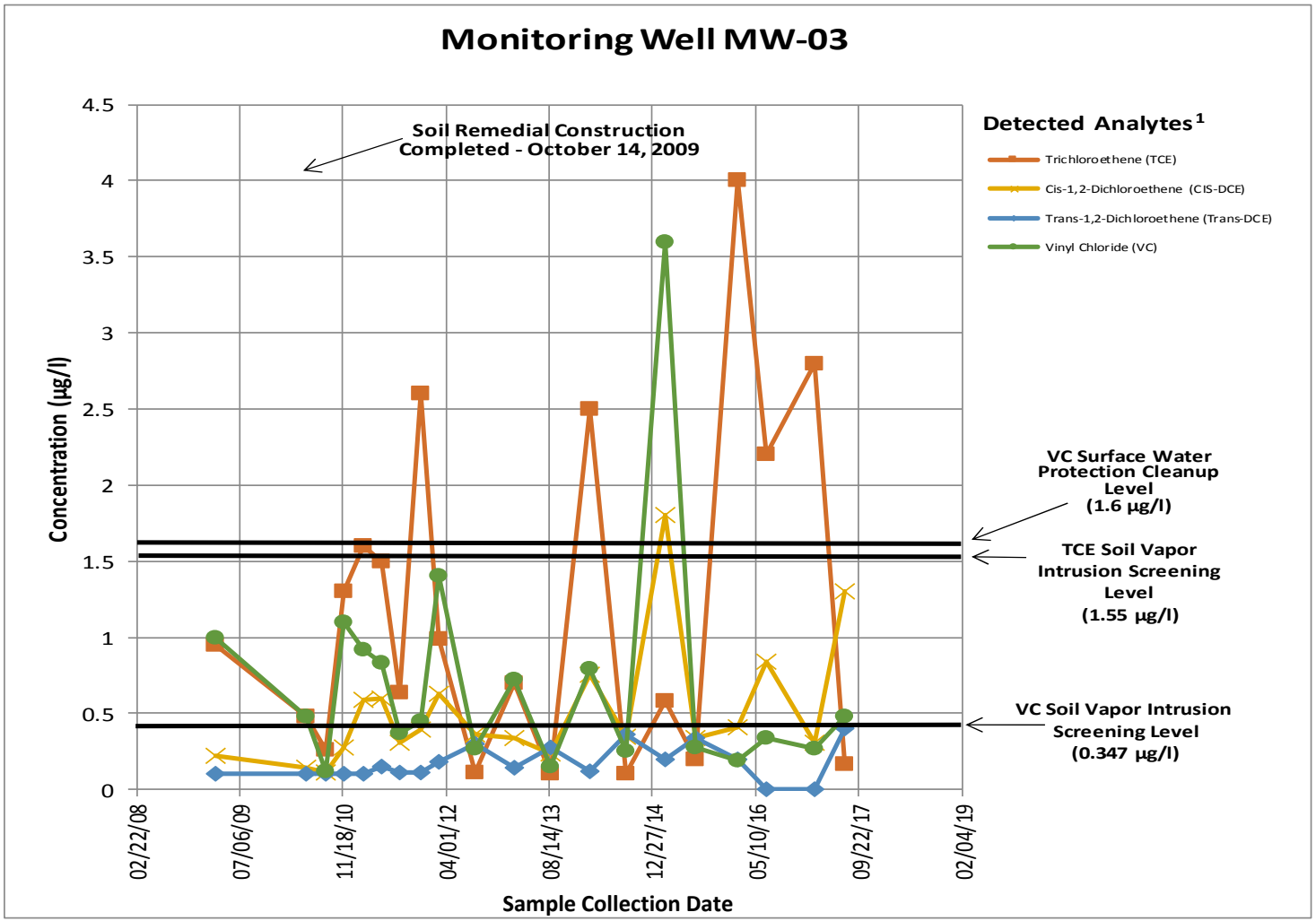
Chemical Analytical Results Exceeding Compliance Criteria

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 3

P:\0\0415049\GIS\MXDs\0415049107_F03_GWM_July2017.mxd Date Exported: 10/19/17 by cchelf



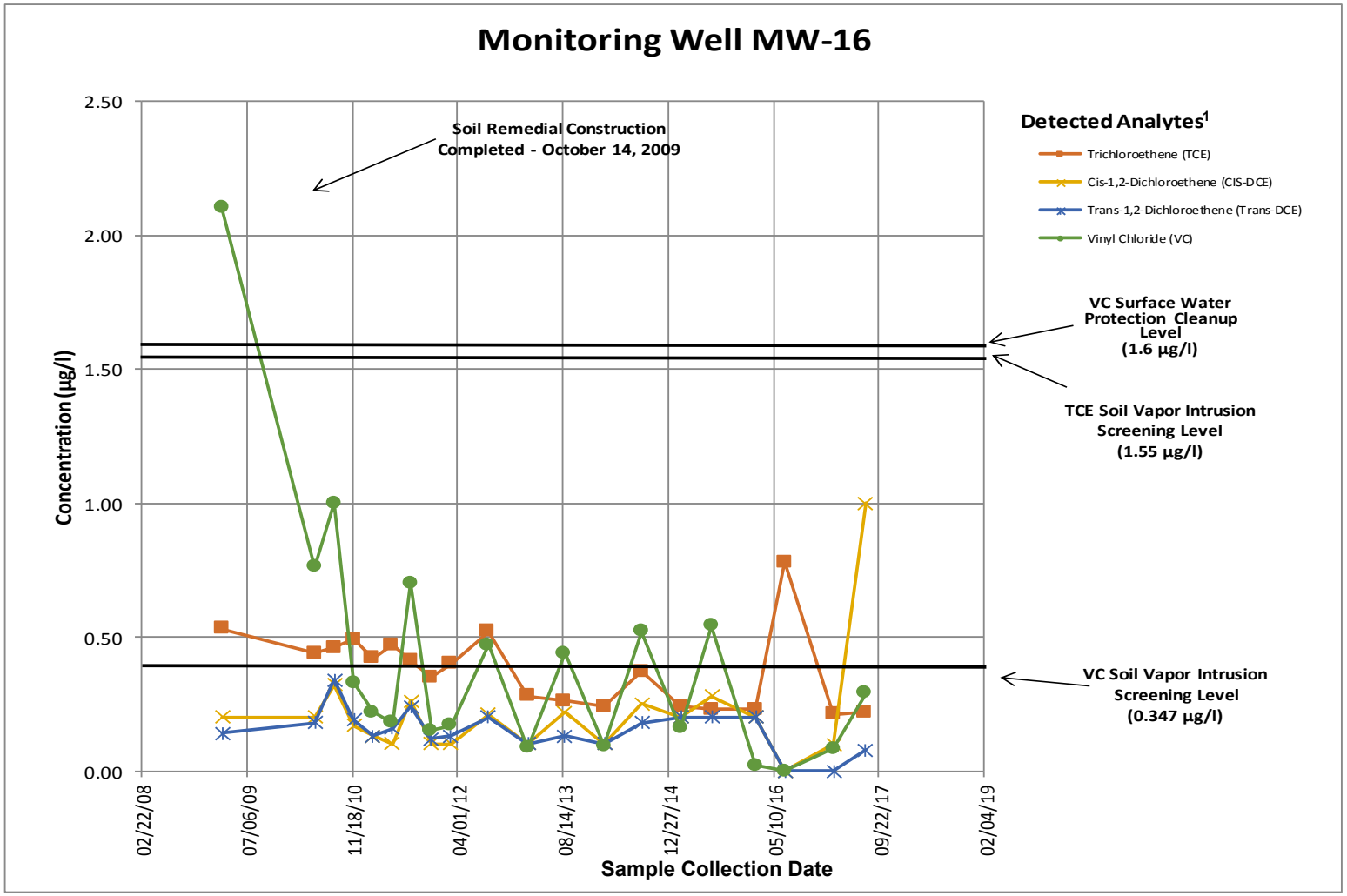
Note:
[1] See Table 1 for a comprehensive summary of the groundwater monitoring results and groundwater cleanup and screening levels.

Trend Analysis – July 2017

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 4



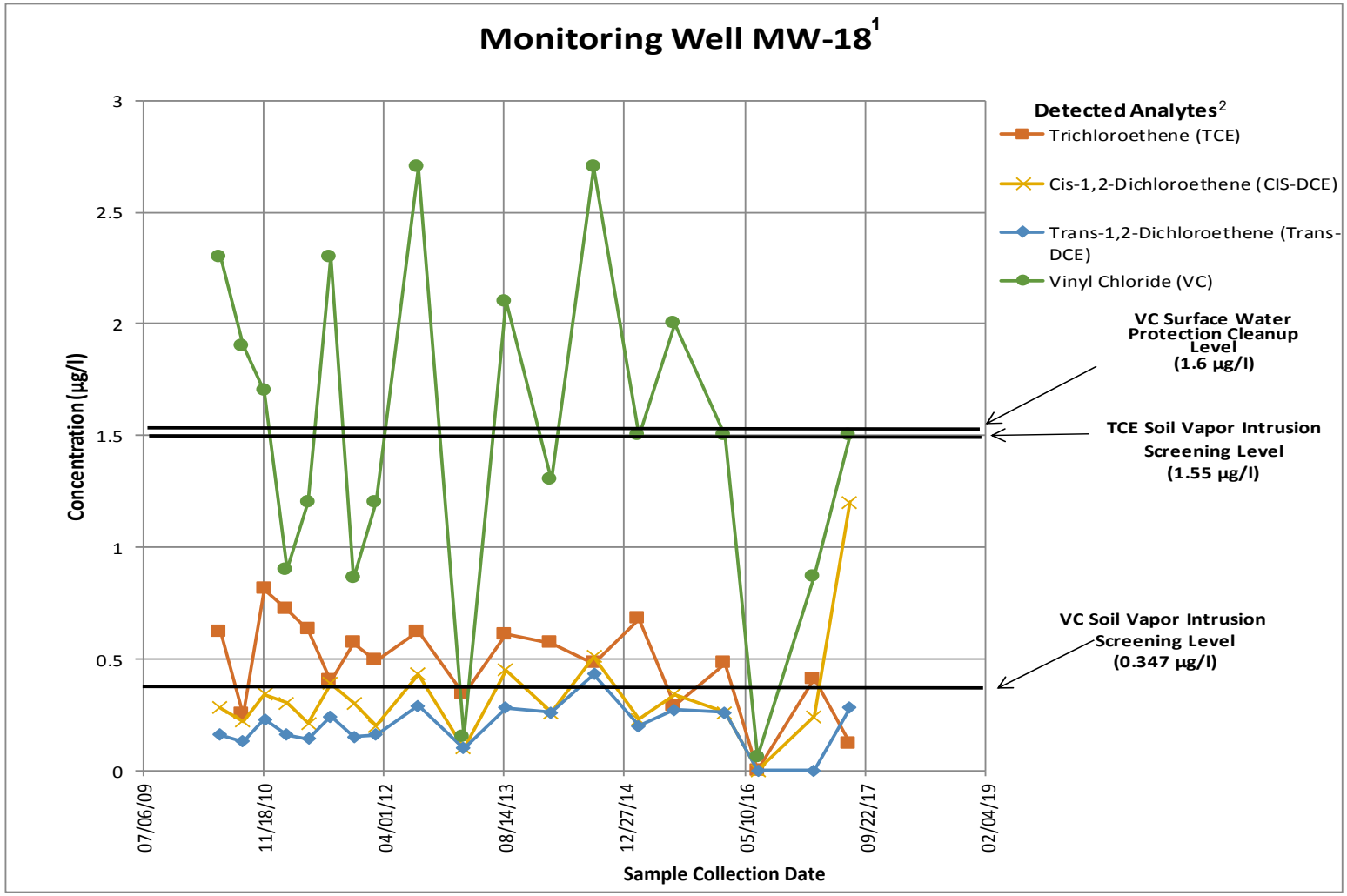
Note:
[1] See Table 1 for a comprehensive summary of the groundwater monitoring results and groundwater cleanup and screening levels.

Trend Analysis – July 2017

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 5



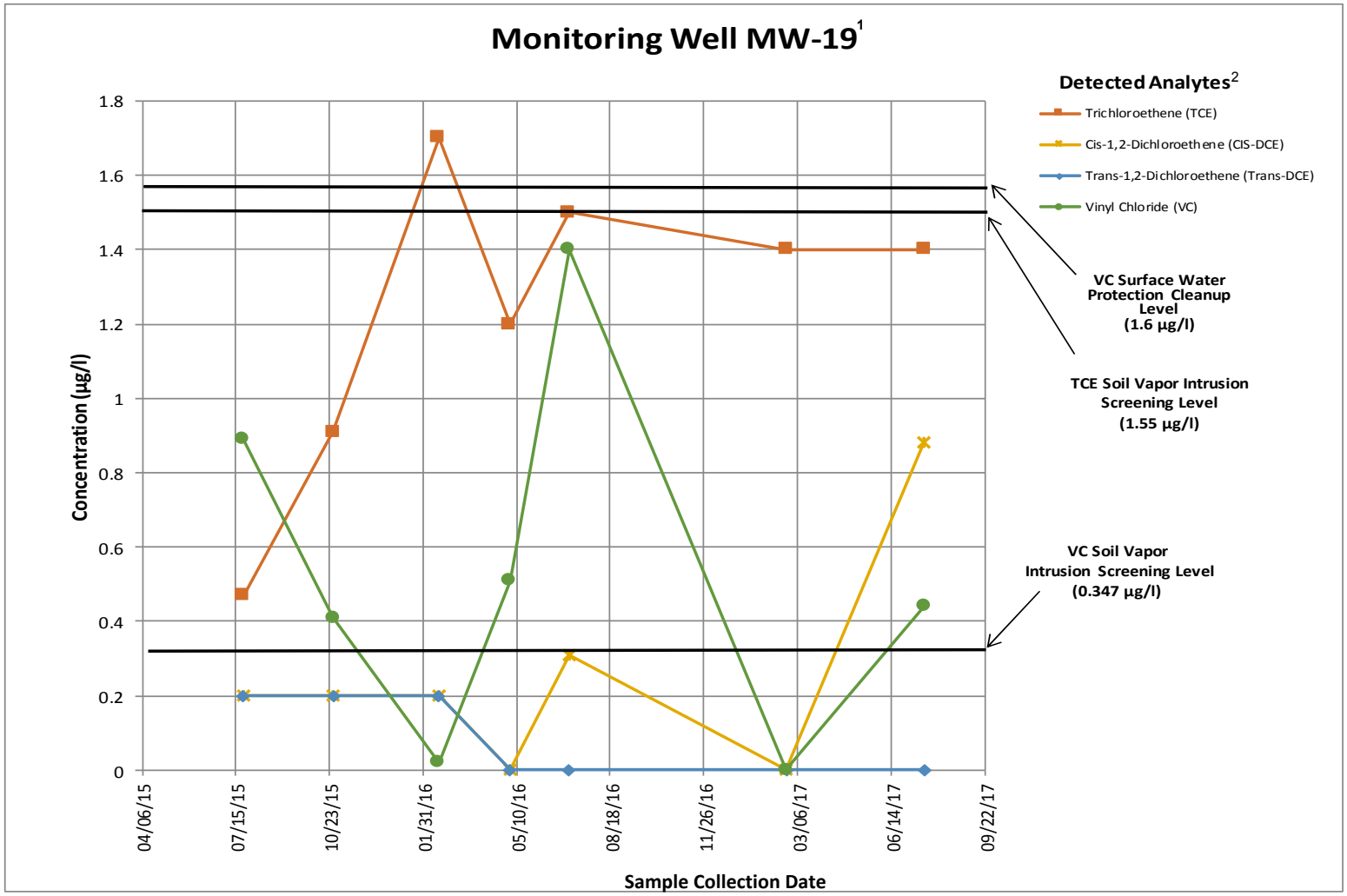
Notes:
[1] MW-18 was installed after remedial actions for soil were completed on October 14, 2009.
[2] See Table 1 for a comprehensive summary of the groundwater monitoring results and groundwater cleanup and screening levels.

