Groundwater Compliance Monitoring Data Summary Report – February 2014

318 State Avenue NE Property
Olympia, Washington

for
City of Olympia

April 17, 2014

GeoEngineers
Earth Science + Technology

Groundwater Compliance Monitoring Data Summary Report – February 2014

318 State Avenue NE Property
Olympia, Washington

for
City of Olympia

April 17, 2014

GeoEngineers

1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Groundwater Compliance Monitoring
Data Summary Report – February 2014

318 State Avenue NE Property
Olympia, Washington

File No. 0415-049-06

April 17, 2014

Prepared for:

City of Olympia
P.O. Box 1967
Olympia, Washington 98507-1967

Attention: Danelle MacEwen

Prepared by:

GeoEngineers, Inc.
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Nick E. Rohrbach
Project Manager, Environmental Scientist

Iain H. Wingard
Associate, Environmental Scientist

NER:IHW:ch

GeoEngineers

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

INTRODUCTION

This data summary report presents the results of groundwater compliance monitoring performed by the City of Olympia (City) in February 2014 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 Property under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP).

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 (CMP) for the Property (GeoEngineers, 2010a).

Groundwater samples were collected on February 27, 2014 from three monitoring wells that included MW-03, MW-16 and MW-18 (Figure 2). These samples were submitted for analysis to TestAmerica Laboratories of Fife, Washington. Groundwater samples and groundwater levels were collected from selected monitoring wells at the site in accordance with the CMP for the Property (GeoEngineers, 2010a).

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 assess if soil and fill with contaminant concentrations greater than cleanup levels were present at the limits of the remedial excavation. 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 concentrations are compared to the MTCA groundwater CULs for unrestricted land use (ULU). 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.
- 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 site through February 2012. Groundwater level measurements were reduced to the five monitoring wells undergoing groundwater sampling and analysis (i.e., MW-03, MW-08 and MW-16 through MW-18) for the monitoring events performed from August 2012 through February 2014.

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 (Table 1). 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 concurrence for discontinuing arsenic analysis was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers 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 or

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 indicate that benzene is not present at concentrations greater than the MTCA Method A CUL (Table 1). 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 (Table 1). 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 (Table 1, Figures 4 through 8). 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 (Table 1). 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.

FIELD ACTIVITIES

Groundwater compliance monitoring samples were collected in February 2014 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 an YSI Professional Plus water quality meter with a flow-through cell. The measured water quality parameters included electrical conductivity, dissolved oxygen, pH, turbidity, ORP and temperature. 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 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 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 evaluated 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 groundwater sample collection and analysis performed in February 2014 are summarized in the following sections. Table 1 summarizes the results for the chemical analyses performed as part of groundwater compliance monitoring in February 2014. Table 1 also includes the results from groundwater compliance monitoring performed in: May, August and November 2010; February, May, August and November 2011; August and February 2012; August and February 2013 for comparison purposes. Table 2 summarizes water quality and natural attenuation parameter measurements collected in February 2014 and also includes the results from: May, August and November 2010; February, May, August and November 2011; August and February 2012; August and February 2013 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 February 2014.

Groundwater Compliance Monitoring Analyses

Natural Attenuation Parameters

The geochemical indicators of natural attenuation measured in February 2014 are generally similar to the February 2012 and February 2013 compliance events which indicate more oxidative conditions in groundwater downgradient of soil remediation area CSZ 1 (Table 2). The more oxidative conditions are indicated by generally higher sulfate and ORP concentrations and lower ferrous iron concentrations in groundwater collected from monitoring wells MW-03, MW-16 and MW-18.

The more oxidative conditions measured downgradient of the soil remediation area CSZ 1 are likely related to seasonal groundwater conditions in February resulting from increased precipitation and associated increase in stormwater infiltration on and around the Property. The Olympia area received approximately 8 inches of precipitation in February 2014 with approximately 6 inches occurring during the 10 days prior to the sampling event and after an extended dry period between December 2013 and January 2014. Oxidative conditions are generally more favorable for degradation of vinyl chloride.

Chlorinated Organic Solvents and Associated Degradation Products

TCE, cis-DCE, trans-DCE and VC were detected in groundwater samples collected from monitoring wells MW-03 and MW-18 and TCE and VC from MW-16 in February 2014 (Table 1). The detected concentrations of TCE, cis-DCE and trans-DCE at the Property continue to be well below the MTCA groundwater CULs.

VC was detected less than the MTCA Method A CUL in groundwater from monitoring well MW-16. VC was detected in the groundwater samples collected from monitoring wells MW-03 and MW-18 during the February 2014 sampling event at a concentrations greater than the MTCA Method A CUL (Table 1 and Figure 3).

DISCUSSION

Natural Attenuation of Chlorinated Solvents and Associated Degradation Products in Groundwater

Soil remedial actions were performed at CSZ 1 in September and October 2009 to remove material with chemical concentrations greater than soil cleanup levels that was a source of chlorinated compounds in groundwater. Prior to remedial actions for soil, TCE and VC were detected at concentrations greater than CULs in groundwater. VC was detected in groundwater at concentrations greater than the CUL in seven wells present at the Property prior to completion of the remedial actions for soil. VC is the remaining chlorinated compound present in groundwater at the Property at a concentration greater than CULs. VC was detected in groundwater at two locations at a concentration greater than the CUL in February 2014.

Continued temporal analysis of the detected concentrations of chlorinated compounds present in groundwater at the Property was performed to assess trends in chlorinated compound concentrations. The detected chlorinated compound concentrations plotted through time are presented in Figures 4 through 6. 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 remedial. 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. The following summarizes the results of the trend analysis:

- MW-03 – Monitoring well MW-03 is located downgradient/crossgradient of soil remedial action area CSZ 1 (Figure 3). The concentrations of chlorinated compounds including VC in groundwater from MW-03 decreased after completion of soil remedial actions at CSZ 1 in the sample collected in May 2010 (Figure 4 and Table 1). The concentrations of chlorinated compounds have fluctuated (i.e., increased and decreased) in groundwater at MW-03 between August 2010 and February 2014. Increases in chlorinated compound concentrations between August 2010 and February 2014 are likely related to higher groundwater levels. Higher concentrations of chlorinated compounds in groundwater at MW-03 are generally present when groundwater levels are highest in November and February, including February 2014 (Figure 5 and Tables 1 and 2). The VC concentration in groundwater at MW-03 in February 2014 was similar to the concentration during the February 2013 monitoring event and greater than the MTCA Method A CUL.
- MW-16 – Monitoring well MW-16 is located downgradient of soil remedial action area CSZ 1 (Figure 3). The concentration of VC in groundwater from MW-16 decreased after completion of soil remedial actions at CSZ 1. VC was detected at MW-16 at concentrations less than the MTCA Method A CUL during the May 2011, November 2011, February 2012 and February 2013 monitoring events (Figure 5 and Table 1). VC was again detected at a concentration less than the MTCA Method A CUL during the February 2014 monitoring event. The concentrations of VC, TCE, cis-DCE and trans-DCE continue to trend down at MW-16. The concentrations of TCE, cis-DCE and trans-DCE continue to be an order of magnitude less than the MTCA CULs.
- MW-18 – Monitoring well MW-18 is located downgradient of soil remedial action area CSZ 1 (Figure 3). The concentration of VC in groundwater from MW-18 decreased between May 2010 and February 2011 after completion of soil remedial actions at CSZ 1 (Figure 6 and Table 1). The VC concentrations in groundwater at monitoring well MW-18 have fluctuated between May 2010 and August 2013. The concentration of VC decreased to less than the MTCA Method A CUL for the first time during the February 2013 monitoring event. The VC concentration at monitoring well MW-18 increased during the August 2013 compliance event which is most likely attributed to residual VC concentrations migrating from the upgradient monitoring well location MW-03. During the February 2014 compliance monitoring event the concentration of VC decreased from the August 2013 event but continues to be above the MTCA Method A CUL. The concentrations of TCE, cis-DCE and trans-DCE at MW-18 remain less than the MTCA CULs for these compounds.

Overview of Groundwater Compliance Monitoring Results

The results of groundwater compliance monitoring indicate that natural attenuation of chlorinated solvents and associated degradation products generally continue to occur at the Property. The concentrations of VC in groundwater also continue to trend downward in portions of the Property. The observed concentrations of PCE and TCE and associated degradation products cis-DCE and

trans-DCE in groundwater samples collected from the Property remain well below the CULs for these compounds.

Two locations had VC concentrations greater than the MTCA Method A CUL in groundwater during the February 2014monitoring event (i.e., MW-03 and MW-18) (Figures 4 and 6 and Table 1). VC decreased in groundwater at MW-16 and MW-18, and increased at MW-03 during the February 2014 monitoring event.

Geochemical indicators of natural attenuation have fluctuated seasonally between reductive and oxidative conditions during compliance monitoring events performed at the Property. Oxidative conditions generally occur during the February timeframe and were generally present during the February 2014 compliance monitoring event. It is anticipated that reductive conditions will return during the summer and fall months of 2014. The groundwater conditions observed during the February 2014 event and previously observed at the Property (i.e., fluctuation between reductive and oxidative conditions) are anticipated to be favorable to the continued breakdown of chlorinated solvents and associated degradation products.

Future Groundwater Compliance Monitoring

The next round of semi-annual groundwater compliance monitoring is scheduled to be performed in August 2014. Groundwater compliance monitoring will be performed at groundwater monitoring wells MW-03, MW-16 and MW-18.

REFERENCES

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.

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 COMPLIANCE MONITORING PARAMETERS[1] - FEBRUARY 2014

318 STATE AVENUE NE

OLYMPIA, WASHINGTON

			Volatile Organic Compounds							Total Metals
		Analyte	**Tetrachloroethene**	**Trichloroethene**	**1,1-Dichloroethene**	**Cis-1,2-Dichloroethene**	**Trans-1,2-Dichloroethene**	**Vinyl Chloride**	**Benzene**	**Arsenic**
		Unit	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(mg/l)**
		MTCA Method A Cleanup Level	**5**	**5**	**4,000,000 [2]**	**800,000 [2]**	**1,600,000 [2]**	**0.2**	**5**	**0.005**
Location	**Sample ID**	**Sample Date**								
MW-13 [11]	MW13-052510-W	05/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA	**0.0041 J**
	MW13-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.058 J**
	MW13-112210-W	11/22/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.0004 UJ
	MW13-022211-W	02/22/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0012**
MW-04 [11]	MW4-052510-W	05/25/10	0.1 U	**0.28**	0.1 U	**0.11**	0.1 U	**0.12**	NA	**0.0045 J**
	MW4-082410-W	08/24/10	0.1 U	**0.14**	0.1 U	**0.14**	0.1 U	**0.074**	0.1 U	**0.0051 J**
	MW4-112210-W	11/22/10	0.1 U	**0.34**	0.1 U	0.1 U	0.1 U	**0.065**	0.1 U	**0.00067 J**
	MW4-022211-W	02/22/11	0.1 U	**0.25**	0.1 U	0.1 U	0.1 U	**0.053**	0.1 U	**0.0023**
MW-17 [14]	MW17-052410-W	05/24/10	0.1 UJ	**0.26 J**	0.1 UJ	0.1 UJ	0.1 UJ	**0.084 J**	**0.17 J**	**0.0031 J**
	MW17-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	**0.11**	0.1 U	**0.025**	0.1 U	0.002 UJ
	MW17-112210-W	11/22/10	0.1 U	**0.22**	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0016 J**
	MW17-022211-W	02/22/11	0.1 U	**0.18**	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0012**
	MW17-052511-W	05/25/11	**0.1**	**0.21**	0.1 U	0.1 U	0.1 U	**0.02**	NA[12]	NA[12]
	MW17-082411-W	08/24/11	0.1 U	**0.18**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-112911-W	11/29/11	0.1 U	**0.12**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-022812-W	02/28/12	0.1 U	**0.10**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-082312-W	08/23/12	0.1 U	**0.14**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-022813-W	02/28/13	0.1 U	0.1U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.020 U	NA[12]	NA[12]
MW-09 [11]	MW9-052510-W	05/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA	**0.0016 J**
	MW9-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.002 UJ
	MW9-112210-W	11/22/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.0004 UJ
	MW9-022211-W	02/22/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.00059**
MW-03 [14]	MW3-052410-W	05/24/10	0.1 U	**0.48**	0.1 U	**0.14**	0.1 U	**0.48**	0.1 U	**0.002 J**
	MW3-082510-W	08/25/10	0.1 U	**0.26**	0.1 U	**0.11**	0.1 U	**0.12**	0.1 U	0.002 UJ
	MW3-112410-W	11/24/10	0.1 U	**1.3**	0.1 U	**0.28**	0.1 U	**1.1**	0.1 U	0.0004 UJ
	MW3-022311-W	02/23/11	0.1 U	**1.6**	0.1 U	**0.59**	0.1 U	**0.92**	0.1 U	**0.0010**
	MW3-052511-W	05/25/11	0.1 U	**1.5**	0.1 U	**0.6**	**0.15**	**0.83**	NA[12]	NA[12]
	DUP-052511-W[7]	05/25/11	0.1 U	**1.2**	0.1 U	**0.36**	**0.12**	**0.69**	NA[12]	NA[12]
	MW3-082411-W	08/24/11	0.1 U	**0.64 J**	0.1 U	**0.31**	**0.11**	**0.37 J**	NA[12]	NA[12]
	DUP-082411-W[8]	08/24/11	0.1 U	**0.49 J**	0.1 U	**0.23**	0.1 U	**0.27 J**	NA[12]	NA[12]
	MW3-112911-W	11/29/11	0.1 U	**2.6**	0.1 U	**0.39**	**0.11**	**0.45**	NA[12]	NA[12]
	DUP-112911-W[9]	11/29/11	0.1 U	**2.7**	0.1 U	**0.41**	**0.10**	**0.52**	NA[12]	NA[12]
	MW3-022812-W	02/28/12	0.1 U	**0.99**	0.1 U	**0.63**	**0.18**	**1.4**	NA[12]	NA[12]
	DUP-022812-W[10]	02/28/12	0.1 U	**1.3**	0.1 U	**0.84**	**0.19**	**1.9**	NA[12]	NA[12]
	MW3-082312-W	08/23/12	0.1 U	**0.11**	0.1 U	**0.36**	**0.3**	**0.27**	NA[12]	NA[12]
	DUP-082312-W[13]	08/23/12	0.1 U	**0.11**	0.1 U	**0.34**	**0.33**	**0.26**	NA[12]	NA[12]
	MW3-022813-W	02/28/13	0.1 U	**0.70**	0.1 U	**0.34**	**0.14**	**0.72**	NA[12]	NA[12]
	DUP-022813-W[15]	02/28/13	0.1 U	**0.68**	0.1 U	**0.32**	**0.12**	**0.69**	NA[12]	NA[12]
	MW03-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	**0.24**	**0.28**	**0.15**	NA[12]	NA[12]
	DUP01-82213-W[16]	08/22/13	0.1 U	0.1 U	0.1 U	**0.23**	**0.32**	**0.16**	NA[12]	NA[12]
	MW3-140227-W	02/27/14	0.1 U	**2.5**	0.10 U	**0.75**	**0.12**	**0.79**	NA[12]	NA[12]

			Volatile Organic Compounds							Total Metals
		Analyte	Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Vinyl Chloride	Benzene	Arsenic
		Unit	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)
		MTCA Method A Cleanup Level	5	5	4,000,000 [2]	800,000 [2]	1,600,000 [2]	0.2	5	0.005
MW-08 [14]	MW8-052410-W	05/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.21**	0.1 U	**0.0027 J**
	DUP-1-052410-W[3]	05/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.23**	0.1 U	**0.0027 J**
	MW8-082510-W	08/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.29**	0.1 U	**0.0045 J**
	DUP-1-082510-W[4]	08/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.29**	0.1 U	**0.0045 J**
	MW8-112410-W	11/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.066**	0.1 U	0.0004 UJ
	MW8-022311-W	02/23/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0019**
	MW8-052511-W	05/25/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.04**	NA[12]	NA[12]
	MW8-082411-W	08/24/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.21**	NA[12]	NA[12]
	MW08-112911-W	11/29/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW08-022812-W	02/28/12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW08-082312-W	08/23/12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.13**	NA[12]	NA[12]
	MW08-022813-W	02/28/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02U	NA[12]	NA[12]
	MW8-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.10**	NA[12]	NA[12]
MW-16 [14]	MW16-052410-W	05/24/10	0.1 U	**0.44**	0.1 U	**0.2**	**0.18**	**0.76**	0.1 U	**0.0019 J**
	MW16-082510-W	08/25/10	0.1 U	**0.46**	0.1 U	**0.32**	**0.34**	**1.0**	**0.12**	0.002 UJ
	MW16-112410-W	11/24/10	0.1 U	**0.49**	0.1 U	**0.17**	**0.19**	**0.33**	0.1 U	**0.0013 J**
	DUP-1-112410-W[5]	11/24/10	0.1 U	**0.50**	0.1 U	**0.16**	**0.21**	**0.38**	0.1 U	0.0004 UJ
	MW16-022311-W	02/23/11	0.1 U	**0.42**	0.1 U	**0.13**	**0.13**	**0.22**	0.1 U	**0.0014**
	DUP-1-022311-W[6]	02/23/11	0.1 U	**0.43**	0.1 U	**0.11**	**0.15**	**0.23**	0.1 U	**0.0015**
	MW16-052511-W	05/25/11	0.1 U	**0.47**	0.1 U	0.1 U	**0.16**	**0.18**	NA[12]	NA[12]
	MW16-082411-W	08/24/11	0.1 U	**0.41**	0.1 U	**0.26**	**0.24**	**0.70**	NA[12]	NA[12]
	MW16-112911-W	11/29/11	0.1 U	**0.35**	0.1 U	**0.10**	**0.12**	**0.15**	NA[12]	NA[12]
	MW16-022812-W	02/28/12	0.1 U	**0.40**	0.1 U	0.1 U	**0.13**	**0.17**	NA[12]	NA[12]
	MW16-082312-W	08/23/12	0.1 U	**0.52**	0.1 U	**0.21**	**0.2**	**0.47**	NA[12]	NA[12]
	MW16-022813-W	02/28/13	0.1 U	**0.28**	0.1 U	0.1 U	0.1 U	**0.086**	NA[12]	NA[12]
	MW16-82213-W	08/22/13	0.1 U	**0.26**	0.1 U	**0.22**	**0.13**	**0.44**	NA[12]	NA[12]
	MW16-140227-W	02/27/14	0.1 U	**0.24**	0.1 U	0.1 U	0.1 U	**0.093**	NA[12]	NA[12]
	DUP01-140227-W[17]	02/27/14	0.1 U	**0.26**	0.1 U	0.1 U	0.1 U	**0.090**	NA[12]	NA[12]
MW-18 [14]	MW18-052410-W	05/24/10	0.1 U	**0.62**	0.1 U	**0.28**	**0.16**	**2.3**	**0.2**	**0.0038 J**
	MW18-082510-W	08/25/10	0.1 U	**0.25**	0.1 U	**0.22**	**0.13**	**1.9**	**0.19**	**0.0028 J**
	MW18-112410-W	11/24/10	0.1 U	**0.81**	0.1 U	**0.34**	**0.23**	**1.7**	**0.11**	**0.0032 J**
	MW18-022311-W	02/23/11	0.1 U	**0.72**	0.1 U	**0.3**	**0.16**	**0.9**	0.1 U	**0.0045**
	MW18-052511-W	05/25/11	0.1 U	**0.63**	0.1 U	**0.21**	**0.14**	**1.2**	NA[12]	NA[12]
	MW18-082411-W	08/24/11	0.1 U	**0.4**	0.1 U	**0.39**	**0.24**	**2.3**	NA[12]	NA[12]
	MW18-112911-W	11/29/11	0.1 U	**0.57**	0.1 U	**0.30**	**0.15**	**0.86**	NA[12]	NA[12]
	MW18-022812-W	02/28/12	0.1 U	**0.49**	0.1 U	**0.20**	**0.16**	**1.20**	NA[12]	NA[12]
	MW18-082312-W	08/23/12	0.1 U	**0.62**	0.1 U	**0.43**	**0.29**	**2.7**	NA[12]	NA[12]
	MW18-022813-W	02/28/13	0.1 U	**0.34**	0.1 U	0.1U	0.1U	**0.15**	NA[12]	NA[12]
	MW18-82213-W	08/22/13	0.1 U	**0.61**	0.1 U	**0.45**	**0.28**	**2.1**	NA[12]	NA[12]
	MW18-140227-W	02/27/14	0.1 U	**0.57**	0.1 U	**0.26**	**0.26**	**1.3**	NA[12]	NA[12]

Notes:

[1] The parameters presented are the groundwater compliance monitoring parameters specified in the Groundwater Compliance Monitoring Plan (GeoEngineers 2010) and benzene as requested by Ecology in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated July 19, 2010. Analysis for benzene and arsenic were discontinued as benzene was never detected at a concentration greater than cleanup levels and arsenic concentrations are less than cleanup levels and appear to be associated with regional conditions. Ecology concurrence for discontinuing benzene and arsenic analysis was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[2] A MTCA Method A groundwater cleanup level has not been established; therefore, the MTCA Method B groundwater cleanup level has been provided.

