November 9, 2015

Ms. Heather Vick
Voluntary Cleanup Program Site Manager
Department of Ecology, Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

**Re: Submittal of Remedial Investigation/Feasibility Study and Request for Opinion**
**HERS Industrial Park Site (VCP Site No. NW1554)**
Project No. 140252

Dear Heather:

We are reengaging with the Washington State Department of Ecology (Ecology) for the HERS Industrial Park site (Site) at 4403 Russell Road in Mukilteo, Washington. Russell Road Industrial Park, LLC, purchased parcels at the Site on June 29 and July 1, 2005, and enrolled the Site in the Voluntary Cleanup Program (VCP) on January 24, 2006 following Phase I and II environmental site assessments completed from June to December 2005. The Riley Group, Inc. (Riley) submitted Site characterization and interim action documents to Ecology in 2012 and requested an opinion under the VCP on July 23, 2012, which Ecology provided on October 18, 2012. In this opinion, Ecology requested a Remedial Investigation for the Site and identified several investigation data gaps.

Russell Road Industrial Park, LLC, engaged Aspect Consulting, LLC, (Aspect) in September 2014 to assist them with their goal of securing no further action (NFA) determinations for the parcels at the Site. We performed investigation activities at the Site between October 2014 and August 2015 to address data gaps identified by Ecology and prepared a Remedial Investigation and Feasibility Study (RI/FS) for the Site. The RI/FS:

- Defines the Site and summarizes the ownership and operational history of the Site and surrounding parcels;
- Describes the environmental setting;
- Summarizes previous environmental investigations and cleanup actions;
- Provides a conceptual site model for the release and distribution of the chemicals of potential concern;
- Proposes chemicals of concern, cleanup levels, and points of compliance and identifies the impacted media;
- Identifies the remedial action objectives; and

- Screens remedial technologies, develops and evaluates cleanup action alternatives, and recommends a preferred cleanup action alternative.

The impacted and non-impacted Site parcels are summarized in the table below.

**Impacted and Non-Impacted Parcels**

| Parcel Address | Snohomish County Tax Parcel No. (TPN) | Parcel Size (acres) | Owner |
|---|---|---|---|
| **Impacted Parcels** | | | |
| 4403 Russell Rd. | 00441400004600 | 1.64 | Russell Road Industrial Park LLC |
| 4351 Chennault Beach Rd. | 00441400004700 | 1.59 | Russell Road Industrial Park LLC |
| 4424 Chennault Beach Rd. | 00548700001700 | 2.36 | International Church of Foursquare Gospel |
| 4424 Chennault Beach Rd. | 00548700001701 | 0.5 | International Church of Foursquare Gospel |
| **Non-Impacted Parcels** | | | |
| 4433 Russell Rd. | 00441400004502 | 1.10 | Russell Road Industrial Park LLC |
| 4463 Russell Rd. | 00441400004400 | 1.17 | Russell Road Industrial Park LLC |
| 4493 Russell Rd. | 00441400004300 | 1.41 | Russell Road Industrial Park LLC |
| 4440 Chennault Beach Rd. | 00548700001600 | 1.29 | Russell Road Industrial Park LLC |
| 4470 Chennault Beach Rd. | 01031600000200 | Not recorded | Gonyea Woodworking Inc. |
| 4480 Chennault Beach Rd. | 01031600000100 | Not recorded | Himalayan Holdings Group, LLC |

Based on the findings of the RI, we are seeking property-specific NFA determinations for the non-impacted parcels. The preferred remedy identified in the FS involves interim actions to enhance the natural attenuation of chlorinated solvent contamination on the impacted parcels. After demonstrating the attainment of the cleanup levels on the impacted parcels owned by the International Church of Foursquare Gospel, we plan to request a NFA determination, which includes an environmental covenant for the impacted parcels owned by Russell Road Industrial Park, LLC. The covenant would include a long-term groundwater management plan to confirm the stability and attenuation of the residual contamination on the two parcels. We are seeking

Ecology's opinion supporting the findings of the RI and concurring that the preferred remedy will likely achieve a Site NFA determination.

We plan to submit Site data to Ecology through the Environmental Information Management (EIM) system in November 2015. We have electronic data deliverables for sampling data collected by Aspect, and hard copies of sampling data collected by Riley from June 14, 2005 to January 13, 2012. As we understand, Ecology requests that sample data collected after August 2005 be submitted to the EIM system. We plan to enter available Site data collected since June 2005.

We look forward to your review and opinion of this RI/FS and our plan of action. Please let me know if I can provide any clarification or assistance.

Sincerely,

Aspect consulting, LLC



**Alan Noell, PhD, PE**
Associate Remediation Engineer
anoell@aspectconsulting.com

Attachments: Remedial Investigation/Feasibility Study, HERS Industrial Park, November 2015

cc: Jason Bontrager, Russell Road Industrial Park, LLC

V:\140252 HERS Industrial Park\Deliverables\RI FS\HERS Industrial Park - RIFS submittal and request for opinion.docx

# REMEDIAL INVESTIGATION/ FEASIBILITY STUDY

## HERS Industrial Park, Mukilteo, Washington

Prepared for: Russell Road Industrial Park, LLC

Project No. 140252 • November 2015

Aspect CONSULTING

earth + water

# REMEDIAL INVESTIGATION/ FEASIBILITY STUDY

## HERS Industrial Park, Mukilteo, Washington

Prepared for: Russell Road Industrial Park, LLC

Project No. 140252 • November 2015

Aspect Consulting, LLC




**Kirsi S. Longley**
Sr. Project Environmental Scientist
klongley@aspectconsulting.com

**Alan Noell, PhD, PE**
Associate Remediation Engineer
anoell@aspectconsulting.com

V:\140252 HERS Industrial Park\Deliverables\RI FS\HERS Industrial Park RIFS Report_November 2015.docx

# Contents

**Acronyms and Abbreviations** ..... **vi**

**Executive Summary** ..... **ES-1**

**1 Introduction** ..... **1**
1.1 Purpose and Objectives ..... 1
1.2 Report Organization ..... 1

**2 Site Description and Background** ..... **3**
2.1 Site Location, Zoning, and Ownership ..... 3
2.2 Property Ownership and Use History ..... 4
2.2.1 4403 Russell Road ..... 4
2.2.2 4433 Russell Road ..... 5
2.2.3 4463 Russell Road ..... 6
2.2.4 4493 Russell Road ..... 7
2.2.5 4351 Chennault Beach Road ..... 7
2.2.6 4424 Chennault Beach Road ..... 8
2.2.7 4440 Chennault Beach Road ..... 8
2.2.8 4470 Chennault Beach Road ..... 8
2.2.9 4480 Chennault Beach Road ..... 9
2.3 Surrounding Properties ..... 9

**3 Environmental Setting** ..... **11**
3.1 Site Use, Conditions, and Infrastructure ..... 11
3.1.1 Structures ..... 11
3.1.2 Surface Cover ..... 11
3.1.3 Utilities ..... 11
3.2 Topography, Drainage, and Surface Water ..... 12
3.3 Geology and Hydrogeology ..... 12
3.3.1 Geology ..... 12
3.3.2 Hydrogeology ..... 13
3.4 Climate ..... 14

**4 Environmental Investigations and Cleanup Actions** ..... **15**
4.1 Previous Investigations ..... 15
4.1.1 Phase I Environmental Site Assessment (1994) ..... 15
4.1.2 UST Decommissioning (1995) ..... 16
4.1.3 Phase II Environmental Site Assessment (1995) ..... 16
4.1.4 Site Assessment Report (1996) ..... 17
4.1.5 Phase I ESA (2005) ..... 18
4.1.6 Supplemental Phase II Subsurface Investigation (2005) ..... 18
4.1.7 Well Installation and Groundwater Sampling (2005-2012) ..... 19

4.2 Interim Cleanup Actions ..... 20
4.2.1 UST and Soil Removal (1995) ..... 20
4.2.2 Floor Drain Removal (1995) ..... 20
4.2.3 Catch Basin Restoration and Excavation of Contaminated Soil (1996) ..... 20
4.2.4 Catch Basin Filter Installation (1996) ..... 21
4.2.5 In Situ Chemical Oxidation (2006) ..... 21
4.3 RI Data Gap Investigations ..... 21

**5 Conceptual Site Model ..... 24**
5.1 Potential Historical Releases ..... 24
5.1.1 Chlorinated VOCs ..... 24
5.1.2 Petroleum Hydrocarbons ..... 26
5.1.3 Heating Oil UST ..... 27
5.1.4 Metals ..... 27
5.2 COPC Distribution and Migration Pathways ..... 28
5.2.1 Chlorinated VOCs ..... 28
5.2.2 Petroleum Hydrocarbons ..... 31
5.3 Exposure Pathways and Receptors ..... 31
5.3.1 Human Receptors ..... 31
5.3.2 Ecological Receptors ..... 33

**6 Impacted Media ..... 34**
6.1 Proposed Chemicals of Concern ..... 34
6.2 Proposed Cleanup Levels and Points of Compliance ..... 36
6.3 Impacted Media ..... 36

**7 Remedial Action Objectives ..... 38**

**8 Remedial Action Technology Screening ..... 39**
8.1 Excavation ..... 39
8.2 Monitored Natural Attenuation ..... 40
8.3 Biostimulation ..... 41
8.4 *In Situ* Chemical Oxidation ..... 41
8.5 *In Situ* and *Ex-Situ* Soil Mixing ..... 43
8.6 Air Sparging/Soil Vapor Extraction ..... 44

**9 Development of Cleanup Alternatives ..... 45**
9.1 Interim Actions Completed to Date ..... 45
9.2 Cleanup Action Alternatives ..... 45
9.2.1 Alternative 1 – Completed Actions and MNA ..... 46
9.2.2 Alternative 2 – Completed Actions, Biostimulation, and MNA ..... 47
9.2.3 Alternative 3 – Completed Actions, Permanganate Injection, and MNA ..... 49
9.2.4 Alternative 4 – Completed Actions, In Situ Soil Mixing, and MNA ..... 50
9.2.5 Alternative 5 – Completed Actions, Excavation, and MNA ..... 51

**10 Detailed Evaluation of Cleanup Alternatives ..... 53**
10.1 Evaluation of Performance Requirements ..... 53

10.1.1 Protectiveness ..... 53
10.1.2 Permanence ..... 55
10.1.3 Cost ..... 56
10.1.4 Long-Term Effectiveness ..... 56
10.1.5 Management of Short-Term Risks ..... 57
10.1.6 Implementability ..... 57
10.1.7 Public Concerns ..... 58
10.2 Disproportionate Cost Analysis ..... 58
10.3 Reasonable Restoration Time Frame Requirements ..... 59

**11 Preferred Cleanup Action ..... 61**

**12 References ..... 62**

## List of Tables

ES-1 Impact and Non-Impacted Parcels (in text)

4.1 Soil Sampling Results

4.2 Groundwater Sampling Results and Injection Notes

4.3 Summary of ISCO Remediation of the Monitoring/Injection Wells (in text)

4.4 Gore Soil Gas Survey Sample Results

4.5 Groundwater Elevation Data

6.1 Chemicals of Potential Concern and Proposed Chemicals of Concern (in text)

6.2 Proposed Chemicals of Concern, Cleanup Levels, and Points of Compliance (in text)

9.1 Summary of Cleanup Alternative Components and Costs

9.2 Cost Estimate for Alternative 1: Completed Actions and MNA

9.3 Cost Estimate for Alternative 2: Completed Actions, Biostimulation, and MNA

9.4 Cost Estimate for Alternative 3: Completed Actions, Permanganate Injections, and MNA

9.5 Cost Estimate for Alternative 4: Completed Actions, *In Situ* Mixing, and MNA

9.6 Cost Estimate for Alternative 5: Completed Actions, Excavation, and MNA

10.1 Evaluation of Cleanup Alternatives for Permanence Criteria and Disproportionate Cost Analysis

10.2 Evaluation of Cleanup Alternatives for Reasonable Restoration Time Frame

## List of Figures


| | |
|---|---|
| 1 | Site Vicinity |
| 2 | Site Map |
| 3 | Surficial Geology |
| 4 | Site Location within Public Land System |
| 5A | Gore-Survey Results - Interpolated Data for Tetrachloroethylene (PCE) |
| 5B | Gore-Survey Results - Interpolated Data for Trichloroethylene (PCE) |
| 5C | Gore-Survey Results - Interpolated Data for cis-1,2-Dichloroethylene (cDCE) |
| 5D | Gore-Survey Results - Interpolated Data for Total Petroleum Hydrocarbons (TPH) |
| 5E | Gore-Survey Results - Interpolated Data for BTEX Compounds |
| 6A | Soil Sampling Results - Chlorinated Solvents |
| 6B | Soil Sampling Results - Petroleum Hydrocarbons |
| 6C | Soil Sampling Results - RCRA Metals |
| 7A | Groundwater Sampling Results - Chlorinated Solvents |
| 7B | Groundwater Sampling Results - Detail Chlorinated Solvents |
| 7C | Groundwater Sampling Results - Petroleum Hydrocarbons |
| 7D | Groundwater Sampling Results - BTEX |
| 7E | Groundwater Sampling Results - Arsenic and Water Quality Parameters |
| 8A | Groundwater Potentiometric Map - January 2015 |
| 8B | Groundwater Potentiometric Map - April 2015 |
| 8C | Groundwater Potentiometric Map - August 2015 |
| 9A | Alternative 2 – Biostimulation Wells |
| 9B | Alternative 3 – Permanganate Injection Wells and Borings |
| 9C | Alternative 4 – In Situ Soil Mixing Borings |
| 9D | Alternative 5 – Excavation Area |
| 10 | Disproportionate Cost Evaluation |