Trend Analysis – July 2017

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 6



Notes:
[1] MW-19 was installed on July 16, 2015 as part of monitoring groundwater from the southeast portion of the property.
[2] See Table 1 for a comprehensive summary of the groundwater monitoring results and groundwater cleanup and screening levels.

Trend Analysis – July 2017

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 7

APPENDIX A
Laboratory Analytical Reports

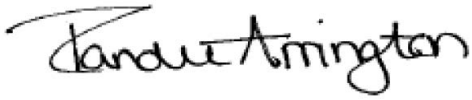
ANALYTICAL REPORT

Job Number: 580-70043-1

Job Description: 318 State AVE NE (WA)/0415-049-07

For:
GeoEngineers Inc
1101 Fawcett, Suite 200
Tacoma, WA 98402

Attention: Mr. Iain Wingard



Approved for release.
Randee E Arrington
Project Manager II
8/4/2017 3:24 PM

Randee E Arrington, Project Manager II
11922 East 1st Ave, Spokane, WA, 99206
(509)924-9200
randee.arrington@testamericainc.com
08/04/2017

TestAmerica Tacoma is a part of TestAmerica Laboratories, Inc.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan and meet all requirements of NELAC. All data have been found to be compliant with laboratory protocol, with the exception of any items noted in the case narrative.

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Table of Contents

Receipt
The samples were received on 7/19/2017 3:55 PM; the samples arrived in good condition. The temperature of the cooler at receipt was 19.4º C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: MW-03-170719-W (580-70043-1), MW-16-170719-W (580-70043-2), MW-18-170719-W (580-70043-3), MW-18-170719-W (580-70043-3[MS]), MW-18-170719-W (580-70043-3[MSD]), MW-19-170719-W (580-70043-4), DUP-170719 (580-70043-5) and Trip Blank (580-70043-6). The samples are considered acceptable since it was collected and submitted to the laboratory on the same day and there is evidence that the chilling process has begun.

The chain of custody (COC) and the container labels of the matrix spike and matrix spike dup (MS/MSD) samples of parent sample MW-18-170719-W have various times (1337 & 1339). The parent and MS/MSD ought to have the same time. Samples were logged in according to the collection time of the parent sample.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): MW-19-170719-W (580-70043-4). The container labels list the sampling time at 1156, while the COC lists 1155. The sample was logged in per COC.

GC/MS VOA
Method 8260C: The method blank for analytical batch 580-252709 contained cis-1,2-Dichloroethene above the method detection limit. This target analyte concentration was less than the elevated reporting limit (RL) of 2 ug/L; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 8260C: The following analyte was detected in the Method Blank (MB) and samples: cis-1,2-Dichloroethene. The results are due to instrument contamination. The reporting limit was elevated from 0.2 to 2.0 ug/L, and the detections in the samples are considered to be false positives in the following samples: MW-03-170719-W (580-70043-1), MW-16-170719-W (580-70043-2), MW-18-170719-W (580-70043-3), MW-19-170719-W (580-70043-4), DUP-170719 (580-70043-5) and Trip Blank (580-70043-6).

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

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

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Analysis Batch Number: 252017

Lab Sample ID: ICV 580-252017/15 Client Sample ID:

Date Analyzed: 07/25/17 01:29 Lab File ID: G2420170021.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Dichlorodifluoromethane	4.25	Peak Tail	kolowinskih	07/25/17 13:01
Trichlorofluoromethane	6.04	Incomplete Integration	kolowinskih	07/25/17 10:22

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Analysis Batch Number: 252709

Lab Sample ID: CCVIS 580-252709/3 Client Sample ID:

Date Analyzed: 08/01/17 19:09 Lab File ID: H012017_019.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Dichlorodifluoromethane	4.25	Incomplete Integration	thaneerat w	08/02/17 10:29
Vinyl chloride	4.77	Incomplete Integration	thaneerat w	08/02/17 10:29
Trichlorofluoromethane	6.04	Incomplete Integration	thaneerat w	08/02/17 10:30

Lab Sample ID: MB 580-252709/5 Client Sample ID:

Date Analyzed: 08/01/17 19:57 Lab File ID: H012017_021.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethene		Unspecified		
Tetrachloroethene		Unspecified		
Trichloroethene		Unspecified		

Lab Sample ID: LCS 580-252709/6 Client Sample ID:

Date Analyzed: 08/01/17 20:22 Lab File ID: H012017_022.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	4.76	Incomplete Integration	thaneerat w	08/02/17 10:50

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Analysis Batch Number: 252709

Lab Sample ID: 580-70043-6 Client Sample ID: Trip Blank

Date Analyzed: 08/01/17 21:34 Lab File ID: H012017_025.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethene		Unspecified		
Tetrachloroethene		Unspecified		
Trichloroethene		Unspecified		
Vinyl chloride		Unspecified		

Lab Sample ID: 580-70043-1 Client Sample ID: MW-03-170719-W

Date Analyzed: 08/01/17 23:34 Lab File ID: H012017_030.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	4.75	Incomplete Integration	thaneerat w	08/02/17 14:05
1,1-Dichloroethene		Unspecified		
Tetrachloroethene		Unspecified		

Lab Sample ID: 580-70043-2 Client Sample ID: MW-16-170719-W

Date Analyzed: 08/01/17 23:58 Lab File ID: H012017_031.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	4.75	Incomplete Integration	thaneerat w	08/02/17 15:31
1,1-Dichloroethene		Unspecified		
Tetrachloroethene		Unspecified		

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Analysis Batch Number: 252709

Lab Sample ID: 580-70043-4 Client Sample ID: MW-19-170719-W

Date Analyzed: 08/02/17 00:22 Lab File ID: H012017_032.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	4.74	Incomplete Integration	thaneerat w	08/02/17 15:34
1,1-Dichloroethene		Unspecified		
trans-1,2-Dichloroethene		Unspecified		
Tetrachloroethene	11.77	Incomplete Integration	thaneerat w	08/02/17 15:33

Lab Sample ID: 580-70043-5 Client Sample ID: DUP-170719

Date Analyzed: 08/02/17 00:47 Lab File ID: H012017_033.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	4.75	Assign Peak	thaneerat w	08/02/17 15:35
1,1-Dichloroethene		Unspecified		
trans-1,2-Dichloroethene		Unspecified		

Lab Sample ID: 580-70043-3 Client Sample ID: MW-18-170719-W

Date Analyzed: 08/02/17 01:11 Lab File ID: H012017_034.D GC Column: DB-VRX ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethene		Unspecified		
Tetrachloroethene		Unspecified		

SAMPLE SUMMARY

Client: GeoEngineers Inc

Job Number: 580-70043-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
580-70043-1	MW-03-170719-W	Water	07/19/2017 1440	07/19/2017 1555
580-70043-2	MW-16-170719-W	Water	07/19/2017 1250	07/19/2017 1555
580-70043-3	MW-18-170719-W	Water	07/19/2017 1335	07/19/2017 1555
580-70043-3MS	MW-18-170719-W	Water	07/19/2017 1335	07/19/2017 1555
580-70043-3MSD	MW-18-170719-W	Water	07/19/2017 1335	07/19/2017 1555
580-70043-4	MW-19-170719-W	Water	07/19/2017 1155	07/19/2017 1555
580-70043-5	DUP-170719	Water	07/19/2017 1200	07/19/2017 1555
580-70043-6	Trip Blank	Water	07/19/2017 0001	07/19/2017 1555

EXECUTIVE SUMMARY - Detections

Client: GeoEngineers Inc

Job Number: 580-70043-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
580-70043-1	**MW-03-170719-W**					
Vinyl chloride		0.48		0.10	ug/L	8260C
trans-1,2-Dichloroethene		0.40		0.20	ug/L	8260C
cis-1,2-Dichloroethene		1.3	J B *	2.0	ug/L	8260C
Trichloroethene		0.17	J	0.20	ug/L	8260C
Sulfate		99		1.2	mg/L	300.0
580-70043-2	**MW-16-170719-W**					
Vinyl chloride		0.29		0.10	ug/L	8260C
trans-1,2-Dichloroethene		0.077	J	0.20	ug/L	8260C
cis-1,2-Dichloroethene		1.0	J B *	2.0	ug/L	8260C
Trichloroethene		0.22		0.20	ug/L	8260C
Sulfate		36		1.2	mg/L	300.0
580-70043-3	**MW-18-170719-W**					
Vinyl chloride		1.5		0.10	ug/L	8260C
trans-1,2-Dichloroethene		0.28		0.20	ug/L	8260C
cis-1,2-Dichloroethene		1.2	J B *	2.0	ug/L	8260C
Trichloroethene		0.12	J	0.20	ug/L	8260C
Sulfate		87	F1	1.2	mg/L	300.0
580-70043-4	**MW-19-170719-W**					
Vinyl chloride		0.56		0.10	ug/L	8260C
cis-1,2-Dichloroethene		0.95	J B *	2.0	ug/L	8260C
Trichloroethene		1.3		0.20	ug/L	8260C
Tetrachloroethene		0.12	J	0.50	ug/L	8260C
Sulfate		25		1.2	mg/L	300.0
580-70043-5	**DUP-170719**					
Vinyl chloride		0.44		0.10	ug/L	8260C
cis-1,2-Dichloroethene		0.88	J B *	2.0	ug/L	8260C
Trichloroethene		1.4		0.20	ug/L	8260C
Tetrachloroethene		0.11	J	0.50	ug/L	8260C
Sulfate		25		1.2	mg/L	300.0
580-70043-6	**TRIP BLANK**					
cis-1,2-Dichloroethene		1.3	J B *	2.0	ug/L	8260C

METHOD SUMMARY

Client: GeoEngineers Inc

Job Number: 580-70043-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL SEA	SW846 8260C	
Purge and Trap	TAL SEA		SW846 5030B
Anions, Ion Chromatography	TAL SEA	MCAWW 300.0	

Lab References:

TAL SEA = TestAmerica Seattle

Method References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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

METHOD / ANALYST SUMMARY

Client: GeoEngineers Inc

Job Number: 580-70043-1

Method	Analyst	Analyst ID
SW846 8260C	Thaneerat, Wijittra 1	W1T
MCAWW 300.0	Michalek, Mattie M	MMM

Client: GeoEngineers Inc

Job Number: 580-70043-1

Client Sample ID: **MW-03-170719-W**

Lab Sample ID: 580-70043-1
Client Matrix: Water

Date Sampled: 07/19/2017 1440
Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_030.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 2334			Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 2334				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	0.48		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	0.40		0.025	0.20
cis-1,2-Dichloroethene	1.3	J B *	0.025	2.0
Trichloroethene	0.17	J	0.025	0.20
Tetrachloroethene	ND		0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	101		75 - 125
Trifluorotoluene (Surr)	101		74 - 118
Dibromofluoromethane (Surr)	101		42 - 132
4-Bromofluorobenzene (Surr)	100		81 - 120
1,2-Dichloroethane-d4 (Surr)	105		46 - 150

Client: GeoEngineers Inc | Job Number: 580-70043-1

Client Sample ID: **MW-16-170719-W**

Lab Sample ID: 580-70043-2 | Date Sampled: 07/19/2017 1250
Client Matrix: Water | Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_031.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 2358			Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 2358				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	0.29		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	0.077	J	0.025	0.20
cis-1,2-Dichloroethene	1.0	J B *	0.025	2.0
Trichloroethene	0.22		0.025	0.20
Tetrachloroethene	ND		0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	104		75 - 125
Trifluorotoluene (Surr)	99		74 - 118
Dibromofluoromethane (Surr)	100		42 - 132
4-Bromofluorobenzene (Surr)	98		81 - 120
1,2-Dichloroethane-d4 (Surr)	107		46 - 150

Client: GeoEngineers Inc

Job Number: 580-70043-1

Client Sample ID: **MW-18-170719-W**

Lab Sample ID: 580-70043-3
Client Matrix: Water

Date Sampled: 07/19/2017 1335
Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_034.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/02/2017 0111			Final Weight/Volume:	5 mL
Prep Date:	08/02/2017 0111				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	1.5		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	0.28		0.025	0.20
cis-1,2-Dichloroethene	1.2	J B *	0.025	2.0
Trichloroethene	0.12	J	0.025	0.20
Tetrachloroethene	ND		0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	102		75 - 125
Trifluorotoluene (Surr)	103		74 - 118
Dibromofluoromethane (Surr)	101		42 - 132
4-Bromofluorobenzene (Surr)	98		81 - 120
1,2-Dichloroethane-d4 (Surr)	102		46 - 150

Client: GeoEngineers Inc | Job Number: 580-70043-1

Client Sample ID: **MW-19-170719-W**

Lab Sample ID: 580-70043-4 | Date Sampled: 07/19/2017 1155
Client Matrix: Water | Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_032.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/02/2017 0022			Final Weight/Volume:	5 mL
Prep Date:	08/02/2017 0022				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	0.56		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	ND		0.025	0.20
cis-1,2-Dichloroethene	0.95	J B *	0.025	2.0
Trichloroethene	1.3		0.025	0.20
Tetrachloroethene	0.12	J	0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	99		75 - 125
Trifluorotoluene (Surr)	100		74 - 118
Dibromofluoromethane (Surr)	99		42 - 132
4-Bromofluorobenzene (Surr)	99		81 - 120
1,2-Dichloroethane-d4 (Surr)	106		46 - 150