[3] Sample DUP-1-052410-W is a field duplicate of sample MW8-052410-W.

[4] Sample DUP-1-082510-W is a field duplicate of sample MW8-082510-W.

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

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

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

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

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

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

[11] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater samples were not collected during the current monitoring event. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[12] See Footnote 1.

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

[14] Groundwater sampling and analysis frequency at this monitoring well location has been reduced from quarterly monitoring to semi-annual monitoring. Concurrence for reducing the sampling and analysis frequency at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 8, 2012.

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

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

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

Green shading indicates sample results for the current monitoring event.

MTCA = Model Toxics Control Act

µg/l = microgram per liter

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

NA = Not analyzed

mg/l = milligram per liter

J = The analyte concentration is estimated

NC = Not Collected

Bold indicates analyte was detected

Gray shading indicates concentration is greater than cleanup level

TABLE 2

SUMMARY OF GROUNDWATER QUALITY PARAMETERS[1] - FEBRUARY 2014

318 STATE AVENUE NE
OLYMPIA, WASHINGTON

Location ID	Sample Date	Ferrous Iron (mg/l)	Sulfate (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (uS/m)	Salinity (%)	Total Dissolved Solids (g/l)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)	Water Level (ft btoc)
MW-13 [3]	05/25/10	2.2	6.0	1.23	8.34	156,000	0.1	1	4.74	14.4	-97	2.91
	08/24/10	3.8	1.6	2.21	6.58	999,000	0	0.72	4.16	21.07	-115	3.82
	11/22/10	1.2	8.1	0.98	6.63	400,000	0	0.26	8.97	14.79	6	2.24
	02/22/11	1.0	6.3	0.81	6.56	407,000	0	0.26	0.8	11.12	-43	2.62
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.85
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.61
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.04
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.30
MW-04 [3]	05/25/10	4.5	6.7	1.34	7.34	59,500	0	0.38	0.99	13.9	-80	3.29
	08/24/10	3.6	1.2 U	0.72	6.15	645,000	0	0.41	1.82	21.12	-75	4.23
	11/22/10	3.8	3.8	1.97	6.52	371,000	0	0.24	1.8	12.64	-57	2.61
	02/22/11	2.2	2.6	0.99	6.56	255,000	0	0.17	1.08	10.11	-70	2.95
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.15
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.11
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.41
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.54
MW-17 [6]	05/24/10	0.0	31	1.78	7	45,700	0	0.3	2.49	13.5	-23	3.83
	08/24/10	0.0	28	0.58	7.04	999,000	0	0.79	9.03	21.5	54	4.53
	11/22/10	0.2	28	0.00	7.16	509,000	0	0.33	10.5	15.64	39	3.32
	02/22/11	0.0	36	0.39	6.78	364,000	0	0.24	7.2	11.39	73	3.62
	05/25/11	0.0	23	0.28	6.65	404,000	NC	NC	5.49	12.48	114	3.67
	08/24/11	0.0	11.9	0.40	6.99	549,000	0	0.35	3.54	19.28	239	4.41
	11/29/11	0.0	28	4.80	6.96	33,800	0	0.22	64.7	13.88	192	3.08
	02/28/12	0.0	58 UJ	6.90	6.91	28,100	0	0.18	132	10.49	200	3.31
	08/23/12	0.0	3.7	0.15	6.5	40,100	0	0.25	2.92	18.3	82	4.47
	02/28/13	0.0	7.2	4.10	6.17	39,500	0	0.26	26.8	10.46	195	3.50
	08/22/13	0.0	6.2	0.20	7.14	34,000	0	0.23	7.1	19.9	-200	4.54
	02/27/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.07
MW-09 [3]	05/25/10	1.6	9.1	1.22	8.8	99,900	0	0.6	0.96	14.8	-157	3.65
	08/24/10	2.2	1.2 U	0.99	6.74	1,450,000	0.1	0.9	1.48	23.16	-89	4.44
	11/22/10	0.4	1.9	1.32	7.01	447,000	0	0.29	1.99	15.08	-76	2.92
	02/22/11	0.4	1.7	0.15	7.06	472,000	0	0.31	0	12.73	-114	3.35
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.42
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.31
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.60
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.98

Location ID	Sample Date	Ferrous Iron (mg/l)	Sulfate (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (uS/m)	Salinity (%)	Total Dissolved Solids (g/l)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)	Water Level (ft btoc)
MW-03 [4]	05/24/10	0.9	7.5	4.38	9.79	272,000	0.1	1.4	0.89	16.2	-211	4.27
	08/25/10	1.4	1.2 U	0.31	6.96	750,000	0	0.48	0.94	21.32	-133	4.99
	11/24/10	0.8	6.6	0.00	7.04	667,000	0	0.43	0.84	15.53	-94	3.80
	02/23/11	0.6	2.5	0.01	7.10	463,000	0	0.3	2.51	11.26	-117	4.05
	05/25/11	0.8	2.4	0.01	7.07	467,000	NC	NC	0.59	15.12	-130	4.10
	08/24/11	1.1	1 U	0.40	7.20	723,000	0	0.46	0.44	21.02	-90	4.82
	11/29/11	0.6	11	5.00	7.10	59,000	0	0.38	3.06	13.67	89	3.49
	02/28/12	0.8	40 UJ	2.60	7.25	41,500	0	0.27	5.45	10.99	-59	3.75
	08/23/12	1.0	1.2 U	7.14	6.87	53,000	0	0.34	0.59	21.3	-117	4.92
	02/28/13	1.5	2.1	0.78	6.53	48,000	0	0.31	17.6	11.52	-48	3.98
	08/22/13	1.6	1.2 U	0.10	7.61	61,700	0	0.40	37.4 [5]	23.2	-156	4.98
	02/27/14	0.0	11	3.80	7.30	332,000	0	0.31	0.63	10.3	204.4	3.44
MW-08 [6]	05/24/10	0.3	10.0	1.30	8.45	245,000	0.1	1.6	0.73	14.9	-145	3.45
	08/25/10	3.0	2.5	0.11	7.06	692,000	0	0.44	1.25	21.68	-155	4.50
	11/24/10	0.6	17	2.33	7.21	546,000	0	0.35	1.24	15.08	-67	3.14
	02/23/11	0.0	7.9	2.04	7.27	332,000	0	0.22	4.98	11.59	-37	3.51
	05/25/11	0.0	8.4	0.73	7.16	374,000	NC	NC	1.02	13.85	37	3.59
	08/24/11	1.4	1.6	0.30	7.25	686,000	0	0.44	0.61	20.04	-117	4.39
	11/29/11	1.6	8.9	6.60	7.20	32,500	0	0.21	2.75	12.81	69	2.82
	02/28/12	0.0	47 UJ	8.20	7.37	29,300	0	0.19	18.6	10.26	33	3.21
	08/23/12	0.0	1.7	0.33	6.40	49,900	0	0.33	9.2	19.5	-99	4.39
	02/28/13	0.0	8.1	8.50	6.55	35,700	0	0.23	21.7	11.08	175	3.32
	08/22/13	7.5	2.1	1.86	7.61	56,500	0	0.36	59.5 [5]	23.1	-203	4.39
	02/27/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.77
MW-16 [4]	05/24/10	0.0	20.0	2.44	8.19	26,600	0	0.17	2.9	15.1	-116	4.24
	08/25/10	0.4	42.0	0.04	7.26	698,000	0	0.44	1.2	21.91	-106	5.02
	11/24/10	0.0	28	1.93	7.54	498,000	0	0.36	1.16	15.42	-34	3.68
	02/23/11	0.0	17	5.08	7.53	375,000	0	0.24	2.58	11.53	-9	4.04
	05/25/11	0.0	11	1.02	7.55	331,000	NC	NC	2.28	13.87	64	4.06
	08/24/11	1.2	4.9	1.00	7.66	510,000	0	0.33	1.28	20.26	-56	4.86
	11/29/11	0.4	19	6.20	7.60	35,300	0	0.23	4.00	13.82	96	3.33
	02/28/12	0.0	54 UJ	6.80	7.70	29,800	0	0.19	1.87	10.89	87	3.72
	08/23/12	0.0	3.9	3.21	7.02	31,400	0	0.2	1.22	19.7	-109	4.91
	02/28/13	0.0	7.7	5.86	6.84	29,400	0	0.19	0.40	11.36	115	3.86
	08/22/13	0.0	3.5	0.11	7.93	46,500	0	0.3	62 [5]	22.9	-177	4.91
	02/27/14	0.0	7.3	2.61	7.24	236,000	0	0.21	0.31	10.9	206.2	3.33
MW-18 [4]	05/24/10	0.0	34.0	3.92	9.16	90,000	0	0.5	1.9	14.3	-194	4.39
	08/25/10	0.2	11.0	0.00	6.81	719,000	0	0.46	4.12	21.82	-75	5.09
	11/24/10	0.0	38	0.01	7.11	479,000	0	0.31	0.61	15.52	39	3.87
	02/23/11	0.0	23	0.17	7.22	403,000	0	0.26	0.99	11.7	55	4.15
	05/25/11	0.0	17	0.00	7.15	408,000	NC	NC	1.07	12.8	31	4.21
	08/24/11	0.2	18.5	0.50	7.33	741,000	0	0.47	0.48	19.54	-48	4.97
	11/29/11	0.4	23	3.50	6.81	34,300	0	0.22	2.82	13.18	183	3.53
	02/28/12	0.0	67 UJ	8.20	7.21	32,900	0	0.21	1.56	10.33	93	3.87
	08/23/12	1.0	7.5	4.03	7.08	53,400	0	0.34	3	18.2	-110	5.02
	02/28/13	0.0	7.4	5.68	6.05	21,100	0	0.14	7	10.94	182	4.02
	08/22/13	1.1	4.1	1.90	7.72	59,300	0	0.38	54.8 [5]	20.9	-153	5.04
	02/27/14	0.0	11	3.00	7.1	222,000	0	0.2	0.48	10.6	201.3	3.52

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] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater quality parameters were not collected during the current monitoring event. However, the water level was collected to monitor the groundwater gradient. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[4] Groundwater sampling and analysis frequency at this monitoring well location has been reduced from quarterly monitoring to semi-annual monitoring. Concurrence for reducing the sampling and analysis frequency at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 8, 2012.

[5] 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.

[6] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater quality parameters were not collected during the current monitoring event. However, the water level was collected to monitor the groundwater gradient. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated November 4, 2013.

ORP = Oxidation/reduction potential

mg/l = milligrams per liter

g/l = grams per liter

% = percent

mv = Millivolts

uS/m = microSiemens per meter

C = Celsius

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

NTU = nephelometric turbidity unit

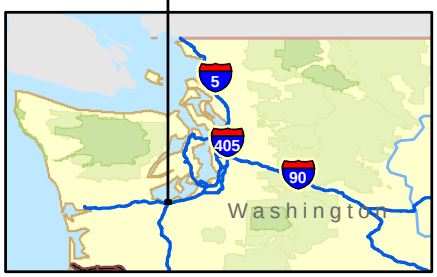
NC = Not Collected

Green shading indicates sample results for current quarter of monitoring.

ft btoc = feet below the top of monitoring well casing

J = Analyte concentration is estimated.

NS = Not Sampled. Monitoring well location no longer a part of compliance monitoring program. See Footnote 3.



N
W E
S

2,000 0 2,000

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. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: 2008 Shaded Relief from ESRI, 2008 Topographic Maps from National Geographic Society
Projection: NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Datum: D_North_American_1983

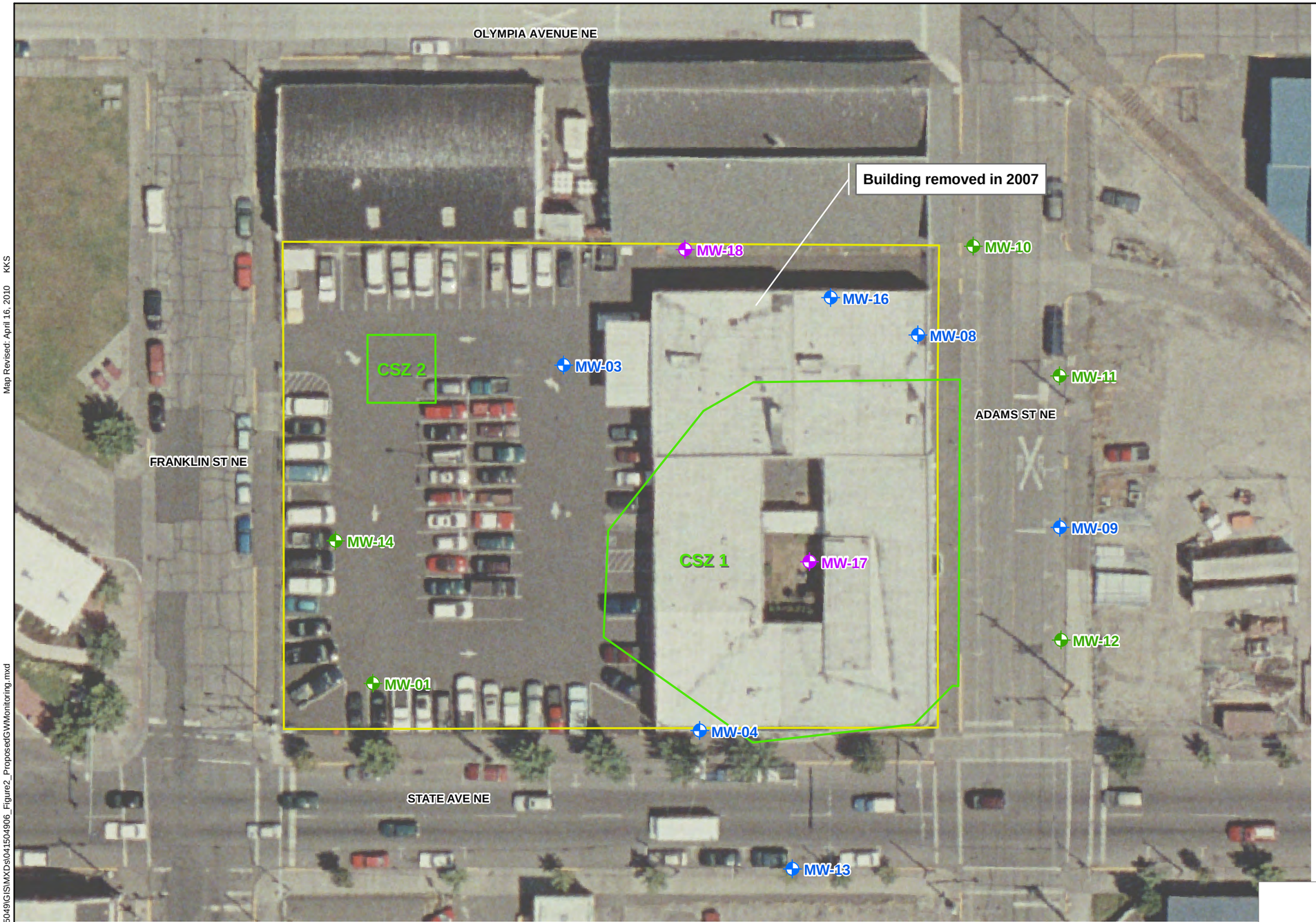
Vicinity Map

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 1

Office: TAC Path: \P:\0\0415049\GIS\MXDs\041504906_Figure1_VicinityMap.mxd Map Revised: April 13, 2010 KKS



Legend

- Approximate Property Boundary
- MW-04 — Existing Monitoring Well to be Sampled for Groundwater Analysis
- MW-17 — New Monitoring Well to be Sampled for Groundwater Analysis
- MW-01 — Existing Monitoring Well to be Used to Monitor Groundwater Gradients
- CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009

N W E S

40 0 40
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 (2003) from Thurston County Data Center. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

Groundwater Compliance Monitoring Locations

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 2

Map Revised: April 16, 2010 KKS

Path: P:\0\04150491\GIS\MXDs\041504906_Figure2_ProposedGWMonitoring.mxd

Office: TAC

Legend

- MW-03 — Monitoring Well Sampled for Groundwater Analysis and used to Monitor Groundwater levels
- MW-01 — Existing Monitoring Well Previously Sampled for Groundwater Analysis and to Monitor Groundwater levels
- Vinyl Chloride at concentrations greater than MTCA Method A (0.2 ug/L)
- CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009
- Approximate Property Boundary

Well	Event	Result
MW-3		
Vinyl Chloride	March-14	0.79 ug/L
MW-18		
Vinyl Chloride	March-14	1.3 ug/L

N
W E
S

40 0 40
Feet

Notes:
1. MTCA = Model Toxics Control Act, ug/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 2013 from ESRI. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