## List of Appendices


| | |
|---|---|
| A | Ecology Opinion Letter |

B Occupancy Maps from Phase I Environmental Site Assessments

C Well Construction and Soil Boring Logs

D Investigation Maps from Previous Environmental Reports

E Gore-Survey Report

F Laboratory Analytical Reports

# Acronyms and Abbreviations

| | |
|---|---|
| 3DMe® | 3-D Microemulsion® |
| µg/L | micrograms per liter |
| µg/$m^3$ | micrograms per cubic meter |
| ACS | Absolute Cleaning Service |
| AS/SVE | air sparging/soil vapor extraction |
| Aspect | Aspect Consulting, LLC |
| AST | aboveground storage tank |
| ATC | ATC Environmental, Inc. |
| bgs | below ground surface |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CAMU | corrective action management unit |
| cDCE | cis-1,2-dichloroethylene |
| CDF | controlled density fill |
| Coleman | Coleman Machine Works |
| COPC | chemical of potential concern |
| CSM | Conceptual Site Model |
| CUL | cleanup level |
| CO | certificate of occupancy |
| DCE | dichloroethylene |
| DCA | disproportionate cost analysis |
| DNAPL | dense nonaqueous phase liquid |
| Ecology | Washington State Department of Ecology |
| EPA | U.S. Environmental Protection Agency |
| ESA | environmental site assessment |
| Exotic Tool | Exotic Tool Welding, Inc. |
| HRC Primer® | Hydrogen Release Compound Primer® |
| Intermec | Intermec Corporation |
| ISB | *in situ* bioremediation |

| | |
|---|---|
| ISB | *in situ* biostimulation |
| ISCO | *in situ* chemical oxidation |
| ITRC | Interstate Technology Regulatory Council |
| FS | feasibility study |
| JPHC | James P. Hurley Co. |
| lbs | pounds |
| LQG | large quantity generator |
| MCL | maximum contaminant level |
| mg/kg | milligrams per kilogram |
| MNA | monitored natural attenuation |
| MS4 | municipal separate stormwater sewer |
| MTBE | methyl tert-butyl ether |
| MTCA | Model Toxics Control Act |
| NAPL | nonaqueous phase liquid |
| NFA | no further action |
| NGVD29 | National Geodetic Vertical Datum of 1929 |
| ORP | oxidation-reduction potential |
| PAH | polycyclic aromatic hydrocarbons |
| PCE | tetrachloroethylene |
| PID | photoionization detector |
| PVC | polyvinyl chloride |
| RCRA | Resource Conservation and Recovery Act |
| PCS | petroleum contaminated soil |
| RI | remedial investigation |
| RI/FS | Remedial Investigation/Feasibility Study |
| Riley | The Riley Group, Inc. |
| SEPA | State Environmental Policy Act |
| sf | square feet |
| Site | HERS Industrial Park Site |

| | |
|---|---|
| SQG | small quantity generator |
| SVE | soil vapor extraction |
| TCA | trichloroethane |
| TCE | trichloroethylene |
| TPH | total petroleum hydrocarbon |
| TPH-D | diesel-range TPH |
| TPH-G | gasoline-range TPH |
| TPH-O | oil-range TPH |
| TPN | tax parcel number |
| UIC | underground injection control |
| USGS | United State Geological Survey |
| UST | underground storage tank |
| VCP | Voluntary Cleanup Program |
| VOC | volatile organic compound |
| WAC | Washington Administrative Code |

# Executive Summary

The HERS Industrial Park facility, located at 4403 Russell Road, Mukilteo, Washington (Site), was enrolled in the Voluntary Cleanup Program (VCP) with the Washington State Department of Ecology (Ecology) on January 25, 2006 (VCP No. NW1554) and Ecology provided an opinion letter on October 12, 2012 requesting a Remedial Investigation. This Remedial Investigation and Feasibility Study (RI/FS) Report was prepared in accordance with the Model Toxics Control Act (MTCA) and addresses specific concerns identified by Ecology in their opinion letter.

The Site includes 10 contiguous parcels that are owned by multiple entities, as shown in Figure 2 and summarized in Table ES-1. The parcels are zoned as light industrial and are developed with eight flex facility industrial buildings and asphalt cover. The RI/FS reviewed past tenant operations, potential sources of contamination, and previous environmental investigations and interim cleanup actions.

Following prior investigation and cleanup actions, additional monitoring wells and soil borings were installed and sampled in 2015 to identify and confirm the sources of contamination and to delineate the nature and extent of contamination. The conceptual site model (CSM) identifies the release of chlorinated volatile organic compounds (VOCs) to storm drains and delineates the vertical and lateral migration of contamination. Diesel-range total petroleum hydrocarbons (TPH) and arsenic were encountered in groundwater at concentrations slightly above the Method A groundwater cleanup levels (CULs). The diesel-range TPH detections contained polar compounds that were removed using silica gel cleanup preparation, and the source of contamination appears to be from stormwater runoff into the catch basins and perforated lateral drainage pipes. Arsenic is not a suspected contaminant, and the concentrations observed were minor, erratic, and appear to be associated with background conditions (the Site is potentially within the influence area of the Everett Smelter). This RI/FS proposes chlorinated VOCs as the chemicals of concern (COCs) and Method A soil and groundwater cleanup levels for the Site.

Table ES-1 summarizes the impacted and non-impacted parcels at the Site for the proposed COCs.

**Table ES-1: Impacted and Non-Impacted Parcels**

| Parcel Address | Snohomish County Tax Parcel No. (TPN) | Parcel Size (acres) | Owner |
|---|---|---|---|
| **Impacted Parcels** | | | |
| 4403 Russell Rd. | 00441400004600 | 1.64 | Russell Road Industrial Park LLC |
| 4351 Chennault Beach Rd. | 00441400004700 | 1.59 | Russell Road Industrial Park LLC |
| 4424 Chennault Beach Rd. | 00548700001700 | 2.36 | International Church of Foursquare Gospel |
| 4424 Chennault Beach Rd. | 00548700001701 | 0.5 | International Church of Foursquare Gospel |
| **Non-Impacted Parcels** | | | |
| 4433 Russell Rd. | 00441400004502 | 1.10 | Russell Road Industrial Park LLC |
| 4463 Russell Rd. | 00441400004400 | 1.17 | Russell Road Industrial Park LLC |
| 4493 Russell Rd. | 00441400004300 | 1.41 | Russell Road Industrial Park LLC |
| 4440 Chennault Beach Rd. | 00548700001600 | 1.29 | Russell Road Industrial Park LLC |
| 4470 Chennault Beach Rd. | 01031600000200 | Not recorded | Gonyea Woodworking Inc. |
| 4480 Chennault Beach Rd. | 01031600000100 | Not recorded | Himalayan Holdings Group, LLC |

The following remedial action objectives were developed:

- Remediate accessible source area to allow natural attenuation of residual contamination in soil and groundwater and to decrease the concentrations of chlorinated VOCs on the 4424 Chennault Beach Road parcel to below the Method A soil and groundwater CULs.
- Implement monitoring program to confirm the stability and attenuation of residual contamination in the Vashon Till formation.
- Protect current and future human receptors from potential exposure pathways.
- Secure a no further action (NFA) determination for the impacted Site parcels owned by Russell Road Industrial Park with an environmental covenant that addresses a groundwater monitoring plan.
- Secure an unrestricted NFA determination for the non-impacted Site parcels.

Following defining remedial action objectives, potentially applicable remediation technologies were identified and five cleanup alternatives were developed and evaluated to address the chlorinated VOC exceedance area on the impacted parcels.

Based on this report's evaluation, biostimulation in Alternative 2 is selected as the preferred cleanup alternative, at an estimated remediation cost of $370,000 (see Table 9.3). The residual concentrations of chlorinated VOCs are fairly low, not indicative of free-phase product, and are amenable to enhanced and natural bioattenuation. Biostimulation is appropriate because it treats soil and groundwater in the source area on the northeast side of the 4403 Russell Road building and impacted soil and groundwater on the southeast corner of the Foursquare Church building (4424 Chennault Beach Road parcel) and it enhances and complements the attenuation of chlorinated VOC contamination outside the treatment area. Chlorinated VOC contamination is contained vertically and laterally within the Vashon Till at the Site. Chlorinated VOCs have migrated about 125 feet laterally and 100 feet vertically from the source. The Site is underlain by about 175 feet of Vashon Till, and chlorinated VOCs have not been detected in the underlying Esperance Sand. In addition, there are no current water supply wells downgradient from the Site.

Biostimulation would be performed in six existing remediation wells, monitoring wells MW-16 and MW-16D, and in seven new injection wells, as shown in Figure 9A. The biostimulants would be lactate-based chemicals that would migrate with groundwater and stimulate natural anaerobic bacteria for more than a year after injection. Bioremediation is a proven technology and natural reductive dechlorination reactions have been observed at the Site. A second, contingent round of biostimulation would be performed after several years if needed after the depletion of the initial biostimulants.

Alternative 2 includes the decommissioning of non-impacted monitoring wells and the monitoring of impacted and sentinel monitoring wells at 18 month intervals in opposing seasons until the concentrations of the chemicals of concern attenuate to below the Method A groundwater cleanup levels.

For the non-impacted parcels, we plan to request an unrestricted no further action (NFA) determination from Ecology.

For the impacted parcels, an environmental covenant would be recorded concurrently with an NFA determination from Ecology for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel. The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site.

# 1 Introduction

This report presents the results of the Remedial Investigation (RI) and Feasibility Study (FS) conducted for the HERS Industrial Park facility located at 4403 Russell Road, Mukilteo, Washington (Site). The RI/FS was completed to comply with the Washington State Model Toxics Control Act Cleanup (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC 173-340) and regulations implementing it. The RI/FS collects, develops, and evaluates information to allow for the selection and implementation of a final cleanup action. The work has been conducted as an independent action under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP).

The Site was enrolled into the VCP on January 25, 2006 and assigned VCP No. NW1554. Investigation documentation and a request for an opinion on the sufficiency of the initial Site characterization was submitted in 2012. Ecology provided an opinion letter, dated October 12, 2012 (Ecology, 2012), requesting additional Site characterization. The opinion letter is provided in Appendix A.

## 1.1 Purpose and Objectives

The purpose of the RI is to collect and interpret sufficient information to develop and evaluate technically feasible cleanup alternatives in accordance with WAC 173-340-360 through -390. The RI provides data to develop a conceptual site model (CSM) that identifies the suspected sources of chemicals of potential concern (COPCs), the nature and extent of the COPCs, the impacted media, potential exposure pathways, contaminant fate and transport characteristics, and potential receptors.

The FS has been conducted to develop and evaluate technically feasible cleanup alternatives to enable selection of a final cleanup action for the Site in accordance with WAC 173-340-360. The FS portion of this report presents the screening, evaluation, and selection of the preferred cleanup action for impacted media at the Site.

## 1.2 Report Organization

**Section 1 –** The **Introduction** provides a brief overview of the project and states the purpose and objectives for this work.

**Section 2 –** The **Site History and Background** defines the Site and summarizes the property ownership and historical use of the Site parcels and surrounding properties.

**Section 3 –** The **Environmental Setting** describes the Site use, conditions, and infrastructure; the topography and drainage, the geology and hydrogeology, and the ecological setting.

**Section 4 –** The **Environmental Investigations and Cleanup Actions** summarize the environmental investigations and interim cleanup actions that have been conducted at the Site and the data gaps investigation that was performed following Ecology's 2012 opinion letter (see Appendix A).

**Section 5 –** The **Conceptual Site Model** describes potential historical releases of contaminants, contaminant fate and transport, and the potential exposure pathways and receptors at the Site.

**Section 6 –** The **Impacted Media** summarizes the chemicals of potential concern (COPCs) and screening levels; proposes the chemicals of concern (COCs), cleanup levels (CULs), and points of compliance; and identifies the impacted media.

**Section 7 –** The **Remedial Action Objectives** for the Site are presented.

**Section 8 –** The **Remedial Action Technology Screening** identifies potentially application remediation technologies to retain for development of cleanup alternatives.

**Section 9** – The **Development of Cleanup Alternatives** summarizes the previously performed interim cleanup actions and develops five potential final cleanup alternatives for evaluation.

**Section 10** – The **Detailed Evaluation of Cleanup Alternatives** comparatively evaluates the five cleanup alternatives for performance requirements and anticipated restoration time frames. This section also presents a disproportionate cost analysis for all retained alternatives, in accordance with WAC 173-340-360.

**Section 11** – The **Preferred Cleanup Action** section summarizes the preferred final cleanup alternative.

**Section 12** – The **References** section lists all references used in the RI/FS.

# 2 Site Description and Background

This section provides a summary of the Site including location, description, and history of the Site.