Client: GeoEngineers Inc

Job Number: 580-70043-1

Client Sample ID: DUP-170719

Lab Sample ID: 580-70043-5
Client Matrix: Water

Date Sampled: 07/19/2017 1200
Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_033.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/02/2017 0047			Final Weight/Volume:	5 mL
Prep Date:	08/02/2017 0047				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	0.44		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	ND		0.025	0.20
cis-1,2-Dichloroethene	0.88	J B *	0.025	2.0
Trichloroethene	1.4		0.025	0.20
Tetrachloroethene	0.11	J	0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	104		75 - 125
Trifluorotoluene (Surr)	109		74 - 118
Dibromofluoromethane (Surr)	98		42 - 132
4-Bromofluorobenzene (Surr)	93		81 - 120
1,2-Dichloroethane-d4 (Surr)	99		46 - 150

Client: GeoEngineers Inc

Job Number: 580-70043-1

Client Sample ID: **Trip Blank**

Lab Sample ID: 580-70043-6
Client Matrix: Water

Date Sampled: 07/19/2017 0001
Date Received: 07/19/2017 1555

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	580-252709	Instrument ID:	TAC048
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	H012017_025.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 2134			Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 2134				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	ND		0.025	0.20
cis-1,2-Dichloroethene	1.3	J B *	0.025	2.0
Trichloroethene	ND		0.025	0.20
Tetrachloroethene	ND		0.070	0.50

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	101		75 - 125
Trifluorotoluene (Surr)	104		74 - 118
Dibromofluoromethane (Surr)	101		42 - 132
4-Bromofluorobenzene (Surr)	97		81 - 120
1,2-Dichloroethane-d4 (Surr)	107		46 - 150

General Chemistry

Client Sample ID: **MW-03-170719-W**

Lab Sample ID: 580-70043-1 Date Sampled: 07/19/2017 1440
Client Matrix: Water Date Received: 07/19/2017 1555

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	99		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-251802 Analysis Date: 07/20/2017 1254

General Chemistry

Client Sample ID: **MW-16-170719-W**

Lab Sample ID: 580-70043-2 Date Sampled: 07/19/2017 1250
Client Matrix: Water Date Received: 07/19/2017 1555

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	36		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-251802 Analysis Date: 07/20/2017 1310

General Chemistry

Client Sample ID: **MW-18-170719-W**

Lab Sample ID: 580-70043-3 Date Sampled: 07/19/2017 1335
Client Matrix: Water Date Received: 07/19/2017 1555

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	87	F1	mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-251802 Analysis Date: 07/20/2017 1326

General Chemistry

Client Sample ID: **MW-19-170719-W**

Lab Sample ID: 580-70043-4 Date Sampled: 07/19/2017 1155
Client Matrix: Water Date Received: 07/19/2017 1555

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	25		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-251802 Analysis Date: 07/20/2017 1413

General Chemistry

Client Sample ID: DUP-170719

Lab Sample ID: 580-70043-5 Date Sampled: 07/19/2017 1200
Client Matrix: Water Date Received: 07/19/2017 1555

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	25		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-251802 Analysis Date: 07/20/2017 1429

Client: GeoEngineers Inc

Job Number: 580-70043-1

Surrogate Recovery Report

8260C Volatile Organic Compounds (GC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	DBFM %Rec	DCA %Rec	TFT %Rec	TOL %Rec	BFB %Rec
580-70043-1	MW-03-170719-W	101	105	101	101	100
580-70043-2	MW-16-170719-W	100	107	99	104	98
580-70043-3	MW-18-170719-W	101	102	103	102	98
580-70043-4	MW-19-170719-W	99	106	100	99	99
580-70043-5	DUP-170719	98	99	109	104	93
580-70043-6	Trip Blank	101	107	104	101	97
MB 580-252709/5		101	105	102	103	100
LCS 580-252709/6		102	105	100	99	98
LCSD 580-252709/7		102	104	96	96	98
580-70043-3 MS	MW-18-170719-W MS	102	107	95	101	100
580-70043-3 MSD	MW-18-170719-W MSD	102	106	101	100	97

Surrogate	Acceptance Limits
DBFM = Dibromofluoromethane (Surr)	42-132
DCA = 1,2-Dichloroethane-d4 (Surr)	46-150
TFT = Trifluorotoluene (Surr)	74-118
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	81-120

Client: GeoEngineers Inc

Job Number: 580-70043-1

Method Blank - Batch: 580-252709

Method: 8260C
Preparation: 5030B

Lab Sample ID:	MB 580-252709/5	Analysis Batch:	580-252709	Instrument ID:	TAC048
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H012017_021.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 1957	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 1957				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Vinyl chloride	ND		0.013	0.10
1,1-Dichloroethene	ND		0.018	0.10
trans-1,2-Dichloroethene	ND		0.025	0.20
cis-1,2-Dichloroethene	1.88	J	0.025	2.0
Trichloroethene	ND		0.025	0.20
Tetrachloroethene	ND		0.070	0.50

Surrogate	% Rec	Acceptance Limits
Toluene-d8 (Surr)	103	75 - 125
Trifluorotoluene (Surr)	102	74 - 118
Dibromofluoromethane (Surr)	101	42 - 132
4-Bromofluorobenzene (Surr)	100	81 - 120
1,2-Dichloroethane-d4 (Surr)	105	46 - 150

Client: GeoEngineers Inc Job Number: 580-70043-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 580-252709

Method: 8260C
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-252709/6	Analysis Batch:	580-252709	Instrument ID:	TAC048
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H012017_022.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 2022	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 2022				5 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-252709/7	Analysis Batch:	580-252709	Instrument ID:	TAC048
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H012017_023.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/01/2017 2046	Units:	ug/L	Final Weight/Volume:	5 mL
Prep Date:	08/01/2017 2046				5 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl chloride	104	110	59 - 140	5	30		
1,1-Dichloroethene	100	103	64 - 125	3	28		
trans-1,2-Dichloroethene	107	105	69 - 124	2	27		
cis-1,2-Dichloroethene	139	131	73 - 130	6	20	*	*
Trichloroethene	108	109	72 - 123	0	20		
Tetrachloroethene	107	105	67 - 123	2	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Toluene-d8 (Surr)	99	96	75 - 125
Trifluorotoluene (Surr)	100	96	74 - 118
Dibromofluoromethane (Surr)	102	102	42 - 132
4-Bromofluorobenzene (Surr)	98	98	81 - 120
1,2-Dichloroethane-d4 (Surr)	105	104	46 - 150

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-252709

Method: 8260C
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-252709/6	Units:	ug/L	LCSD Lab Sample ID:	LCSD 580-252709/7
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/01/2017 2022			Analysis Date:	08/01/2017 2046
Prep Date:	08/01/2017 2022			Prep Date:	08/01/2017 2046
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual		LCSD Result/Qual	
Vinyl chloride	5.00	5.00	5.19		5.48	
1,1-Dichloroethene	5.00	5.00	5.00		5.16	
trans-1,2-Dichloroethene	5.00	5.00	5.35		5.27	
cis-1,2-Dichloroethene	5.00	5.00	6.95	*	6.54	*
Trichloroethene	5.00	5.00	5.42		5.43	
Tetrachloroethene	5.00	5.00	5.34		5.26	

Client: GeoEngineers Inc

Job Number: 580-70043-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-252709

Method: 8260C
Preparation: 5030B

MS Lab Sample ID:	580-70043-3	Analysis Batch:	580-252709	Instrument ID:	TAC048
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H012017_035.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/02/2017 0135			Final Weight/Volume:	5 mL
Prep Date:	08/02/2017 0135				5 mL
Leach Date:	N/A				

MSD Lab Sample ID:	580-70043-3	Analysis Batch:	580-252709	Instrument ID:	TAC048
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	H012017_036.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/02/2017 0159			Final Weight/Volume:	5 mL
Prep Date:	08/02/2017 0159				5 mL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Vinyl chloride	115	97	59 - 140	14	35		
1,1-Dichloroethene	111	104	64 - 125	7	35		
trans-1,2-Dichloroethene	112	104	69 - 124	7	35		
cis-1,2-Dichloroethene	107	101	73 - 130	5	35		
Trichloroethene	110	107	72 - 123	3	35		
Tetrachloroethene	108	105	67 - 123	3	35		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Toluene-d8 (Surr)	101	100	75 - 125
Trifluorotoluene (Surr)	95	101	74 - 118
Dibromofluoromethane (Surr)	102	102	42 - 132
4-Bromofluorobenzene (Surr)	100	97	81 - 120
1,2-Dichloroethane-d4 (Surr)	107	106	46 - 150

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-252709

Method: 8260C
Preparation: 5030B

MS Lab Sample ID:	580-70043-3	Units:	ug/L	MSD Lab Sample ID:	580-70043-3
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/02/2017 0135			Analysis Date:	08/02/2017 0159
Prep Date:	08/02/2017 0135			Prep Date:	08/02/2017 0159
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Vinyl chloride	1.5		5.00	5.00	7.26	6.33
1,1-Dichloroethene	ND		5.00	5.00	5.56	5.19
trans-1,2-Dichloroethene	0.28		5.00	5.00	5.88	5.48
cis-1,2-Dichloroethene	1.2	J	5.00	5.00	6.53	6.22
Trichloroethene	0.12	J	5.00	5.00	5.64	5.46
Tetrachloroethene	ND		5.00	5.00	5.42	5.25

Client: GeoEngineers Inc

Job Number: 580-70043-1

Method Blank - Batch: 580-251802

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 580-251802/3	Analysis Batch:	580-251802	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	14.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/20/2017 1222	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
Sulfate	ND		1.2	1.2

Lab Control Sample - Batch: 580-251802

Method: 300.0
Preparation: N/A

Lab Sample ID:	LCS 580-251802/4	Analysis Batch:	580-251802	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	15.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/20/2017 1238	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	50.0	50.5	101	90 - 110	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-251802

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-70043-3	Analysis Batch:	580-251802	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	19.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/20/2017 1341			Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

MSD Lab Sample ID:	580-70043-3	Analysis Batch:	580-251802	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	20.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	07/20/2017 1357			Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Sulfate	89	89	90 - 110	0	15	F1	F1

Client: GeoEngineers Inc

Job Number: 580-70043-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-251802

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-70043-3	Units: mg/L	MSD Lab Sample ID:	580-70043-3	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	07/20/2017 1341		Analysis Date:	07/20/2017 1357	
Prep Date:	N/A		Prep Date:	N/A	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
Sulfate	87	50.0	50.0	132	F1	132	F1

DATA REPORTING QUALIFIERS

Client: GeoEngineers Inc Job Number: 580-70043-1

Lab Section	Qualifier	Description
GC/MS VOA		
	B	Compound was found in the blank and sample.
	*	LCS or LCSD is outside acceptance limits.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	F1	MS and/or MSD Recovery is outside acceptance limits.

Client: GeoEngineers Inc

Job Number: 580-70043-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:580-252709					
LCS 580-252709/6	Lab Control Sample	T	Water	8260C	
LCSD 580-252709/7	Lab Control Sample Duplicate	T	Water	8260C	
MB 580-252709/5	Method Blank	T	Water	8260C	
580-70043-1	MW-03-170719-W	T	Water	8260C	
580-70043-2	MW-16-170719-W	T	Water	8260C	
580-70043-3	MW-18-170719-W	T	Water	8260C	
580-70043-3MS	Matrix Spike	T	Water	8260C	
580-70043-3MSD	Matrix Spike Duplicate	T	Water	8260C	
580-70043-4	MW-19-170719-W	T	Water	8260C	
580-70043-5	DUP-170719	T	Water	8260C	
580-70043-6	Trip Blank	T	Water	8260C	

Report Basis
T = Total

General Chemistry					
Analysis Batch:580-251802					
LCS 580-251802/4	Lab Control Sample	T	Water	300.0	
MB 580-251802/3	Method Blank	T	Water	300.0	
580-70043-1	MW-03-170719-W	T	Water	300.0	
580-70043-2	MW-16-170719-W	T	Water	300.0	
580-70043-3	MW-18-170719-W	T	Water	300.0	
580-70043-3MS	Matrix Spike	T	Water	300.0	
580-70043-3MSD	Matrix Spike Duplicate	T	Water	300.0	
580-70043-4	MW-19-170719-W	T	Water	300.0	
580-70043-5	DUP-170719	T	Water	300.0	

Report Basis
T = Total

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
5X SUR/IS/TFT_00001	10/04/17	04/14/17	MeOH, Lot 147462	5 mL	SURR/IS/TFT_00081	1 mL	1,4-Dichlorobenzene-d4	48.75 ppm
							Chlorobenzene-d5	48.75 ppm
							Fluorobenzene (IS)	48.75 ppm
.SURR/IS/TFT_00081	10/04/17	04/12/17	blk, Lot voarsurr/is_00039	25 mL	VOARSURR/IS_00039	24.375 mL	1,4-Dichlorobenzene-d4	243.75 ppm
							Chlorobenzene-d5	243.75 ppm
							Fluorobenzene (IS)	243.75 ppm
..VOARSURR/IS_00039	01/31/22	Restek, Lot A0124018			(Purchased Reagent)		1,4-Dichlorobenzene-d4	250 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Fluorobenzene (IS)	250 ug/mL
5X SUR/IS/TFT_00001	10/04/17	04/14/17	MeOH, Lot 147462	5 mL	SURR/IS/TFT_00081	1 mL	Trifluorotoluene (Surr)	49.98 ppm
							1,2-Dichloroethane-d4 (Surr)	48.75 ppm
							4-Bromofluorobenzene (Surr)	48.75 ppm
							Dibromofluoromethane (Surr)	48.75 ppm
							Toluene-d8 (Surr)	48.75 ppm
.SURR/IS/TFT_00081	10/04/17	04/12/17	blk, Lot voarsurr/is_00039	25 mL	V-TFTStk_00031	625 uL	Trifluorotoluene (Surr)	249.9 ppm
					VOARSURR/IS_00039	24.375 mL	1,2-Dichloroethane-d4 (Surr)	243.75 ppm
							4-Bromofluorobenzene (Surr)	243.75 ppm
							Dibromofluoromethane (Surr)	243.75 ppm
							Toluene-d8 (Surr)	243.75 ppm
..V-TFTStk_00031	10/04/17	04/04/17	methanol, Lot 0000147462	50 mL	TFTneat_00013	420 uL	Trifluorotoluene (Surr)	9996 mg/L
...TFTneat_00013	03/31/19	Sigma-Aldrich, Lot STBG2214V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
..VOARSURR/IS_00039	01/31/22	Restek, Lot A0124018			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	250 ug/mL
							4-Bromofluorobenzene (Surr)	250 ug/mL
							Dibromofluoromethane (Surr)	250 ug/mL
							Toluene-d8 (Surr)	250 ug/mL
IC-Custom-EE_00006	09/14/17	Environmental Express, Lot 1625317			(Purchased Reagent)		Sulfate	1000 mg/L
IC-Custom-EE_00007	02/17/18	Environmental Express, Lot 1704533			(Purchased Reagent)		Sulfate	1000 mg/L
VOAMasterMix_00010	09/30/17	07/08/17	methanol, Lot 147462	50 mL	VOARGAS__00012	1000 uL	Vinyl chloride	50 ug/mL
					VOARMegMix__00019	1000 uL	1,1-Dichloroethene	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							Trichloroethene	50 ug/mL
.VOARGAS__00012	01/31/20	Restek, Lot A0124278			(Purchased Reagent)		Vinyl chloride	2500 ug/mL
.VOARMegMix__00019	03/31/18	Restek, Lot A0118177			(Purchased Reagent)		1,1-Dichloroethene	2500 ug/mL
							cis-1,2-Dichloroethene	2500 ug/mL
							Tetrachloroethene	2500 ug/mL
							trans-1,2-Dichloroethene	2500 ug/mL
							Trichloroethene	2500 ug/mL
VOAMasterSEC_00007	09/30/17	07/08/17	methanol, Lot 147462	25 mL	VOASGAS2__00012	500 uL	Vinyl chloride	50 ug/mL
					VOASMegMix2__00013	500 uL	1,1-Dichloroethene	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							Tetrachloroethene	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							trans-1,2-Dichloroethene	50 ug/mL
							Trichloroethene	50 ug/mL
.VOASGAS2__00012	11/30/18		Restek, Lot A0115484		(Purchased Reagent)		Vinyl chloride	2500 ug/mL
.VOASMegMix2__00013	07/31/18		Restek, Lot A0120604		(Purchased Reagent)		1,1-Dichloroethene	2500 mg/L
							cis-1,2-Dichloroethene	2500 mg/L
							Tetrachloroethene	2500 mg/L
							trans-1,2-Dichloroethene	2500 mg/L
							Trichloroethene	2500 mg/L