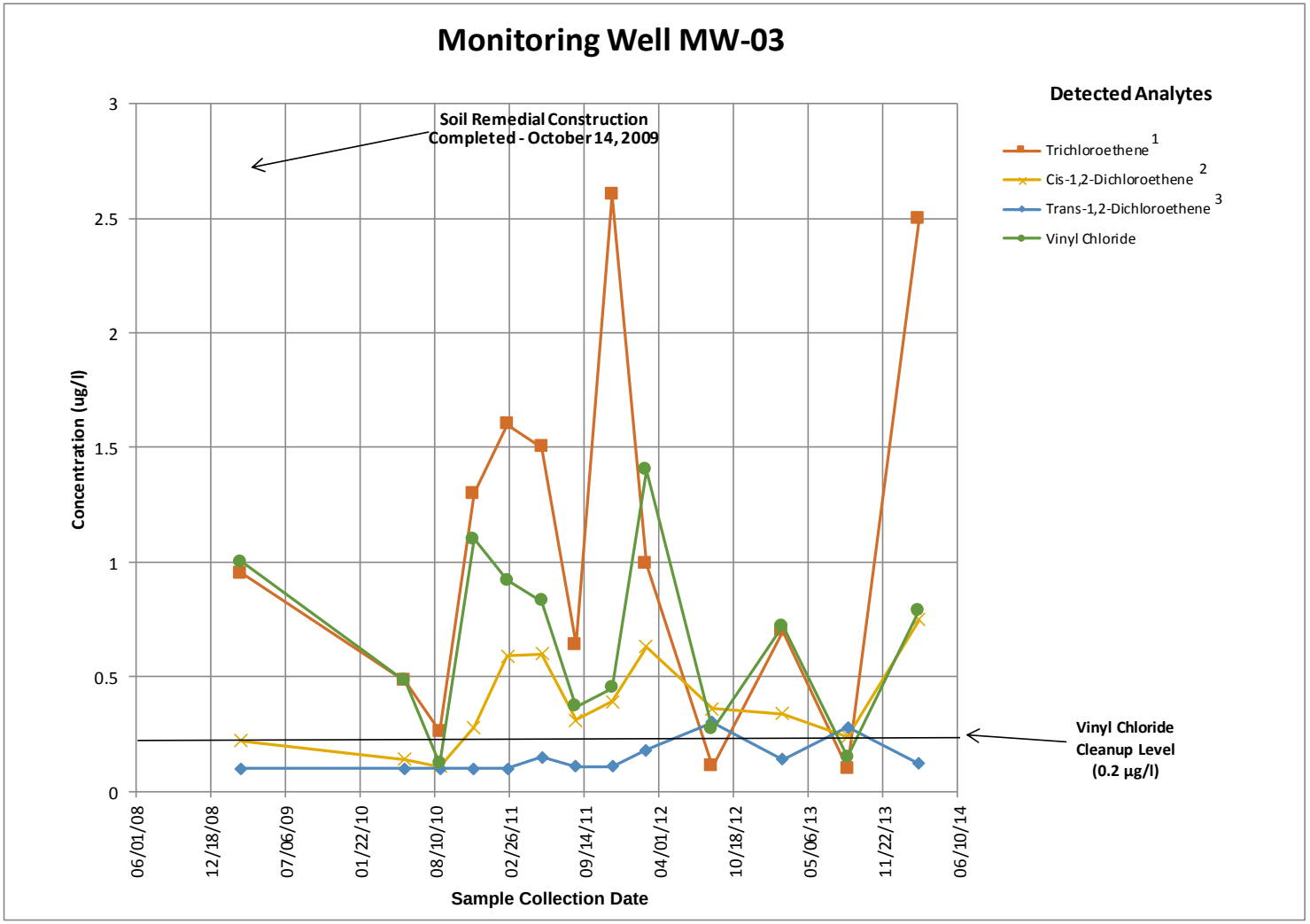
Chemical Analytical Results Exceeding Groundwater Compliance Criteria

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 3

Office: TAC Path: \\TAC\projects\0\04150\49\GIS\MXDs\041504906_F3_CHEM_EXCEEDANCES_Mar2014.mxd Map Revised: 27 March 2014 cgonzales



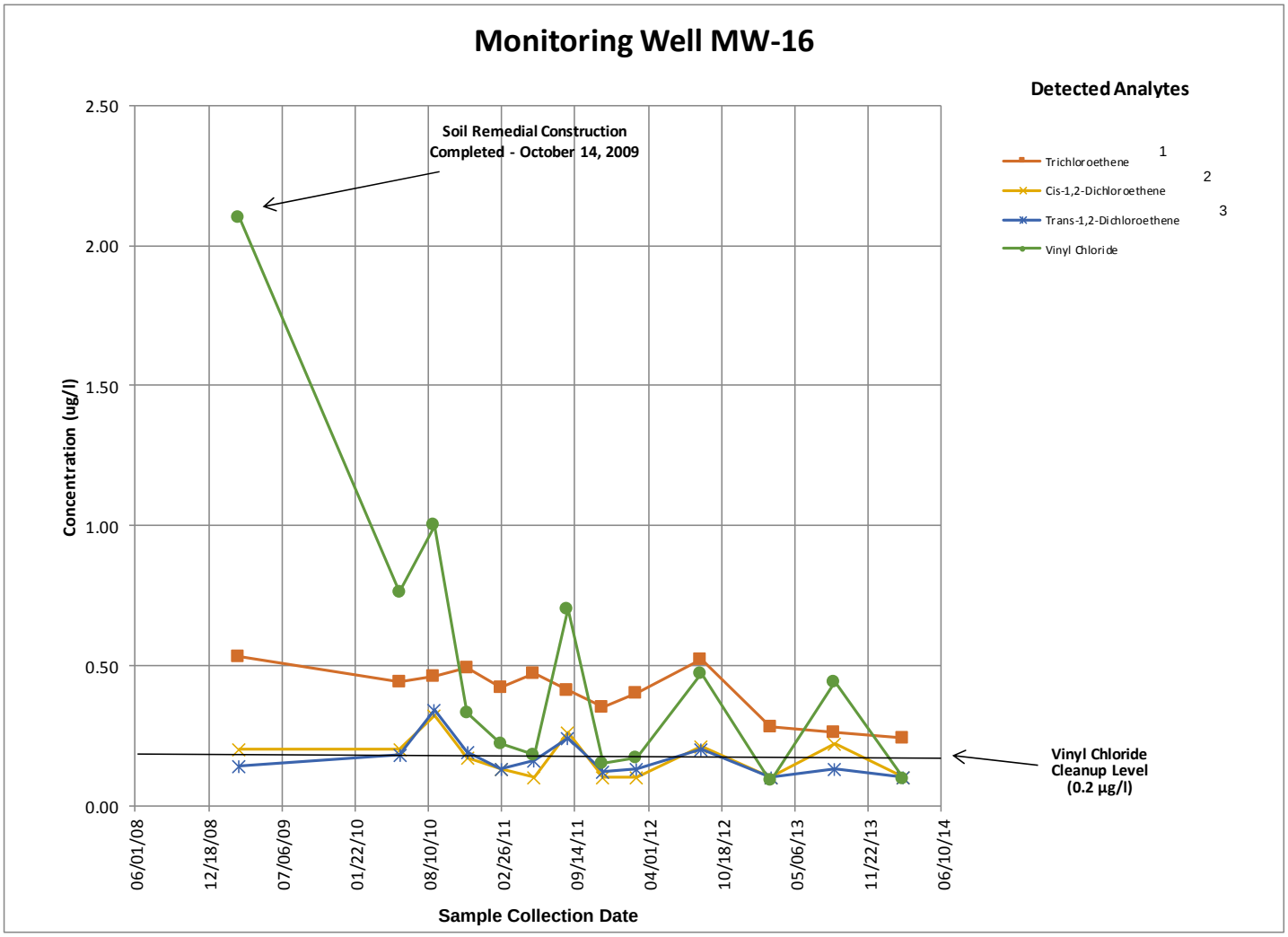
Notes:
[1] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[2] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the Cis-DCE cleanup level of 800,000 µg/l.
[3] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – February 2014

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 4



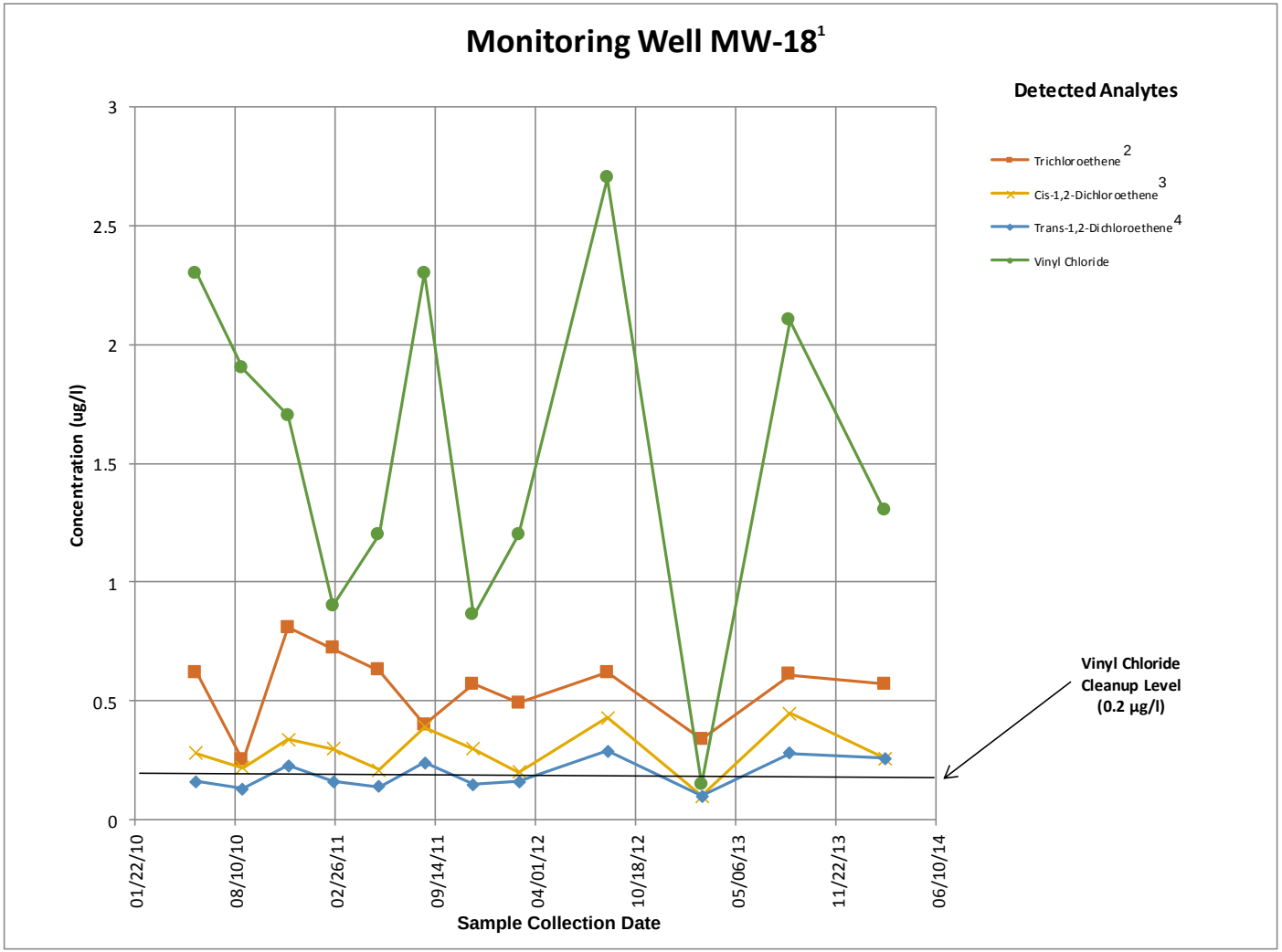
Notes:
[1] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[2] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the Cis-DCE cleanup level of 800,000 µg/l.
[3] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – February 2014

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] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[3] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the cis-DCE cleanup level of 800,000 µg/l.
[4] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – February 2014

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 6

APPENDIX A
Laboratory Reports

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 580-42527-1

Job Description: 318 State AVE NE (WA)

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

Attention: Mr. Iain Wingard

Approved for release.
Melissa A Armstrong
Project Manager II
3/13/2014 3:44 PM

Melissa A Armstrong, Project Manager II
5755 8th Street East, Tacoma, WA, 98424
(253)922-2310 x135
melissa.armstrong@testamericainc.com
03/13/2014

cc: Nick Rohrbach

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.

Table of Contents

Table of Contents

CASE NARRATIVE

Client: GeoEngineers Inc
Project: 318 State AVE NE (WA)
Report Number: 580-42527-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

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

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/27/2014 3:25 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.5º C.

Except:
The chain of custody (COC) lists sample 3 as separate samples for matrix spike (MS) and matrix spike dup (MSD) with separate times for each sample. Logged in for one sample with ID of MW18-140227-W with time of 1335 and MS/MSD assigned to sample: MW18-140227-W (580-42527-3).

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS) LOW LEVEL
Samples MW16-140227-W (580-42527-1), MW3-140227-W (580-42527-2), MW18-140227-W (580-42527-3), DUP01-140227-W (580-42527-4) and TRIP BLANK (580-42527-5) were analyzed for volatile organic compounds (GC-MS) low level in accordance with EPA SW-846 8260B. The samples were analyzed on 03/10/2014.

No difficulties were encountered during the volatile organic compounds (GC-MS) low level analysis.

All quality control parameters were within the acceptance limits.

ANIONS
Samples MW16-140227-W (580-42527-1), MW3-140227-W (580-42527-2), MW18-140227-W (580-42527-3) and DUP01-140227-W (580-42527-4) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 03/12/2014.

No difficulties were encountered during the anions analysis.

All quality control parameters were within the acceptance limits.

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Instrument ID: SEA015 Analysis Batch Number: 154612

Lab Sample ID: STD00002 580-154612/3 IC Client Sample ID:

Date Analyzed: 03/05/14 10:24 Lab File ID: I0341266.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Tetrachloroethene	3.54	Peak Not Integrated	bogatayj	03/06/14 13:46
1,2-Dichloroethane		Unspecified		
1,3-Dichlorobenzene		Unspecified		
4-Isopropyltoluene		Unspecified		
Acrolein		Unspecified		
Acrylonitrile		Unspecified		
Bromomethane		Unspecified		
Chloroethane		Unspecified		
Chloromethane		Unspecified		
Methyl tert-butyl ether		Unspecified		
n-Hexane		Unspecified		

Lab Sample ID: STD0001 580-154612/4 IC Client Sample ID:

Date Analyzed: 03/05/14 10:49 Lab File ID: I0341267.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Vinyl chloride	0.96	Peak Not Integrated	bogatayj	03/06/14 13:51
Chlorobenzene	3.89	Peak Not Integrated	bogatayj	03/06/14 13:51
1,2,3-Trichloropropane	4.45	Peak Not Integrated	bogatayj	03/06/14 13:51
Chloroethane		Unspecified		

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Instrument ID: SEA015 Analysis Batch Number: 154612

Lab Sample ID: STD0002 580-154612/5 IC Client Sample ID:

Date Analyzed: 03/05/14 11:13 Lab File ID: I0341268.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Butanone	2.27	Peak Not Integrated	bogatayj	03/06/14 13:53
2-Hexanone	3.57	Peak Not Integrated	bogatayj	03/06/14 13:53
1,2-Dibromoethane	3.70	Peak Not Integrated	bogatayj	03/06/14 13:53
1,1,1,2-Tetrachloroethane	3.92	Peak Not Integrated	bogatayj	03/06/14 13:53
trans-1,4-Dichloro-2-butene	4.45	Peak Not Integrated	bogatayj	03/06/14 13:53

SAMPLE SUMMARY

Client: GeoEngineers Inc

Job Number: 580-42527-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
580-42527-1	MW16-140227-W	Water	02/27/2014 1130	02/27/2014 1525
580-42527-2	MW3-140227-W	Water	02/27/2014 1250	02/27/2014 1525
580-42527-3	MW18-140227-W	Water	02/27/2014 1335	02/27/2014 1525
580-42527-3MS	MW18-140227-W	Water	02/27/2014 1335	02/27/2014 1525
580-42527-3MSD	MW18-140227-W	Water	02/27/2014 1335	02/27/2014 1525
580-42527-4	DUP01-140227-W	Water	02/27/2014 1200	02/27/2014 1525
580-42527-5	TRIP BLANK	Water	02/27/2014 0000	02/27/2014 1525

METHOD SUMMARY

Client: GeoEngineers Inc

Job Number: 580-42527-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL SEA	SW846 8260B	
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.

Client: GeoEngineers Inc

Job Number: 580-42527-1

Client Sample ID: **MW16-140227-W**

Lab Sample ID: 580-42527-1
Client Matrix: Water

Date Sampled: 02/27/2014 1130
Date Received: 02/27/2014 1525

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-154844	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0341363.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 1127			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 1127				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	0.24		0.10	0.10
Vinyl chloride	0.093		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Trifluorotoluene (Surr)	117		80 - 125
Toluene-d8 (Surr)	97		75 - 125
Dibromofluoromethane (Surr)	100		85 - 115
1,2-Dichloroethane-d4 (Surr)	107		70 - 120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Client Sample ID: **MW3-140227-W**

Lab Sample ID: 580-42527-2
Client Matrix: Water

Date Sampled: 02/27/2014 1250
Date Received: 02/27/2014 1525

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-154844	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0341364.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 1151			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 1151				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.75		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.12		0.10	0.10
Trichloroethene	2.5		0.10	0.10
Vinyl chloride	0.79		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Trifluorotoluene (Surr)	110		80 - 125
Toluene-d8 (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	101		85 - 115
1,2-Dichloroethane-d4 (Surr)	109		70 - 120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Client Sample ID: **MW18-140227-W**

Lab Sample ID: 580-42527-3
Client Matrix: Water

Date Sampled: 02/27/2014 1335
Date Received: 02/27/2014 1525

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-154844	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0341365.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 1215			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 1215				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.26		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.26		0.10	0.10
Trichloroethene	0.57		0.10	0.10
Vinyl chloride	1.3		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Trifluorotoluene (Surr)	119		80 - 125
Toluene-d8 (Surr)	97		75 - 125
Dibromofluoromethane (Surr)	98		85 - 115
1,2-Dichloroethane-d4 (Surr)	109		70 - 120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Client Sample ID: **DUP01-140227-W**

Lab Sample ID: 580-42527-4
Client Matrix: Water

Date Sampled: 02/27/2014 1200
Date Received: 02/27/2014 1525

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-154844	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0341366.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 1240			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 1240				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	0.26		0.10	0.10
Vinyl chloride	0.090		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Trifluorotoluene (Surr)	124		80 - 125
Toluene-d8 (Surr)	99		75 - 125
Dibromofluoromethane (Surr)	99		85 - 115
1,2-Dichloroethane-d4 (Surr)	110		70 - 120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Client Sample ID: **TRIP BLANK**

Lab Sample ID: 580-42527-5
Client Matrix: Water

Date Sampled: 02/27/2014 0000
Date Received: 02/27/2014 1525

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-154844	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0341362.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 1102			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 1102				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	ND		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	102		75 - 120
Trifluorotoluene (Surr)	105		80 - 125
Toluene-d8 (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	102		85 - 115
1,2-Dichloroethane-d4 (Surr)	107		70 - 120

General Chemistry

Client Sample ID: **MW16-140227-W**

Lab Sample ID: 580-42527-1 Date Sampled: 02/27/2014 1130

Client Matrix: Water Date Received: 02/27/2014 1525

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	7.3		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-155074 Analysis Date: 03/12/2014 1014

General Chemistry

Client Sample ID: **MW3-140227-W**

Lab Sample ID: 580-42527-2 Date Sampled: 02/27/2014 1250

Client Matrix: Water Date Received: 02/27/2014 1525

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	11		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-155074 Analysis Date: 03/12/2014 1028

General Chemistry

Client Sample ID: **MW18-140227-W**

Lab Sample ID: 580-42527-3 Date Sampled: 02/27/2014 1335

Client Matrix: Water Date Received: 02/27/2014 1525

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	11		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-155074 Analysis Date: 03/12/2014 1043

General Chemistry

Client Sample ID: **DUP01-140227-W**

Lab Sample ID: 580-42527-4 Date Sampled: 02/27/2014 1200

Client Matrix: Water Date Received: 02/27/2014 1525

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	7.4		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-155074 Analysis Date: 03/12/2014 1140