## 2.1 Site Location, Zoning, and Ownership

The Site is located at 4403 to 4493 Russell Road and 4351 to 4480 Chennault Beach Road in Mukilteo, Washington in the southeast quarter of Section 21 and southwest quarter of Section 22 in Township 28 North, Range 4 East. The Site vicinity is shown in Figure 1 and the Site map is shown in Figure 2. The Site is located on ten tax parcels totaling approximately 12.8 acres of real property. The Site parcels include:

| Parcel Address | Snohomish County Tax Parcel No. (TPN) | Parcel Size (acres) | Owner |
|---|---|---|---|
| 4403 Russell Rd. | 00441400004600 | 1.64 | Russell Road Industrial Park LLC |
| 4433 Russell Rd. | 00441400004502 | 1.10 | Russell Road Industrial Park LLC |
| 4463 Russell Rd. | 00441400004400 | 1.17 | Russell Road Industrial Park LLC |
| 4493 Russell Rd. | 00441400004300 | 1.41 | Russell Road Industrial Park LLC |
| 4351 Chennault Beach Rd. | 00441400004700 | 1.59 | Russell Road Industrial Park LLC |
| 4424 Chennault Beach Rd. | 00548700001700 | 2.36 | International Church of Foursquare Gospel |
| 4424 Chennault Beach Rd. | 00548700001701 | 0.5 | International Church of Foursquare Gospel |
| 4440 Chennault Beach Rd. | 00548700001600 | 1.29 | Russell Road Industrial Park LLC |
| 4470 Chennault Beach Rd. | 01031600000200 | Not recorded | Gonyea Woodworking Inc. |
| 4480 Chennault Beach Rd. | 01031600000100 | Not recorded | Himalayan Holdings Group, LLC |

The Site parcels are zoned as light industrial and the surrounding parcels are zoned as light industrial or industrial park (City of Mukilteo, 2012). The Site is developed with eight flex facility industrial buildings ranging in size from approximately 10,200 to

43,152 square feet (sf), and is predominantly covered by asphalt pavement. Vegetative buffer strips are present along Russell Road and Chennault Beach Road.

## 2.2 Property Ownership and Use History

This section describes the property ownership and current and former businesses that operate on the Site parcels. The current and former tenants were identified from a 1994 Phase I Environmental Site Assessment (ESA) prepared by ATC Environmental (ATC) (ATC, 1994), a 2005 Phase I ESA prepared by The Riley Group (Riley) (Riley, 2005a), and from current tax records (Snohomish County, 2015). Occupancy maps from the 1994 and 2005 Phase I ESAs are provided in Appendix B.

### *2.2.1 4403 Russell Road*

Russell Road Industrial Park LLC purchased TPN 00441400004600 on June 29, 2005. This parcel is 1.64 acres and contains a 32,000 sf, single-story flex facility industrial building that was constructed in 1976. This remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Russell Road.

#### Past Tenants

The 1994 Phase I ESA (ATC, 1994) identified current and former tenants in the building. The tenants included:

- Intermec Corporation (Intermec). Intermec, a Resource Conservation and Recovery Act (RCRA) large quantity generator (LQG), obtained certificate of occupancy (CO) for 4405 Russell Road in February 3, 1978. Intermec occupied the lease spaced on the north side of the building. Intermec is an electronics manufacturer that generated spent halogenated solvents used in degreasing.

- King Machine, Inc./Our Gang American Motorcycles (King Machine). Our Gang American Motorcycles was a subsidiary of King Machine. King Machine obtained a CO in the former Intermec lease space on December 4, 1990. King Machine, a RCRA small quantity generator (SQG), serviced motorcycles. Spent machining coolant was generated as hazardous waste and picked up by Safety Kleen. Waste hydraulic and cutting oil were accumulated in 55 gallon drums and picked by a local oil recycler. Mr. Larry King, owner, indicated that the floor drain in the lease space had been used by Intermec and he suspected that chemicals were released to the drain by Intermec. The original floor drain was sunken, and Mr. King indicated that he removed the floor drain, installed a new floor drain at the finished floor level, and poured new concrete.

- Absolute Cleaning Services (ACS). ACS operated in both the 4403 and 4433 buildings. ATC (1994) reported that ACS used the annex facility in the 4403 building for cleaning used rags in a large commercial washer and dryer.

- Production Plating. Production Plating, a RCRA LQG, operates their main facility south of the Site at 4330 Russell Road. Production Plating leased warehouse space on the south end of the 4403 building in 1994. Production Plating stored finished products in this space, but chemicals were not stored here. Production Plating reportedly did not use the truck wash on the southwest corner of the building.

- Cheeseburger Chuckwagon. Cheeseburger Chuckwagon occupied the lease space on the south side of the building, which was later occupied by Production Plating. Cheeseburger Chuckwagon obtained a plumbing permit on July 12, 1993 for the construction of a floor drain and grease trap on the southwest corner of the building. The Phase I ESA (ATC, 1994) indicated the truck wash was clean and that Cheeseburger Chuckwagon likely used the truck wash for cleaning food catering trucks.

- Additional 1994 tenants: Custom Cabinets (cabinetry and woodworking), Dansco (cabinetry and woodworking), and Custom Cabling (offices).

- Additional tenants before 1994: Can Am Manufacturing (seafood processing, January 9, 1978 CO), Mr. Parts (auto parts store, February 3, 1978 CO), Fabrication Systems (aluminum fabrication, February 3, 1978 CO), Jansport (warehouse, September 19, 1978 CO), Jalon Inc. (wood shop/spray booth, October 2, 1979 CO), Light Fleet Services (November 1, 1990 CO), Hawaiian Trust (April 3, 1992 building permit), Granny's Kitchen (undated CO), Evergreen Industries (metal fabrication, undated CO), Cabinet Shop (undated CO), Kerry Enterprises (auto engine salvage, undated CO) American Concrete Cutting (4407 Russell Road, February 3, 1978 CO), and Alaska Pacific Crab (4413 Russell Road, March 15, 1978 CO).

The 2005 Phase I ESA (Riley, 2005a) identified the tenants in 4403 Russell Road as a granite cutting shop, Legacy Roofing, Pacific Rail, Pacific Glass, and Accurate Sheet Metal, Inc. (storage space). Accurate Sheet Metal, Inc. currently operates at 4301 Russell Road, east of the Site.

### Current Tenants

The current tenants at 4403 Russell Road include ProGranite Surfaces LLC, Glass Gardens Northwest, and Legends Roofing Company Inc. (Snohomish County, 2015). ProGranite vacated the west side of the former Intermec lease space in spring of 2015, which allowed sampling to be performed adjacent to the former Intermec drain in July 2015.

## *2.2.2 4433 Russell Road*

Russell Road Industrial Park LLC purchased TPN 00441400004502 on June 29, 2005. This parcel is 1.10 acres and contains an 18,600 sf, single-story flex facility industrial building that was constructed in 1976. This remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Russell Road.

### Past Tenants

The 1994 Phase I ESA (ATC, 1994) identified current and former tenants in the building. The tenants included:

- Absolute Cleaning Services (ACS). ACS occupied the north part of the 4433 building, and had an annex facility in the 4403 building. ACS operated a restaurant kitchen exhaust cleaning business and ATC (1994) indicated that their base operations were in the 4433 Russell Road building. ACS stored less than 500 gallons of hazardous materials, including sodium hydroxide,

tetrachloroethylene (PCE), and kerosene, and most of the materials were stored in 5-gallon containers or less. PCE and kerosene were mixed in a 55-gallon drum and then dispensed for use as a metal polish on job sites.

- Exotic Tool Welding, Inc. (Exotic Tool). Exotic Tool occupied the south end of the 4433 building during the 1994 and 2005 Phase I ESAs and moved to a new location in 2008. Exotic Tool performed precision welding, brazing, and light fabrication services and stored less than five gallons of acetone onsite, along with compressed gases. The 1994 Phase I ESA indicated that the facility had a floor drain that appeared to have been previously connected to a trench system, which was filled with concrete before 1994. The business owner was not aware of the previous use of the drain.
- Coleman Machine Works (Coleman). Coleman operated at 4463 Russell Road, but maintained a small annex in the 4433 Russell Road building north of the Exotic Tool lease space.
- Additional 1994 tenants: Double Bluff Design (manufactures oak furniture), Buchanon Companies (office space with limited storage),

The 2005 Phase I ESA indicated that Double Bluff, Exotic Tool, ACI Stanley Door, and Futurecom Tech (office space) operated at the 4433 Russell Road address.

### Current Tenants

The current tenants in the building include Grouchy Enterprises LLC doing business as (dba) Grouchy Chef and Carport Structures Inc. dba Henderson Enterprises (Snohomish County, 2015).

## *2.2.3 4463 Russell Road*

Russell Road Industrial Park LLC purchased TPN 00441400004400 on June 29, 2005. This parcel is 1.17 acres and contains a 10,200 sf, single-story flex facility industrial building that was constructed in 1976. This remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Russell Road. A material storage area is located north of the building.

### Past Tenants

The 1994 Phase I ESA (ATC, 1994) identified current and former tenants in the building. The tenants included:

- Coleman Machine Works (Coleman). Coleman operated in the northern two-thirds of the 4463 Russell Road building. Coleman stored less than 500 gallons of hydraulic oil, machine oil, machine coolant, and solvents. Most of the chemicals were stored in 5-gallon containers or less, and waste oil was accumulated in 55-gallon drums and picked up by a waste oil recycler. The office manager indicated that the parts washer was replenished with solvent as needed and the solvent was not changed out. The 1994 Phase I ESA indicated that the chemicals were properly stored, but that the store was cluttered and poorly maintained with oil-stained flooring throughout and a large oil stain on the asphalt parking lot. The Coleman lease space was vacant in 2005.

- Pacific Planners operated a wood working shop in the remaining southern end of the building.

The 2005 Phase I ESA (Riley, 2005a) indicates that Coleman lease space was vacant and that a stone masonry shop operated in the south end of the building in the former Pacific Planners lease space.

### Current Tenants

The Snohomish County tax records do not indicate any related properties for this parcel (Snohomish County, 2015).

## *2.2.4 4493 Russell Road*

Russell Road Industrial Park LLC purchased TPN 00441400004300 on June 29, 2005. This parcel is 1.41 acres and contains a 32,000 sf, single-story flex facility industrial building that was constructed in 2007. This remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Russell Road.

### Past Tenants

The 1994 Phase I ESA (ATC, 1994) identified current and former tenants in the building. The tenants included:

- Adaptive Engineering Lab, Inc. (Adaptive Engineering). Adaptive Engineering manufactured hardware and accessories for the physically challenged, and generated small quantities of hydraulic oil, machine oil, and solvents
- Mr. Ed's Bingo & Casino Supply, Inc. stored paper products, tables, and chairs.
- Hawaiian Trust obtained a building permit on July 1, 1993 for this building.
- An unused underground storage tank (UST) was located near the southeast corner of the building, which was subsequently decommissioned in June 1995 (JPHC, 1995a).

The building was removed between July 1994 and June 2002, based on aerial photographs, before the current building was constructed in 2007. The 2005 Phase I ESA indicated the Glacier Environmental Services, Inc. rented the fenced area on the parcel, and they stored empty aboveground storage tanks (ASTs) and drums from job sites at this location.

### Current Tenants

The current tenants in the building include Northwestern Fuels and Landscaping (sells manufactured wood heating logs), Dive Xtras Inc., Marrott Dental, and Mazza Coffee Company LLC (Snohomish County, 2015).

## *2.2.5 4351 Chennault Beach Road*

Russell Road Industrial Park LLC purchased TPN 00441400004700 on June 29, 2005. This parcel is located on Russell Road adjacent to 4403 Russell Road, but the address for the parcel is 4351 Chennault Beach Road. This parcel is 1.59 acres and contains a 4,000 sf canopy. This parcel is completely covered with asphalt pavement.

The Snohomish County tax records do not indicate any related properties for this parcel (Snohomish County, 2015). Petrochem Insulation, Inc. currently leases the asphalt paved lot and uses the parcel for equipment storage.

### 2.2.6 4424 Chennault Beach Road

The International Church of Foursquare Gospel purchased TPN 00548700001700 and TPN 00548700001701 on May 27, 2004. The Snohomish County parcel viewer map does not distinguish these two parcels. These parcels contain a 43,152 sf, single-story, flex facility industrial building that was constructed in 1980. This remaining area of the parcels is covered with asphalt pavement with a vegetative buffer strip along Chennault Beach Road. Family Life Center Foursquare Church has facilities on the property.

### 2.2.7 4440 Chennault Beach Road

Russell Road Industrial Park LLC purchased TPN 00441400001600 on June 29, 2005. This parcel is 1.29 acres and contains a 32,600 sf, single-story, flex facility industrial building that was constructed in 1978. The remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Chennault Beach Road.

#### Past Tenants

The 1994 Phase I ESA (ATC, 1994) indicated that the northern third of the building was occupied by Franz bakery who received a July 1, 1994 CO. The remaining building was vacant, but Provet used some storage space for pet and veterinary supplies. Provet operated in the 4470 Chennault Beach Road building. The 2005 Phase I ESA indicated that Franz Bakery, A+ House Cleaning, Fiber International, and D&L Homeplate (training facility) occupied the building.