Certification Summary

Client: GeoEngineers Inc
TestAmerica Job ID: 580-70043-1
Project/Site: 318 State AVE NE (WA)/0415-049-07

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Seattle	Alaska (UST)	State Program	10	UST-022
TestAmerica Seattle	California	State Program	9	2901
TestAmerica Seattle	L-A-B	DoD ELAP		L2236
TestAmerica Seattle	L-A-B	ISO/IEC 17025		L2236
TestAmerica Seattle	Montana (UST)	State Program	8	N/A
TestAmerica Seattle	Oregon	NELAP	10	WA100007
TestAmerica Seattle	US Fish & Wildlife	Federal		LE058448-0
TestAmerica Seattle	USDA	Federal		P330-14-00126
TestAmerica Seattle	Washington	State Program	10	C553

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method 8260C Low Level

Volatile Organic Compounds (GC/MS) by Method 8260C Low Level

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-VRX ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TFT #	TOL #	BFB #
MW-03-170719-W	580-70043-1	101	105	101	101	100
MW-16-170719-W	580-70043-2	100	107	99	104	98
MW-18-170719-W	580-70043-3	101	102	103	102	98
MW-19-170719-W	580-70043-4	99	106	100	99	99
DUP-170719	580-70043-5	98	99	109	104	93
Trip Blank	580-70043-6	101	107	104	101	97
	MB 580-252709/5	101	105	102	103	100
	LCS 580-252709/6	102	105	100	99	98
	LCSD 580-252709/7	102	104	96	96	98
MW-18-170719-W MS	580-70043-3 MS	102	107	95	101	100
MW-18-170719-W MSD	580-70043-3 MSD	102	106	101	100	97

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	42-132
DCA = 1,2-Dichloroethane-d4 (Surr)	46-150
TFT = Trifluorotoluene (Surr)	74-118
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	81-120

Column to be used to flag recovery values

FORM II 8260C

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water Level: Low Lab File ID: H012017_022.D

Lab ID: LCS 580-252709/6 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Vinyl chloride	5.00	5.19	104	59-140	
1,1-Dichloroethene	5.00	5.00	100	64-125	
trans-1,2-Dichloroethene	5.00	5.35	107	69-124	
cis-1,2-Dichloroethene	5.00	6.95	139	73-130	*
Trichloroethene	5.00	5.42	108	72-123	
Tetrachloroethene	5.00	5.34	107	67-123	

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water Level: Low Lab File ID: H012017_023.D

Lab ID: LCSD 580-252709/7 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Vinyl chloride	5.00	5.48	110	5	30	59-140	
1,1-Dichloroethene	5.00	5.16	103	3	28	64-125	
trans-1,2-Dichloroethene	5.00	5.27	105	2	27	69-124	
cis-1,2-Dichloroethene	5.00	6.54	131	6	20	73-130	*
Trichloroethene	5.00	5.43	109	0	20	72-123	
Tetrachloroethene	5.00	5.26	105	2	20	67-123	

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water Level: Low Lab File ID: H012017_035.D

Lab ID: 580-70043-3 MS Client ID: MW-18-170719-W MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Vinyl chloride	5.00	1.5	7.26	115	59-140	
1,1-Dichloroethene	5.00	ND	5.56	111	64-125	
trans-1,2-Dichloroethene	5.00	0.28	5.88	112	69-124	
cis-1,2-Dichloroethene	5.00	1.2 J	6.53	107	73-130	
Trichloroethene	5.00	0.12 J	5.64	110	72-123	
Tetrachloroethene	5.00	ND	5.42	108	67-123	

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water Level: Low Lab File ID: H012017_036.D

Lab ID: 580-70043-3 MSD Client ID: MW-18-170719-W MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Vinyl chloride	5.00	6.33	97	14	35	59-140	
1,1-Dichloroethene	5.00	5.19	104	7	35	64-125	
trans-1,2-Dichloroethene	5.00	5.48	104	7	35	69-124	
cis-1,2-Dichloroethene	5.00	6.22	101	5	35	73-130	
Trichloroethene	5.00	5.46	107	3	35	72-123	
Tetrachloroethene	5.00	5.25	105	3	35	67-123	

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab File ID: H012017_021.D Lab Sample ID: MB 580-252709/5

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: TAC048 Date Analyzed: 08/01/2017 19:57

GC Column: DB-VRX ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 580-252709/6	H012017_022.D	08/01/2017 20:22
	LCSD 580-252709/7	H012017_023.D	08/01/2017 20:46
Trip Blank	580-70043-6	H012017_025.D	08/01/2017 21:34
MW-03-170719-W	580-70043-1	H012017_030.D	08/01/2017 23:34
MW-16-170719-W	580-70043-2	H012017_031.D	08/01/2017 23:58
MW-19-170719-W	580-70043-4	H012017_032.D	08/02/2017 00:22
DUP-170719	580-70043-5	H012017_033.D	08/02/2017 00:47
MW-18-170719-W	580-70043-3	H012017_034.D	08/02/2017 01:11
MW-18-170719-W MS	580-70043-3 MS	H012017_035.D	08/02/2017 01:35
MW-18-170719-W MSD	580-70043-3 MSD	H012017_036.D	08/02/2017 01:59

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab File ID: H012017_018.D BFB Injection Date: 08/01/2017

Instrument ID: TAC048 BFB Injection Time: 18:45

Analysis Batch No.: 252709

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	26.1	
75	30.0 - 60.0 % of mass 95	50.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	1.3	(1.5) 1
174	50.0 - 120.00 % of mass 95	83.9	
175	5.0 - 9.0 % of mass 174	6.2	(7.3) 1
176	95.0 - 101.0 % of mass 174	80.5	(95.9) 1
177	5.0 - 9.0 % of mass 176	5.1	(6.4) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 580-252709/3	H012017_019.D	08/01/2017	19:09
	MB 580-252709/5	H012017_021.D	08/01/2017	19:57
	LCS 580-252709/6	H012017_022.D	08/01/2017	20:22
	LCSD 580-252709/7	H012017_023.D	08/01/2017	20:46
Trip Blank	580-70043-6	H012017_025.D	08/01/2017	21:34
MW-03-170719-W	580-70043-1	H012017_030.D	08/01/2017	23:34
MW-16-170719-W	580-70043-2	H012017_031.D	08/01/2017	23:58
MW-19-170719-W	580-70043-4	H012017_032.D	08/02/2017	00:22
DUP-170719	580-70043-5	H012017_033.D	08/02/2017	00:47
MW-18-170719-W	580-70043-3	H012017_034.D	08/02/2017	01:11
MW-18-170719-W MS	580-70043-3 MS	H012017_035.D	08/02/2017	01:35
MW-18-170719-W MSD	580-70043-3 MSD	H012017_036.D	08/02/2017	01:59

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Sample No.: CCVIS 580-252709/3 Date Analyzed: 08/01/2017 19:09

Instrument ID: TAC048 GC Column: DB-VRX ID: 0.25(mm)

Lab File ID (Standard): H012017_019.D Heated Purge: (Y/N) N

Calibration ID: 25201

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3332624	9.43	2696976	12.38	1512823	14.67
UPPER LIMIT			9.93		12.88		15.17
LOWER LIMIT			8.93		11.88		14.17
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-252709/5		3285458	9.43	2591154	12.38	1416843	14.67
LCS 580-252709/6		3356286	9.43	2718340	12.38	1466371	14.67
LCSD 580-252709/7		3143433	9.43	2647429	12.38	1445207	14.67
580-70043-6	Trip Blank	3255205	9.43	2581003	12.38	1372909	14.67
580-70043-1	MW-03-170719-W	3294438	9.43	2587871	12.38	1434665	14.67
580-70043-2	MW-16-170719-W	3165676	9.43	2584262	12.38	1406116	14.67
580-70043-4	MW-19-170719-W	3065664	9.43	2504110	12.38	1377250	14.67
580-70043-5	DUP-170719	3348993	9.43	2603267	12.38	1333974	14.67
580-70043-3	MW-18-170719-W	3245462	9.43	2582050	12.38	1408061	14.67
580-70043-3 MS	MW-18-170719-W MS	3061759	9.43	2515372	12.38	1414121	14.67
580-70043-3 MSD	MW-18-170719-W MSD	3165399	9.43	2553208	12.38	1386192	14.67

FB = Fluorobenzene (IS)
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260C

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-03-170719-W | Lab Sample ID: 580-70043-1

Matrix: Water | Lab File ID: H012017_030.D

Analysis Method: 8260C | Date Collected: 07/19/2017 14:40

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 23:34

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	0.48		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	0.40		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	1.3	J B *	2.0	0.025
79-01-6	Trichloroethene	0.17	J	0.20	0.025
127-18-4	Tetrachloroethene	ND		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	101		75-125
98-08-8	Trifluorotoluene (Surr)	101		74-118
1868-53-7	Dibromofluoromethane (Surr)	101		42-132
460-00-4	4-Bromofluorobenzene (Surr)	100		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-16-170719-W | Lab Sample ID: 580-70043-2

Matrix: Water | Lab File ID: H012017_031.D

Analysis Method: 8260C | Date Collected: 07/19/2017 12:50

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 23:58

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	0.29		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	0.077	J	0.20	0.025
156-59-2	cis-1,2-Dichloroethene	1.0	J B *	2.0	0.025
79-01-6	Trichloroethene	0.22		0.20	0.025
127-18-4	Tetrachloroethene	ND		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	104		75-125
98-08-8	Trifluorotoluene (Surr)	99		74-118
1868-53-7	Dibromofluoromethane (Surr)	100		42-132
460-00-4	4-Bromofluorobenzene (Surr)	98		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-18-170719-W | Lab Sample ID: 580-70043-3

Matrix: Water | Lab File ID: H012017_034.D

Analysis Method: 8260C | Date Collected: 07/19/2017 13:35

Sample wt/vol: 5(mL) | Date Analyzed: 08/02/2017 01:11

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	1.5		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	0.28		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	1.2	J B *	2.0	0.025
79-01-6	Trichloroethene	0.12	J	0.20	0.025
127-18-4	Tetrachloroethene	ND		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	102		75-125
98-08-8	Trifluorotoluene (Surr)	103		74-118
1868-53-7	Dibromofluoromethane (Surr)	101		42-132
460-00-4	4-Bromofluorobenzene (Surr)	98		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-19-170719-W | Lab Sample ID: 580-70043-4

Matrix: Water | Lab File ID: H012017_032.D

Analysis Method: 8260C | Date Collected: 07/19/2017 11:55

Sample wt/vol: 5(mL) | Date Analyzed: 08/02/2017 00:22

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	0.56		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	ND		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	0.95	J B *	2.0	0.025
79-01-6	Trichloroethene	1.3		0.20	0.025
127-18-4	Tetrachloroethene	0.12	J	0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	99		75-125
98-08-8	Trifluorotoluene (Surr)	100		74-118
1868-53-7	Dibromofluoromethane (Surr)	99		42-132
460-00-4	4-Bromofluorobenzene (Surr)	99		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: DUP-170719 | Lab Sample ID: 580-70043-5

Matrix: Water | Lab File ID: H012017_033.D

Analysis Method: 8260C | Date Collected: 07/19/2017 12:00

Sample wt/vol: 5(mL) | Date Analyzed: 08/02/2017 00:47

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	0.44		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	ND		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	0.88	J B *	2.0	0.025
79-01-6	Trichloroethene	1.4		0.20	0.025
127-18-4	Tetrachloroethene	0.11	J	0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	104		75-125
98-08-8	Trifluorotoluene (Surr)	109		74-118
1868-53-7	Dibromofluoromethane (Surr)	98		42-132
460-00-4	4-Bromofluorobenzene (Surr)	93		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: Trip Blank | Lab Sample ID: 580-70043-6

Matrix: Water | Lab File ID: H012017_025.D

Analysis Method: 8260C | Date Collected: 07/19/2017 00:01

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 21:34

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	ND		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	ND		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	1.3	J B *	2.0	0.025
79-01-6	Trichloroethene	ND		0.20	0.025
127-18-4	Tetrachloroethene	ND		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	101		75-125
98-08-8	Trifluorotoluene (Surr)	104		74-118
1868-53-7	Dibromofluoromethane (Surr)	101		42-132
460-00-4	4-Bromofluorobenzene (Surr)	97		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		46-150

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: ICV 580-252017/15 Calibration Date: 07/25/2017 01:29