Client: GeoEngineers Inc

Job Number: 580-42527-1

Surrogate Recovery Report

8260B Volatile Organic Compounds (GC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	DBFM %Rec	DCA %Rec	TFT %Rec	TOL %Rec	BFB %Rec
580-42527-1	MW16-140227-W	100	107	117	97	96
580-42527-2	MW3-140227-W	101	109	110	100	97
580-42527-3	MW18-140227-W	98	109	119	97	96
580-42527-4	DUP01-140227-W	99	110	124	99	96
580-42527-5	TRIP BLANK	102	107	105	100	102
MB 580-154844/6		103	109	112	101	97
LCS 580-154844/7		103	108	109	100	102
LCSD 580-154844/8		104	110	108	102	104
580-42527-3 MS	MW18-140227-W MS	101	107	110	99	103
580-42527-3 MSD	MW18-140227-W MSD	99	107	108	102	102

Surrogate	Acceptance Limits
DBFM = Dibromofluoromethane (Surr)	85-115
DCA = 1,2-Dichloroethane-d4 (Surr)	70-120
TFT = Trifluorotoluene (Surr)	80-125
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	75-120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Method Blank - Batch: 580-154844

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 580-154844/6	Analysis Batch:	580-154844	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0341353.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 0721	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 0721				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	ND		0.020	0.020

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	97	75 - 120
Trifluorotoluene (Surr)	112	80 - 125
Toluene-d8 (Surr)	101	75 - 125
Dibromofluoromethane (Surr)	103	85 - 115
1,2-Dichloroethane-d4 (Surr)	109	70 - 120

Client: GeoEngineers Inc

Job Number: 580-42527-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 580-154844

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-154844/7	Analysis Batch:	580-154844	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0341354.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 0745	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 0745				10 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-154844/8	Analysis Batch:	580-154844	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0341355.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 0810	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 0810				10 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
cis-1,2-Dichloroethene	106	107	80 - 130	1	20		
1,1-Dichloroethene	121	119	70 - 150	2	20		
Tetrachloroethene	86	98	40 - 180	12	20		
trans-1,2-Dichloroethene	117	117	80 - 140	0	20		
Trichloroethene	108	113	80 - 130	5	20		
Vinyl chloride	113	114	65 - 140	2	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	102	104	75 - 120
Trifluorotoluene (Surr)	109	108	80 - 125
Toluene-d8 (Surr)	100	102	75 - 125
Dibromofluoromethane (Surr)	103	104	85 - 115
1,2-Dichloroethane-d4 (Surr)	108	110	70 - 120

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-154844

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-154844/7	Units:	ug/L	LCSD Lab Sample ID:	LCSD 580-154844/8
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	03/10/2014 0745			Analysis Date:	03/10/2014 0810
Prep Date:	03/10/2014 0745			Prep Date:	03/10/2014 0810
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
cis-1,2-Dichloroethene	5.00	5.00	5.32	5.36
1,1-Dichloroethene	5.00	5.00	6.03	5.93
Tetrachloroethene	5.00	5.00	4.31	4.88
trans-1,2-Dichloroethene	5.00	5.00	5.86	5.86
Trichloroethene	5.00	5.00	5.39	5.67
Vinyl chloride	5.00	5.00	5.63	5.72

Client: GeoEngineers Inc

Job Number: 580-42527-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-154844

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	580-42527-3	Analysis Batch:	580-154844	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0341356.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 0835			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 0835				10 mL
Leach Date:	N/A				

MSD Lab Sample ID:	580-42527-3	Analysis Batch:	580-154844	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0341357.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	03/10/2014 0859			Final Weight/Volume:	10 mL
Prep Date:	03/10/2014 0859				10 mL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
cis-1,2-Dichloroethene	106	103	71 - 144	3	20		
1,1-Dichloroethene	118	115	78 - 151	2	30		
Tetrachloroethene	67	65	64 - 161	2	20		
trans-1,2-Dichloroethene	113	108	73 - 135	4	20		
Trichloroethene	106	107	79 - 131	0	30		
Vinyl chloride	114	107	47 - 160	5	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	103	102	75 - 120
Trifluorotoluene (Surr)	110	108	80 - 125
Toluene-d8 (Surr)	99	102	75 - 125
Dibromofluoromethane (Surr)	101	99	85 - 115
1,2-Dichloroethane-d4 (Surr)	107	107	70 - 120

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-154844

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	580-42527-3	Units:	ug/L	MSD Lab Sample ID:	580-42527-3
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	03/10/2014 0835			Analysis Date:	03/10/2014 0859
Prep Date:	03/10/2014 0835			Prep Date:	03/10/2014 0859
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
cis-1,2-Dichloroethene	0.26	5.00	5.00	5.58	5.40
1,1-Dichloroethene	ND	5.00	5.00	5.88	5.77
Tetrachloroethene	ND	5.00	5.00	3.33	3.26
trans-1,2-Dichloroethene	0.26	5.00	5.00	5.90	5.65
Trichloroethene	0.57	5.00	5.00	5.88	5.90
Vinyl chloride	1.3	5.00	5.00	6.97	6.62

Client: GeoEngineers Inc

Job Number: 580-42527-1

Method Blank - Batch: 580-155074

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 580-155074/3	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	13.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 0748	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/
Lab Control Sample Duplicate Recovery Report - Batch: 580-155074

Method: 300.0
Preparation: N/A

LCS Lab Sample ID:	LCS 580-155074/4	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	14.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 0803	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-155074/5	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	15.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 0817	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Sulfate	102	103	90 - 110	1	15		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-155074

Method: 300.0
Preparation: N/A

LCS Lab Sample ID:	LCS 580-155074/4	Units:	mg/L	LCSD Lab Sample ID:	LCSD 580-155074/5
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	03/12/2014 0803			Analysis Date:	03/12/2014 0817
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Sulfate	12.0	12.0	12.3	12.4

Client: GeoEngineers Inc

Job Number: 580-42527-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-155074

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-42527-3	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	26.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 1111			Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

MSD Lab Sample ID:	580-42527-3	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	27.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 1126			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	96	97	90 - 110	0	15		

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-155074

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-42527-3	Units:	mg/L	MSD Lab Sample ID:	580-42527-3
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	03/12/2014 1111			Analysis Date:	03/12/2014 1126
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	11	12.0	12.0	22.8	22.9

Duplicate - Batch: 580-155074

Method: 300.0
Preparation: N/A

Lab Sample ID:	580-42527-3	Analysis Batch:	580-155074	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	25.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	03/12/2014 1057	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Sulfate	11	11.2	0.4	10	

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

Client: GeoEngineers Inc

Job Number: 580-42527-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:580-154844					
LCS 580-154844/7	Lab Control Sample	T	Water	8260B	
LCSD 580-154844/8	Lab Control Sample Duplicate	T	Water	8260B	
MB 580-154844/6	Method Blank	T	Water	8260B	
580-42527-1	MW16-140227-W	T	Water	8260B	
580-42527-2	MW3-140227-W	T	Water	8260B	
580-42527-3	MW18-140227-W	T	Water	8260B	
580-42527-3MS	Matrix Spike	T	Water	8260B	
580-42527-3MSD	Matrix Spike Duplicate	T	Water	8260B	
580-42527-4	DUP01-140227-W	T	Water	8260B	
580-42527-5	TRIP BLANK	T	Water	8260B	

Report Basis

T = Total

General Chemistry					
Analysis Batch:580-155074					
LCS 580-155074/4	Lab Control Sample	T	Water	300.0	
LCSD 580-155074/5	Lab Control Sample Duplicate	T	Water	300.0	
MB 580-155074/3	Method Blank	T	Water	300.0	
580-42527-1	MW16-140227-W	T	Water	300.0	
580-42527-2	MW3-140227-W	T	Water	300.0	
580-42527-3	MW18-140227-W	T	Water	300.0	
580-42527-3DU	Duplicate	T	Water	300.0	
580-42527-3MS	Matrix Spike	T	Water	300.0	
580-42527-3MSD	Matrix Spike Duplicate	T	Water	300.0	
580-42527-4	DUP01-140227-W	T	Water	300.0	

Report Basis

T = Total

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
IC-Custom-Std_00002	07/09/14	Environmental Express, Lot 1318404			(Purchased Reagent)		Sulfate	1200 mg/L
TAC044 CCV_00004	03/11/20	Accustandard, Lot 212125095+212115043			(Purchased Reagent)		Sulfate	37.5 mg/L
TAC044 LCS_00003	03/11/20	Environmental Express, Lot 1235623			(Purchased Reagent)		Sulfate	12 mg/L
V-SurTFTWk_00021	09/25/14	09/26/13	fisher MeOH, Lot 123279	200 mL	V-TFTStk_00020	800 uL	Trifluorotoluene (Surr)	39.984 mg/L
.V-TFTStk_00020	09/25/14	09/26/13	methanol, Lot 0000038701	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
VOARSURR/IS_00001	02/28/18	Restek, Lot A093508			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	150 ug/mL
							1,4-Dichlorobenzene-d4	250 ug/mL
							4-Bromofluorobenzene (Surr)	150 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Dibromofluoromethane (Surr)	150 ug/mL
							Fluorobenzene (IS)	250 ug/mL
							TBA-d9 (IS)	5000 ug/mL
							Toluene-d8 (Surr)	150 ug/mL
VOASECGAS2_00004	04/18/14	02/13/14	methanol, Lot 124454	1 mL	VOASGAS2__00001	25 uL	Vinyl chloride	50.0025 ug/mL
.VOASGAS2__00001	02/28/15	Restek, Lot A093618			(Purchased Reagent)		Vinyl chloride	2000.1 ug/mL
VOASECLIQ2_00011	07/06/14	03/04/14	methanol, Lot 0000049909	10 mL	VOASMegMix2__00004	250 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
.VOASMegMix2__00004	02/29/16	Restek, Lot A093733			(Purchased Reagent)		1,1-Dichloroethene	2000 mg/L
							cis-1,2-Dichloroethene	2000 mg/L
							Tetrachloroethene	2000 mg/L
							trans-1,2-Dichloroethene	2000 mg/L
							Trichloroethene	2000 mg/L
VOASTDACROLPT_00014	05/31/14	02/03/14	Methanol, Lot 0000038701	10 mL	VOARAcrolein_00006	600 uL	Acrolein	300 ug/mL
.VOARAcrolein_00006	05/31/14	Restek, Lot A0100485			(Purchased Reagent)		Acrolein	5000 ug/mL
VOASTDADDPT_00007	08/21/14	02/21/14	methanol, Lot 0000049909	50 mL	VOARADDCOM__00003	1250 uL	1,3,5-Trichlorobenzene	50 ug/mL
							Tert-amyl methyl ether	50 ug/mL
							Tert-butyl ethyl ether	50 ug/mL
.VOARADDCOM__00003	08/31/14	Restek, Lot A093634			(Purchased Reagent)		1,3,5-Trichlorobenzene	2000 ug/mL
							Tert-amyl methyl ether	2000 ug/mL
							Tert-butyl ethyl ether	2000 ug/mL
VOASTDGASweek_00038	03/09/14	03/02/14	methanol, Lot 124454	1 mL	V-TFTStk_00022	5 uL	Trifluorotoluene (Surr)	49.98 mg/L
					VOARGAS__00001	25 uL	Bromomethane	50.0025 mg/L
							Chloroethane	50 mg/L
							Chloromethane	49.995 mg/L
							Dichlorodifluoromethane	50 mg/L
							Trichlorofluoromethane	49.9975 mg/L
							Vinyl chloride	50.0025 mg/L

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.V-TFTStk_00022	09/25/14	02/06/14	MeOH, Lot 0000049909	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
.VOARGAS__00001	02/28/15	Restek, Lot A093341			(Purchased Reagent)		Bromomethane	2000.1 ug/mL
							Chloroethane	2000 ug/mL
							Chloromethane	1999.8 ug/mL
							Dichlorodifluoromethane	2000 ug/mL
							Trichlorofluoromethane	1999.9 ug/mL
							Vinyl chloride	2000.1 ug/mL
VOASTDGASweek_00039	03/17/14	03/10/14	methanol, Lot 124454	1 mL	V-TFTStk_00022	5 uL	Trifluorotoluene (Surr)	49.98 mg/L
					VOARGAS__00001	25 uL	Vinyl chloride	50.0025 mg/L
.V-TFTStk_00022	09/25/14	02/06/14	MeOH, Lot 0000049909	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
.VOARGAS__00001	02/28/15	Restek, Lot A093341			(Purchased Reagent)		Vinyl chloride	2000.1 ug/mL
VOASTDLIQPT_00010	05/31/14	02/14/14	methanol, Lot 0000038701	50 mL	VOAR2CEVE__00001	1250 uL	2-Chloroethyl vinyl ether	50 ug/mL
					VOARKETON__00002	1000 uL	2-Butanone (MEK)	200 ug/mL
							2-Hexanone	200 ug/mL
							4-Methyl-2-pentanone (MIBK)	200 ug/mL
							Acetone	200 ug/mL
					VOARMegMix__00005	1250 uL	1,1,1,2-Tetrachloroethane	50 ug/mL
							1,1,1-Trichloroethane	50 ug/mL
							1,1,2,2-Tetrachloroethane	50 ug/mL
							1,1,2-Trichloro-1,2,2-trifluoroethane	49.9975 ug/mL
							1,1,2-Trichloroethane	50 ug/mL
							1,1-Dichloroethane	50 ug/mL
							1,1-Dichloroethene	50 ug/mL
							1,1-Dichloropropene	50 ug/mL
							1,2,3-Trichlorobenzene	50 ug/mL
							1,2,3-Trichloropropane	50 ug/mL
							1,2,4-Trichlorobenzene	50 ug/mL
							1,2,4-Trimethylbenzene	50 ug/mL
							1,2-Dibromo-3-Chloropropane	50 ug/mL
							1,2-Dichlorobenzene	50 ug/mL
							1,2-Dichloroethane	50 ug/mL
							1,2-Dichloropropane	50 ug/mL
							1,3,5-Trimethylbenzene	50 ug/mL
							1,3-Dichlorobenzene	50 ug/mL
							1,3-Dichloropropane	50 ug/mL
							1,4-Dichlorobenzene	50 ug/mL
							2,2-Dichloropropane	50 ug/mL
							2-Chlorotoluene	50 ug/mL
							2-Methyl-2-propanol	500 ug/mL
							4-Chlorotoluene	50 ug/mL
							4-Isopropyltoluene	50 ug/mL
							Acrylonitrile	500 ug/mL
							Benzene	50 ug/mL

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Bromobenzene	50 ug/mL
							Bromoform	50 ug/mL
							Carbon disulfide	50 ug/mL
							Carbon tetrachloride	50 ug/mL
							Chlorobenzene	50 ug/mL
							Chlorobromomethane	50 ug/mL
							Chlorodibromomethane	50 ug/mL
							Chloroform	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							cis-1,3-Dichloropropene	50 ug/mL
							Dibromomethane	50 ug/mL
							Dichlorobromomethane	50 ug/mL
							Ethylbenzene	50 ug/mL
							Ethylene Dibromide	50 ug/mL
							Hexachlorobutadiene	50 ug/mL
							Hexane	50 ug/mL
							Iodomethane	50 ug/mL
							Isopropylbenzene	50 ug/mL
							m-Xylene & p-Xylene	50 ug/mL
							Methyl tert-butyl ether	50 ug/mL
							Methylene Chloride	50 ug/mL
							n-Butylbenzene	50 ug/mL
							N-Propylbenzene	50 ug/mL
							Naphthalene	50 ug/mL
							o-Xylene	50 ug/mL
							sec-Butylbenzene	50 ug/mL
							Styrene	50 ug/mL
							tert-Butylbenzene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							Toluene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							trans-1,3-Dichloropropene	50 ug/mL
							trans-1,4-Dichloro-2-butene	50 ug/mL
							Trichloroethene	50 ug/mL
					VOARVA__00005	1250 uL	Vinyl acetate	99.85 ug/mL
.VOAR2CEVE__00001	02/29/16		Restek, Lot A093368		(Purchased Reagent)		2-Chloroethyl vinyl ether	2000 ug/mL
.VOARKETON__00002	02/29/16		Restek, Lot A093365		(Purchased Reagent)		2-Butanone (MEK)	10000 ug/mL
							2-Hexanone	10000 ug/mL
							4-Methyl-2-pentanone (MIBK)	10000 ug/mL
							Acetone	10000 ug/mL
.VOARMegMix__00005	02/29/16		Restek, Lot A093733		(Purchased Reagent)		1,1,1,2-Tetrachloroethane	2000 mg/L
							1,1,1-Trichloroethane	2000 mg/L
							1,1,2,2-Tetrachloroethane	2000 mg/L
							1,1,2-Trichloro-1,2,2-trifluoroethane	1999.9 mg/L
							1,1,2-Trichloroethane	2000 mg/L
							1,1-Dichloroethane	2000 mg/L
							1,1-Dichloroethene	2000 mg/L

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1-Dichloropropene	2000 mg/L
							1,2,3-Trichlorobenzene	2000 mg/L
							1,2,3-Trichloropropane	2000 mg/L
							1,2,4-Trichlorobenzene	2000 mg/L
							1,2,4-Trimethylbenzene	2000 mg/L
							1,2-Dibromo-3-Chloropropane	2000 mg/L
							1,2-Dichlorobenzene	2000 mg/L
							1,2-Dichloroethane	2000 mg/L
							1,2-Dichloropropane	2000 mg/L
							1,3,5-Trimethylbenzene	2000 mg/L
							1,3-Dichlorobenzene	2000 mg/L
							1,3-Dichloropropane	2000 mg/L
							1,4-Dichlorobenzene	2000 mg/L
							2,2-Dichloropropane	2000 mg/L
							2-Chlorotoluene	2000 mg/L
							2-Methyl-2-propanol	20000 mg/L
							4-Chlorotoluene	2000 mg/L
							4-Isopropyltoluene	2000 mg/L
							Acrylonitrile	20000 mg/L
							Benzene	2000 mg/L
							Bromobenzene	2000 mg/L
							Bromoform	2000 mg/L
							Carbon disulfide	2000 mg/L
							Carbon tetrachloride	2000 mg/L
							Chlorobenzene	2000 mg/L
							Chlorobromomethane	2000 mg/L
							Chlorodibromomethane	2000 mg/L
							Chloroform	2000 mg/L
							cis-1,2-Dichloroethene	2000 mg/L
							cis-1,3-Dichloropropene	2000 mg/L
							Dibromomethane	2000 mg/L
							Dichlorobromomethane	2000 mg/L
							Ethylbenzene	2000 mg/L
							Ethylene Dibromide	2000 mg/L
							Hexachlorobutadiene	2000 mg/L
							Hexane	2000 mg/L
							Iodomethane	2000 mg/L
							Isopropylbenzene	2000 mg/L
							m-Xylene & p-Xylene	2000 mg/L
							Methyl tert-butyl ether	2000 mg/L
							Methylene Chloride	2000 mg/L
							n-Butylbenzene	2000 mg/L
							N-Propylbenzene	2000 mg/L
							Naphthalene	2000 mg/L
							o-Xylene	2000 mg/L
							sec-Butylbenzene	2000 mg/L
							Styrene	2000 mg/L
							tert-Butylbenzene	2000 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Tetrachloroethene	2000 mg/L
							Toluene	2000 mg/L
							trans-1,2-Dichloroethene	2000 mg/L
							trans-1,3-Dichloropropene	2000 mg/L
							trans-1,4-Dichloro-2-butene	2000 mg/L
							Trichloroethene	2000 mg/L
.VOARVA__00005	05/31/14		Restek, Lot A099480		(Purchased Reagent)		Vinyl acetate	3994 ug/mL