#### Current Tenants

The Snohomish County tax records do not indicate any related properties for this parcel (Snohomish County, 2015).

Fiber International leases a tenant space on this parcel and services truck fleet vehicles. Automotive wastes (e.g., oil, filters, coolant) were stored in 55-gallon drums and an approximate 1,000 gallon waste oil AST was located in the southwest corner of the building (Riley, 2005a). The parts washer contained mineral spirits and “naphtha” (Riley, 2005a).

### 2.2.8 4470 Chennault Beach Road

The Snohomish County parcel viewer map does not distinguish parcel boundaries or provide areas for the parcels at 4470 and 4480 Chennault Road. The address for the south building is 4470 Chennault Road and the address for the north building is 4480 Chennault Road.

Gonyea Woodworking Inc. purchased TPN 01031600020 at 4470 Chennault Beach Road on July 1, 2005 and subsequently transferred this parcel to Russell Road Industrial Park LLC, who transferred TPN 01031600000200 to Chenault Beach Road Industrial Park on December 11, 2007. The Snohomish County tax records list Gonyea Woodworking Inc. as the owner of the parcel (Snohomish County, 2015). This parcel contains a 20,000 sf, single-story flex facility industrial building that was constructed in 1978. The remaining parcel is covered with asphalt pavement.

### Past Tenants

The 1994 Phase I ESA (ATC, 1994) indicated that Provet and Buffalo Bob's restaurant operated in the building. Provet occupied most of the building and their tenant space consisted of offices and warehousing for a pet and veterinary supply distribution center. The 2005 Phase I ESA indicates that the building was vacant in 2005.

### Current Tenants

The Snohomish County tax records do not indicate any related properties (Snohomish County, 2015).

### *2.2.9 4480 Chennault Beach Road*

This parcel contains a 17,600 sf, single-story flex facility industrial building that was constructed in 1978. The remaining parcel is covered with asphalt pavement with a vegetative buffer strip along Chennault Beach Road.

Chennault Beach Road Industrial Park purchased TPN 01031600000100 at 4480 Chennault Beach Road on July 1, 2005 and the tax records indicate that Russell Road Industrial Park LLC transferred the parcel to Chenault Beach Road Industrial Park on December 11, 2007. Chennault Beach Road Industrial Park sold the parcel to Himalayan Corporation on December 23, 2012, who transferred the parcel to Himalayan Holdings Group LLC on August 8, 2013.

### Past Tenants

The 1994 Phase I ESA (ATC, 1994) indicated that the Mukilteo City Hall and the Mukilteo Police Department operated in the building and the 2005 Phase I ESA (Riley, 2005a) indicated that the City of Mukilteo operated in the building.

### Current Tenants

Currently, the Himalayan Corporation, dba Himalayan Dog Chew, produces dog treats in this building.

## 2.3 Surrounding Properties

The City of Mukilteo (2012) zoning map indicates that the Site and surrounding properties are zoned as light industrial, except for the two adjoining parcels west of 4493 Russell Road, which are zoned as industrial park. The Site is surrounded by industrial properties, including:

- Branch Solutions, Inc., a division of Level 7, Inc., operates at 4314 Russell Road adjacent and south of the Site. Branch Solutions provide and refurbish barcode, scanning, data collection, and point of sale equipment for retailers and wholesalers.
- Production Plating operates at 4330 and 4416 Russell Road adjacent and south of the Site. Production Plating is a RCRA LQG that performs various stripping and plating operations for aerospace and commercial industries.
- Plexus Manufacturing, Inc. operates at 4416 Russell Road adjacent and southwest of the Site. Plexus Manufacturing performs plastic molding operations.

- TEO Technologies, Inc. operates at 11609 49th Place W adjacent and southwest of the Site.
- Ram Technologies operates at 4605 116th Street SW adjacent and southwest of the Site. Ram Technologies manufactures foam products.
- Several businesses operate in the Harbour Pointe Industrial Park at 4602 Chennault Beach Road adjacent and west of the Site. These include Cascade Boiler Services Inc., Aero Mac Inc., Pacific Glass & Door Inc., and Diamond Knot Production (microbrewery). Aero Mac Inc. performs shot peening of aviation components.
- ElectroImpact, Inc. operates at 4517 and 4503 Chennault Beach Road adjacent and north of the Site. ElectoImpact, Inc. manufactures production line equipment for Boeing.
- Petrocard, Inc. operates a fleet fueling station at 4420 Chennault Beach Road adjacent and northeast of the Foursquare Church parcel.
- The property at 4422 Chennault Beach Road is adjacent and east of the Foursquare Church parcel and south and adjacent to the Petrocard, Inc. fueling facility. The parcel has a small single-story structure and the remaining parcel is covered with grass and parked cars.
- Accurate Sheet Metal, Inc. operates at 4301 Russell Road adjacent and east of the Site. Accurate Sheet Metal fabricates sheet metal and structural steel products.

# 3 Environmental Setting

## 3.1 Site Use, Conditions, and Infrastructure

### *3.1.1 Structures*

The Site is developed with eight flex facility industrial buildings ranging in size from approximately 10,200 to 43,152 sf. Additionally, a 4,000 sf canopy is present on one parcel. The canopy is approximately 20 feet tall.

### *3.1.2 Surface Cover*

The Site structures are surrounded by asphalt pavement. Vegetative buffer strips are present along Russell Road on the south and along Chennault Beach Road on the north.

### *3.1.3 Utilities*

The Site is developed with standard subsurface utilities including:

- Power
- Water supply
- Sanitary sewer
- Stormwater
- Natural gas

A private stormwater system impacts groundwater gradients and is a potential vector for the release of contamination to soil and groundwater. The storm drains are shown in the Figure 2 Site map. The Site is covered almost entirely of impervious surfaces and stormwater is captured by 39 catch basins in the asphalt pavement. The private stormwater system on the north and west parts of the Site discharges to the City of Mukilteo's municipal separate stormwater system (MS4; City of Mukilteo, 2013), whereas the storm drains on the southeast side of the Site drain to the MS4 along Russell Road and Cyrus Way. Additionally, the private stormwater system is designed as a low-impact development stormwater system where the captured stormwater is allowed to infiltrate to soil and shallow groundwater through perforated lateral drain pipes (Riley, 2005a).

Several floor drains appear to be connected to the sanitary sewer system. The 1994 Phase I ESA (ATC, 1994) identified floor drains in the north side of the 4403 Russell Road building (current ProGranite, former King Machine, and former Intermec lease space) and in the south side of the 4433 Russell Road building in the former Exotic Tool lease space, both of which were removed in 1995 (JPHC, 1995b). Additionally, Cheeseburger Chuckwagon obtained a plumbing permit on July 12, 1993 for the construction of a floor drain and grease trap on the southwest corner of the 4403 building. The 2005 Phase I ESA (Riley, 2005a) identified a floor drain in the northeast corner of the Fiber International truck service shop in the southwest corner of the 4400 Chennault Beach Road building.

The Mukilteo Water and Wastewater District has a 12-inch-diameter sanitary sewer along Chennault Beach Road on the north side of the Site, which flows west along the street. Additional municipal sanitary sewers are present east of the Site along Russell Road (flowing east) and present south of the Site along Cyrus Way (flowing south) (Gray and Osborne, 2010). The private sanitary sewer connections appear to connect the municipal system on the north side of the Site at Chennault Beach Road.

Water is delivered to the Site by the municipal water system through 12-inch-diameter water mains located within Chennault Beach Road and Russell Road, in addition to 8- and 12-inch water services extending through the parcels from the water mains (Gray and Osborne, 2010).

## 3.2 Topography, Drainage, and Surface Water

As shown in Figures 1 and 3, the Site is located on a plateau, bound by Harbour Pointe Boulevard on the north, west, and south, at an approximate elevation of 540 feet NGVD29 (National Geodetic Vertical Datum of 1929) near a topographic divide, where Puget Sound is located about 8,500 feet west of the Site, Big Gulch creek is located about 6,000 feet north-northwest of the Site, and a creek draining to Picnic Point is located about 6,000 feet south-southwest of the Site. The Site topography is relatively flat, but slopes locally towards Russell Road to the south and towards Chennault Beach Road to the north.

The Site is covered by impervious surfaces and stormwater is captured by a private stormwater system. As shown in Figure 2, the storm drains in the north and west portions of the Site drain to a drainage ditch on the south side of Chennault Beach Road and then west to the City Mukilteo MS4. The storm drains on the southeast side of the Site drain south to Russell Road and to the City Mukilteo MS4 along Cyrus Way.

## 3.3 Geology and Hydrogeology

### *3.3.1 Geology*

Geologic conditions in the vicinity of the Site primarily consist of Late Pleistocene glacially consolidated Vashon Till overlying Esperance Sand (Yount et al, 1993). Figure 3 shows the regional surficial geologic units near the Site, and boring logs for the Site are provided in Appendix C. Geologic units identified at the Site, from ground surface downward, include:

- **Vashon Till** – Very dense glacial till comprised of heterogeneous, non-sorted mixture of silt, sand, and gravel was identified in the boring logs. The top 10 to 15 feet of till is weathered, and the till becomes stiff and relatively impermeable below 15 feet below ground surface (bgs). The till generally overlies advanced outwash deposits including the Esperance Sand. Monitoring well MW-2D was constructed to determine the thickness of the Vashon Till at the Site in July 2015. Vashon Till was encountered from the surface to 177 feet bgs in MW-2D, and the till was very dense between 15 and 175 feet bgs.

- **Esperance Sand** – The Esperance Sand is an advanced outwash deposit characterized by moderately to well-sorted and well-stratified gravel and sand and silt and clay. The top of the Esperance Sand was encountered at 177 feet bgs in MW-2D. The non-surveyed Site elevation is about 540 feet NGVD29 and the

top of the Esperance Sand is about 360 feet NGVD29. As shown in Figure 3, the top of the Esperance Sand is about 340 to 380 feet NGVD29 at the outcrop about 5,500 feet west of MW-2D. The thickness of the Esperance Sand is about 120 to 160 feet at the outcrop.

### *3.3.2 Hydrogeology*

The Site contains shallow, perched groundwater within the weathered Vashon Till, isolated intervals of water bearing units within the Vashon Till, and groundwater within the Esperance Sand. These groundwater-bearing intervals are not hydraulically connected with each other.

Shallow, perched groundwater is present within the weathered till from approximately 2 to 15 feet bgs. The perched groundwater is likely recharged by stormwater infiltration from perforated storm drains since the Site is largely covered by impervious surfaces that prevent precipitation infiltration at the surface. Groundwater flow direction is largely seasonally variable at the Site and is governed by local topography and the presence of the perforated stormwater lateral drain pipes. Figures 8A, 8B, and 8C show potentiometric maps for the perched groundwater using gauging results from Site monitoring wells in January, April, and August 2015.

The Vashon Till formation is generally moist with isolated water-bearing intervals. Two wells, MW-2D and MW-16D, were constructed at the Site (see Appendix C for well log documentation) to evaluate the depth of contamination, depth of Vashon Till, and potential impacts to groundwater. MW-16D was constructed to 100 feet bgs beneath the source of contamination. The Vashon Till was hard and moist below 15 feet bgs, but wet cuttings were observed at 65 feet bgs, and MW-2D was screened from 80 to 100 feet bgs. The groundwater level was 58 feet bgs in MW-16D in April 2015, which indicates that groundwater was not in hydraulic connection with the shallow groundwater within the weathered till.

MW-2D was subsequently constructed in July 2015 to identify the thickness of the Vashon Till and the potential impact to groundwater within the Esperance Sand. The Vashon Till was very hard from 15 to 175 feet bgs. The till was moist from 15 to 85 feet bgs, very moist from 85 to 100 feet bgs, moist from 100 to 115 feet bgs, and wet from 115 to 165 feet bgs. Esperance Sand was encountered at 177 feet bgs and MW-2D was screened from 176 to 196 feet bgs within the Esperance Sand. The groundwater level was 162 feet bgs in MW-2D in August 2015, which indicates that groundwater within the Esperance Sand is not hydraulically connected to the shallow groundwater or saturated portions of the Vashon Till. Groundwater within the Esperance Sand would be anticipated to discharge west toward the outcrop shown in Figure 3.

Regional well logs were retrieved from Ecology (2015b) to evaluate the use of groundwater near the Site. The Site straddles the southeast quarter of Section 21 and southwest quarter of Section 22 in Township 28 North, Range 4 East, as shown in Figures 3 and 4. Full sections have a nominal area of one square mile.

- Section 21 includes the Site and the area west of the Site toward the outcrop and Puget Sound. Ecology records 98 wells logs in Section 21, including 68 resource protection wells and 30 abandoned wells. The deepest well is 75 feet deep and

used as a slope indicator. The next deepest well is 35 feet deep. There are no water wells in Section 21.