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: G2420170021.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.1852	0.2281	0.1000	12.3	10.0	23.1	30.0
Chloromethane	Ave	0.5303	0.5815	0.1000	11.0	10.0	9.6	30.0
Vinyl chloride	Lin2		0.4726	0.1000	10.5	10.0	5.4	30.0
Bromomethane	Ave	0.2376	0.2302	0.1000	9.69	10.0	-3.1	30.0
Chloroethane	Ave	0.0808	0.0755	0.0600	9.34	10.0	-6.6	30.0
Acrolein	Ave	0.0613	0.0610		51.8	52.0	-0.4	30.0
Trichlorofluoromethane	Lin2		0.4998	0.1000	10.7	10.0	7.1	30.0
Acetone	Lin1		0.1148	0.0200	47.3	50.0	-5.5	30.0
1,1-Dichloroethene	Lin2		0.2693	0.1000	10.2	10.0	2.3	30.0
2-Methyl-2-propanol	Qua1		0.0387		96.0	100	-4.0	30.0
Acrylonitrile	Ave	0.1199	0.1408		117	100	17.4	30.0
Iodomethane	Ave	0.4607	0.4944		10.7	10.0	7.3	30.0
Methylene Chloride	Lin2		0.3025	0.1000	10.6	10.0	5.9	30.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Lin2		0.2356	0.1000	10.2	10.0	2.1	30.0
Carbon disulfide	Ave	0.8789	0.9760	0.1000	11.1	10.0	11.1	30.0
trans-1,2-Dichloroethene	Lin2		0.2982	0.1000	10.8	10.0	8.2	30.0
Methyl tert-butyl ether	Lin2		0.8560	0.1000	11.0	10.0	10.2	30.0
1,1-Dichloroethane	Ave	0.5813	0.6169	0.2000	10.6	10.0	6.1	30.0
Vinyl acetate	Qua1		0.0504		32.5	25.0	29.8	30.0
Hexane	Lin1		0.6449		11.3	10.0	13.1	30.0
2-Butanone (MEK)	Lin2		0.0317	0.0200	49.1	50.0	-1.9	30.0
cis-1,2-Dichloroethene	Ave	0.3216	0.3166	0.1000	9.85	10.0	-1.5	30.0
Chlorobromomethane	Ave	0.1936	0.1967		10.2	10.0	1.6	30.0
Chloroform	Lin2		0.5022	0.2000	10.4	10.0	4.2	30.0
Tert-butyl ethyl ether	Ave	0.4170	0.4240		12.7	12.5	1.7	30.0
2,2-Dichloropropane	Ave	0.3658	0.3742		10.2	10.0	2.3	30.0
1,2-Dichloroethane	Lin2		0.4530	0.1000	10.3	10.0	2.6	30.0
1,1,1-Trichloroethane	Lin2		0.4856	0.1000	10.8	10.0	8.5	30.0
1,1-Dichloropropene	Lin2		0.4276		11.1	10.0	10.6	30.0
Carbon tetrachloride	Lin2		0.4526	0.1000	10.7	10.0	7.4	30.0
Benzene	Qua2		1.133	0.5000	11.0	10.0	9.5	30.0
Tert-amyl methyl ether	Qua2		0.8826		12.6	12.5	1.1	30.0
Dibromomethane	Lin2		0.1968		10.1	10.0	0.7	30.0
1,2-Dichloropropane	Ave	0.3511	0.3527	0.1000	10.0	10.0	0.5	30.0
Trichloroethene	Lin2		0.3001	0.2000	10.1	10.0	0.6	30.0
Dichlorobromomethane	Lin2		0.3925	0.2000	10.3	10.0	2.6	30.0
2-Chloroethyl vinyl ether	Lin2		0.2849		9.86	10.0	-1.4	30.0
cis-1,3-Dichloropropene	Lin1		0.6149	0.2000	10.8	10.0	8.3	30.0
4-Methyl-2-pentanone (MIBK)	Lin1		0.1679	0.0600	55.3	50.0	10.6	30.0
trans-1,3-Dichloropropene	Lin2		0.5577	0.1000	10.3	10.0	3.4	30.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: ICV 580-252017/15 Calibration Date: 07/25/2017 01:29

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: G2420170021.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,1,2-Trichloroethane	Lin2		0.3155	0.1000	10.3	10.0	2.7	30.0
Toluene	Qua2		1.494	0.4000	10.9	10.0	8.9	30.0
1,3-Dichloropropane	Ave	0.5522	0.5577		10.1	10.0	1.0	30.0
2-Hexanone	Lin1		0.1587	0.0600	55.0	50.0	9.9	30.0
Chlorodibromomethane	Lin2		0.3936	0.1000	10.1	10.0	0.6	30.0
Ethylene Dibromide	Lin2		0.3353	0.1000	9.89	10.0	-1.1	30.0
Tetrachloroethene	Lin2		0.3136	0.2000	10.3	10.0	3.3	30.0
1,1,1,2-Tetrachloroethane	Lin2		0.4032		10.7	10.0	7.2	30.0
Chlorobenzene	Qua2		0.9940	0.5000	10.4	10.0	4.2	30.0
Ethylbenzene	Qua1		1.718	0.1000	10.4	10.0	4.4	30.0
m-Xylene & p-Xylene	Qua1		1.369	0.1000	10.1	10.0	1.1	30.0
Bromoform	Lin2		0.2991	0.1000	10.1	10.0	0.9	30.0
Styrene	Qua1		1.094	0.3000	10.1	10.0	1.4	30.0
o-Xylene	Qua1		1.439	0.3000	10.4	10.0	3.7	30.0
1,1,2,2-Tetrachloroethane	Lin2		0.7668	0.3000	10.3	10.0	2.9	30.0
trans-1,4-Dichloro-2-butene	Lin2		0.3195		9.78	10.0	-2.2	30.0
1,2,3-Trichloropropane	Lin2		0.2437		10.1	10.0	0.7	30.0
Isopropylbenzene	Qua1		1.818	0.1000	10.6	10.0	5.7	30.0
Bromobenzene	Ave	0.7990	0.8131		10.2	10.0	1.8	30.0
N-Propylbenzene	Qua1		3.627		10.4	10.0	3.5	30.0
2-Chlorotoluene	Lin2		0.7685		10.3	10.0	2.7	30.0
4-Chlorotoluene	Lin2		0.7925		10.4	10.0	4.4	30.0
1,3,5-Trimethylbenzene	Qua1		2.731		10.3	10.0	3.2	30.0
tert-Butylbenzene	Qua1		2.344		9.95	10.0	-0.5	30.0
1,2,4-Trimethylbenzene	Qua1		2.759		10.1	10.0	0.8	30.0
sec-Butylbenzene	Qua1		3.486		10.1	10.0	1.1	30.0
1,3-Dichlorobenzene	Qua2		1.581	0.6000	10.3	10.0	2.8	30.0
4-Isopropyltoluene	Qua1		3.098		10.3	10.0	3.0	30.0
1,4-Dichlorobenzene	Qua2		1.626	0.5000	10.5	10.0	4.8	30.0
1,2-Dichlorobenzene	Lin1		1.520	0.4000	11.6	10.0	16.4	30.0
n-Butylbenzene	Lin2		0.7901		10.1	10.0	0.7	30.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1913	0.0500	9.80	10.0	-2.0	30.0
1,3,5-Trichlorobenzene	Lin2		1.215		10.4	10.0	4.4	30.0
1,2,4-Trichlorobenzene	Lin1		1.048	0.2000	10.4	10.0	4.1	30.0
Naphthalene	Qua2		2.416		9.71	10.0	-2.9	30.0
Hexachlorobutadiene	Lin2		0.5719		9.73	10.0	-2.7	30.0
1,2,3-Trichlorobenzene	Lin2		0.9775		10.3	10.0	2.6	30.0
Dibromofluoromethane (Surr)	Ave	0.2675	0.2625		9.57	9.75	-1.9	30.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3613	0.3584		9.67	9.75	-0.8	30.0
Trifluorotoluene (Surr)	Ave	1.084	1.054		9.72	10.0	-2.8	30.0
Toluene-d8 (Surr)	Ave	1.229	1.225		9.72	9.75	-0.3	30.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: ICV 580-252017/15 Calibration Date: 07/25/2017 01:29

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: G2420170021.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
4-Bromofluorobenzene (Surr)	Ave	0.4325	0.4396		9.91	9.75	1.6	30.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: CCVIS 580-252709/3 Calibration Date: 08/01/2017 19:09

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: H012017_019.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.1852	0.1723	0.1000	9.30	10.0	-7.0	20.0
Chloromethane	Ave	0.5303	0.5129	0.1000	9.67	10.0	-3.3	20.0
Vinyl chloride	Lin2		0.4555	0.1000	10.2	10.0	1.6	20.0
Bromomethane	Ave	0.2376	0.2297	0.1000	9.67	10.0	-3.3	20.0
Chloroethane	Ave	0.0808	0.0773	0.0600	9.57	10.0	-4.3	20.0
Acrolein	Ave	0.0613	0.0586		57.4	60.0	-4.4	20.0
Trichlorofluoromethane	Lin2		0.4868	0.1000	10.4	10.0	4.3	20.0
Acetone	Lin1		0.1452	0.0200	60.4	50.0	20.9*	20.0
2-Methyl-2-propanol	Qua1		0.0389		96.5	100	-3.5	20.0
1,1-Dichloroethene	Lin2		0.2668	0.1000	10.1	10.0	1.4	20.0
Acrylonitrile	Ave	0.1199	0.1301		108	100	8.5	20.0
Iodomethane	Ave	0.4607	0.4808		10.4	10.0	4.4	20.0
Methylene Chloride	Lin2		0.2957	0.1000	10.4	10.0	3.5	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Lin2		0.2339	0.1000	10.1	10.0	1.4	20.0
Carbon disulfide	Ave	0.8789	0.9187	0.1000	10.5	10.0	4.5	20.0
trans-1,2-Dichloroethene	Lin2		0.2901	0.1000	10.5	10.0	5.3	20.0
Methyl tert-butyl ether	Lin2		0.8382	0.1000	10.8	10.0	7.9	20.0
1,1-Dichloroethane	Ave	0.5813	0.6197	0.2000	10.7	10.0	6.6	20.0
Vinyl acetate	Qua1		0.0510		32.8	25.0	31.2*	20.0
Hexane	Lin1		0.6430		11.3	10.0	12.8	20.0
2-Butanone (MEK)	Lin2		0.0341	0.0200	52.7	50.0	5.4	20.0
cis-1,2-Dichloroethene	Ave	0.3216	0.4194	0.1000	13.0	10.0	30.4*	20.0
Chlorobromomethane	Ave	0.1936	0.1937		10.0	10.0	0.0	20.0
Chloroform	Lin2		0.5358	0.2000	11.1	10.0	11.2	20.0
Tert-butyl ethyl ether	Ave	0.4170	0.4213		12.6	12.5	1.0	20.0
2,2-Dichloropropane	Ave	0.3658	0.4098		11.2	10.0	12.0	20.0
1,2-Dichloroethane	Lin2		0.4884	0.1000	11.1	10.0	10.7	20.0
1,1,1-Trichloroethane	Lin2		0.4928	0.1000	11.0	10.0	10.1	20.0
1,1-Dichloropropene	Lin2		0.4228		10.9	10.0	9.4	20.0
Carbon tetrachloride	Lin2		0.4565	0.1000	10.8	10.0	8.4	20.0
Benzene	Qua2		1.119	0.5000	10.8	10.0	8.0	20.0
Tert-amyl methyl ether	Qua2		0.8791		12.6	12.5	0.7	20.0
Dibromomethane	Lin2		0.2020		10.3	10.0	3.4	20.0
1,2-Dichloropropane	Ave	0.3511	0.3513	0.1000	10.0	10.0	0.0	20.0
Trichloroethene	Lin2		0.3113	0.2000	10.4	10.0	4.3	20.0
Dichlorobromomethane	Lin2		0.4111	0.2000	10.7	10.0	7.4	20.0
2-Chloroethyl vinyl ether	Lin2		0.2742		9.50	10.0	-5.0	20.0
cis-1,3-Dichloropropene	Lin1		0.6251	0.2000	11.0	10.0	10.1	20.0
4-Methyl-2-pentanone (MIBK)	Lin1		0.1633	0.0600	53.8	50.0	7.6	20.0
trans-1,3-Dichloropropene	Lin2		0.5787	0.1000	10.7	10.0	7.3	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: CCVIS 580-252709/3 Calibration Date: 08/01/2017 19:09

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: H012017_019.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,1,2-Trichloroethane	Lin2		0.3075	0.1000	10.0	10.0	0.0	20.0
Toluene	Qua2		1.503	0.4000	11.0	10.0	9.5	20.0
1,3-Dichloropropane	Ave	0.5522	0.5791		10.5	10.0	4.9	20.0
2-Hexanone	Lin1		0.1659	0.0600	57.5	50.0	14.9	20.0
Chlorodibromomethane	Lin2		0.4012	0.1000	10.2	10.0	2.5	20.0
Ethylene Dibromide	Lin2		0.3293	0.1000	9.72	10.0	-2.8	20.0
Tetrachloroethene	Lin2		0.3201	0.2000	10.5	10.0	5.4	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.3870		10.3	10.0	2.9	20.0
Chlorobenzene	Qua2		1.002	0.5000	10.5	10.0	5.1	20.0
Ethylbenzene	Qua1		1.761	0.1000	10.7	10.0	7.4	20.0
m-Xylene & p-Xylene	Qua1		1.382	0.1000	10.2	10.0	2.2	20.0
Bromoform	Lin2		0.2765	0.1000	9.33	10.0	-6.7	20.0
Styrene	Qua1		1.075	0.3000	9.94	10.0	-0.6	20.0
o-Xylene	Qua1		1.432	0.3000	10.3	10.0	3.1	20.0
1,1,2,2-Tetrachloroethane	Lin2		0.7641	0.3000	10.3	10.0	2.5	20.0
trans-1,4-Dichloro-2-butene	Lin2		0.2760		8.48	10.0	-15.2	20.0
1,2,3-Trichloropropane	Lin2		0.2365		9.77	10.0	-2.3	20.0
Isopropylbenzene	Qua1		1.818	0.1000	10.6	10.0	5.7	20.0
Bromobenzene	Ave	0.7990	0.8095		10.1	10.0	1.3	20.0
N-Propylbenzene	Qua1		3.816		11.0	10.0	10.3	20.0
2-Chlorotoluene	Lin2		0.7589		10.1	10.0	1.4	20.0
4-Chlorotoluene	Lin2		0.7980		10.5	10.0	5.1	20.0
1,3,5-Trimethylbenzene	Qua1		2.754		10.4	10.0	4.2	20.0
tert-Butylbenzene	Qua1		2.404		10.2	10.0	2.4	20.0
1,2,4-Trimethylbenzene	Qua1		2.879		10.6	10.0	5.9	20.0
sec-Butylbenzene	Qua1		3.639		10.7	10.0	6.6	20.0
1,3-Dichlorobenzene	Qua2		1.603	0.6000	10.4	10.0	4.3	20.0
4-Isopropyltoluene	Qua1		3.162		10.6	10.0	5.5	20.0
1,4-Dichlorobenzene	Qua2		1.621	0.5000	10.4	10.0	4.5	20.0
1,2-Dichlorobenzene	Lin1		1.508	0.4000	11.5	10.0	15.4	20.0
n-Butylbenzene	Lin2		0.7942		10.1	10.0	1.2	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1752	0.0500	8.97	10.0	-10.3	20.0
1,3,5-Trichlorobenzene	Lin2		1.225		10.5	10.0	5.3	20.0
1,2,4-Trichlorobenzene	Lin1		1.065	0.2000	10.6	10.0	5.9	20.0
Naphthalene	Qua2		2.351		9.43	10.0	-5.7	20.0
Hexachlorobutadiene	Lin2		0.5860		9.97	10.0	-0.3	20.0
1,2,3-Trichlorobenzene	Lin2		0.9594		10.1	10.0	0.7	20.0
Dibromofluoromethane (Surr)	Ave	0.2675	0.2699		9.84	9.75	0.9	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3613	0.3806		10.3	9.75	5.3	20.0
Trifluorotoluene (Surr)	Ave	1.084	1.026		9.47	10.0	-5.3	20.0
Toluene-d8 (Surr)	Ave	1.229	1.207		9.58	9.75	-1.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Lab Sample ID: CCVIS 580-252709/3 Calibration Date: 08/01/2017 19:09