Certification Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-42527-1

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	USDA	Federal		P330-11-00222
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 8260B Low Level

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

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): ZB-624short ID: 0.18 (mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TFT #	TOL #	BFB #
MW16-140227-W	580-42527-1	100	107	117	97	96
MW3-140227-W	580-42527-2	101	109	110	100	97
MW18-140227-W	580-42527-3	98	109	119	97	96
DUP01-140227-W	580-42527-4	99	110	124	99	96
TRIP BLANK	580-42527-5	102	107	105	100	102
	MB 580-154844/6	103	109	112	101	97
	LCS 580-154844/7	103	108	109	100	102
	LCSD 580-154844/8	104	110	108	102	104
MW18-140227-W MS	580-42527-3 MS	101	107	110	99	103
MW18-140227-W MSD	580-42527-3 MSD	99	107	108	102	102

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	85-115
DCA = 1,2-Dichloroethane-d4 (Surr)	70-120
TFT = Trifluorotoluene (Surr)	80-125
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	75-120

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0341354.D

Lab ID: LCS 580-154844/7 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.32	106	80-130	
1,1-Dichloroethene	5.00	6.03	121	70-150	
Tetrachloroethene	5.00	4.31	86	40-180	
trans-1,2-Dichloroethene	5.00	5.86	117	80-140	
Trichloroethene	5.00	5.39	108	80-130	
Vinyl chloride	5.00	5.63	113	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0341355.D

Lab ID: LCSD 580-154844/8 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.36	107	1	20	80-130	
1,1-Dichloroethene	5.00	5.93	119	2	20	70-150	
Tetrachloroethene	5.00	4.88	98	12	20	40-180	
trans-1,2-Dichloroethene	5.00	5.86	117	0	20	80-140	
Trichloroethene	5.00	5.67	113	5	20	80-130	
Vinyl chloride	5.00	5.72	114	2	20	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0341356.D

Lab ID: 580-42527-3 MS Client ID: MW18-140227-W MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	0.26	5.58	106	71-144	
1,1-Dichloroethene	5.00	ND	5.88	118	78-151	
Tetrachloroethene	5.00	ND	3.33	67	64-161	
trans-1,2-Dichloroethene	5.00	0.26	5.90	113	73-135	
Trichloroethene	5.00	0.57	5.88	106	79-131	
Vinyl chloride	5.00	1.3	6.97	114	47-160	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0341357.D

Lab ID: 580-42527-3 MSD Client ID: MW18-140227-W MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.40	103	3	20	71-144	
1,1-Dichloroethene	5.00	5.77	115	2	30	78-151	
Tetrachloroethene	5.00	3.26	65	2	20	64-161	
trans-1,2-Dichloroethene	5.00	5.65	108	4	20	73-135	
Trichloroethene	5.00	5.90	107	0	30	79-131	
Vinyl chloride	5.00	6.62	107	5	20	47-160	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab File ID: I0341353.D Lab Sample ID: MB 580-154844/6

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

Instrument ID: SEA015 Date Analyzed: 03/10/2014 07:21

GC Column: ZB-624short ID: 0.18(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 580-154844/7	I0341354.D	03/10/2014 07:45
	LCSD 580-154844/8	I0341355.D	03/10/2014 08:10
MW18-140227-W MS	580-42527-3 MS	I0341356.D	03/10/2014 08:35
MW18-140227-W MSD	580-42527-3 MSD	I0341357.D	03/10/2014 08:59
TRIP BLANK	580-42527-5	I0341362.D	03/10/2014 11:02
MW16-140227-W	580-42527-1	I0341363.D	03/10/2014 11:27
MW3-140227-W	580-42527-2	I0341364.D	03/10/2014 11:51
MW18-140227-W	580-42527-3	I0341365.D	03/10/2014 12:15
DUP01-140227-W	580-42527-4	I0341366.D	03/10/2014 12:40

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

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab File ID: I0341265.D BFB Injection Date: 03/05/2014

Instrument ID: SEA015 BFB Injection Time: 10:00

Analysis Batch No.: 154612

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.8	
75	30.0 - 60.0 % of mass 95	48.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.5	(0.5)1
174	50.0 - 120.00 % of mass 95	87.0	
175	5.0 - 9.0 % of mass 174	6.1	(7.0)1
176	95.0 - 101.0 % of mass 174	84.9	(97.6)1
177	5.0 - 9.0 % of mass 176	5.7	(6.7)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
	STD00002 580-154612/3	I0341266.D	03/05/2014	10:24
	STD0001 580-154612/4	I0341267.D	03/05/2014	10:49
	STD0002 580-154612/5	I0341268.D	03/05/2014	11:13
	STD0004 580-154612/6	I0341269.D	03/05/2014	11:38
	STD001 580-154612/7	I0341270.D	03/05/2014	12:02
	STD005 580-154612/8	I0341271.D	03/05/2014	12:26
	ICIS 580-154612/9	I0341272.D	03/05/2014	12:51
	STD025 580-154612/10	I0341273.D	03/05/2014	13:15
	STD050 580-154612/11	I0341274.D	03/05/2014	13:40
	STD080 580-154612/12	I0341275.D	03/05/2014	14:04
	ICV 580-154612/14	I0341277.D	03/05/2014	14:53

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

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab File ID: I0341349.D BFB Injection Date: 03/10/2014

Instrument ID: SEA015 BFB Injection Time: 05:42

Analysis Batch No.: 154844

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.7	
75	30.0 - 60.0 % of mass 95	51.7	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.8	
173	Less than 2.0 % of mass 174	0.6	(0.7)1
174	50.0 - 120.00 % of mass 95	87.4	
175	5.0 - 9.0 % of mass 174	5.8	(6.7)1
176	95.0 - 101.0 % of mass 174	84.9	(97.1)1
177	5.0 - 9.0 % of mass 176	5.5	(6.5)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 580-154844/3	I0341350.D	03/10/2014	06:07
	MB 580-154844/6	I0341353.D	03/10/2014	07:21
	LCS 580-154844/7	I0341354.D	03/10/2014	07:45
	LCSD 580-154844/8	I0341355.D	03/10/2014	08:10
MW18-140227-W MS	580-42527-3 MS	I0341356.D	03/10/2014	08:35
MW18-140227-W MSD	580-42527-3 MSD	I0341357.D	03/10/2014	08:59
TRIP BLANK	580-42527-5	I0341362.D	03/10/2014	11:02
MW16-140227-W	580-42527-1	I0341363.D	03/10/2014	11:27
MW3-140227-W	580-42527-2	I0341364.D	03/10/2014	11:51
MW18-140227-W	580-42527-3	I0341365.D	03/10/2014	12:15
DUP01-140227-W	580-42527-4	I0341366.D	03/10/2014	12:40

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

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Sample No.: ICIS 580-154612/9 Date Analyzed: 03/05/2014 12:51

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0341272.D Heated Purge: (Y/N) N

Calibration ID: 16232

		TBA		FB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		299180	1.76	1482056	2.69	1107778	3.88
UPPER LIMIT		598360	2.26		3.19	2215556	4.38
LOWER LIMIT		149590	1.26		2.19	553889	3.38
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 580-154612/14		383156	1.77	1684828	2.69	1262385	3.88

TBA = TBA-d9 (IS)
FB = Fluorobenzene (IS)
CBZ = Chlorobenzene-d5

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 8260B

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

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Sample No.: ICIS 580-154612/9 Date Analyzed: 03/05/2014 12:51

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0341272.D Heated Purge: (Y/N) N

Calibration ID: 16232

		DCB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		669738	4.89				
UPPER LIMIT		1339476	5.39				
LOWER LIMIT		334869	4.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 580-154612/14		748081	4.89				

DCB = 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 8260B

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

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Sample No.: CCVIS 580-154844/3 Date Analyzed: 03/10/2014 06:07

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0341350.D Heated Purge: (Y/N) N

Calibration ID: 16232

		FB		CBZ		DCB	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1296876	2.69	1004739	3.88	598673	4.89
UPPER LIMIT			3.19	2009478	4.38	1197346	5.39
LOWER LIMIT			2.19	502370	3.38	299337	4.39
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-154844/6		1190332	2.69	866010	3.87	521214	4.90
LCS 580-154844/7		1250485	2.69	967352	3.88	565797	4.89
LCSD 580-154844/8		1279816	2.69	1016573	3.88	604945	4.89
580-42527-3 MS	MW18-140227-W MS	1296080	2.69	1039496	3.88	611552	4.89
580-42527-3 MSD	MW18-140227-W MSD	1373597	2.69	1098941	3.88	631223	4.89
580-42527-5	TRIP BLANK	1281659	2.69	924508	3.88	559007	4.89
580-42527-1	MW16-140227-W	1274463	2.69	1006800	3.88	557564	4.89
580-42527-2	MW3-140227-W	1272051	2.69	1002279	3.88	573239	4.89
580-42527-3	MW18-140227-W	1310089	2.69	1043511	3.88	573592	4.89
580-42527-4	DUP01-140227-W	1256351	2.69	993518	3.88	539629	4.89

FB = Fluorobenzene (IS)
CBZ = Chlorobenzene-d5
DCB = 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 8260B

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: MW16-140227-W | Lab Sample ID: 580-42527-1

Matrix: Water | Lab File ID: I0341363.D

Analysis Method: 8260B | Date Collected: 02/27/2014 11:30

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 11:27

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	0.24		0.10	0.10
75-01-4	Vinyl chloride	0.093		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		75-120
98-08-8	Trifluorotoluene (Surr)	117		80-125
2037-26-5	Toluene-d8 (Surr)	97		75-125
1868-53-7	Dibromofluoromethane (Surr)	100		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: MW3-140227-W | Lab Sample ID: 580-42527-2

Matrix: Water | Lab File ID: I0341364.D

Analysis Method: 8260B | Date Collected: 02/27/2014 12:50

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 11:51

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.75		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.12		0.10	0.10
79-01-6	Trichloroethene	2.5		0.10	0.10
75-01-4	Vinyl chloride	0.79		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		75-120
98-08-8	Trifluorotoluene (Surr)	110		80-125
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	101		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	109		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: MW18-140227-W | Lab Sample ID: 580-42527-3

Matrix: Water | Lab File ID: I0341365.D

Analysis Method: 8260B | Date Collected: 02/27/2014 13:35

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 12:15

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.26		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.26		0.10	0.10
79-01-6	Trichloroethene	0.57		0.10	0.10
75-01-4	Vinyl chloride	1.3		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		75-120
98-08-8	Trifluorotoluene (Surr)	119		80-125
2037-26-5	Toluene-d8 (Surr)	97		75-125
1868-53-7	Dibromofluoromethane (Surr)	98		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	109		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: DUP01-140227-W | Lab Sample ID: 580-42527-4

Matrix: Water | Lab File ID: I0341366.D

Analysis Method: 8260B | Date Collected: 02/27/2014 12:00

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 12:40

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	0.26		0.10	0.10
75-01-4	Vinyl chloride	0.090		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		75-120
98-08-8	Trifluorotoluene (Surr)	124		80-125
2037-26-5	Toluene-d8 (Surr)	99		75-125
1868-53-7	Dibromofluoromethane (Surr)	99		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	110		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: TRIP BLANK | Lab Sample ID: 580-42527-5

Matrix: Water | Lab File ID: I0341362.D

Analysis Method: 8260B | Date Collected: 02/27/2014 00:00

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 11:02

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	ND		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	102		75-120
98-08-8	Trifluorotoluene (Surr)	105		80-125
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	102		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		70-120