- Section 22 includes the eastern portion of the Site and the inland area. Ecology records 24 resource protection wells and 16 abandoned wells in the southwest quarter of Section 22. The deepest well is 37 feet bgs. There are no water wells in the southwest corner of Section 22.
- Section 28 is south and west of the Site and toward the outcrop and Puget Sound. Ecology records 9 well logs in Section 28, including eight resource protection wells and one abandoned well. Four of the wells are slope indicator wells, with three completed to 103 feet bgs and one completed to 153 feet bgs. Community Transit has four resource protection wells completed to 20 feet bgs. The only well in the northeast quarter section of Section 28 (nearest to Site) is an abandoned well completed to 25 feet bgs. There are no water wells in Section 28.
- Section 27 is located south and east of the Site on the inland side. Ecology records 60 resource protection wells and 11 abandoned wells in the northwest corner of Section 27. The City of Mukilteo has 26 “Geo Loop TEC” wells that are completed to 300 feet bgs and 9 additional wells that are completed to depths ranging from 16.5 to 100.5 feet bgs. Geo Loop TEC wells are used as a geothermal heat pump (www.geolooptec.com). Although heat pumps can be open or closed loop systems, Geo Loop TEC indicates that closed-loop systems can be installed in vertical wells up to 300 feet deep. The remaining wells in this quarter section appear to be associated with cleanup sites and the deepest of these wells is completed to 45 feet bgs. There are no water wells in the northwest corner of Section 27.

## 3.4 Climate

Data obtained from the National Weather Service Forecast Office the mean average temperature for the greater Everett area (including Mukilteo) ranges from 41˚F in January to 65˚F in July and August. Monthly average precipitation ranges from 1 inch in July and August to 5.5 inches in November.

# 4 Environmental Investigations and Cleanup Actions

This section summarizes previous Site investigations and interim cleanup actions and describes the RI data gaps investigation completed in 2015.

## 4.1 Previous Investigations

The initial investigation at the Site began in 1994 in response to a property transfer. Investigations had continued periodically over the years through the present. The following subsections summarize the previous investigations.

### *4.1.1 Phase I Environmental Site Assessment (1994)*

The Phase I ESA (ATC, 1994) identified tenants at the Site in 1994 and included records searches, property and tenant observations, and interviews with several business managers in the industrial park regarding operational practices. Section 2.2 summarizes many of the Phase I ESA findings. The Phase I ESA findings and recommendations include:

- An abandoned 550-gallon heating oil UST was identified on the south side of the 4493 Russell Road building. ATC recommended decommissioning the UST.
- A truck wash and grease trap was observed on the southwest side of the 4403 Russell Road building. The truck wash was constructed by the previous tenant, Cheeseburger Chuckwagon, in 1993 and was not used by Production Plating, which used the tenant space on the south side of the 4403 building for the storage of finished products only.
- Floor drains were observed in the King Machine and Exotic Tool tenant spaces. Mr. King, owner of King Machine, indicated that the previous tenant, Intermec, likely discharged chemicals to the drain on the north side of the 4403 Russell Road building. King Machine previously removed and replaced the drain at a higher elevation and poured new concrete. However, Mr. King indicated that King Machine did not use the new floor drain. Intermec was a RCRA LQG that generated chlorinated solvent waste from degreasing operations. Exotic Tool reportedly did not use the floor drain on the south side of the 4433 Russell Road building. The Exotic Tool floor drain had historically been connected to a system of trench drains that were filled with concrete prior to 1994. ATC recommended investigating shallow soils adjacent to the floor drains in the King Machine and Exotic Tool tenant spaces.
- ACS stored 5-gallon containers of PCE and prepared solutions of PCE and kerosene in 55-gallon drums in the 4433 Russell Road building. ACS used the PCE and kerosene mixture as a solvent for cleaning restaurant exhaust systems. ACS cleaned used rags in a large commercial washer and drier in the 4403 Russell Road building.

- Site catch basins infiltrate untreated stormwater to the subsurface. ATC recommended tight-lining the perforated stormwater lateral lines to an approved municipal stormwater system, and recommended investigating shallow soils at each catch basin for contamination.

### 4.1.2 UST Decommissioning (1995)

James P. Hurley Company (JPHC, 1995a) removed the 500-gallon, single-wall steel UST on the south side of the 4493 Russell Road building on June 16, 1995. The UST was used for heating oil storage. JPHC observed that the tank was in good condition, but that UST had a drain outlet with a 1-inch-diameter bolt at the bottom of the tank where heating oil appeared to leak. Approximately 20 tons of petroleum-contaminated soil (PCS) was excavated from beneath the tank and placed in a containment berm, and then removed from the Site on June 30, 1995 and disposed at the Rabanco facility in Seattle, Washington. A sample from the excavated soil contained 510 mg/kg of diesel-range TPH (TPH-D). TPH was not detected in a sample collected from the excavation bottom at 7 feet bgs. Two composite sidewall samples were collected. The composite sample collected from the south and west sidewalls contained 54 mg/kg TPH-D and no TPH contamination was detected in the composite sample from the north and west sidewalls. The concentrations of TPH-D in the soil confirmation samples and the waste sample were below the current 2,000 mg/kg MTCA Method A soil CUL.

### 4.1.3 Phase II Environmental Site Assessment (1995)

The Phase II ESA (JPHC, 1995b) involved the excavation of test pits near stormwater catch basins and near interior floor drains in the King Machine and Exotic Tool tenant spaces. Test pits TP-1 to TP-5 were excavated to expose, observe, and sample soil from five stormwater catch basins. The catch basins were connected to non-grouted masonry brick (8-inch by 8-inch by 16-inch) vaults that were about 2 feet deep and 18-inches by 18-inches at the base. The storm drain vault on the east side of the King Machine tenant space on the north side of the 4403 Russell Road building did not have a base. The vaults were connected to 4-inch- and/or 6-inch-diameter perforated polyvinyl chloride (PVC) lateral pipes, which allow stormwater to discharge to subsurface soil. None of the catch basins contained an oil-water separator.

JPHC observed a slight sheen on water in each vault. Soil samples were collected from 3 feet bgs in each vault and submitted for the analysis of the hydrocarbon identification (HCID) method. Hydrocarbons were detected in TP-2 on the east side of Coleman Machine Works in the 4463 Russell Road building and in TP-4 on the east side of King Machine in the 4403 Russell Road building. The concentration of TPH-D was 150 mg/kg in TP-2, well below the 2,000 mg/kg Method A soil CUL. The concentration of TPH-D was 4,000 mg/kg in TP-4, which exceeded the 2,000 mg/kg Method A soil CUL. The soil sample from TP-4 was also submitted for the analysis of volatile organic compounds (VOCs) by EPA Method 8240 and for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270. The sample results indicated high concentrations of PAHs, low levels of toluene and xylenes, and the absence of benzene and chlorinated ethylenes. The concentration of benzo(a)pyrene was an estimated 71 mg/kg and the concentration of carcinogenic PAHs (per MTCA Table 708-2) was 95.3 mg/kg, which both exceed the 0.1 mg/kg benzo(a)pyrene Method A soil CUL. Toluene and xylenes were detected below the Method A soil CULs. Methylene chloride was detected at a concentration of 0.23 mg/kg, which exceeded the 0.02 mg/kg Method A soil CUL. Methylene chloride is

used as a solvent, but can also form by the biodegradation of chlorination disinfection byproducts in potable water. Section 4.2.3 describes the remediation of the impacted soil near TP-4.

JPHC removed the interior floor drain in the Exotic Tool lease space at the south end of the 4433 Russell Road building and excavated test pit TP-6. JPHC observed two 2-inch-diameter steel pipes connected to the flush-mounted, 4-inch-diameter floor drain, and stated that the steel pipes appeared to be connected the storm drainage system. JPHC noted that soil beneath the drain had oil stains at 1.5 feet bgs. A soil sample was collected from 1.5 feet bgs beneath the floor drain and submitted for the analysis of HCID, gasoline-range TPH (TPH-G), and PAHs. Gasoline- and oil-range TPH were detected by the HCID method, and the concentration of TPH-G was 1 mg/kg, well below the 30 mg/kg Method A soil CUL (for detectable benzene). Naphthalene was detected at a concentration of 0.042 mg/kg, well below the 5 mg/kg Method A soil CUL, and no carcinogenic PAHs were detected. JPHC subsequently excavated about 1 cubic yard of soil beneath the drain on July 6, 1995 and noted that visual contamination was limited to a 2-foot-diameter area and the top 2 feet of soil beneath the drain. A confirmation sample collected from 3 feet bgs beneath the drain was submitted for the analysis of HCID and TPH was not detected in the sample.

JPHC removed the interior floor drain in the King Machine lease space at the north end of the 4403 Russell Road building and excavated test pit TP-7. King Machine had previously replaced the floor drain that Intermec had used and poured new concrete to level the surrounding floor. JPHC observed the floor drain was connected to a 2-inch-diameter steel pipe that was connected to the sanitary sewer. The drain, concrete, and soil appeared in good condition. A confirmation sample collected from 18-inches bgs was submitted for the analysis of the HCID method and no TPHs were detected.

### *4.1.4 Site Assessment Report (1996)*

JPHC (1996a) excavated about 25 tons of PCS adjacent to Drain D34 and test pit TP-4 on the east side of the King Machine lease space on the north side of the 4403 Russell Road building. JPHC also pumped sludge from the base of the catch basin, reset brick at the base of the catch basin, installed a sediment and oil filter for the inlet, and re-paved the excavation area. JPHC concluded that oily water leaked from a gap between the bricks at the base of the catch basin and stated that PCS was limited to approximately 5 cubic yards directly beneath the catch basin and that petroleum hydrocarbons were not detected in a confirmation sample from the base of excavation. JPHC stated that groundwater was not impacted by the release.

JPHC (1996a) performed additional assessment of the Site catch basins. Four additional test pits and 23 direct-push soil borings were advanced in August 1996 to assess the condition of soil adjacent to the remaining stormwater catch basins. Soil samples were collected from 5 to 7 feet bgs near each catch basin, and from 10 to 12 feet bgs in the excavation near Drain D34. Diesel contamination was detected in 20 of 27 samples at a maximum concentration of 63 parts per million (ppm) using a calibrated field screening test (Dexsil PetroFLAG hydrocarbon analyzer system). PetroFLAG uses an emulsion turbidimetry technique to measure hydrocarbon concentrations from the amount to light scattered from the emulsion. The method lacks sensitivity to interferents such as PCE (Environmental Protection Agency, 2001), which would prevent the detection of

chlorinated VOC-contaminated soil near former storm drain D29 on the east side of the former Intermec lease space in the 4403 Russell Road building, where chlorinated VOCs were later detected in 2005 (Riley, 2005b).

### 4.1.5 Phase I ESA (2005)

The Phase I ESA (Riley, 2005a) summarized previous assessments and response action reports, provided the previous reports as appendices, identified tenants at the Site in 2005, provided Site reconnaissance observations, tenant interviews, an updated records search, and Site assessment recommendations. The findings and recommendations are summarized below:

- Section 2 of this RI/FS describes the tenants at the Site and observations made during the 2005 Site reconnaissance.
- The former truck wash on the southwest side of the 4403 Russell Road building, which was constructed for Chesseburger Chuckwagon in 1993, appeared in good condition, with no staining or indications of recent use.
- The floor drain on the northeast side of the Fiber International truck shop, which is located on the southwest side of the 4440 Chennault Beach Road building, had no staining and the drain was reportedly not used by the tenant.
- Riley (2005a) recommended a Phase II ESA be conducted to evaluate potential soil and groundwater contamination from the use, storage, handling, and disposal of petroleum products and chlorinated ethylenes at the former Intermec, King Machine, and Absolute Cleaning Service lease spaces in the 4403 and 4433 Russell Road buildings.
- Riley (2005a) recommended that the Phase II ESA evaluate the subsurface conditions near the estimated 32 storm drains on the property.

### 4.1.6 Supplemental Phase II Subsurface Investigation (2005)

Riley (2005b) advanced soil borings SP1 to SP10 to depths ranging from 8 to 12 feet bgs on June 14, 2005. The locations of the borings are shown in the investigation map (Riley, 2005b) in Appendix D and in Site Figures 6A to 6C and 7A to 7D. Borings were advanced around the former King Machine and Absolute Cleaning Services tenant spaces; adjacent to stormwater catch basins; and in the vicinity of the former heating oil UST. Soils at the Site generally consisted of fine- to medium-grained sand with silt and gravel fill to depths up to 12 feet bgs, and underlain by very dense glacial till. Perched groundwater was encountered at depths ranging from 4 to 7 feet bgs.

Soil and groundwater samples were collected from borings SP1 to SP10, and Tables 4.1 and 4.2 include the soil and groundwater field screening and analytical results from these samples. Twenty-two (22) soil samples were collected from the 10 borings and screened with a photoionization detector (PID), and a couple of soil samples were submitted for the analysis of chemicals of potential concern (COPCs). Groundwater grab samples were collected from each boring and submitted for the analysis for VOCs and most were submitted for the analysis of TPH-G and TPH-D. The sample results are summarized below:

- A soil sample from the 7.5 to 8 foot bgs interval of SP8, near the former heating oil UST, was submitted for the analysis of TPH-G; TPH-D; benzene, toluene, ethylbenzene, and xylene (BTEX) compounds; and naphthalene. TPH-D, oil-range TPH (TPH-O), and toluene were detected at concentrations below their Method A soil CULs. The PID measurement was lower in the 11 to 12 foot bgs interval than in the 8.5 to 9 foot bgs interval. Toluene was the only compound detected in the groundwater sample from SP8, at a concentration well below the Method A groundwater CUL.