Instrument ID: TAC048 Calib Start Date: 07/24/2017 20:17

GC Column: DB-VRX ID: 0.25(mm) Calib End Date: 07/25/2017 00:18

Lab File ID: H012017_019.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
4-Bromofluorobenzene (Surr)	Ave	0.4325	0.4278		9.64	9.75	-1.1	20.0

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 580-252709/5

Matrix: Water | Lab File ID: H012017_021.D

Analysis Method: 8260C | Date Collected:

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 19:57

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	ND		0.10	0.013
75-35-4	1,1-Dichloroethene	ND		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	ND		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	1.88	J	2.0	0.025
79-01-6	Trichloroethene	ND		0.20	0.025
127-18-4	Tetrachloroethene	ND		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	103		75-125
98-08-8	Trifluorotoluene (Surr)	102		74-118
1868-53-7	Dibromofluoromethane (Surr)	101		42-132
460-00-4	4-Bromofluorobenzene (Surr)	100		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 580-252709/6

Matrix: Water | Lab File ID: H012017_022.D

Analysis Method: 8260C | Date Collected:

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 20:22

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	5.19		0.10	0.013
75-35-4	1,1-Dichloroethene	5.00		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	5.35		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	6.95		2.0	0.025
79-01-6	Trichloroethene	5.42		0.20	0.025
127-18-4	Tetrachloroethene	5.34		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	99		75-125
98-08-8	Trifluorotoluene (Surr)	100		74-118
1868-53-7	Dibromofluoromethane (Surr)	102		42-132
460-00-4	4-Bromofluorobenzene (Surr)	98		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 580-252709/7

Matrix: Water | Lab File ID: H012017_023.D

Analysis Method: 8260C | Date Collected:

Sample wt/vol: 5(mL) | Date Analyzed: 08/01/2017 20:46

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	5.48		0.10	0.013
75-35-4	1,1-Dichloroethene	5.16		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	5.27		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	6.54		2.0	0.025
79-01-6	Trichloroethene	5.43		0.20	0.025
127-18-4	Tetrachloroethene	5.26		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	96		75-125
98-08-8	Trifluorotoluene (Surr)	96		74-118
1868-53-7	Dibromofluoromethane (Surr)	102		42-132
460-00-4	4-Bromofluorobenzene (Surr)	98		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-18-170719-W MS | Lab Sample ID: 580-70043-3 MS

Matrix: Water | Lab File ID: H012017_035.D

Analysis Method: 8260C | Date Collected: 07/19/2017 13:35

Sample wt/vol: 5(mL) | Date Analyzed: 08/02/2017 01:35

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	7.26		0.10	0.013
75-35-4	1,1-Dichloroethene	5.56		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	5.88		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	6.53		2.0	0.025
79-01-6	Trichloroethene	5.64		0.20	0.025
127-18-4	Tetrachloroethene	5.42		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	101		75-125
98-08-8	Trifluorotoluene (Surr)	95		74-118
1868-53-7	Dibromofluoromethane (Surr)	102		42-132
460-00-4	4-Bromofluorobenzene (Surr)	100		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		46-150

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-70043-1

SDG No.:

Client Sample ID: MW-18-170719-W MSD | Lab Sample ID: 580-70043-3 MSD

Matrix: Water | Lab File ID: H012017_036.D

Analysis Method: 8260C | Date Collected: 07/19/2017 13:35

Sample wt/vol: 5(mL) | Date Analyzed: 08/02/2017 01:59

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 252709 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-01-4	Vinyl chloride	6.33		0.10	0.013
75-35-4	1,1-Dichloroethene	5.19		0.10	0.018
156-60-5	trans-1,2-Dichloroethene	5.48		0.20	0.025
156-59-2	cis-1,2-Dichloroethene	6.22		2.0	0.025
79-01-6	Trichloroethene	5.46		0.20	0.025
127-18-4	Tetrachloroethene	5.25		0.50	0.070

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	100		75-125
98-08-8	Trifluorotoluene (Surr)	101		74-118
1868-53-7	Dibromofluoromethane (Surr)	102		42-132
460-00-4	4-Bromofluorobenzene (Surr)	97		81-120
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		46-150

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Start Date: 07/24/2017 19:53

Analysis Batch Number: 252017 End Date: 07/25/2017 01:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 580-252017/1		07/24/2017 19:53	1		DB-VRX 0.25(mm)
STD 580-252017/2 IC		07/24/2017 20:17	1		DB-VRX 0.25(mm)
STD 580-252017/3 IC		07/24/2017 20:41	1		DB-VRX 0.25(mm)
STD 580-252017/4 IC		07/24/2017 21:06	1		DB-VRX 0.25(mm)
STD 580-252017/5 IC		07/24/2017 21:30	1		DB-VRX 0.25(mm)
STD 580-252017/6 IC		07/24/2017 21:54	1		DB-VRX 0.25(mm)
STD 580-252017/7 IC		07/24/2017 22:18	1		DB-VRX 0.25(mm)
STD 580-252017/8 IC		07/24/2017 22:42	1		DB-VRX 0.25(mm)
ICIS 580-252017/9		07/24/2017 23:06	1		DB-VRX 0.25(mm)
STD 580-252017/10 IC		07/24/2017 23:30	1		DB-VRX 0.25(mm)
STD 580-252017/11 IC		07/24/2017 23:54	1		DB-VRX 0.25(mm)
STD 580-252017/12 IC		07/25/2017 00:18	1		DB-VRX 0.25(mm)
ICV 580-252017/15		07/25/2017 01:29	1	G2420170021.D	DB-VRX 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC048 Start Date: 08/01/2017 18:45

Analysis Batch Number: 252709 End Date: 08/02/2017 02:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 580-252709/2		08/01/2017 18:45	1	H012017_018.D	DB-VRX 0.25(mm)
CCVIS 580-252709/3		08/01/2017 19:09	1	H012017_019.D	DB-VRX 0.25(mm)
CCVL 580-252709/4		08/01/2017 19:33	1		DB-VRX 0.25(mm)
MB 580-252709/5		08/01/2017 19:57	1	H012017_021.D	DB-VRX 0.25(mm)
LCS 580-252709/6		08/01/2017 20:22	1	H012017_022.D	DB-VRX 0.25(mm)
LCSD 580-252709/7		08/01/2017 20:46	1	H012017_023.D	DB-VRX 0.25(mm)
ZZZZZ		08/01/2017 21:10	1		DB-VRX 0.25(mm)
580-70043-6		08/01/2017 21:34	1	H012017_025.D	DB-VRX 0.25(mm)
ZZZZZ		08/01/2017 21:58	1		DB-VRX 0.25(mm)
ZZZZZ		08/01/2017 22:22	1		DB-VRX 0.25(mm)
ZZZZZ		08/01/2017 22:46	1		DB-VRX 0.25(mm)
ZZZZZ		08/01/2017 23:10	1		DB-VRX 0.25(mm)
580-70043-1		08/01/2017 23:34	1	H012017_030.D	DB-VRX 0.25(mm)
580-70043-2		08/01/2017 23:58	1	H012017_031.D	DB-VRX 0.25(mm)
580-70043-4		08/02/2017 00:22	1	H012017_032.D	DB-VRX 0.25(mm)
580-70043-5		08/02/2017 00:47	1	H012017_033.D	DB-VRX 0.25(mm)
580-70043-3		08/02/2017 01:11	1	H012017_034.D	DB-VRX 0.25(mm)
580-70043-3 MS		08/02/2017 01:35	1	H012017_035.D	DB-VRX 0.25(mm)
580-70043-3 MSD		08/02/2017 01:59	1	H012017_036.D	DB-VRX 0.25(mm)
ZZZZZ		08/02/2017 02:24	1		DB-VRX 0.25(mm)

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-70043-1

SDG No.:

Project: 318 State AVE NE (WA)/0415-049-07

Client Sample ID	Lab Sample ID
MW-03-170719-W	580-70043-1
MW-16-170719-W	580-70043-2
MW-18-170719-W	580-70043-3
MW-19-170719-W	580-70043-4
DUP-170719	580-70043-5

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW-03-170719-W
Lab Sample ID: 580-70043-1
Lab Name: TestAmerica Seattle
Job No.: 580-70043-1
SDG ID.:
Matrix: Water
Date Sampled: 07/19/2017 14:40
Reporting Basis: WET
Date Received: 07/19/2017 15:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	99	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW-16-170719-W
Lab Sample ID: 580-70043-2
Lab Name: TestAmerica Seattle
Job No.: 580-70043-1
SDG ID.:
Matrix: Water
Date Sampled: 07/19/2017 12:50
Reporting Basis: WET
Date Received: 07/19/2017 15:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	36	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW-18-170719-W
Lab Sample ID: 580-70043-3
Lab Name: TestAmerica Seattle
Job No.: 580-70043-1
SDG ID.:
Matrix: Water
Date Sampled: 07/19/2017 13:35
Reporting Basis: WET
Date Received: 07/19/2017 15:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	87	1.2		mg/L		F1	1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW-19-170719-W
Lab Sample ID: 580-70043-4
Lab Name: TestAmerica Seattle
Job No.: 580-70043-1
SDG ID.:
Matrix: Water
Date Sampled: 07/19/2017 11:55
Reporting Basis: WET
Date Received: 07/19/2017 15:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	25	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: DUP-170719 Lab Sample ID: 580-70043-5

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG ID.:

Matrix: Water Date Sampled: 07/19/2017 12:00

Reporting Basis: WET Date Received: 07/19/2017 15:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	25	1.2		mg/L			1	300.0

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Analyst: MMM Batch Start Date: 06/06/2017

Reporting Units: mg/L Analytical Batch No.: 247764

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
34	ICV	19:16	Sulfate	50.4	50.0	101	90-110		IC-Custom-EE_00006
1	ICB	19:32	Sulfate	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Analyst: MMM Batch Start Date: 07/20/2017

Reporting Units: mg/L Analytical Batch No.: 251802

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	11:50	Sulfate	50.5	50.0	101	90-110		IC-Custom-EE_00007
2	CCB	12:06	Sulfate	ND					
13	CCV	15:01	Sulfate	50.2	50.0	100	90-110		IC-Custom-EE_00007
14	CCB	15:17	Sulfate	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 251802 Date: 07/20/2017 12:22							
300.0	MB 580-251802/3	Sulfate	ND		mg/L	1.2	1

FORM III-IN

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 251802 Date: 07/20/2017 13:41											
300.0	580-70043-3	Sulfate	87		mg/L						F1
300.0	580-70043-3 MS	Sulfate	132		mg/L	50.0	89	90-110			F1

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 251802 Date: 07/20/2017 13:57											
300.0	580-70043-3 MSD	Sulfate	132		mg/L	50.0	89	90-110	0	15	F1

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 251802	Date: 07/20/2017 12:38										
						LCS Source: IC-Custom-EE_00007					
300.0	LCS 580-251802/4	Sulfate	50.5		mg/L	50.0	101	90-110			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-70043-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 RL Date: 05/10/2017 11:54

Analyte	Wavelength/ Mass	RL (mg/L)	
Sulfate		1.2	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-70043-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 XMDL Date: 05/10/2017 12:33

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Sulfate		1.2	0.26

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC044 Method: 300.0

Start Date: 06/06/2017 17:09 End Date: 06/07/2017 01:53

Lab Sample ID	D / F	Type	Time	Analytes																			
IC 580-247764/8			17:09																				
IC 580-247764/12			17:25																				
IC 580-247764/23			17:41																				
IC 580-247764/29			17:57																				
IC 580-247764/30			18:12																				
IC 580-247764/31			18:28																				
IC 580-247764/32			18:44																				
IC 580-247764/33			19:00																				
ICV 580-247764/34	1		19:16																				
ICB 580-247764/1	1		19:32																				
CCV 580-247764/2			19:48																				
CCB 580-247764/3			20:03																				
ZZZZZZ			20:19																				
ZZZZZZ			20:35																				
ZZZZZZ			20:51																				
ZZZZZZ			21:07																				
ZZZZZZ			21:23																				
ZZZZZZ			21:38																				
ZZZZZZ			21:54																				
ZZZZZZ			22:10																				
ZZZZZZ			22:26																				
ZZZZZZ			22:42																				
CCV 580-247764/16			22:58																				
CCB 580-247764/17			23:14																				
ZZZZZZ			23:29																				
ZZZZZZ			23:45																				
ZZZZZZ			00:01																				
ZZZZZZ			00:17																				
ZZZZZZ			00:33																				
ZZZZZZ			00:49																				
ZZZZZZ			01:05																				
ZZZZZZ			01:21																				
CCV 580-247764/27			01:37																				
CCB 580-247764/28			01:53																				

Prep Types

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Instrument ID: TAC044 Method: 300.0