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD00002 580-154612/3	I0341266.D
Level 2	STD0001 580-154612/4	I0341267.D
Level 3	STD0002 580-154612/5	I0341268.D
Level 4	STD0004 580-154612/6	I0341269.D
Level 5	STD001 580-154612/7	I0341270.D
Level 6	STD005 580-154612/8	I0341271.D
Level 7	ICIS 580-154612/9	I0341272.D
Level 8	STD025 580-154612/10	I0341273.D
Level 9	STD050 580-154612/11	I0341274.D
Level 10	STD080 580-154612/12	I0341275.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.5139	0.3548 0.5080	0.4538 0.5063	0.4961 0.4697	0.5098 0.4238	Ave		0.4707				11.0		15.0			
Chloromethane	+++++ 0.4239	0.6132 0.4026	0.4483 0.4039	0.5458 0.3725	0.4215 0.3327	Lin1	0.0380	0.3607			0.1000				0.9930		0.9900
Vinyl chloride	0.4926 0.4189	0.4297 0.4060	0.4462 0.4163	0.4101 0.3929	0.4345 0.3574	Ave		0.4205				8.4		15.0			
Bromomethane	+++++ 0.3191	0.4350 0.3128	0.5796 0.3052	0.2995 0.2789	0.3569 0.2027	Qua1	0.0130	0.3497	-0.002						0.9970		0.9900
Chloroethane	+++++ 0.0715	+++++ 0.0669	0.1118 0.0652	0.0954 0.0580	0.0900 0.0524	Qua2	0.0081	0.0736	0						0.9950		0.9900
Trichlorofluoromethane	+++++ 0.6373	0.4115 0.6015	0.4497 0.6309	0.5026 0.5620	0.5772 0.4813	Ave		0.5393				15.0		15.0			
Acrolein	+++++ 0.0195	+++++ 0.0224	+++++ 0.0175	+++++ 0.0187	0.0185 0.0184	Ave		0.0192				9.0		15.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	+++++ 0.3587	0.3325 0.3444	0.3710 0.3580	0.3241 0.3372	0.3606 0.2933	Ave		0.3422				7.0		15.0			
1,1-Dichloroethene	+++++ 0.3564	0.4150 0.3424	0.3761 0.3489	0.3496 0.3348	0.3495 0.3019	Ave		0.3527				8.7		15.0			
Acetone	0.2955 0.0288	0.0761 0.0331	0.0789 0.0275	0.0670 0.0314	0.0409 0.0353	Lin1	0.0226	0.0326							0.9900		0.9900
Iodomethane	0.8636 0.8133	0.6764 0.7720	0.7567 0.8005	0.8545 0.7612	0.8462 0.6826	Ave		0.7827				8.5		15.0			
Carbon disulfide	+++++ 1.0152	0.9972 0.9267	0.8662 1.0491	0.9662 0.9922	0.9540 0.8330	Ave		0.9555				7.3		15.0			
Methylene Chloride	+++++ 0.4271	+++++ 0.3752	1.7708 0.3500	1.1274 0.3303	0.6652 0.2941	Qua2	0.2829	0.3782	-0.001						0.9960		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
2-Methyl-2-propanol	+++++ 0.0078	0.0084 0.0061	0.0082 0.0062	0.0074 0.0082	0.0070 +++++	Ave		0.0074				12.0		15.0			
Methyl tert-butyl ether	+++++ 0.7380	0.7884 0.7285	0.7590 0.7103	0.7833 0.6946	0.7274 0.6268	Ave		0.7285				6.8		15.0			
trans-1,2-Dichloroethene	+++++ 0.3808	0.3950 0.3584	0.3945 0.3726	0.4004 0.3540	0.4041 0.3147	Ave		0.3749				7.7		15.0			
Acrylonitrile	+++++ 0.0470	0.0710 0.0510	0.0491 0.0451	0.0598 0.0483	0.0607 0.0483	Lin1	0.0260	0.0479							0.9990		0.9900
n-Hexane	+++++ 0.3217	0.4133 0.3198	0.4230 0.3183	0.3507 0.3096	0.3114 0.2735	Ave		0.3379				15.0		15.0			
1,1-Dichloroethane	+++++ 0.6309	0.8042 0.5972	0.6764 0.6065	0.7010 0.5742	0.6411 0.5084	Ave		0.6378			0.1000	13.0		15.0			
Vinyl acetate	+++++ 0.0296	0.0411 0.0296	0.0326 0.0275	0.0335 0.0268	0.0304 0.0268	Ave		0.0309				15.0		15.0			
Tert-butyl ethyl ether	0.4220 0.3666	0.3312 0.3657	0.3711 0.3601	0.3906 0.3581	0.3771 0.3294	Ave		0.3672				7.3		15.0			
2,2-Dichloropropane	+++++ 0.3563	0.5064 0.3180	0.4188 0.3601	0.4220 0.3225	0.3439 0.2590	Qua2	0.0151	0.3547	-0.001						0.9940		0.9900
cis-1,2-Dichloroethene	+++++ 0.3760	0.3813 0.3730	0.3429 0.3810	0.3726 0.3807	0.3956 0.3586	Ave		0.3735				4.0		15.0			
2-Butanone	+++++ 0.0061	+++++ 0.0063	+++++ 0.0063	0.0052 0.0057	0.0073 0.0061	Ave		0.0061				10.0		15.0			
Chlorobromomethane	+++++ 0.2166	0.1555 0.2143	0.2032 0.2266	0.2156 0.2278	0.2149 0.2261	Ave		0.2112				11.0		15.0			
Chloroform	0.6401 0.7133	0.6598 0.6723	0.6403 0.6882	0.6907 0.6729	0.6839 0.6294	Ave		0.6691				4.0		15.0			
1,1,1-Trichloroethane	+++++ 0.5457	0.4803 0.5472	0.4924 0.5810	0.5340 0.5649	0.5469 0.5202	Ave		0.5347				6.1		15.0			
1,1-Dichloropropene	+++++ 0.4366	0.3421 0.4386	0.4164 0.4588	0.4330 0.4615	0.4222 0.4295	Ave		0.4265				8.2		15.0			
Carbon tetrachloride	+++++ 0.4665	0.3730 0.4732	0.4430 0.5296	0.4772 0.5279	0.4574 0.4932	Ave		0.4712				10.0		15.0			
Benzene	+++++ 1.2514	1.2913 1.2448	1.1561 1.2644	1.2013 1.2804	1.2104 1.2190	Ave		1.2355				3.5		15.0			
1,2-Dichloroethane	+++++ 0.4485	0.4683 0.4493	0.4979 0.4326	0.4732 0.4290	0.4534 0.4062	Ave		0.4509				6.0		15.0			
Tert-amyl methyl ether	+++++ 0.7120	0.6301 0.7497	0.5732 0.7788	0.6683 0.7993	0.6575 0.7534	Ave		0.7025				11.0		15.0			
Trichloroethene	+++++ 0.3400	0.2840 0.3473	0.3547 0.3614	0.3231 0.3737	0.3221 0.3611	Ave		0.3408				8.1		15.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
1,2-Dichloropropane	+++++ 0.3037	0.2967 0.3041	0.2868 0.3082	0.3030 0.3162	0.3199 0.3034	Ave		0.3047				3.2		15.0			
Dibromomethane	+++++ 0.1720	0.1569 0.1822	0.1884 0.1844	0.1884 0.1898	0.1873 0.1920	Ave		0.1824				6.1		15.0			
Dichlorobromomethane	+++++ 0.4206	0.3634 0.4291	0.3778 0.4505	0.3816 0.4716	0.3883 0.4658	Ave		0.4165				9.7		15.0			
2-Chloroethyl vinyl ether	+++++ 0.1135	+++++ 0.1295	+++++ 0.1336	+++++ 0.1401	+++++ 0.1523	Ave		0.1338				11.0		15.0			
cis-1,3-Dichloropropene	+++++ 0.4952	0.3779 0.5500	0.4384 0.5612	0.4352 0.5989	0.4456 0.5887	Lin2	-0.019	0.5378							0.9900		0.9900
4-Methyl-2-pentanone	+++++ 0.0799	0.0709 0.0868	0.0640 0.0828	0.0720 0.0875	0.0741 0.0846	Ave		0.0781				10.0		15.0			
Toluene	+++++ 1.5296	1.4188 1.5314	1.5485 1.6004	1.4416 1.6265	1.5043 1.5228	Ave		1.5249				4.4		15.0			
trans-1,3-Dichloropropene	+++++ 0.3698	0.2850 0.4122	0.2773 0.4054	0.3111 0.4423	0.3243 0.4626	Lin1	-0.037	0.4432							0.9970		0.9900
1,1,2-Trichloroethane	+++++ 0.2656	0.2620 0.2662	0.2794 0.2605	0.2854 0.2664	0.2672 0.2635	Ave		0.2685				3.1		15.0			
Tetrachloroethene	+++++ 0.5437	0.3678 0.5671	0.4523 0.6046	0.4297 0.6484	0.5240 0.6459	Lin2	-0.025	0.5831							0.9900		0.9900
1,3-Dichloropropane	+++++ 0.4232	0.4276 0.4368	0.4311 0.4272	0.4542 0.4376	0.4290 0.4446	Ave		0.4346				2.3		15.0			
2-Hexanone	+++++ 0.0743	0.0668 0.0792	0.0583 0.0671	0.0596 0.0749	0.0624 0.0746	Ave		0.0686				11.0		15.0			
Chlorodibromomethane	+++++ 0.3148	0.2156 0.3379	0.2494 0.3536	0.2644 0.3874	0.2732 0.3878	Lin1	-0.033	0.3782							0.9970		0.9900
1,2-Dibromoethane	+++++ 0.2694	0.2161 0.2809	0.2041 0.2692	0.2709 0.2806	0.2670 0.2811	Ave		0.2599				11.0		15.0			
Chlorobenzene	+++++ 1.0442	0.9211 1.0330	1.0738 1.0204	1.0216 1.0750	1.0343 1.0565	Ave		1.0311			0.3000	4.5		15.0			
Ethylbenzene	1.6758 1.7363	1.4222 1.7660	1.4460 1.8214	1.6257 1.8823	1.7156 1.5535	Ave		1.6645				9.2		15.0			
1,1,1,2-Tetrachloroethane	+++++ 0.3829	0.3749 0.4058	0.2908 0.4432	0.3309 0.4607	0.3626 0.4331	Ave		0.3872				14.0		15.0			
m-Xylene & p-Xylene	+++++ 1.3580	1.0390 1.3515	1.1436 1.4185	1.1224 1.4355	1.1375 1.3568	Ave		1.2625				12.0		15.0			
o-Xylene	1.2377 1.3966	0.8790 1.4336	1.1169 1.5245	1.0439 1.5966	1.1555 1.4165	Qua1	-0.036	1.5486	-0.001						0.9970		0.9900
Styrene	1.0019 1.0276	0.7797 1.0625	0.6972 1.0773	0.7429 1.1572	0.8068 1.1289	Lin1	-0.025	1.1208							0.9980		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Bromoform	+++++ 0.1673	0.1353 0.1756	0.1197 0.1969	0.1614 0.2120	0.1537 0.2168	Lin1	-0.018	0.2090			0.1000				0.9960		0.9900
Isopropylbenzene	+++++ 1.6089	1.0147 1.6819	1.0289 1.8617	1.1971 1.8907	1.3323 1.6600	Lin1	-0.136	1.7594							0.9960		0.9900
1,1,2,2-Tetrachloroethane	+++++ 0.5553	0.5076 0.5587	0.5242 0.5790	0.5107 0.5760	0.5945 0.5541	Ave		0.5511			0.3000	5.6		15.0			
Bromobenzene	+++++ 0.7438	0.6356 0.7728	0.7156 0.8011	0.7353 0.8729	0.7517 0.8775	Ave		0.7674				9.9		15.0			
trans-1,4-Dichloro-2-butene	+++++ 0.1364	+++++ 0.1379	0.1276 0.1402	0.1194 0.1412	0.1315 0.1394	Ave		0.1342				5.6		15.0			
1,2,3-Trichloropropane	+++++ 0.1559	0.1156 0.1604	0.1584 0.1567	0.1639 0.1666	0.1396 0.1603	Ave		0.1530				10.0		15.0			
N-Propylbenzene	+++++ 3.2833	2.5274 3.4375	2.6025 3.6758	2.8228 3.8028	2.9342 2.9474	Ave		3.1148				15.0		15.0			
2-Chlorotoluene	+++++ 0.6902	0.5336 0.7070	0.6439 0.7640	0.5362 0.8173	0.6270 0.7822	Ave		0.6779				15.0		15.0			
1,3,5-Trimethylbenzene	1.7590 2.3025	1.4713 2.4351	1.6045 2.6667	1.6695 2.7850	1.8626 2.5499	Lin1	-0.074	2.6179							0.9970		0.9900
4-Chlorotoluene	0.5726 0.6861	0.5421 0.7229	0.4740 0.7499	0.6180 0.7803	0.6632 0.7885	Lin1	-0.016	0.7730							0.9990		0.9900
tert-Butylbenzene	+++++ 1.8218	1.0950 2.2913	1.1776 2.4354	1.3521 2.4510	1.4420 2.2712	Lin1	-0.250	2.3397							0.9970		0.9900
1,2,4-Trimethylbenzene	+++++ 2.4064	1.4304 2.4684	1.6766 2.7636	1.6894 2.8828	1.7876 2.6561	Lin1	-0.252	2.7236							0.9970		0.9900
sec-Butylbenzene	+++++ 2.6159	1.6254 2.8204	1.8072 3.2032	1.9235 3.2790	2.1473 3.0145	Lin1	-0.290	3.1015							0.9970		0.9900
4-Isopropyltoluene	+++++ 2.2551	1.3120 2.3947	1.4082 2.7769	1.5479 2.9473	1.7115 2.6948	Lin1	-0.305	2.7553							0.9960		0.9900
1,3-Dichlorobenzene	+++++ 1.4877	1.1905 1.4900	1.2629 1.5708	1.3940 1.6071	1.4439 1.6028	Ave		1.4500				10.0		15.0			
1,4-Dichlorobenzene	1.7197 1.5404	1.3895 1.5481	1.5970 1.6068	1.5324 1.6663	1.5330 1.6914	Ave		1.5825				6.1		15.0			
n-Butylbenzene	+++++ 0.4826	0.4382 0.5299	0.3770 0.5900	0.3440 0.6065	0.4123 0.5619	Lin1	-0.044	0.5755							0.9970		0.9900
1,2-Dichlorobenzene	1.4489 1.4075	0.9874 1.4258	1.2883 1.5072	1.3419 1.5613	1.3495 1.4948	Ave		1.3813				12.0		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.0888	+++++ 0.0982	0.0487 0.1075	0.0595 0.1200	0.0818 0.1153	Lin1	-0.022	0.1144							0.9970		0.9900
1,3,5-Trichlorobenzene	+++++ 1.0045	0.8298 1.0905	0.7776 1.1847	0.8931 1.2386	0.9243 1.1397	Lin1	-0.077	1.1698							0.9980		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
1,2,4-Trichlorobenzene	+++++ 0.8056	0.6227 0.8903	0.7524 1.0700	0.7622 1.1250	0.7317 1.0288	Lin1	-0.088	1.0500							0.9950		0.9900
Hexachlorobutadiene	+++++ 0.3839	0.3960 0.3965	0.3567 0.4484	0.3898 0.4470	0.4268 0.3999	Ave		0.4050				7.5		15.0			
Naphthalene	+++++ 1.3227	0.9662 1.5829	0.8988 1.9725	0.8017 2.0999	0.9819 1.9114	Lin1	-0.262	1.9430							0.9920		0.9900
1,2,3-Trichlorobenzene	+++++ 0.7501	0.5252 0.8092	0.6234 0.9515	0.6449 0.9892	0.6104 0.9013	Lin1	-0.081	0.9258							0.9960		0.9900
Dibromofluoromethane (Surr)	0.3098 0.3177	0.3219 0.3128	0.3142 0.3141	0.3172 0.3145	0.3120 0.3060	Ave		0.3140				1.4		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3249 0.3195	0.3423 0.3247	0.3366 0.3159	0.3292 0.3176	0.3296 0.3074	Ave		0.3248				3.2		15.0			
Trifluorotoluene (Surr)	+++++ 1.0823	1.0741 1.0937	1.0779 1.1543	0.9261 1.2323	1.0006 1.2069	Ave		1.0942				8.7		15.0			
Toluene-d8 (Surr)	1.1638 1.2136	1.1541 1.1937	1.1529 1.1959	1.1588 1.1804	1.1799 1.1512	Ave		1.1744				1.8		15.0			
4-Bromofluorobenzene (Surr)	0.4308 0.4409	0.4215 0.4283	0.4171 0.4173	0.4122 0.4124	0.4275 0.4211	Ave		0.4229				2.1		15.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD00002 580-154612/3	I0341266.D
Level 2	STD0001 580-154612/4	I0341267.D
Level 3	STD0002 580-154612/5	I0341268.D
Level 4	STD0004 580-154612/6	I0341269.D
Level 5	STD001 580-154612/7	I0341270.D
Level 6	STD005 580-154612/8	I0341271.D
Level 7	ICIS 580-154612/9	I0341272.D
Level 8	STD025 580-154612/10	I0341273.D
Level 9	STD050 580-154612/11	I0341274.D
Level 10	STD080 580-154612/12	I0341275.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dichlorodifluoromethane	FB	Ave	+++++ 143783	1985 301141	5149 754253	11195 1523750	28122 2507784	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chloromethane	FB	Lin1	+++++ 118567	3430 238672	5086 601608	12314 1208151	23245 1968308	+++++ 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
Vinyl chloride	FB	Ave	551 117208	2404 240704	5063 620156	9254 1274461	23969 2114716	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Bromomethane	FB	Qua1	+++++ 89288	2434 185440	6577 454692	6759 904596	19686 1199499	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chloroethane	FB	Qua2	+++++ 20014	+++++ 39634	1269 97155	2153 188004	4964 309912	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Trichlorofluoromethane	FB	Ave	+++++ 178286	2302 356542	5102 939793	11340 1822884	31838 2847721	+++++ 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
Acrolein	FB	Ave	+++++ 32700	+++++ 79826	+++++ 156562	+++++ 363670	6120 654315	+++++ 30.0	+++++ 60.0	+++++ 150	+++++ 300	6.00 480
1,1,2-Trichloro-1,2,2-trifluoroetha ne	FB	Ave	+++++ 100354	1860 204186	4209 533235	7314 1093612	19890 1735557	+++++ 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
1,1-Dichloroethene	FB	Ave	+++++ 99709	2322 202977	4267 519755	7889 1086186	19277 1786109	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Acetone	FB	Lin1	1322 32250	1704 78559	3583 163692	6046 407735	9026 835553	0.0800 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Iodomethane	FB	Ave	966 227535	3784 457645	8586 1192518	19282 2469313	46677 4038682	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Carbon disulfide	FB	Ave	+++++ 284018	5579 549350	9828 1562875	21802 3218542	52624 4928457	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Methylene Chloride	FB	Qua2	+++++ 119473	+++++ 222398	20092 521348	25440 1071533	36693 1739921	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Methyl-2-propanol	FB	Ave	+++++ 21833	472 36191	933 92577	1678 264405	3874 +++++	+++++ 50.0	1.00 100	2.00 250	4.00 500	10.0 +++++

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Methyl tert-butyl ether	FB	Ave	+++++ 206453	4411 431848	8612 1058161	17675 2253094	40122 3708487	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,2-Dichloroethene	FB	Ave	+++++ 106541	2210 212462	4476 555111	9036 1148187	22289 1861801	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Acrylonitrile	FB	Lin1	+++++ 131612	3974 302331	5573 672250	13496 1566946	33480 2855286	+++++ 50.0	1.00 100	2.00 250	4.00 500	10.0 800
n-Hexane	FB	Ave	+++++ 89993	2312 189563	4799 474135	7913 1004402	17174 1618430	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1-Dichloroethane	FB	Ave	+++++ 176511	4499 354046	7675 903526	15818 1862614	35364 3008091	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Vinyl acetate	FB	Ave	+++++ 16545	459 35059	739 81791	1508 173335	3345 316845	+++++ 9.99	0.200 20.0	0.399 49.9	0.799 99.9	2.00 160
Tert-butyl ethyl ether	FB	Ave	472 102553	1853 216807	4211 536437	8813 1161648	20800 1948680	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2,2-Dichloropropane	FB	Qua2	+++++ 99686	2833 188511	4752 536451	9522 1046078	18968 1532183	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
cis-1,2-Dichloroethene	FB	Ave	+++++ 105181	2133 221096	3890 567525	8407 1235034	21820 2121800	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Butanone	FB	Ave	+++++ 6798	+++++ 14969	+++++ 37519	467 74104	1601 144707	+++++ 20.0	+++++ 40.0	+++++ 100	1.60 200	4.00 320
Chlorobromomethane	FB	Ave	+++++ 60592	870 127028	2306 337616	4866 739080	11852 1337749	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chloroform	FB	Ave	716 199568	3691 398528	7265 1025291	15585 2182848	37722 3723698	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,1-Trichloroethane	FB	Ave	+++++ 152653	2687 324416	5587 865509	12050 1832341	30168 3078098	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1-Dichloropropene	FB	Ave	+++++ 122143	1914 259989	4724 683435	9771 1497091	23288 2541506	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Carbon tetrachloride	FB	Ave	+++++ 130515	2087 280546	5026 788901	10768 1712398	25230 2918273	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Benzene	FB	Ave	+++++ 350106	7224 737957	13117 1883613	27107 4153450	66764 7212400	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichloroethane	FB	Ave	+++++ 125466	2620 266354	5649 644422	10679 1391498	25007 2403165	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Tert-amyl methyl ether	FB	Ave	+++++ 199177	3525 444428	6504 1160245	15080 2592744	36265 4457724	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Trichloroethene	FB	Ave	+++++ 95116	1589 205880	4024 538354	7292 1212381	17767 2136811	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichloropropane	FB	Ave	+++++ 84961	1660 180261	3254 459203	6837 1025770	17646 1795362	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Dibromomethane	FB	Ave	+++++ 48127	878 108022	2138 274766	4251 615625	10331 1135971	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dichlorobromomethane	FB	Ave	+++++ 117656	2033 254386	4287 671083	8610 1529823	21420 2755783	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Chloroethyl vinyl ether	CBZ	Ave	+++++ 23219	+++++ 57383	+++++ 149203	+++++ 346160	+++++ 718351	+++++ 5.00	+++++ 10.0	+++++ 25.0	+++++ 50.0	+++++ 80.0
cis-1,3-Dichloropropene	CBZ	Lin2	+++++ 101255	1542 243728	3620 626619	7198 1480034	17758 2776579	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Methyl-2-pentanone	CBZ	Ave	+++++ 65391	1157 153842	2115 369795	4762 865384	11815 1595792	+++++ 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Toluene	CBZ	Ave	+++++ 312786	5790 678562	12787 1787024	23844 4019674	59955 7182547	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,3-Dichloropropene	CBZ	Lin1	+++++ 75621	1163 182650	2290 452710	5145 1093080	12926 2181750	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,2-Trichloroethane	CBZ	Ave	+++++ 54318	1069 117948	2307 290831	4721 658288	10650 1242601	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Tetrachloroethene	CBZ	Lin2	+++++ 111192	1501 251304	3735 675116	7107 1602477	20884 3046351	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3-Dichloropropane	CBZ	Ave	+++++ 86539	1745 193572	3560 476975	7512 1081558	17099 2097081	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Hexanone	CBZ	Ave	+++++ 60772	1091 140401	1924 299838	3941 740670	9954 1408027	+++++ 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Chlorodibromomethane	CBZ	Lin1	+++++ 64368	880 149742	2059 394866	4374 957519	10889 1828925	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dibromoethane	CBZ	Ave	+++++ 55082	882 124484	1685 300596	4481 693410	10640 1325638	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chlorobenzene	CBZ	Ave	+++++ 213528	3759 457719	8867 1139464	16897 2656739	41221 4982979	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Ethylbenzene	CBZ	Ave	1308 355064	5804 782525	11940 2033811	26889 4651750	68374 7327316	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,1,2-Tetrachloroethane	CBZ	Ave	+++++ 78297	1530 179829	2401 494941	5473 1138651	14452 2042716	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
m-Xylene & p-Xylene	CBZ	Ave	+++++ 277703	4240 598859	9443 1583906	18565 3547640	45335 6399629	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
o-Xylene	CBZ	Qua1	966 285588	3587 635264	9223 1702345	17267 3945838	46053 6681138	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Styrene	CBZ	Lin1	782 210145	3182 470794	5757 1202930	12287 2859856	32154 5324620	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Bromoform	CBZ	Lin1	+++++ 34220	552 77807	988 219860	2670 523842	6125 1022743	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Isopropylbenzene	CBZ	Lin1	+++++ 329018	4141 745284	8496 2078864	19800 4672666	53097 7829687	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,2,2-Tetrachloroethane	DCB	Ave	+++++ 71326	1265 149677	2604 374471	5136 809355	14654 1469066	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Bromobenzene	DCB	Ave	+++++ 95539	1584 207019	3555 518159	7395 1226450	18530 2326488	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,4-Dichloro-2-butene	DCB	Ave	+++++ 17522	+++++ 36930	634 90706	1201 198431	3241 369604	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,3-Trichloropropane	DCB	Ave	+++++ 20024	288 42968	787 101378	1648 234030	3442 425017	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
N-Propylbenzene	DCB	Ave	+++++ 421750	6299 920887	12929 2377468	28391 5343025	72328 7814371	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Chlorotoluene	DCB	Ave	+++++ 88665	1330 189407	3199 494123	5393 1148298	15456 2073855	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3,5-Trimethylbenzene	DCB	Lin1	851 295761	3667 652341	7971 1724815	16791 3913086	45914 6760279	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Chlorotoluene	DCB	Lin1	277 88129	1351 193663	2355 485029	6216 1096356	16349 2090521	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
tert-Butylbenzene	DCB	Lin1	+++++ 234018	2729 613824	5850 1575164	13599 3443807	35546 6021431	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,4-Trimethylbenzene	DCB	Lin1	+++++ 309112	3565 661264	8329 1787479	16992 4050441	44065 7041875	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
sec-Butylbenzene	DCB	Lin1	+++++ 336028	4051 755568	8978 2071803	19346 4607104	52932 7992197	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Isopropyltoluene	DCB	Lin1	+++++ 289675	3270 641532	6996 1796082	15568 4141104	42189 7144502	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3-Dichlorobenzene	DCB	Ave	+++++ 191102	2967 399157	6274 1015962	14021 2258024	35593 4249403	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,4-Dichlorobenzene	DCB	Ave	832 197876	3463 414735	7934 1039261	15413 2341207	37789 4484432	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
n-Butylbenzene	DCB	Lin1	+++++ 61987	1092 141950	1873 381602	3460 852126	10164 1489847	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichlorobenzene	DCB	Ave	701 180801	2461 381964	6400 974827	13497 2193627	33265 3963150	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dibromo-3-Chloropropane	DCB	Lin1	+++++ 11403	+++++ 26315	242 69501	598 168559	2017 305702	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3,5-Trichlorobenzene	DCB	Lin1	+++++ 129031	2068 292146	3863 766235	8983 1740342	22783 3021508	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,4-Trichlorobenzene	DCB	Lin1	+++++ 103488	1552 238516	3738 692086	7666 1580706	18036 2727552	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Hexachlorobutadiene	DCB	Ave	+++++ 49320	987 106219	1772 290029	3921 628122	10520 1060159	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Naphthalene	DCB	Lin1	+++++ 169903	2408 424062	4465 1275805	8063 2950486	24205 5067706	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,3-Trichlorobenzene	DCB	Lin1	+++++ 96355	1309 216780	3097 615439	6486 1389931	15047 2389430	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-42527-1 Analy Batch No.: 154612