- The highest PID measurements were recorded in SP10 near the catch basin on the east side of the King Machine and former Intermec lease space on the north side of the 4403 Russell Road building. A sample was collected from the bottom of the boring at 10 to 11 feet bgs, which had the highest PID response, and submitted for the analysis of TPH-G, TPH-D, BTEX, PAHs, and RCRA metals. Toluene was the only detected organic compound, at a concentration slightly above the detection limit and well below the Method A soil CUL, and the concentrations of metals were also well below the Method A soil CULs. High concentrations of chlorinated VOCs were detected in the groundwater sample from SP10. TCE was detected at a concentration of 42,000 µg/L, which exceeds the 5 µg/L Method A groundwater CUL and is indicative of dense nonaqueous phase liquids (DNAPLs). PCE, cis-1,2-dichloroethylene (cDCE), 1,1-DCE, vinyl chloride, 1,1,1-trichloroethane, and methylene chloride were also detected at concentrations up to two orders-of-magnitude above their respective Method A groundwater CULs.

- PCE, TCE, and vinyl chloride were also detected at concentrations slightly above the Method A groundwater CUL in groundwater samples from SP1, SP2, and SP3 on the west and east sides of the former Intermec, former King Machine, and former Absolute Cleaning Service lease spaces.

Riley (2005b) indicated that groundwater contamination in boring SP10 appeared to originate from a catch basin about 40 feet east of the 4403 Russell Road building (i.e., Drain D30). This catch basin is north of the catch basin (Drain 34) where 25 tons of PCS were previously excavated (JPHC, 1996a).

### *4.1.7 Well Installation and Groundwater Sampling (2005-2012)*

Riley (2005c) constructed monitoring wells MW-1 to MW-5 on September 11, 2005 to define the extent of chlorinated VOC contamination and then constructed MW-5 to MW-7 as remediation wells in October 4, 2005. The wells were installed to 15 feet bgs and screened from 5 to 15 feet bgs. MW-1 to MW-5 were constructed with 1.5-inch diameter Schedule 40 PVC pre-pack wells and MW-6 to MW-8 were constructed with Schedule 5 304 stainless steel wells. The wells were constructed with a hollow stem auger and the borings logs indicate silty sand and gravel. Well construction and boring logs are provided in Appendix C. Riley subsequently constructed MW-9 to MW-15 are remediation wells prior to March 2006; however, Riley did not document the well construction logs.

Sieve analyses were performed on soil samples from the 5- and 10-foot bgs intervals of borings MW-2 and MW-3. The sieve analyses showed that the four soil samples were

consistent and composed of well-mixed silty sand with trace gravel, which is consistent with Vashon Till.

Two rising head slug tests were conducted in MW-7 on October 12, 2005, which was subsequently used as a remediation well. The representative hydraulic conductivity from the slug tests was 1.6e-4 centimeters/second (0.45 feet/day).

Riley sampled select Site monitoring wells in September/October 2005, May 2006, January 2007, April 2008, March 2009, September 2009, and January 2012 (Riley, 2005c; Riley, 2007; Riley, 2008; Riley 2009; and Riley, 2012). The groundwater analytical results are summarized in Table 4.2 and shown in Figures 7A to 7D. Monitoring wells MW-9 to MW-15 were constructed as remediation wells and no background samples were collected prior to treatment. MW-1 and MW-7 were also used as remediation wells, but background samples were collected prior to remediation. The remediation activities are described in Section 4.2 below.

## 4.2 Interim Cleanup Actions

Several independent interim cleanup actions have taken place at the Site since 1995. The following subsection is a brief summary of those cleanup actions.

### *4.2.1 UST and Soil Removal (1995)*

As described in Section 4.1, JPHC (1995a) removed the 500 gallon heating oil UST on the south side of the 4493 Russell Road building on June 16, 1995. Approximately 20 tons of PCS was excavated from beneath the tank to a depth of about 7 feet bgs and placed in a containment berm, and then removed from the Site on June 30, 1995 and disposed at the Rabanco waste facility in Seattle, Washington. The concentrations of TPH-D in the three soil confirmation samples and the waste sample were below the current 2,000 mg/kg Method A soil CUL.

### *4.2.2 Floor Drain Removal (1995)*

As described in Section 4.1.3, JPHC (1995b) removed the floor drain and about 1 cubic yard of soil from the Exotic Tool lease space at the south end of the 4433 Russell Road building on June 19 and July 6, 1995. Visually staining was confined to the top 2 feet of soil and no TPH was detected in the confirmation sample collected from 3 feet bgs beneath the drain.

JPHC (1995b) removed the new floor drain from the King Machine lease space at the north side of the 4403 Russell Road building on June 19, 1995. King Machine had previously removed and replaced the floor drain that Intermec had used, and poured new concrete to level the floor. The drain, concrete, and soil appeared in good condition, and no TPH was detected in the confirmation sample collected from 1.5 feet bgs.

### *4.2.3 Catch Basin Restoration and Excavation of Contaminated Soil (1996)*

As described in Section 4.1.4, JPHC (1996a) excavated about 25 tons of PCS adjacent to Drain D34 and test pit TP-4 on the east side of the King Machine lease space on the north side of the 4403 Russell Road building. JPHC also pumped sludge from the base of catch basin, reset brick at the base of the catch basin, installed a sediment and oil filter for the inlet, and re-paved the excavation area. JPHC concluded that oily water leaked from a

gap between the bricks at the base of the catch basin and stated that PCS was limited to approximately 5 cubic yards directly beneath the catch basin and that petroleum hydrocarbons were not detected in a confirmation sample from the base of excavation.

### 4.2.4 Catch Basin Filter Installation (1996)

JPHC (1996b) installed filter inserts in all but the easternmost stormwater catch basins between August and October 1996. A filter insert was not installed in catch basin D30, which is east of the former King Machine lease space on the north end of 4403 Russell Road building, because the catch basin had a different design than the others.

### 4.2.5 In Situ Chemical Oxidation (2006)

Riley (2006) performed *in situ* chemical oxidation (ISCO) injection events at the Site in March, April, and October 2006. The ISCO injections were conducted in monitoring wells MW-1, MW-7, and MW-9 through MW-15. Table 4.2 summarizes the ISCO injection activity and the groundwater analytical results for remediation wells MW-1, MW-7, and MW-9 to MW-15. The ISCO injections are summarized in the table below.

**Table 4.3: Summary of ISCO Remediation of the Monitoring/Injection Wells**

| Treatment Date | Treated Wells | Chemicals Injected (Fenton's Reagent) |
|---|---|---|
| March 15, 2006 | MW-7, MW-9, MW-10, MW-11 | Injected 30 to 40 gallons hydrochloric acid and ferrous sulfate solution, followed by 50 to 240 gallons of 18% hydrogen peroxide solution |
| April 14, 2006 | MW-7, MW-9, MW-12, MW-13, MW-14, MW-15 | Injected 20 to 30 gallons of hydrochloric acid and ferrous sulfate solution, followed by 110 to 120 gallons of 18% hydrogen peroxide solution |
| October 4, 2006 | MW-1, MW-7, MW-12, MW-13, MW-15 | Injected 50 gallons of acetic acid and ferrous sulfate solution, followed by 180 to 190 gallons of 18% hydrogen peroxide solution |

## 4.3 RI Data Gap Investigations

Aspect conducted additional Site investigation activities in 2014 and 2015 to address data gaps identified in Ecology's 2012 opinion letter (see Appendix A), including:

- Gore soil gas survey (October to November, 2014);
- Installation and soil sampling of MW-16 to MW-19 and Site-wide groundwater sampling for COPCs (January 2015);
- Installation and soil sampling of MW-16D and MW-20 and groundwater sampling for COPCs in these two wells (April 2015); and

- Installation and soil sampling of MW-2D, MW-21, and MW-22; sampling of soil borings AB-1 to AB-4 near the former Intermec floor drain for VOCs; and Site-wide groundwater sampling for COPCs (July to August 2015).

The well construction and soil boring logs are provided in Appendix C.

The Gore soil gas survey was conducted to:

- Delineate the horizontal extent of chlorinated VOCs in soil gas near the former storm drain on the east side of the 4403 building;
- Optimize the placement of monitoring wells by first delineating the horizontal extent of VOCs in shallow groundwater;
- Evaluate potential for additional VOC sources below the 4403 building footprint; and
- Screen for the presence of VOCs in shallow soil and groundwater adjacent to the property boundaries.

The Gore survey measures contamination adsorbed by the samplers and is indicative of the presence of soil and/or groundwater contamination. The 56 Gore-Sorbers were installed in 7/8-inch-diameter, surface-sealed borings to 3 feet below the asphalt and concrete in October 30 and 31, 2014, and then retrieved on November 10 and 11, 2014 and submitted for the analysis of VOCs and TPH. The analytical results and interpolated results are provided in Appendix E. The Gore survey results are summarized in Table 4.4. Figures 5A to 5E show the interpolated results for PCE, TCE, cDCE, TPH, and total BTEX compounds.

The objectives for the monitoring wells and soil borings included:

- MW-16 was constructed in January 2015 near the highest suspected source of contamination based on previous investigation activities, but where the Gore-Sorbers did not detect contamination.
- MW-17 was constructed in January 2015 northeast of MW-1 to define the lateral limit of contamination in shallow groundwater.
- MW-18 was constructed in January 2015 west of the former ACS tenant space in the 4403 building, where the highest masses of PCE and TCE were detected by the Gore-Sorbers.
- MW-19 was constructed in January 2015 north of the former ACS lease space in the 4433 building adjacent to the current truck service business and storm sewer line to evaluate lower levels of chlorinated VOC contamination detected by the Gore-Sorbers.
- MW-16D was constructed in April 2015 adjacent to MW-16 to evaluate the depth of contamination beneath the highest source area. MW-16D was constructed to 100 feet bgs in the Vashon Till, and the screened from 80 to 100 feet bgs. MW-16D was drilled using a hollow-stem auger, and this drilling method was not capable of advancing the boring to the Esperance Sand.

- MW-20 was constructed in April 2015 on the property boundary for the 4403 Russell Road parcel to evaluate whether chlorinated VOC contamination extends beyond the parcel boundary in shallow groundwater.
- MW-21 was constructed in July 2015 on the Foursquare Church property adjacent to the building to evaluate the nature and extent of contamination.
- MW-22 was constructed in July 2015 on the Foursquare Church property to define the lateral limit of chlorinated VOC contamination in shallow groundwater.
- MW-2D was constructed in July 2015 using mud-rotary drilling to determine the depth of the Vashon Till and top of the Esperance Sand formation. The Esperance Sand formation was encountered 177 feet bgs and the well was screened from 176 to 196 feet bgs in the Esperance Sand formation in the apparent downgradient direction from the shallow contamination in the Vashon Till.
- Soil borings AB-1 to AB-4 were sampled in July 2015 within the 4403 building adjacent to the former Intermec floor drain. These were sampled using a probe rig while the tenant space was vacant and under redevelopment.

The soil and groundwater analytical results are provided in Appendix F and summarized in Tables 4.1 and 4.2. The groundwater elevation data are summarized in Table 4.5.

# 5 Conceptual Site Model

This section presents the Conceptual Site Model (CSM), including contaminant release and transport mechanisms and identified pathways for potential receptor exposure.

## 5.1 Potential Historical Releases

Chlorinated VOCs and TPH were released from historical Site operations, and arsenic was detected in groundwater above the Method A groundwater CULs (discussed in Section 5.1.4 below). This section identifies potential historical releases of contamination at the Site and the background concentrations of arsenic. This section also summarizes the MTCA compliance for the source areas, where appropriate.

### *5.1.1 Chlorinated VOCs*

Contamination from chlorinated VOCs at the Site appear to extend from former storm drain D29 and existing storm drain D30, both located on the east side of the 4403 Russell Road building where Intermec and ACS formerly operated. Chlorinated VOCs were used by Intermec from 1978 through the 1980s and by ACS.

- Intermec Corporation manufactured and supplied automated identification and data capture equipment, including barcode scanners, barcode printers, mobile computers, radio frequency identification (RFID) systems, voice recognition systems, and life cycle systems. Intermec was a RCRA large quantity generator that used chlorinated solvents in degreasing (ATC, 1994).
- ACS operated a restaurant exhaust cleaning business, and performed operations in both the 4403 and 4433 Russell Road buildings. ACS stored PCE in small containers, and prepared a metal polishing solution on the Site by mixing PCE and kerosene in 55-gallon drums. ACS also operated commercial washing machines to clean PCE-contaminated rags from off-Site metal polishing operations.