Start Date: 07/20/2017 11:50 End Date: 07/20/2017 20:02

Lab Sample ID	D/F	Type	Time	Analytes																				
				SO4																				
CCV 580-251802/1	1		11:50	X																				
CCB 580-251802/2	1		12:06	X																				
MB 580-251802/3	1	T	12:22	X																				
LCS 580-251802/4	1	T	12:38	X																				
580-70043-1	1	T	12:54	X																				
580-70043-2	1	T	13:10	X																				
580-70043-3	1	T	13:26	X																				
580-70043-3 MS	1	T	13:41	X																				
580-70043-3 MSD	1	T	13:57	X																				
580-70043-4	1	T	14:13	X																				
580-70043-5	1	T	14:29	X																				
ZZZZZZ			14:45																					
CCV 580-251802/13	1		15:01	X																				
CCB 580-251802/14	1		15:17	X																				
ZZZZZZ			15:32																					
ZZZZZZ			15:48																					
ZZZZZZ			16:04																					
ZZZZZZ			16:20																					
ZZZZZZ			16:36																					
ZZZZZZ			16:52																					
ZZZZZZ			17:07																					
ZZZZZZ			17:23																					
ZZZZZZ			17:39																					
ZZZZZZ			17:55																					
CCV 580-251802/25			18:11																					
CCB 580-251802/26			18:27																					
ZZZZZZ			18:43																					
ZZZZZZ			18:58																					
ZZZZZZ			19:14																					
ZZZZZZ			19:30																					
CCV 580-251802/31			19:46																					
CCB 580-251802/32			20:02																					

Prep Types

T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Batch Number: 247764 Batch Start Date: 06/06/17 17:09 Batch Analyst: Michalek, Mattie M

Batch Method: 300.0 Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	IC-Custom-EE 00006			
ICB 580-247764/1		300.0		5 mL	5 mL				
ICV 580-247764/34		300.0		5 mL	5 mL	0.25 mL			

Batch Notes	
Filter ID	9727627

Basis	Basis Description

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.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Seattle Job No.: 580-70043-1

SDG No.:

Batch Number: 251802 Batch Start Date: 07/20/17 11:50 Batch Analyst: Michalek, Mattie M

Batch Method: 300.0 Batch End Date: 07/21/17 09:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	IC-Custom-EE 00007			
CCV 580-251802/1		300.0		5 mL	5 mL	0.25 mL			
CCB 580-251802/2		300.0		5 mL	5 mL				
MB 580-251802/3		300.0		5 mL	5 mL				
LCS 580-251802/4		300.0		5 mL	5 mL	0.25 mL			
580-70043-D-1	MW-03-170719-W	300.0	T	5 mL	5 mL				
580-70043-D-2	MW-16-170719-W	300.0	T	5 mL	5 mL				
580-70043-D-3	MW-18-170719-W	300.0	T	5 mL	5 mL				
580-70043-D-3 MS	MW-18-170719-W	300.0	T	5 mL	5 mL	0.25 mL			
580-70043-D-3 MSD	MW-18-170719-W	300.0	T	5 mL	5 mL	0.25 mL			
580-70043-D-4	MW-19-170719-W	300.0	T	5 mL	5 mL				
580-70043-D-5	DUP-170719	300.0	T	5 mL	5 mL				
CCV 580-251802/13		300.0		5 mL	5 mL	0.25 mL			
CCB 580-251802/14		300.0		5 mL	5 mL				

Batch Notes	
Filter ID	9727627

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.

Shipping and Receiving Documents

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: GeoEngineers	Client Contact: Nick Rohrbach	Date: 7/19/17	Chain of Custody Number: 31314
Address: 1101 S. Fawcett Ave #200	Telephone Number (Area Code)/Fax Number: 253-383-4940	Lab Number: ~~7003~~ 70043	Page 1 of 1
City: Tacoma / State: WA / Zip Code:	Sampler: Paul Robinette / Lab Contact:		
Project Name and Location (State):	Billing Contact:		
Contract/Purchase Order/Quote No.: GEI # 0415-049-07			

Analysis (Attach list if more space is needed)

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	VOC 8260*	Sulfate	Special Instructions/ Conditions of Receipt
-1 MW-03-170719-W	7/19/17	1440		X				1			3			X	X	*Reporting limits,
-2 MW-16-170719-W		1250		X				1			3			X	X	analyte list, QA/QC
-3 MW-18-170719-W		1335		X				1			3			X	X	to be achieved see
MW-18-170719-MS		1337		X				[illegible]			3			X	~~X~~ [illegible]	Table B-4 in monitoring
MW-18-170719-MSD		1339		X							3			X		plan
MW-18-170719-MS/MSD		1337		X				1							X	
-4 MW-19-170719-W		1155		X				1			3			X	X	
-5 DUP-170719		1200		X				1			3			X	X	
-6 Trip Blank														X		

TB A2 Cooler ___ Cor 19.4 Unc 20.2
Cooler Dsc [illegible] @Lab
Wet/Packs Packing bubble
Cl \ do w/o

580-70043 Chain of Custody

Cooler ☐ Yes ☐ No Cooler Temp: ____

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B

____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days) ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other STD

QC Requirements (Specify)

1. Relinquished By Sign/Print: [signature] Paul Robinette	Date: 7/19/17	Time: 355	1. Received By Sign/Print: B. Gall B. Gall SEA TP	Date: 7/19/1	Time: 1555
2. Relinquished By Sign/Print	Date	Time	2. Received By Sign/Print	Date	Time
3. Relinquished By Sign/Print	Date	Time	3. Received By Sign/Print	Date	Time

Comments

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 580-70043-1

Login Number: 70043
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
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.	N/A	
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").	False	Refer to Job Narrative for details.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

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ANALYTICAL REPORT

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

TestAmerica Job ID: 580-70043-1
Client Project/Site: 318 State AVE NE (WA)/0415-049-07

For:
GeoEngineers Inc
1101 Fawcett, Suite 200
Tacoma, Washington 98402

Attn: Mr. Iain Wingard

Authorized for release by:
8/4/2017 3:16:32 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

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

Case Narrative

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Job ID: 580-70043-1

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 7/19/2017 3:55 PM; the samples arrived in good condition. The temperature of the cooler at receipt was 19.4º C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: MW-03-170719-W (580-70043-1), MW-16-170719-W (580-70043-2), MW-18-170719-W (580-70043-3), MW-18-170719-W (580-70043-3[MS]), MW-18-170719-W (580-70043-3[MSD]), MW-19-170719-W (580-70043-4), DUP-170719 (580-70043-5) and Trip Blank (580-70043-6). The samples are considered acceptable since it was collected and submitted to the laboratory on the same day and there is evidence that the chilling process has begun.

The chain of custody (COC) and the container labels of the matrix spike and matrix spike dup (MS/MSD) samples of parent sample MW-18-170719-W have various times (1337 & 1339). The parent and MS/MSD ought to have the same time. Samples were logged in according to the collection time of the parent sample.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): MW-19-170719-W (580-70043-4). The container labels list the sampling time at 1156, while the COC lists 1155. The sample was logged in per COC.

GC/MS VOA
Method 8260C: The method blank for analytical batch 580-252709 contained cis-1,2-Dichloroethene above the method detection limit. This target analyte concentration was less than the elevated reporting limit (RL) of 2 ug/L; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 8260C: The following analyte was detected in the Method Blank (MB) and samples: cis-1,2-Dichloroethene. The results are due to instrument contamination. The reporting limit was elevated from 0.2 to 2.0 ug/L, and the detections in the samples are considered to be false positives in the following samples: MW-03-170719-W (580-70043-1), MW-16-170719-W (580-70043-2), MW-18-170719-W (580-70043-3), MW-19-170719-W (580-70043-4), DUP-170719 (580-70043-5) and Trip Blank (580-70043-6).

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

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

Definitions/Glossary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance 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)

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: MW-03-170719-W
Date Collected: 07/19/17 14:40
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	**0.48**		0.10	0.013	ug/L			08/01/17 23:34	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/01/17 23:34	1
trans-1,2-Dichloroethene	**0.40**		0.20	0.025	ug/L			08/01/17 23:34	1
cis-1,2-Dichloroethene	**1.3**	**J B ***	2.0	0.025	ug/L			08/01/17 23:34	1
Trichloroethene	**0.17**	**J**	0.20	0.025	ug/L			08/01/17 23:34	1
Tetrachloroethene	ND		0.50	0.070	ug/L			08/01/17 23:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*75 - 125*		*08/01/17 23:34*	*1*
Trifluorotoluene (Surr)	*101*		*74 - 118*		*08/01/17 23:34*	*1*
Dibromofluoromethane (Surr)	*101*		*42 - 132*		*08/01/17 23:34*	*1*
4-Bromofluorobenzene (Surr)	*100*		*81 - 120*		*08/01/17 23:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*46 - 150*		*08/01/17 23:34*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**99**		1.2	1.2	mg/L			07/20/17 12:54	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: MW-16-170719-W
Date Collected: 07/19/17 12:50
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	**0.29**		0.10	0.013	ug/L			08/01/17 23:58	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/01/17 23:58	1
trans-1,2-Dichloroethene	**0.077**	**J**	0.20	0.025	ug/L			08/01/17 23:58	1
cis-1,2-Dichloroethene	**1.0**	**J B ***	2.0	0.025	ug/L			08/01/17 23:58	1
Trichloroethene	**0.22**		0.20	0.025	ug/L			08/01/17 23:58	1
Tetrachloroethene	ND		0.50	0.070	ug/L			08/01/17 23:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*75 - 125*		*08/01/17 23:58*	*1*
Trifluorotoluene (Surr)	*99*		*74 - 118*		*08/01/17 23:58*	*1*
Dibromofluoromethane (Surr)	*100*		*42 - 132*		*08/01/17 23:58*	*1*
4-Bromofluorobenzene (Surr)	*98*		*81 - 120*		*08/01/17 23:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*46 - 150*		*08/01/17 23:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**36**		1.2	1.2	mg/L			07/20/17 13:10	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: MW-18-170719-W
Date Collected: 07/19/17 13:35
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	**1.5**		0.10	0.013	ug/L			08/02/17 01:11	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/02/17 01:11	1
trans-1,2-Dichloroethene	**0.28**		0.20	0.025	ug/L			08/02/17 01:11	1
cis-1,2-Dichloroethene	**1.2**	**J B ***	2.0	0.025	ug/L			08/02/17 01:11	1
Trichloroethene	**0.12**	**J**	0.20	0.025	ug/L			08/02/17 01:11	1
Tetrachloroethene	ND		0.50	0.070	ug/L			08/02/17 01:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*75 - 125*		*08/02/17 01:11*	*1*
Trifluorotoluene (Surr)	*103*		*74 - 118*		*08/02/17 01:11*	*1*
Dibromofluoromethane (Surr)	*101*		*42 - 132*		*08/02/17 01:11*	*1*
4-Bromofluorobenzene (Surr)	*98*		*81 - 120*		*08/02/17 01:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*46 - 150*		*08/02/17 01:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**87**	**F1**	1.2	1.2	mg/L			07/20/17 13:26	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: MW-19-170719-W
Date Collected: 07/19/17 11:55
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	**0.56**		0.10	0.013	ug/L			08/02/17 00:22	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/02/17 00:22	1
trans-1,2-Dichloroethene	ND		0.20	0.025	ug/L			08/02/17 00:22	1
cis-1,2-Dichloroethene	**0.95**	**J B ***	2.0	0.025	ug/L			08/02/17 00:22	1
Trichloroethene	**1.3**		0.20	0.025	ug/L			08/02/17 00:22	1
Tetrachloroethene	**0.12**	**J**	0.50	0.070	ug/L			08/02/17 00:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*75 - 125*		*08/02/17 00:22*	*1*
Trifluorotoluene (Surr)	*100*		*74 - 118*		*08/02/17 00:22*	*1*
Dibromofluoromethane (Surr)	*99*		*42 - 132*		*08/02/17 00:22*	*1*
4-Bromofluorobenzene (Surr)	*99*		*81 - 120*		*08/02/17 00:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*46 - 150*		*08/02/17 00:22*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**25**		1.2	1.2	mg/L			07/20/17 14:13	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: DUP-170719
Date Collected: 07/19/17 12:00
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	**0.44**		0.10	0.013	ug/L			08/02/17 00:47	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/02/17 00:47	1
trans-1,2-Dichloroethene	ND		0.20	0.025	ug/L			08/02/17 00:47	1
cis-1,2-Dichloroethene	**0.88**	**J B ***	2.0	0.025	ug/L			08/02/17 00:47	1
Trichloroethene	**1.4**		0.20	0.025	ug/L			08/02/17 00:47	1
Tetrachloroethene	**0.11**	**J**	0.50	0.070	ug/L			08/02/17 00:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*75 - 125*		*08/02/17 00:47*	*1*
Trifluorotoluene (Surr)	*109*		*74 - 118*		*08/02/17 00:47*	*1*
Dibromofluoromethane (Surr)	*98*		*42 - 132*		*08/02/17 00:47*	*1*
4-Bromofluorobenzene (Surr)	*93*		*81 - 120*		*08/02/17 00:47*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*46 - 150*		*08/02/17 00:47*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**25**		1.2	1.2	mg/L			07/20/17 14:29	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: Trip Blank
Date Collected: 07/19/17 00:01
Date Received: 07/19/17 15:55

Lab Sample ID: 580-70043-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.10	0.013	ug/L			08/01/17 21:34	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/01/17 21:34	1
trans-1,2-Dichloroethene	ND		0.20	0.025	ug/L			08/01/17 21:34	1
cis-1,2-Dichloroethene	**1.3**	**J B ***	2.0	0.025	ug/L			08/01/17 21:34	1
Trichloroethene	ND		0.20	0.025	ug/L			08/01/17 21:34	1
Tetrachloroethene	ND		0.50	0.070	ug/L			08/01/17 21:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*75 - 125*		*08/01/17 21:34*	*1*
Trifluorotoluene (Surr)	*104*		*74 - 118*		*08/01/17 21:34*	*1*
Dibromofluoromethane (Surr)	*101*		*42 - 132*		*08/01/17 21:34*	*1*
4-Bromofluorobenzene (Surr)	*97*		*81 - 120*		*08/01/17 21:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*46 - 150*		*08/01/17 21:34*	*1*

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

Lab Sample ID: MB 580-252709/5
Matrix: Water
Analysis Batch: 252709

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.10	0.013	ug/L			08/01/17 19:57	1
1,1-Dichloroethene	ND		0.10	0.018	ug/L			08/01/17 19:57	1
trans-1,2-Dichloroethene	ND		0.20	0.025	ug/L			08/01/17 19:57	1
cis-1,2-Dichloroethene	1.88	J	2.0	0.025	ug/L			08/01/17 19:57	1
Trichloroethene	ND		0.20	0.025	ug/L			08/01/17 19:57	1
Tetrachloroethene	ND		0.50	0.070	ug/L			08/01/17 19:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*75 - 125*		*08/01/17 19:57*	*1*
Trifluorotoluene (Surr)	*102*		*74 - 118*		*08/01/17 19:57*	*1*
Dibromofluoromethane (Surr)	*101*		*42 - 132*		*08/01/17 19:57*	*1*
4-Bromofluorobenzene (Surr)	*100*		*81 - 120*		*08/01/17 19:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*46 - 150*		*08/01/17 19:57*	*1*