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/05/2014 10:24 Calibration End Date: 03/05/2014 14:04 Calibration ID: 16232

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dibromofluoromethane (Surr)	FB	Ave	259871	270109	267390	268451	258158	15.0	15.0	15.0	15.0	15.0
			266602	278196	280735	306082	339507	15.0	15.0	15.0	15.0	15.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	272555	287288	286424	278546	272742	15.0	15.0	15.0	15.0	15.0
			268177	288706	282352	309110	341065	15.0	15.0	15.0	15.0	15.0
Trifluorotoluene (Surr)	DCB	Ave	+++++	2676	5353	9311	24654	+++++	0.1000	0.200	0.400	1.000
			138969	292883	746273	1730801	3198381	5.00	10.00	25.0	50.0	80.0
Toluene-d8 (Surr)	CBZ	Ave	681243	706448	713970	718758	705357	15.0	15.0	15.0	15.0	15.0
			744516	793389	801245	875152	1018110	15.0	15.0	15.0	15.0	15.0
4-Bromofluorobenzene (Surr)	CBZ	Ave	252201	258017	258316	255660	255570	15.0	15.0	15.0	15.0	15.0
			270470	284674	279581	305728	372366	15.0	15.0	15.0	15.0	15.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD
Qua1 = Quadratic 1/conc ISTD
Qua2 = Quadratic 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: ICV 580-154612/14 Calibration Date: 03/05/2014 14:53

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341277.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	0.4707	0.5520		11.7	10.0	17.3	25.0
Chloromethane	Lin1		0.4145	0.1000	11.4	10.0	13.9	25.0
Vinyl chloride	Ave	0.4205	0.4133		9.83	10.0	-1.7	25.0
Bromomethane	Qua1		0.2913		8.67	10.0	-13.3	25.0
Chloroethane	Qua2		0.0644		8.96	10.0	-10.4	25.0
Trichlorofluoromethane	Ave	0.5393	0.5841		10.8	10.0	8.3	25.0
Acrolein	Ave	0.0192	0.0209		65.5	60.0	9.2	40.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.3422	0.3386		9.89	10.0	-1.1	40.0
1,1-Dichloroethene	Ave	0.3527	0.3385		9.60	10.0	-4.0	25.0
Acetone	Lin1		0.0409		49.4	40.0	23.6	25.0
Iodomethane	Ave	0.7827	0.7927		10.1	10.0	1.3	40.0
Carbon disulfide	Ave	0.9555	0.999		10.5	10.0	4.5	25.0
Methylene Chloride	Qua2		0.3713		9.33	10.0	-6.7	25.0
2-Methyl-2-propanol	Ave	0.0074	0.0062		83.2	100	-16.8	40.0
Methyl tert-butyl ether	Ave	0.7285	0.7269		9.98	10.0	-0.2	25.0
trans-1,2-Dichloroethene	Ave	0.3749	0.3765		10.0	10.0	0.4	25.0
Acrylonitrile	Lin1		0.0542		113	100	12.6	40.0
n-Hexane	Ave	0.3379	0.3456		10.2	10.0	2.3	40.0
1,1-Dichloroethane	Ave	0.6378	0.6096	0.1000	9.56	10.0	-4.4	25.0
Vinyl acetate	Ave	0.0309	0.0386		20.1	16.0	25.0	40.0
Tert-butyl ethyl ether	Ave	0.3672	0.3564		9.71	10.0	-2.9	40.0
2,2-Dichloropropane	Qua2		0.3654		10.6	10.0	5.7	25.0
cis-1,2-Dichloroethene	Ave	0.3735	0.3999		10.7	10.0	7.1	25.0
2-Butanone	Ave	0.0061	0.0059		38.5	40.0	-3.9	25.0
Chlorobromomethane	Ave	0.2112	0.2324		11.0	10.0	10.0	25.0
Chloroform	Ave	0.6691	0.6843		10.2	10.0	2.3	25.0
1,1,1-Trichloroethane	Ave	0.5347	0.5451		10.2	10.0	1.9	25.0
1,1-Dichloropropene	Ave	0.4265	0.4971		11.7	10.0	16.6	25.0
Carbon tetrachloride	Ave	0.4712	0.4981		10.6	10.0	5.7	25.0
Benzene	Ave	1.235	1.293		10.5	10.0	4.7	25.0
1,2-Dichloroethane	Ave	0.4509	0.4261		9.45	10.0	-5.5	25.0
Tert-amyl methyl ether	Ave	0.7025	0.7572		10.8	10.0	7.8	40.0
Trichloroethene	Ave	0.3408	0.3610		10.6	10.0	5.9	25.0
1,2-Dichloropropane	Ave	0.3047	0.3051		10.0	10.0	0.1	25.0
Dibromomethane	Ave	0.1824	0.1895		10.4	10.0	3.9	25.0
Dichlorobromomethane	Ave	0.4165	0.4244		10.2	10.0	1.9	25.0
2-Chloroethyl vinyl ether	Ave	0.1338	0.1313		9.81	10.0	-1.9	40.0
cis-1,3-Dichloropropene	Lin2		0.5642		10.5	10.0	5.3	25.0
4-Methyl-2-pentanone	Ave	0.0781	0.0884		45.3	40.0	13.2	25.0
Toluene	Ave	1.525	1.620		10.6	10.0	6.3	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: ICV 580-154612/14 Calibration Date: 03/05/2014 14:53

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341277.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
trans-1,3-Dichloropropene	Lin1		0.4370		9.94	10.0	-0.6	25.0
1,1,2-Trichloroethane	Ave	0.2685	0.2703		10.1	10.0	0.7	25.0
Tetrachloroethene	Lin2		0.4329		7.47	10.0	-25.3*	25.0
1,3-Dichloropropane	Ave	0.4346	0.4391		10.1	10.0	1.0	25.0
2-Hexanone	Ave	0.0686	0.0788		45.9	40.0	14.9	25.0
Chlorodibromomethane	Lin1		0.3429		9.15	10.0	-8.5	25.0
1,2-Dibromoethane	Ave	0.2599	0.2765		10.6	10.0	6.4	25.0
Chlorobenzene	Ave	1.031	1.051	0.3000	10.2	10.0	1.9	25.0
Ethylbenzene	Ave	1.664	1.824		11.0	10.0	9.6	25.0
1,1,1,2-Tetrachloroethane	Ave	0.3872	0.4207		10.9	10.0	8.6	25.0
m-Xylene & p-Xylene	Ave	1.263	1.457		11.5	10.0	15.4	25.0
o-Xylene	Qua1		1.534		10.0	10.0	0.0	25.0
Styrene	Lin1		1.081		9.67	10.0	-3.3	25.0
Bromoform	Lin1		0.1791	0.1000	8.66	10.0	-13.4	25.0
Isopropylbenzene	Lin1		1.809		10.4	10.0	3.6	25.0
1,1,2,2-Tetrachloroethane	Ave	0.5511	0.6077	0.3000	11.0	10.0	10.3	25.0
Bromobenzene	Ave	0.7674	0.8032		10.5	10.0	4.7	25.0
1,2,3-Trichloropropane	Ave	0.1530	0.1641		10.7	10.0	7.2	25.0
N-Propylbenzene	Ave	3.115	3.690		11.8	10.0	18.5	25.0
trans-1,4-Dichloro-2-butene	Ave	0.1342	0.1432		10.7	10.0	6.7	40.0
2-Chlorotoluene	Ave	0.6779	0.7884		11.6	10.0	16.3	25.0
1,3,5-Trimethylbenzene	Lin1		2.642		10.1	10.0	1.2	25.0
4-Chlorotoluene	Lin1		0.7925		10.3	10.0	2.7	25.0
tert-Butylbenzene	Lin1		2.189		9.46	10.0	-5.4	25.0
1,2,4-Trimethylbenzene	Lin1		2.669		9.89	10.0	-1.1	25.0
sec-Butylbenzene	Lin1		3.065		9.98	10.0	-0.2	25.0
4-Isopropyltoluene	Lin1		2.626		9.64	10.0	-3.6	25.0
1,3-Dichlorobenzene	Ave	1.450	1.608		11.1	10.0	10.9	25.0
1,4-Dichlorobenzene	Ave	1.582	1.663		10.5	10.0	5.1	25.0
n-Butylbenzene	Lin1		0.5877		10.3	10.0	2.9	25.0
1,2-Dichlorobenzene	Ave	1.381	1.537		11.1	10.0	11.3	25.0
1,2-Dibromo-3-Chloropropane	Lin1		0.1064		9.50	10.0	-5.0	25.0
1,3,5-Trichlorobenzene	Lin1		1.141		9.82	10.0	-1.8	25.0
1,2,4-Trichlorobenzene	Lin1		1.034		9.93	10.0	-0.7	25.0
Hexachlorobutadiene	Ave	0.4050	0.4471		11.0	10.0	10.4	25.0
Naphthalene	Lin1		1.817		9.49	10.0	-5.1	25.0
1,2,3-Trichlorobenzene	Lin1		0.9099		9.92	10.0	-0.8	25.0
Dibromofluoromethane (Surr)	Ave	0.3140	0.3089		14.8	15.0	-1.6	25.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3248	0.2937		13.6	15.0	-9.6	25.0
Trifluorotoluene (Surr)	Ave	1.094	1.175		2.15	2.00	7.4	25.0
Toluene-d8 (Surr)	Ave	1.174	1.181		15.1	15.0	0.6	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: ICV 580-154612/14 Calibration Date: 03/05/2014 14:53

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341277.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	0.4229	0.4381		15.5	15.0	3.6	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: CCVIS 580-154844/3 Calibration Date: 03/10/2014 06:07

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341350.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	0.4707	0.5009		10.6	10.0	6.4	50.0
Chloromethane	Lin1		0.4054	0.1000	11.1	10.0	11.3	50.0
Vinyl chloride	Ave	0.4205	0.4137		9.84	10.0	-1.6	20.0
Bromomethane	Qua1		0.3201		9.58	10.0	-4.2	50.0
Chloroethane	Qua2		0.0724		10.1	10.0	1.2	50.0
Trichlorofluoromethane	Ave	0.5393	0.6618		12.3	10.0	22.7	50.0
Acrolein	Ave	0.0192	0.0263		82.2	60.0	37.1	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.3422	0.3475		10.2	10.0	1.5	50.0
1,1-Dichloroethene	Ave	0.3527	0.3529		10.0	10.0	0.0	20.0
Acetone	Lin1		0.0419		50.7	40.0	26.7	50.0
Iodomethane	Ave	0.7827	0.7699		9.84	10.0	-1.6	50.0
Carbon disulfide	Ave	0.9555	0.9607		10.1	10.0	0.5	50.0
Methylene Chloride	Qua2		0.3763		9.47	10.0	-5.3	40.0
2-Methyl-2-propanol	Ave	0.0074	0.0094		126	100	26.0	50.0
Methyl tert-butyl ether	Ave	0.7285	0.7788		10.7	10.0	6.9	30.0
trans-1,2-Dichloroethene	Ave	0.3749	0.3753		10.0	10.0	0.1	30.0
Acrylonitrile	Lin1		0.0575		119	100	19.4	50.0
n-Hexane	Ave	0.3379	0.3353		9.92	10.0	-0.8	40.0
1,1-Dichloroethane	Ave	0.6378	0.6342	0.1000	9.94	10.0	-0.6	30.0
Vinyl acetate	Ave	0.0309	0.0369		23.9	20.0	19.6	50.0
Tert-butyl ethyl ether	Ave	0.3672	0.3949		10.8	10.0	7.6	30.0
2,2-Dichloropropane	Qua2		0.3545		10.2	10.0	2.5	40.0
cis-1,2-Dichloroethene	Ave	0.3735	0.3535		9.47	10.0	-5.3	30.0
2-Butanone	Ave	0.0061	0.0068		44.1	40.0	10.3	50.0
Chlorobromomethane	Ave	0.2112	0.2130		10.1	10.0	0.8	40.0
Chloroform	Ave	0.6691	0.6733		10.1	10.0	0.6	20.0
1,1,1-Trichloroethane	Ave	0.5347	0.5630		10.5	10.0	5.3	30.0
1,1-Dichloropropene	Ave	0.4265	0.4333		10.2	10.0	1.6	30.0
Carbon tetrachloride	Ave	0.4712	0.4958		10.5	10.0	5.2	30.0
Benzene	Ave	1.235	1.207		9.77	10.0	-2.3	30.0
1,2-Dichloroethane	Ave	0.4509	0.4570		10.1	10.0	1.4	30.0
Tert-amyl methyl ether	Ave	0.7025	0.7774		11.1	10.0	10.7	40.0
Trichloroethene	Ave	0.3408	0.3159		9.27	10.0	-7.3	30.0
1,2-Dichloropropane	Ave	0.3047	0.2999		9.84	10.0	-1.6	20.0
Dibromomethane	Ave	0.1824	0.1762		9.66	10.0	-3.4	30.0
Dichlorobromomethane	Ave	0.4165	0.4470		10.7	10.0	7.3	30.0
2-Chloroethyl vinyl ether	Ave	0.1338	0.1178		8.80	10.0	-12.0	50.0
cis-1,3-Dichloropropene	Lin2		0.5230		9.76	10.0	-2.4	30.0
4-Methyl-2-pentanone	Ave	0.0781	0.0854		43.7	40.0	9.3	50.0
Toluene	Ave	1.525	1.438		9.43	10.0	-5.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: CCVIS 580-154844/3 Calibration Date: 03/10/2014 06:07

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341350.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
trans-1,3-Dichloropropene	Lin1		0.4042		9.20	10.0	-8.0	30.0
1,1,2-Trichloroethane	Ave	0.2685	0.2479		9.23	10.0	-7.7	30.0
Tetrachloroethene	Lin2		0.3770		6.51	10.0	-34.9	40.0
1,3-Dichloropropane	Ave	0.4346	0.4149		9.55	10.0	-4.5	30.0
2-Hexanone	Ave	0.0686	0.0740		43.2	40.0	7.9	50.0
Chlorodibromomethane	Lin1		0.3347		8.94	10.0	-10.6	40.0
1,2-Dibromoethane	Ave	0.2599	0.2702		10.4	10.0	4.0	30.0
Chlorobenzene	Ave	1.031	0.9519	0.3000	9.23	10.0	-7.7	30.0
Ethylbenzene	Ave	1.664	1.664		10.0	10.0	-0.0	20.0
1,1,1,2-Tetrachloroethane	Ave	0.3872	0.3894		10.1	10.0	0.6	30.0
m-Xylene & p-Xylene	Ave	1.263	1.280		10.1	10.0	1.4	30.0
o-Xylene	Qua1		1.362		8.88	10.0	-11.2	30.0
Styrene	Lin1		0.9636		8.62	10.0	-13.8	30.0
Bromoform	Lin1		0.1753	0.1000	8.48	10.0	-15.2	40.0
Isopropylbenzene	Lin1		1.573		9.02	10.0	-9.8	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5511	0.5630	0.3000	10.2	10.0	2.2	30.0
Bromobenzene	Ave	0.7674	0.7113		9.27	10.0	-7.3	30.0
1,2,3-Trichloropropane	Ave	0.1530	0.1596		10.4	10.0	4.3	30.0
N-Propylbenzene	Ave	3.115	3.349		10.8	10.0	7.5	30.0
trans-1,4-Dichloro-2-butene	Ave	0.1342	0.1464		10.9	10.0	9.1	50.0
2-Chlorotoluene	Ave	0.6779	0.6699		9.88	10.0	-1.2	30.0
1,3,5-Trimethylbenzene	Lin1		2.331		8.93	10.0	-10.7	30.0
4-Chlorotoluene	Lin1		0.6768		8.78	10.0	-12.2	30.0
tert-Butylbenzene	Lin1		1.907		8.26	10.0	-17.4	30.0
1,2,4-Trimethylbenzene	Lin1		2.439		9.05	10.0	-9.5	30.0
sec-Butylbenzene	Lin1		2.666		8.69	10.0	-13.1	30.0
4-Isopropyltoluene	Lin1		2.295		8.44	10.0	-15.6	30.0
1,3-Dichlorobenzene	Ave	1.450	1.400		9.66	10.0	-3.4	30.0
1,4-Dichlorobenzene	Ave	1.582	1.442		9.11	10.0	-8.9	30.0
n-Butylbenzene	Lin1		0.4851		8.51	10.0	-14.9	30.0
1,2-Dichlorobenzene	Ave	1.381	1.338		9.69	10.0	-3.1	30.0
1,2-Dibromo-3-Chloropropane	Lin1		0.0993		8.88	10.0	-11.2	50.0
1,3,5-Trichlorobenzene	Lin1		1.055		9.08	10.0	-9.2	30.0
1,2,4-Trichlorobenzene	Lin1		0.8523		8.20	10.0	-18.0	40.0
Hexachlorobutadiene	Ave	0.4050	0.3992		9.86	10.0	-1.4	40.0
Naphthalene	Lin1		1.509		7.90	10.0	-21.0	40.0
1,2,3-Trichlorobenzene	Lin1		0.7732		8.44	10.0	-15.6	40.0
Dibromofluoromethane (Surr)	Ave	0.3140	0.3283		15.7	15.0	4.5	
1,2-Dichloroethane-d4 (Surr)	Ave	0.3248	0.3586		16.6	15.0	10.4	
Trifluorotoluene (Surr)	Ave	1.094	1.037		9.47	10.0	-5.2	
Toluene-d8 (Surr)	Ave	1.174	1.197		15.3	15.0	2.0	

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Lab Sample ID: CCVIS 580-154844/3 Calibration Date: 03/10/2014 06:07

Instrument ID: SEA015 Calib Start Date: 03/05/2014 10:24

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 03/05/2014 14:04

Lab File ID: I0341350.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	0.4229	0.4404		15.6	15.0	4.1	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 580-154844/6

Matrix: Water | Lab File ID: I0341353.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 07:21

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	ND		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		75-120
98-08-8	Trifluorotoluene (Surr)	112		80-125
2037-26-5	Toluene-d8 (Surr)	101		75-125
1868-53-7	Dibromofluoromethane (Surr)	103		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	109		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 580-154844/7

Matrix: Water Lab File ID: I0341354.D

Analysis Method: 8260B Date Collected:

Sample wt/vol: 10(mL) Date Analyzed: 03/10/2014 07:45

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624short ID: 0.18(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 154844 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.32		0.10	0.10
75-35-4	1,1-Dichloroethene	6.03		0.10	0.10
127-18-4	Tetrachloroethene	4.31		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.86		0.10	0.10
79-01-6	Trichloroethene	5.39		0.10	0.10
75-01-4	Vinyl chloride	5.63		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	102		75-120
98-08-8	Trifluorotoluene (Surr)	109		80-125
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	103		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	108		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 580-154844/8

Matrix: Water | Lab File ID: I0341355.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 08:10