PCE and TCE appear to have been released to storm drains on the east side of the 4403 Russell Road building (see Section 4.1.6), which were connected to perforated lateral pipes. The highest concentrations of chlorinated VOC contamination were detected near existing storm drain D30 (near MW-7 and SP10) and former storm drain D29 (near MW-16 and MW-16D). Although soil samples were not collected from MW-7 and SP10, the initial concentrations of TCE in groundwater were respectively 7,000 and 42,000 µg/L of TCE in 2005, which exceed the 5 µg/L Method A groundwater CULs for PCE and TCE. The concentration of TCE in soil boring SP10 was about 4 percent of the 1,100 mg/L solubility limit, which may indicate a DNAPL source area. DNAPL source areas can be suspected when the concentration of a DNAPL-forming compound exceeds 1 percent of its solubility limit (Interstate Technology and Regulatory Council [ITRC], 2005a).

During the 2015 RI sampling, the concentration of TCE in soil was 4.9 mg/kg in the 15.5 to 16 foot bgs interval of MW-16, and the corresponding concentration of TCE in groundwater was 410 µg/L.

Small releases are also suspected through foundations, asphalt, and floor drains. As shown in Figure 5A, the Gore survey indicates additional PCE near the west side of the

former ACS lease space, near the floor drain in the former Intermec lease space, north of the storm drains (former storm drain D29 and existing storm drain D30), beneath the former ACS lease space in the 4433 Russell Road building, and beneath the truck shop in the 4440 Chennault Beach Road. The Gore Sorbers are sensitive to volatile contamination that originates from soil and groundwater, but the adsorbed mass of contamination is not comparable with cleanup standards. The quantification of chlorinated VOC contamination at the Site is orders-of-magnitude lower compared with other dry cleaning sites that Aspect has sampled with Gore Sorbers. Soil and groundwater samples were collected in 2015 to quantify these findings:

- MW-18 was constructed adjacent to J13, which had the highest mass of PCE and TCE. A small PID response of 1.8 ppm was detected in the 10.5 to 11 foot bgs interval, but the concentrations of chlorinated VOCs were below the detection limits in soil. PCE was detected at 1.8 µg/L in January 2015, but was not detected in August 2015. The chlorinated VOC contamination levels are low, and well-below the Method A CULs.

- MW-20 is constructed about 25 feet from M9, which had the second highest mass of PCE and no TCE. The concentration of PCE was 17 and 25 µg/L in MW-20 in April and August 2015, and TCE was not detected. The concentrations of PCE would be expected to be higher in groundwater at MW-20 than in groundwater at M9.

- MW-4 is about 30 feet from I13, which had the third highest mass of PCE. cDCE was detected at 1.4 µg/L in MW-4 in April 2008, but the concentrations of chlorinated VOCs were otherwise below the detection limits in the four rounds of sampling.

- Soil borings AB-1 to AB-4 were sampled near the former Intermec floor drain, near K11, which contained the fourth highest mass of PCE. The highest PID response was 6.1 ppm in the 2 feet bgs interval of AB-1; however, the concentrations of VOCs were below the detection limit in the soil sample.

- MW-3 is about 25 feet east of H11, which had the fifth highest concentration of PCE. The concentrations of PCE and TCE were below the detection limits, but the concentrations of cDCE were 1.5 µg/L in January and August 2015.

- MW-19 is about 35 feet southeast of G8, which had the sixth highest concentration of PCE and the second highest concentration of TCE. TCE was detected at a concentration of 1.2 µg/L in August 2015, but the concentrations of chlorinated VOCs were otherwise below the detection limits in January and August 2015.

The Gore-Survey results indicate the Gore-Sorbers are very sensitive and can detect very low concentrations of chlorinated VOCs in soil and groundwater. The Gore-Sorbers are also subject to false negatives. Chlorinated VOCs were not detected in vapor at L9, L10, and M10, where chlorinated VOC contamination is present in groundwater. The false negatives may be due to the high water table; e.g., the boring for M10 was filled with water when the Gore-Sorber was removed.

### 5.1.2 Petroleum Hydrocarbons

The Site contained a number of businesses that handled various machine oils, including King Machine in the 4403 Russell Road building, Fiber International truck shop in the 4400 Chennault Beach Road building, and Coleman Machine Works in the 4463 Russell Road building. Fiber International had a 1,000 gallon waste oil AST in the southwest corner of the building and a parts washer containing "naphtha", which is a solution composed of petroleum hydrocarbons.

Stormwater drainage appears to be the main source of TPH contamination at the Site. Oily waste has been released to storm drains from non-specific sources. JPHC (1995b) excavated test pits near storm drains, including TP-1 and TP-2 on the west and east sides of Coleman Machine Works, TP-3 between Exotic Tool Welding and King Machine on the west side of the 4403 Russell Road building, TP-4 near former storm drain D34 on the east side of the King Machine lease space, and TP-5 west of the Fiber International truck shop. Method A CULs were only exceeded in TP-4, including 4,000 mg/kg of TPH-D, 71 mg/kg of benzo(a)pyrene, and 95.3 mg/kg of carcinogenic PAHs. JPHC (1996a) subsequently excavated 25 tons of PCS from storm drain D34, and petroleum hydrocarbons were not detected in the soil confirmation sample at the bottom of the excavation. JPHC (1996a) sampled soil from test pits and borings for the remaining storm drains at the Site and did not detect significant petroleum contamination. JPHC (1996b) also installed catch basin filters to protect the storm drains.

Figures 5D and 5E show interpolated Gore-Sorber data for TPH and BTEX compounds, which appear correlated. The highest TPH mass was detected in G11, H11, and H10, which surround the former ACS lease space at the north end of the 4433 Russell Road building. MW-19 was constructed adjacent to the Fiber International truck shop about 25 feet downgradient of the former ACS lease space. The concentrations of TPH, BTEX, and naphthalene were below the detection limits in the soil sample collected from the MW-19 boring (see Table 4.1). MW-3 is closest to the source area and MW-19 is downgradient from the source area. The concentrations of TPH-D were 600 and 700 µg/L in MW-3 in January and August 2005, which exceed the 500 µg/L Method A CUL (see Table 4.2). In January, the concentrations of TPH-D and TPH-O were 660 and 500 µg/L in MW-19, above the 500 µg/L Method A CULs, but the concentrations decreased below the CULs in August 2015.

The next highest TPH mass was in L12, L14, and L13, which extend along the perforated lateral storm drain downstream from former drain D34, which was remediated in 1996 (JPHC, 1996a). MW-6 and MW-9 are located near the TPH source area. During 2015 sampling (see Table 4.2), MW-9 had the highest TPH concentrations at the Site in August 2015, with 830 µg/L of TPH-D and 950 µg/L of TPH-O, but the concentrations were well below the 500 µg/L Method A CUL in January 2015. MW-6 had 590 µg/L of TPH-D in August 2015, but the concentrations of TPH were otherwise below the Method A CULs in January and August 2015.

The only other well with TPH exceedances was MW-16D, which had 750 µg/L of TPH-D and 540 µg/L of TPH-O in April 2015. The concentrations of TPH-D and TPH-O were below the Method A CULs in August 2015.

Stormwater drainage appears to be the main source of TPH contamination, as MW-2 and MW-2D were the only wells that did not contain some TPH-D contamination. The correlations between the groundwater data and the Gore-Sorber data indicate that Gore Survey adequately identifies TPH source areas at the Site.

All TPH detections were flagged with an "x" in the laboratory analytical reports (see Appendix F), which indicates that the chromatographs do not match the calibration standards for gasoline-, diesel-, and oil-range TPH. The August 2015 groundwater samples from MW-3, MW-6, MW-9, MW-16D, and MW-19 were sampled for TPH-D and TPH-O after performing a silica gel cleanup. Silica gel cleanup preparation removes the polar compounds from the sample, including ketones, phenols, aldehydes, alcohols, and acids/esters (Zemo, 2014). The polar compounds may be highly-degraded, oxygenated hydrocarbon metabolites, but these types of compounds are also common chemicals found in the food supply. These classes of compounds have low or low to moderate toxicity. After silica gel cleanup, the concentrations of TPH-D and TPH-O were below the detection limits. These results indicate that diesel-range hydrocarbons were not detected in the wells.

### 5.1.3 Heating Oil UST

As summarized in Section 4.1.2, JPHC (1995a) removed the 500-gallon heating oil UST from the south side of the 4493 Russell Road building in June 1995. JPHC excavated and disposed of 20 tons of PCS. A bottom soil sample and two composite sidewall soil samples were collected. One composite sidewall sample contained 54 mg/kg of TPH-D, which is well below the 2,000 mg/kg Method A soil CUL. TPH was not detected in the two other confirmation soil samples.

Riley (2005b) sampled a soil boring near the decommissioned UST in 2005. A high PID response of 1.8 ppm was detected in the 7.5 to 8 foot bgs interval of SP8, and the sample contained 33 mg/kg of TPH-D, 520 mg/kg of TPH-O, and 0.07 mg/kg of toluene, which are all well below the Method A soil CULs.

Ecology (see 2012 Opinion Letter in Appendix A) indicated that the UST was identified and removed and that PCS associated with the UST was excavated with confirmation sampling that indicated that soil where the former tank was located is compliant with MTCA.

During RI sampling in 2014, Gore-Sorber C17 was sampled adjacent to the former tank. The mass of TPH in C17 was one of the lowest masses at the Site and BTEX was not detected in the sample.

The heating oil UST source area has been remediated and confirmation samples indicate that residual contamination is compliant with MTCA.

### 5.1.4 Metals

Ecology (2012) recommended that metals be sampled in soil and groundwater because of the various machining operations performed at the Site. The soil samples for the new monitoring well borings were sampled for RCRA metals, and no metals were detected above the Method A CULs. The concentrations of arsenic ranged from 2.04 to 2.85 mg/kg in the seven new monitoring well borings. The concentration of arsenic was 7.9 mg/kg in boring SP10. Both concentrations are below the 20 mg/kg Method A soil

CUL for arsenic. SP10 was located near existing storm drain D30 and the groundwater sample collected from the boring contained the highest concentration of chlorinated VOCs at the Site.

Groundwater samples for all monitoring wells at the Site were analyzed for RCRA metals. Arsenic was the only metal detected above the 5 µg/L Method A CUL, and the CUL was exceeded in 11 of the 22 wells that were sampled at the Site. The highest concentration of arsenic was in MW-17, where 9.82 µg/L was detected in January 2015 and 38.5 µg/L was detected in August 2015. MW-17 is on the east side of the Site and the only contamination in the groundwater was low levels of TPH-D associated with stormwater drainage. The second highest concentration of arsenic was in MW-4, where 34.7 µg/L was detected in January 2015 and 7.59 µg/L was detected in August 2015. MW-4 is north and upgradient from Exotic Tool Welding, but arsenic would not have been associated with the welding operations.

The groundwater samples from August 2015 were analyzed for both total and dissolved arsenic. The concentrations of arsenic in the filtered samples were consistent with the non-filtered samples.

The arsenic exceedances do not appear to be associated with historical business operations at the Site, and are likely attributed to natural background concentrations. No pattern exists for the exceedances, either spatially or temporally, or with correlation to other source areas. The concentration of arsenic was 11.4 µg/L in MW-2D, which was completed in Esperance Sand between 176 and 196 feet bgs, and is not hydraulically connected to shallow groundwater.

The U.S. Geological Survey (USGS, 1997) evaluated groundwater in western Snohomish County, which included the analysis of arsenic in 295 wells across various stratigraphic units. The median arsenic concentration found by the USGS was 2 µg/L in Vashon Till. In the entire USGS dataset, 18 percent of the samples had more than 10 µg/L and 2 percent of the samples had more than 50 µg/L.

The Site is about 9 miles southwest of the Everett Smelter, and soil and shallow groundwater is potentially impacted by the smelter. The Site is within an area that is mapped as containing 20 to 40 mg/kg of arsenic in soil (Ecology, 2015a) which exceeds the 20 mg/kg Method A soil CUL.

We recommend that arsenic not be included as a COC for the Site since it is not associated with Site operations, the arsenic exceedances are minor, erratic, and appear to be associated with background conditions, and the Site is potentially within the influence area of the Everett Smelter.

## 5.2 COPC Distribution and Migration Pathways

This section describes the distribution and migration pathways of the chlorinated VOCs and hydrocarbons at Site.

### *5.2.1 Chlorinated VOCs*

This RI identifies that the primary source of chlorinated VOC contamination appears to be former and existing storm drains (D29 and D30, respectively) on the east side of the former Intermec lease space in the 4403 Russell Road building. The chlorinated VOCs

are retained in the Vashon Till and the exceedance area is limited to the three parcels on the east side of the Site – 4403 Russell Road, 4351 Chennault Beach Road, and 4424 Chennault Beach Road.

#### 5.2.1.1 Lateral Distribution of Chlorinated VOCs

The chlorinated VOC exceedance areas for soil and groundwater are shown in Figures 6A, 7A, and 7B. Residual chlorinated VOCs are primarily found in the weathered till and perched groundwater, and their distribution beneath the paved surfaces appears to be controlled the by the stormwater drains. Figures 8A, 8B, and 8C show potentiometric surfaces for the perched groundwater in January 2015, April 2015, and August 2015. The potentiometric surface is influenced by stormwater discharge into the catch basins and the perforated lateral storm drains on the east and west sides of the 4403 Russell Road building and by the apparent capture of groundwater in the storm drain on the southeast side of the 4424 Chennault Beach Road building. This storm drain is located at the bottom of the truck ramp several feet below the finish floor of the building, and the drain appears to capture shallow groundwater. The groundwater gradient between MW-9 and MW-11 ranged from 0.019 feet per foot (ft/ft) in August 2015 during dry weather to 0.036 ft/ft in January 2015 during wet weather.