Lab Sample ID: LCS 580-252709/6
Matrix: Water
Analysis Batch: 252709

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	5.00	5.19		ug/L		104	59 - 140
1,1-Dichloroethene	5.00	5.00		ug/L		100	64 - 125
trans-1,2-Dichloroethene	5.00	5.35		ug/L		107	69 - 124
cis-1,2-Dichloroethene	5.00	6.95	*	ug/L		139	73 - 130
Trichloroethene	5.00	5.42		ug/L		108	72 - 123
Tetrachloroethene	5.00	5.34		ug/L		107	67 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*75 - 125*
Trifluorotoluene (Surr)	*100*		*74 - 118*
Dibromofluoromethane (Surr)	*102*		*42 - 132*
4-Bromofluorobenzene (Surr)	*98*		*81 - 120*
1,2-Dichloroethane-d4 (Surr)	*105*		*46 - 150*

Lab Sample ID: LCSD 580-252709/7
Matrix: Water
Analysis Batch: 252709

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
Vinyl chloride	5.00	5.48		ug/L		110	59 - 140	5	30
1,1-Dichloroethene	5.00	5.16		ug/L		103	64 - 125	3	28
trans-1,2-Dichloroethene	5.00	5.27		ug/L		105	69 - 124	2	27
cis-1,2-Dichloroethene	5.00	6.54	*	ug/L		131	73 - 130	6	20
Trichloroethene	5.00	5.43		ug/L		109	72 - 123	0	20
Tetrachloroethene	5.00	5.26		ug/L		105	67 - 123	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*96*		*75 - 125*

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

Lab Sample ID: LCSD 580-252709/7
Matrix: Water
Analysis Batch: 252709

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

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Trifluorotoluene (Surr)	*96*		*74 - 118*
Dibromofluoromethane (Surr)	*102*		*42 - 132*
4-Bromofluorobenzene (Surr)	*98*		*81 - 120*
1,2-Dichloroethane-d4 (Surr)	*104*		*46 - 150*

Lab Sample ID: 580-70043-3 MS
Matrix: Water
Analysis Batch: 252709

Client Sample ID: MW-18-170719-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	1.5		5.00	7.26		ug/L		115	59 - 140
1,1-Dichloroethene	ND		5.00	5.56		ug/L		111	64 - 125
trans-1,2-Dichloroethene	0.28		5.00	5.88		ug/L		112	69 - 124
cis-1,2-Dichloroethene	1.2	J B *	5.00	6.53		ug/L		107	73 - 130
Trichloroethene	0.12	J	5.00	5.64		ug/L		110	72 - 123
Tetrachloroethene	ND		5.00	5.42		ug/L		108	67 - 123

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*75 - 125*
Trifluorotoluene (Surr)	*95*		*74 - 118*
Dibromofluoromethane (Surr)	*102*		*42 - 132*
4-Bromofluorobenzene (Surr)	*100*		*81 - 120*
1,2-Dichloroethane-d4 (Surr)	*107*		*46 - 150*

Lab Sample ID: 580-70043-3 MSD
Matrix: Water
Analysis Batch: 252709

Client Sample ID: MW-18-170719-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	1.5		5.00	6.33		ug/L		97	59 - 140	14	35
1,1-Dichloroethene	ND		5.00	5.19		ug/L		104	64 - 125	7	35
trans-1,2-Dichloroethene	0.28		5.00	5.48		ug/L		104	69 - 124	7	35
cis-1,2-Dichloroethene	1.2	J B *	5.00	6.22		ug/L		101	73 - 130	5	35
Trichloroethene	0.12	J	5.00	5.46		ug/L		107	72 - 123	3	35
Tetrachloroethene	ND		5.00	5.25		ug/L		105	67 - 123	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*75 - 125*
Trifluorotoluene (Surr)	*101*		*74 - 118*
Dibromofluoromethane (Surr)	*102*		*42 - 132*
4-Bromofluorobenzene (Surr)	*97*		*81 - 120*
1,2-Dichloroethane-d4 (Surr)	*106*		*46 - 150*

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-251802/3
Matrix: Water
Analysis Batch: 251802

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

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.2	1.2	mg/L			07/20/17 12:22	1

Lab Sample ID: LCS 580-251802/4
Matrix: Water
Analysis Batch: 251802

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			50.0	50.5		mg/L		101	90 - 110		

Lab Sample ID: 580-70043-3 MS
Matrix: Water
Analysis Batch: 251802

Client Sample ID: MW-18-170719-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	87	F1	50.0	132	F1	mg/L		89	90 - 110		

Lab Sample ID: 580-70043-3 MSD
Matrix: Water
Analysis Batch: 251802

Client Sample ID: MW-18-170719-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	87	F1	50.0	132	F1	mg/L		89	90 - 110	0	15

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Client Sample ID: MW-03-170719-W
Lab Sample ID: 580-70043-1
Date Collected: 07/19/17 14:40
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/01/17 23:34	W1T	TAL SEA
Total/NA	Analysis	300.0		1	251802	07/20/17 12:54	MMM	TAL SEA

Client Sample ID: MW-16-170719-W
Lab Sample ID: 580-70043-2
Date Collected: 07/19/17 12:50
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/01/17 23:58	W1T	TAL SEA
Total/NA	Analysis	300.0		1	251802	07/20/17 13:10	MMM	TAL SEA

Client Sample ID: MW-18-170719-W
Lab Sample ID: 580-70043-3
Date Collected: 07/19/17 13:35
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/02/17 01:11	W1T	TAL SEA
Total/NA	Analysis	300.0		1	251802	07/20/17 13:26	MMM	TAL SEA

Client Sample ID: MW-19-170719-W
Lab Sample ID: 580-70043-4
Date Collected: 07/19/17 11:55
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/02/17 00:22	W1T	TAL SEA
Total/NA	Analysis	300.0		1	251802	07/20/17 14:13	MMM	TAL SEA

Client Sample ID: DUP-170719
Lab Sample ID: 580-70043-5
Date Collected: 07/19/17 12:00
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/02/17 00:47	W1T	TAL SEA
Total/NA	Analysis	300.0		1	251802	07/20/17 14:29	MMM	TAL SEA

Client Sample ID: Trip Blank
Lab Sample ID: 580-70043-6
Date Collected: 07/19/17 00:01
Matrix: Water
Date Received: 07/19/17 15:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	252709	08/01/17 21:34	W1T	TAL SEA

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Laboratory References:

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

Accreditation/Certification Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Laboratory: 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	02-17-18

Analysis Method	Prep Method	Matrix	Analyte

Sample Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)/0415-049-07

TestAmerica Job ID: 580-70043-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-70043-1	MW-03-170719-W	Water	07/19/17 14:40	07/19/17 15:55
580-70043-2	MW-16-170719-W	Water	07/19/17 12:50	07/19/17 15:55
580-70043-3	MW-18-170719-W	Water	07/19/17 13:35	07/19/17 15:55
580-70043-4	MW-19-170719-W	Water	07/19/17 11:55	07/19/17 15:55
580-70043-5	DUP-170719	Water	07/19/17 12:00	07/19/17 15:55
580-70043-6	Trip Blank	Water	07/19/17 00:01	07/19/17 15:55

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: GeoEngineers	Client Contact: Nick Rohrbach	Date: 7/19/17	Chain of Custody Number: 31314
Address: 1101 S. Fawcett Ave #200	Telephone Number (Area Code)/Fax Number: 253-383-4940	Lab Number: ~~7003~~ 70043	Page 1 of 1
City: Tacoma; State: WA; Zip Code:	Sampler: Paul Robinette	Lab Contact:	
Project Name and Location (State):	Billing Contact:		
Contract/Purchase Order/Quote No.: GEI # 0415-049-07			

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	VOC 8260*	Sulfate	Special Instructions/ Conditions of Receipt
-1	MW-03-170719-W	7/19/17	1440		X			1			3			X	X	*Reporting limits,
-2	MW-16-170719-W		1250		X			1			3			X	X	Analyte list, QA/QC
-3	MW-18-170719-W		1335		X			1			3			X	X	to be achieved see
	MW-18-170719-MS		1337		X			~~1~~			3			X	~~X~~	Table B-4 on monitoring
	MW-18-170719-MSD		1339		X						3			X		Plan
	MW-18-170719-MS/MSD		1337		X			1							X	
-4	MW-19-170719-W		1155		X			1			3			X	X	
-5	DUP-170719		1200		X			1			3			X	X	
-6	Trip Blank													X		

TB A2 Cooler ___ Cor 19.4 Unc 20.2
Cooler Dsc Med Bjw @Lab
Wet/Packs Packing bubble
Cl: do w/o

580-70043 Chain of Custody

Cooler: ☐ Yes ☐ No Cooler Temp: ______

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ... Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other STD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By Sign/Print: [signature] Paul Robinette	7/19/17	355	1. Received By Sign/Print: B. Hall B. Gall SEA TP	7/19/1	1555
2. Relinquished By Sign/Print			2. Received By Sign/Print		
3. Relinquished By Sign/Print			3. Received By Sign/Print		

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 580-70043-1

Login Number: 70043
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
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.	N/A	
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").	False	Refer to Job Narrative for details.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B
Data Quality Assessment Summary

GeoEngineers

1101 Fawcett Avenue, Suite 200, Tacoma, Washington 98402, Telephone: 253.383.4940, Fax: 253.383.4923 www.geoengineers.com

Data Validation Report

Project: City of Olympia – 318 NE State Avenue Site
Eleventh Semi-annual Groundwater Monitoring, July 2017

GEI File No: 0415-049-07

Date: October 19, 2017

This report documents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2A data validation (USEPA Document 540-R-08-005; USEPA 2009) of analytical data from the analyses of groundwater samples collected as part of the eleventh semi-annual groundwater monitoring sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the 318 NE State Avenue Property located in Olympia, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008) and Inorganic Superfund Data Review (USEPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Groundwater Compliance Monitoring Plan (GeoEngineers 2015), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method and Trip Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Field Duplicates

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery group (SDG) listed below in Table 1.

TABLE 1. SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
580-70043-1	MW-03-170719-W, MW-16-170719-W, MW-18-170719-W, MW-19-170719-W, DUP-170719, Trip Blank

CHEMICAL ANALYSIS PERFORMED

TestAmerica Laboratories, Inc. (TestAmerica), located in Tacoma, Washington, performed laboratory analysis on the groundwater samples using the following methods:

- Volatile Organic Compounds (VOCs) by Method SW8260C; and
- Sulfate Anions by Method EPA300.0

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

TestAmerica provided all required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and all identified anomalies were discussed in the relevant laboratory case narrative.

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COC was accurate and complete when submitted to the laboratory, with the following exceptions:

SDG 580-70043-1: The laboratory noted that the sample collection time for the MS and MSD samples did not match the parent, Sample MW-18-170719-W. The laboratory logged the samples with the sample collection time for Sample MW-18-170719-W at 13:35.

The laboratory noted that for Sample MW-19-170719-W the sample collection time was listed as 11:56 on the sample vial label and as 11:55 on the COC. The laboratory logged the sample with the sample collection time listed on the COC.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for all analyses. The sample cooler arrived at the laboratory outside the appropriate temperatures of between two and six degrees Celsius. The out-of-compliance sample cooler temperature is detailed below.

SDG 580-70043-1: The sample cooler temperature recorded at the laboratory was 19.4 degrees Celsius. It was determined through professional judgment, that since the samples were collected the same day they were received by the laboratory, this temperature should not affect the sample analytical results.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. All surrogate percent recoveries for field samples were within the laboratory control limits.

Method and Trip Blanks

Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For all sample batches, method blanks for all applicable methods were analyzed at the required frequency. None of the analytes of interest were detected in the method blank, with the following exception:

SDG 580-70043-1: (VOCs) There was a positive result for cis-1,2-Dichloroethene detected above the method detection limit, but below reporting limit in the method blank analyzed on 8/1/2017. The positive results for cis-1,2-Dichloroethene were qualified as non-detected (U) in Samples MW-03-170719-W, MW-16-170719-W, MW-18-170719-W, MW-19-170719-W, DUP-170719, and Trip Blank.

Trip Blanks

Trip blanks are analyzed to assess whether field sampling or sample transport processes may have introduced measurable concentrations of volatile analytes of interest into project samples. None of the analytes of interest were detected in the trip blank, with the following exception:

SDG 580-70043-1: (VOCs) There was a positive result for cis-1,2-Dichloroethene detected above the method detection limit, but below reporting limit in the trip blank. The positive result for this target analyte was qualified as non-detected due to method blank contamination; therefore, no action was required.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits, with the following exception:

SDG 580-70043-1: (Sulfate) The laboratory performed an MS/MSD sample set on Sample MW-18-170719-W. The percent recovery for sulfate was less than the control limits in the MS/MSD analyzed on 7/20/2017. The positive result for sulfate was qualified as estimated (J) in Sample MW-18-170719-W.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits, with the following exception:

SDG 580-70043-1: (VOCs) The percent recovery for cis-1,2-Dichloroethene was greater than the control limits in the LCS/LCSD analyzed on 8/1/2017. The positive results for cis-1,2-Dichloroethene in the associated field samples were qualified as non-detected due to method blank contamination; therefore, no action was required.

Field Duplicates

In order to assess precision, a field duplicate sample was collected and analyzed along with the reviewed sample batches. The duplicate sample was analyzed for the same parameters as the associated parent sample. Precision is determined by calculating the RPD of sample concentrations between each pair of samples. If one or more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for water samples is 30 percent.

SDG 580-70043-1: One field duplicate sample pair, MW-19-170719-W and DUP-170719, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair, with the exception of vinyl chloride. The positive results for this target analyte were qualified as estimated (J) in this sample pair.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD percent recovery values, with the exceptions noted above. Precision was acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and field duplicate RPD values, with the exception noted above.

The data are acceptable for the intended use, with the following qualifications listed below in Table 2.

TABLE 2. SUMMARY OF QUALIFIED SAMPLES

Sample ID	Analyte	Qualifier	Reason
MW-03-170719-W	cis-1,2-Dichloroethene	U	Method Blank Contamination
MW-16-170719-W	cis-1,2-Dichloroethene	U	Method Blank Contamination
MW-18-170719-W	cis-1,2-Dichloroethene Sulfate	U J	Method Blank Contamination MS/MSD Recovery
MW-19-170719-W	cis-1,2-Dichloroethene Vinyl chloride	U J	Method Blank Contamination Field Duplicate RPD
DUP-170719	cis-1,2-Dichloroethene Vinyl chloride	U J	Method Blank Contamination Field Duplicate RPD
Trip Blank	cis-1,2-Dichloroethene	U	Method Blank Contamination

REFERENCES

U.S. Environmental Protection Agency (USEPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (USEPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (USEPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.

GeoEngineers, Inc. "Groundwater Compliance Monitoring Plan," prepared for City of Olympia. October 1, 2015.