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.36		0.10	0.10
75-35-4	1,1-Dichloroethene	5.93		0.10	0.10
127-18-4	Tetrachloroethene	4.88		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.86		0.10	0.10
79-01-6	Trichloroethene	5.67		0.10	0.10
75-01-4	Vinyl chloride	5.72		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	104		75-120
98-08-8	Trifluorotoluene (Surr)	108		80-125
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	104		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	110		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: MW18-140227-W MS | Lab Sample ID: 580-42527-3 MS

Matrix: Water | Lab File ID: I0341356.D

Analysis Method: 8260B | Date Collected: 02/27/2014 13:35

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 08:35

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.58		0.10	0.10
75-35-4	1,1-Dichloroethene	5.88		0.10	0.10
127-18-4	Tetrachloroethene	3.33		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.90		0.10	0.10
79-01-6	Trichloroethene	5.88		0.10	0.10
75-01-4	Vinyl chloride	6.97		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	103		75-120
98-08-8	Trifluorotoluene (Surr)	110		80-125
2037-26-5	Toluene-d8 (Surr)	99		75-125
1868-53-7	Dibromofluoromethane (Surr)	101		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		70-120

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-42527-1

SDG No.:

Client Sample ID: MW18-140227-W MSD | Lab Sample ID: 580-42527-3 MSD

Matrix: Water | Lab File ID: I0341357.D

Analysis Method: 8260B | Date Collected: 02/27/2014 13:35

Sample wt/vol: 10(mL) | Date Analyzed: 03/10/2014 08:59

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

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

Analysis Batch No.: 154844 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.40		0.10	0.10
75-35-4	1,1-Dichloroethene	5.77		0.10	0.10
127-18-4	Tetrachloroethene	3.26		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.65		0.10	0.10
79-01-6	Trichloroethene	5.90		0.10	0.10
75-01-4	Vinyl chloride	6.62		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	102		75-120
98-08-8	Trifluorotoluene (Surr)	108		80-125
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	99		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		70-120

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Instrument ID: SEA015 Start Date: 03/05/2014 09:35

Analysis Batch Number: 154612 End Date: 03/05/2014 22:28

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RINSE 580-154612/1 BFB		03/05/2014 09:35	1		ZB-624short 0.18(mm)
BFB 580-154612/2		03/05/2014 10:00	1	I0341265.D	ZB-624short 0.18(mm)
STD00002 580-154612/3 IC		03/05/2014 10:24	1	I0341266.D	ZB-624short 0.18(mm)
STD0001 580-154612/4 IC		03/05/2014 10:49	1	I0341267.D	ZB-624short 0.18(mm)
STD0002 580-154612/5 IC		03/05/2014 11:13	1	I0341268.D	ZB-624short 0.18(mm)
STD0004 580-154612/6 IC		03/05/2014 11:38	1	I0341269.D	ZB-624short 0.18(mm)
STD001 580-154612/7 IC		03/05/2014 12:02	1	I0341270.D	ZB-624short 0.18(mm)
STD005 580-154612/8 IC		03/05/2014 12:26	1	I0341271.D	ZB-624short 0.18(mm)
ICIS 580-154612/9		03/05/2014 12:51	1	I0341272.D	ZB-624short 0.18(mm)
STD025 580-154612/10 IC		03/05/2014 13:15	1	I0341273.D	ZB-624short 0.18(mm)
STD050 580-154612/11 IC		03/05/2014 13:40	1	I0341274.D	ZB-624short 0.18(mm)
STD080 580-154612/12 IC		03/05/2014 14:04	1	I0341275.D	ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 14:29	1		ZB-624short 0.18(mm)
ICV 580-154612/14		03/05/2014 14:53	1	I0341277.D	ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 15:18	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 15:42	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 16:46	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 17:10	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 17:35	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 17:59	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 18:24	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 18:48	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 19:13	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 19:37	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 20:02	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 20:26	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 20:50	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 21:15	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 21:39	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 22:04	1		ZB-624short 0.18(mm)
ZZZZZ		03/05/2014 22:28	1		ZB-624short 0.18(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Instrument ID: SEA015 Start Date: 03/10/2014 05:18

Analysis Batch Number: 154844 End Date: 03/10/2014 16:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RINSE 580-154844/1 BFB		03/10/2014 05:18	1		ZB-624short 0.18(mm)
BFB 580-154844/2		03/10/2014 05:42	1	I0341349.D	ZB-624short 0.18(mm)
CCVIS 580-154844/3		03/10/2014 06:07	1	I0341350.D	ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 06:32	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 06:57	1		ZB-624short 0.18(mm)
MB 580-154844/6		03/10/2014 07:21	1	I0341353.D	ZB-624short 0.18(mm)
LCS 580-154844/7		03/10/2014 07:45	1	I0341354.D	ZB-624short 0.18(mm)
LCSD 580-154844/8		03/10/2014 08:10	1	I0341355.D	ZB-624short 0.18(mm)
580-42527-3 MS	MW18-140227-W MS	03/10/2014 08:35	1	I0341356.D	ZB-624short 0.18(mm)
580-42527-3 MSD	MW18-140227-W MSD	03/10/2014 08:59	1	I0341357.D	ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 09:24	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 09:48	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 10:13	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 10:38	1		ZB-624short 0.18(mm)
580-42527-5	TRIP BLANK	03/10/2014 11:02	1	I0341362.D	ZB-624short 0.18(mm)
580-42527-1	MW16-140227-W	03/10/2014 11:27	1	I0341363.D	ZB-624short 0.18(mm)
580-42527-2	MW3-140227-W	03/10/2014 11:51	1	I0341364.D	ZB-624short 0.18(mm)
580-42527-3	MW18-140227-W	03/10/2014 12:15	1	I0341365.D	ZB-624short 0.18(mm)
580-42527-4	DUP01-140227-W	03/10/2014 12:40	1	I0341366.D	ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 13:05	10		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 13:29	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 13:53	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 14:18	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 14:42	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 15:06	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 15:34	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 15:58	1		ZB-624short 0.18(mm)
ZZZZZ		03/10/2014 16:23	1		ZB-624short 0.18(mm)

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-42527-1

SDG No.:

Project: 318 State AVE NE (WA)

Client Sample ID	Lab Sample ID
MW16-140227-W	580-42527-1
MW3-140227-W	580-42527-2
MW18-140227-W	580-42527-3
DUP01-140227-W	580-42527-4

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW16-140227-W
Lab Sample ID: 580-42527-1
Lab Name: TestAmerica Seattle
Job No.: 580-42527-1
SDG ID.:
Matrix: Water
Date Sampled: 02/27/2014 11:30
Reporting Basis: WET
Date Received: 02/27/2014 15:25

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	7.3	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW3-140227-W
Lab Sample ID: 580-42527-2
Lab Name: TestAmerica Seattle
Job No.: 580-42527-1
SDG ID.:
Matrix: Water
Date Sampled: 02/27/2014 12:50
Reporting Basis: WET
Date Received: 02/27/2014 15:25

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	11	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW18-140227-W
Lab Sample ID: 580-42527-3
Lab Name: TestAmerica Seattle
Job No.: 580-42527-1
SDG ID.:
Matrix: Water
Date Sampled: 02/27/2014 13:35
Reporting Basis: WET
Date Received: 02/27/2014 15:25

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	11	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: DUP01-140227-W
Lab Sample ID: 580-42527-4
Lab Name: TestAmerica Seattle
Job No.: 580-42527-1
SDG ID.:
Matrix: Water
Date Sampled: 02/27/2014 12:00
Reporting Basis: WET
Date Received: 02/27/2014 15:25

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	7.4	1.2		mg/L			1	300.0

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Analyst: RSB Batch Start Date: 03/12/2014

Reporting Units: mg/L Analytical Batch No.: 155074

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	07:19	Sulfate	38.0	37.5	101	90-110		TAC044 CCV_00004
2	CCB	07:34	Sulfate	ND					
16	CCV	12:38	Sulfate	36.1	37.5	96	90-110		TAC044 CCV_00004
17	CCB	12:52	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.: 580-42527-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 155074	Date: 03/12/2014 07:48						
300.0	MB 580-155074/3	Sulfate	ND		mg/L	1.2	1

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 155074		Date: 03/12/2014 11:11									
300.0	580-42527-3	Sulfate	11		mg/L						
300.0	580-42527-3 MS	Sulfate	22.8		mg/L	12.0	96	90-110			

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.: 580-42527-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 155074 Date: 03/12/2014 11:26											
300.0	580-42527-3 MSD	Sulfate	22.9		mg/L	12.0	97	90-110	0	15	

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

FORM V-IN

6-IN
DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water

Method	Client Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD	RPD Limit	Qual
Batch ID: 155074 Date: 03/12/2014 10:57								
300.0	MW18-140227-W	580-42527-3	Sulfate	11	mg/L			
300.0	MW18-140227-W	580-42527-3 DU	Sulfate	11.2	mg/L	0.4	10	

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

FORM VI-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 155074	Date: 03/12/2014 08:03										
						LCS Source: TAC044 LCS_00003					
300.0	LCS 580-155074/4	Sulfate	12.3		mg/L	12.0	102	90-110	1	15	

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

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 155074	Date: 03/12/2014 08:17										
						LCSD Source: TAC044 LCS_00003					
300.0	LCSD 580-155074/5	Sulfate	12.4		mg/L	12.0	103	90-110	1	15	

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: 580-42527-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 RL Date: 09/24/2009 08:59

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

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-42527-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 XMDL Date: 08/24/2009 13:55

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Sulfate		1.2	0.4

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Instrument ID: TAC044 Method: 300.0

Start Date: 03/12/2014 07:19 End Date: 03/12/2014 14:04

Lab Sample ID	D / F	Type	Time	Analytes																			
				SO4																			
CCV 580-155074/1	1		07:19	X																			
CCB 580-155074/2	1		07:34	X																			
MB 580-155074/3	1	T	07:48	X																			
LCS 580-155074/4	1	T	08:03	X																			
LCSD 580-155074/5	1	T	08:17	X																			
580-42527-1	1	T	10:14	X																			
580-42527-2	1	T	10:28	X																			
580-42527-3	1	T	10:43	X																			
580-42527-3 DU	1	T	10:57	X																			
580-42527-3 MS	1	T	11:11	X																			
580-42527-3 MSD	1	T	11:26	X																			
580-42527-4	1	T	11:40	X																			
ZZZZZZ			11:55																				
ZZZZZZ			12:09																				
ZZZZZZ			12:23																				
CCV 580-155074/16	1		12:38	X																			
CCB 580-155074/17	1		12:52	X																			
ZZZZZZ			13:07																				
ZZZZZZ			13:21																				
ZZZZZZ			13:35																				
CCV 580-155074/21			13:50																				
CCB 580-155074/22			14:04																				

Prep Types

T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Seattle Job No.: 580-42527-1

SDG No.:

Batch Number: 155074 Batch Start Date: 03/12/14 07:19 Batch Analyst: Brennan, Richard S

Batch Method: 300.0 Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	IC-Custom-Std 00002	TAC044 CCV 00004	TAC044 LCS 00003	
CCV 580-155074/1		300.0		5 mL	5 mL		5 mL		
CCB 580-155074/2		300.0		5 mL	5 mL				
MB 580-155074/3		300.0		5 mL	5 mL				
LCS 580-155074/4		300.0		5 mL	5 mL			5 mL	
LCSD 580-155074/5		300.0		5 mL	5 mL			5 mL	
580-42527-A-1	MW16-140227-W	300.0	T	5 mL	5 mL				
580-42527-A-2	MW3-140227-W	300.0	T	5 mL	5 mL				
580-42527-A-3	MW18-140227-W	300.0	T	5 mL	5 mL				
580-42527-A-3 DU	MW18-140227-W	300.0	T	5 mL	5 mL				
580-42527-A-3 MS	MW18-140227-W	300.0	T	5 mL	5 mL	0.05 mL			
580-42527-A-3 MSD	MW18-140227-W	300.0	T	5 mL	5 mL	0.05 mL			
580-42527-A-4	DUP01-140227-W	300.0	T	5 mL	5 mL				
CCV 580-155074/16		300.0		5 mL	5 mL		5 mL		
CCB 580-155074/17		300.0		5 mL	5 mL				

Batch Notes	
Filter Lot #	R3KA70397

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: GEI
Client Contact: IAIN WINGARD
Date: 2/27/14
Chain of Custody Number: 20586
Address: 1101 S. Fawcett #200
Telephone Number (Area Code)/Fax Number: 253-383-4940
Lab Number: 42527
Page 1 of
City: TACOMA State: WA Zip Code: 98402
Sampler: PDR
Lab Contact: Melissa Armstrong
Project Name and Location (State): 318 State AVE NE (WA)
Billing Contact:
Contract/Purchase Order/Quote No.:

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	Analysis: Sulfate EPA 300	VOCs 8260B	Special Instructions/ Conditions of Receipt
1-MW16-140227-W	2/27	1130		X			1			3			X	X	*Reporting limits
2-MW3-140227-W	2/27	1250		X			1			3			X	X	Analyte list, QA/QC
3-MW18-140227-W	|	1335		X			1			3			X	X	to be achieved
3-MW18-140227-MS	|	1336		X			1			3			X	X	See TABLE B-1
3-MW18-140227-MSD	|	1337		X			1			3			X	X	thru B-4 of
~~MW18-140227~~															compliance
4-DUP01-140227-W	2/27	1200		X			1			3			X	X	monitoring plan
5-TRIP BLANK	2/27			X						3				X	

580-42527 Chain of Custody

Cooler ☐ Yes ☐ No Cooler Temp: ______
Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown
Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ 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 ______
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By Sign/Print: [signature] PAUL ROBINETTE	2/27/14	1525	1. Received By Sign/Print: Heather Prater / Heather Prater	2/27/14	1525
2. Relinquished By Sign/Print			2. Received By Sign/Print		
3. Relinquished By Sign/Print			3. Received By Sign/Print		

Cooler (TB) Dig/IR cor 6.5 unc 6.4 #2
Cooler Dsc Lg Wh @ Lab
(Wet) Packs Packing W/S

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: 580-42527-1

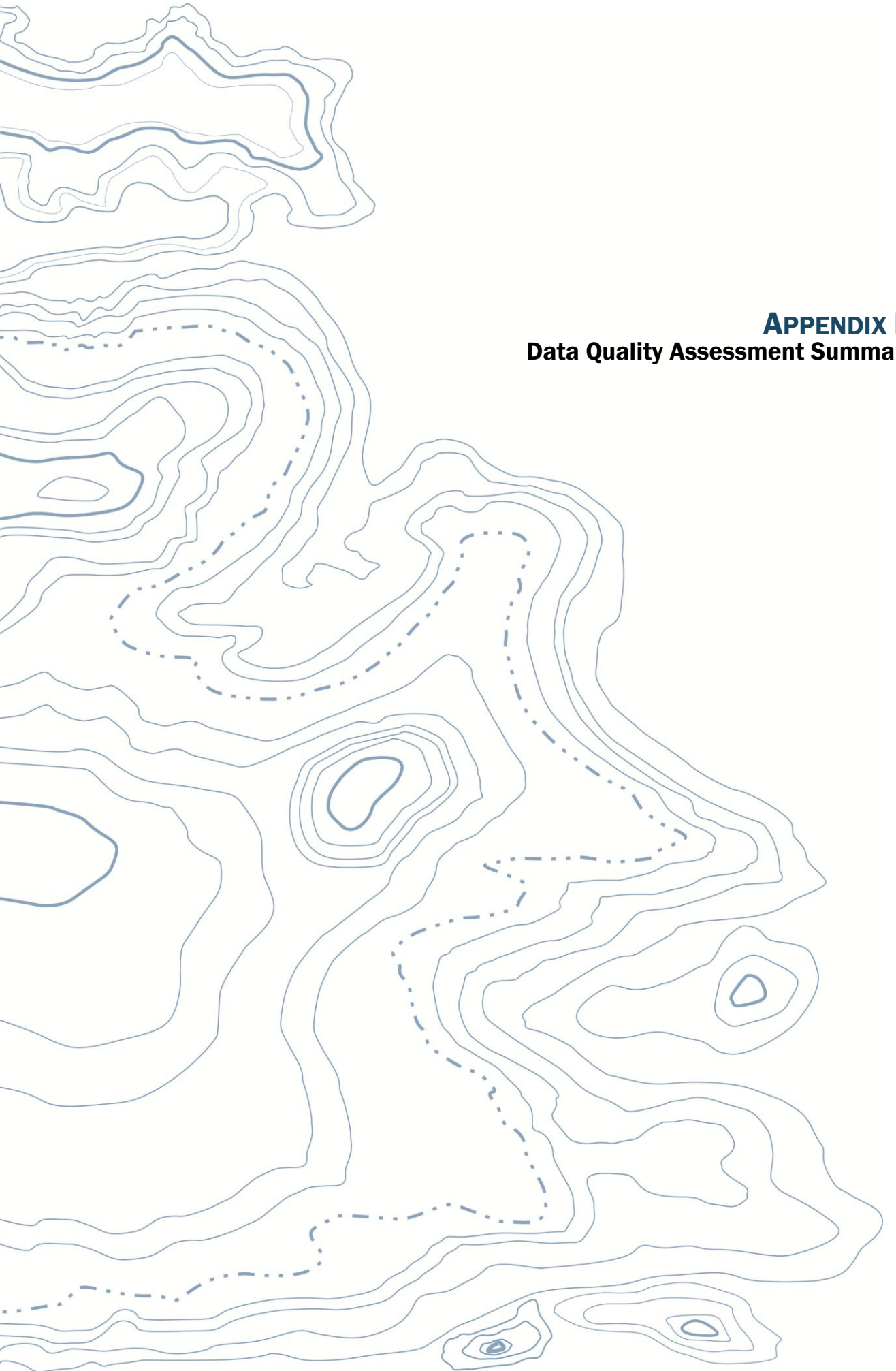
Login Number: 42527

List Source: TestAmerica Seattle

List Number: 1

Creator: Balles, Racheal M

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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	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.	False	Refer to Job Narrative for details.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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").	True	
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

Data Validation Report

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

Project:	City of Olympia – 318 NE State Avenue Site Fourth Semi-annual Groundwater Monitoring, February 2014
GEI File No:	0415-049-06
Date:	April 17, 2014

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 Fourth 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 Site 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, 2010), 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
- Laboratory and 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
580-42527-1	DUP01-140227-W, MW3-140227-W, MW16-140227-W, MW18-140227-W, TRIP BLANK

CHEMICAL ANALYSIS PERFORMED

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

- Volatile Organic Compounds (VOCs) by method SW8260B; 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 COCs were accurate and complete when submitted to the lab with the exceptions identified below.

SDG 580-42527-1: The laboratory noted that Sample MW18-140227-W was listed on the COC as three separate samples to include the matrix spike and matrix spike duplicate (MS/MSD), each with a different time. The laboratory logged Sample MW18-140227-W with a time of 13:35 and assigned the MS/MSD to this sample.

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 above the appropriate temperatures of between 2 and 6 degrees Celsius. The out-of-compliance temperature is detailed below.

SDG 580-42527-1: The sample cooler temperature recorded at the laboratory was 6.5 degrees Celsius. It was determined through professional judgment that since the samples were received by the laboratory the same day they were collected, 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 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 above the reporting limits in any of the method 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 above the reporting limits in the trip blank.

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.

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.

Laboratory Duplicates (Anions Only)

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in the laboratory documents. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

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 greater 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 35 percent.

SDG 580-42527-1: One field duplicate sample pair, MW16-140227-W and DUP01-140227-W, was submitted with this SDG. The precision criteria for all target analytes were met for 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. Precision was acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and laboratory/field duplicate RPD values.

No analytical results were qualified. All data are acceptable for the intended use.

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. April 16, 2010.