The concentrations of chlorinated VOCs within the exceedance area is complicated by the ISCO injections performed in MW-1, MW-7, and MW-9 to MW-15 in March, April, and October 2006 (see Section 4.2.5). Groundwater samples were collected from soil boring SP10 and remediation wells MW-1 and MW-7 prior to ISCO injections, but background samples were not collected from remediation wells MW-9 to MW-15. Fenton's reagent was then injected through the remediation wells without evaluating the radius of treatment. Fenton's reaction creates a strong hydroxyl radical when ferrous iron and hydrogen peroxide react under acidic groundwater conditions. Ideally, the groundwater should be reduced to pH 3 to 6 before hydrogen peroxide is introduced. Although the pH was not recorded, hydrochloric acid was used in the March and April 2006 injection events and weaker acetic acid was used in the October 2006 injection event. The ISCO logs indicate that about 20 to 50 gallons of ferrous sulfate and acid solution were injected into the wells, which would be expected to displace groundwater about 1 foot from the well screen assuming a 30 percent porosity. Iron catalyst and acid injection was followed by injecting 120 to 180 gallons of hydrogen peroxide solution, which would be expected to displace a total of about 2 feet of groundwater from the well screen. Hydrogen peroxide injection is normally limited by the reduced permeability in the formation due to release of oxygen. Fenton's reactions occur quickly, on the order of minutes to hours, and do not leave residual oxidation capacity. The three ISCO injection events likely treated only groundwater within 5 to 10 feet of the injection wells. The trends of concentration in the remediation wells differ in their response to treatment. For example, after three rounds of ISCO treatment, the concentrations remain near detection limits in MW-7, but the concentrations of chlorinated VOCs increased from near detection limits in MW-1 to a high of 1,100 µg/L of TCE in January 2012, which attenuated to 96 and 200 µg/L of TCE in January and August 2015, respectively. The increased concentrations in MW-1 could be related to the one-time ineffectual treatment using a weak acetic acid and the displacement of more impacted groundwater toward the well.

The groundwater exceedance area is delineated by MW-6 and MW-9 to the southeast; MW-17, MW-8, and MW-22 to the northeast; the loading dock storm drain to northwest; MW-2 to the west; and clean soil borings AB-1 to AB-4 in building and MW-18 to the south. The concentrations of TCE have naturally attenuated to below the Method A groundwater CULs in MW-2 and to below the detection limits in MW-6, and chlorinated VOCs have not been detected in MW-17, MW-8, and MW-22. Although MW-9 is a remediation well and a background sample was not collected, the concentrations of VOCs have remained well below the Method A groundwater CULs.

The soil exceedance area is interpreted from the groundwater exceedance area because of the limited soil data. The soil sample from SP10 was not analyzed for chlorinated VOCs and soil samples were not collected from the remediation wells within exceedance area. Soil samples were collected from MW-16, MW-16D, MW-20, and MW-21 within the exceedance area and submitted for the analysis of chlorinated VOCs. The highest concentrations were detected at the base on the weathered till between 15 and 16 feet bgs in MW-16 and MW-16D, where TCE was detected at 4.9 and 1.9 mg/kg, respectively. As shown by the PID measurements on the boring logs in Appendix C, the concentrations of VOCs gradually increased from the top of the water table at about 5 feet bgs to the base of the weathered till. PCE and TCE were also detected at concentrations near the Method A soil CULs in boring MW-21, which is on the 4424 Chennault Beach Road parcel and is the closest well to the truck ramp drain. As shown in the MW-21 boring log, VOCs were only observed beneath the water table at 6 feet bgs and at the base of the weathered till, where is becomes very dense at 9 feet bgs.

#### 5.2.1.2 Vertical Distribution of Chlorinated VOCs

The vertical distribution of chlorinated VOCs was evaluated because of the DNAPL-indicative concentrations of TCE detected in groundwater from soil boring SP10, as requested by Ecology (2012). Deep boring MW-16D was advanced adjacent to MW-16, which had the highest observed concentrations of TCE. The deep boring was not advanced near SP10, which could not be located, or adjacent to MW-7, because the concentrations of chlorinated VOCs have remained near the detection limits following the three rounds of ISCO in 2006.

Soil boring MW-16D was advanced to 100 feet bgs using a hollow-stem auger and a well was installed and screened from 80 to 100 feet bgs. MW-16D is completed entirely in Vashon Till, which was very dense below 10 feet bgs. As recorded on the boring log in Appendix C, a PID response was observed in the moist weathered till at 10 feet bgs and then increased to 5.0 ppm at 15 feet bgs. The PID response was less than 0.5 ppm at 5-foot intervals from 20 to 40 feet bgs, but was 15.4 ppm at 45 feet bgs and 10.1 ppm at 50 feet bgs. The lowest most PID response was 0.3 ppm at 60 feet bgs, and no response was observed in 5-foot intervals from 55 to 100 feet bgs.

A soil sample collected from first suspected zone of contamination in a 1-inch-thick layer of silty sand at 15.5 feet bgs contained 1.9 mg/kg of TCE, and the underlying sample collected from 25 feet bgs contained 0.042 mg/kg of TCE. A soil sample collected from the highest suspected zone of contamination at 45 feet bgs contained 1.3 mg/kg of TCE and the underlying sample collected from 65 feet bgs contained 0.067 mg/kg of TCE. Chlorinated VOCs were not detected in the soil sample collected at 90 feet bgs. The sample results indicate that TCE contamination in soil extends to approximately 65 feet bgs in the Vashon Till.

The Vashon Till soil cuttings were wet below 65 feet bgs and the hollow-stem auger was not capable of advancing further than 100 feet into the Vashon Till. Groundwater samples were collected from the saturated till between 80 and 100 feet bgs in April and August 2015, and TCE was detected at 24 and 10 µg/L, respectively, which exceed the 5 µg/L Method A groundwater CUL. The depth to water was about 58 feet bgs, which indicates that this saturated interval is not hydraulically connected to the perched groundwater in the weathered till. Additionally, the saturated interval does not extend to MW-2D, which is about 100 feet west of MW-16D.

Soil boring MW-2D was advanced through the Vashon Till and into the Esperance Sand formation using mud-rotary drilling. Soil samples were collected at 5-foot intervals to evaluate the stratigraphy and determine the depth to the underlying Esperance Sand formation. As recorded in the boring log in Appendix C, weathered till was encountered from 0 to 15 feet bgs and hard Vashon Till was encountered from 15 to 177 feet bgs. The till was wet from 115 to 160 feet bgs and moist from 165 to 175 feet bgs. The Esperance Sand formation was encountered at 177 feet bgs and was very moist to moist to the bottom of the boring at 200 feet bgs. The PID did not detect contamination in the soil boring; however, a soil sample was collected at 55 feet bgs where 0.4 ppm was recorded with the PID. Another soil sample was collected from the Esperance Sand at 190 feet bgs. The concentrations of chlorinated VOCs were below the detection limits in the MW-2D soil samples.

MW-2D was installed and screened from 177 to 197 feet bgs and sampled in August 2015. The depth to groundwater was 163 feet bgs, which indicates that the Esperance Sand is not hydraulically connected to the perched groundwater in the weathered till or to saturated intervals within the till. As described in Section 3.3 and shown in the geology map in Figure 3, MW-2D is screened in the Esperance Sand at the same elevation as the outcrop, and MW-2D should be downgradient from the chlorinated VOC exceedance area. The concentrations of chlorinated VOCs were below the detection limits in August 2015, which confirms that the groundwater exposure pathway in the Esperance Sand is incomplete.

### *5.2.2 Petroleum Hydrocarbons*

Figure 7C shows the two areas of the Site where diesel-range TPH was detected above the Method A groundwater CULs. These exceedance areas reconcile with the former ACS lease space at the north end of the 4433 Russell Road building, where kerosene was used as a cleaning agent, and remediated storm drain D34 on the east side of the 4403 Russell Road building, where 25 tons of PCS were excavated (JPHC, 1996a). TPH was not detected in the exceedance area wells after the groundwater samples were prepared with silica gel to remove the polar compounds. The residual contamination consists of polar compounds, such as ketones, phenols, aldehydes, alcohols, and acids/esters, which may be degradation byproducts that have low and low-to-moderate toxicity (see Section 5.1.2).

## 5.3 Exposure Pathways and Receptors

### *5.3.1 Human Receptors*

The potential exposure pathways and receptors at the Site include:

**Direct contact by Site workers with contaminated soil.** As shown in Figure 6A, the chlorinated VOC exceedance area on the northeast side of the 4403 Russell Road building contains PCE and TCE at concentrations above the MTCA Method A soil CULs. Method A soil CULs are protective of the groundwater exposure pathway, whereas Method B soil CULs are protective of the direct contact exposure pathway. No contamination was detected over the Method B CULs. The direct contact exposure pathway extends from the surface to 15 feet bgs, which coincides with the depth of the weathered till. As recorded in Table 4.1:

- The highest detected concentration of PCE was 0.13 mg/kg in the 15 foot bgs interval of MW-16D, which is well below the 476 mg/kg Method B soil CUL.
- The highest detected concentration of TCE at the Site was 4.9 mg/kg in the 15.5 to 16 foot bgs interval of MW-16, which is below the 12 mg/kg Method B soil CUL.
- The highest detected concentration of TCE within the direct contact point of compliance was 1.9 mg/kg in the 15 foot bgs interval of MW-16D, which is below the 12 mg/kg Method B soil CUL.

The direct contact exposure pathway is incomplete at the Site.

**Groundwater ingestion**. The Method A groundwater CULs are protective of all pathways including drinking water. The chlorinated VOC exceedance area is shown in Figures 7A and 7B, and the impacted groundwater includes perched groundwater in the weathered till and groundwater within the saturated till. The Site is underlain by about 175 feet of Vashon Till and contamination does not extend to the underlying Esperance Sand. The Site and surrounding properties receive drinking water from the Mukilteo Water and Wastewater District. No water wells were identified within a ½ mile of the Site or within 1-mile downgradient of the Site (Ecology, 2015b). Most of the identified wells are shallow resource protection wells and abandoned wells. The only wells within the Esperance Sand are geothermal wells that are upgradient from the Site. The construction of water wells would not be anticipated downgradient from Site because the Esperance Sand outcrops within 6,000 feet northwest and southwest of the Site and within 8,000 feet west of the Site towards Puget Sound. The groundwater ingestion exposure pathway is incomplete at the Site.

**Inhalation of contaminated vapor by Site workers.** The soil-to-vapor exposure pathway should be evaluated for VOCs whenever the concentration of VOCs in soil are significantly higher than the concentrations derived for groundwater protection (i.e., the Method A soil CULs for PCE and TCE) (WAC 173-340-740(3)(b)(iii)(C)).

The Site soil and groundwater exceedance area is generally beneath the asphalt parking lot. The exceedance area extends from former storm drain D29 and existing storm drain D30 on the northeast side of the 4403 Russell Road building, which appear to have received chlorinated VOC contamination, to the sunken loading ramp drain on the southeast side of the 4424 Chennault Beach Road building, which appears to receive perched groundwater during wet weather months. The concentration of TCE was 4.9 mg/kg in the 15.5 foot bgs interval of MW-16 near former storm drain D29, which significantly exceeds the 0.03 mg/kg Method A soil CUL. The concentration of TCE was 0.056 mg/kg in the 9 to 10 foot bgs of MW-21 near the truck ramp, which slightly exceeds the 0.03 mg/kg Method A soil CUL. No soil contamination was detected in the

vadose zone; thus soil contamination is not suspected to contribute to the vapor intrusion exposure pathway.

Although the Gore survey yielded mass units that are not comparable with screening levels, the Gore-Sorbers measured the mass of individual VOCs that were absorbed to a resin that was placed about 3 feet bgs. Gore Sorbers were placed beneath the parking lot and nearby building and sealed at the surface for about 10 days in November 2014. The masses of chlorinated VOCs were generally low, and chlorinated VOCs were not detected above the soil and groundwater chlorinated VOC exceedance areas.

…

### *5.3.2 Ecological Receptors*

The Property is excluded from the terrestrial ecological exposure evaluation because there are less than 1.5 acres of contiguous undeveloped land on the Property or within 500 feet of any area of the Property (WAC 173-340-7491(1)(c)(i)).

# 6 Impacted Media

This section summarizes the COPCs, proposed COCs and CULs, and the impacted soil and groundwater at the Site.

## 6.1 Proposed Chemicals of Concern

The COPCs for the Site include chlorinated VOCs, petroleum hydrocarbons, and RCRA metals. The COPCs include compounds required for testing for waste oils and unknown oils, in accordance with MTCA Table 830-1, and RCRA metals, as requested by Ecology (2012; see Appendix A). Table 6.1 lists the COPCs, summarizes which ones exceed detection limits or cleanup standards, and identifies which COPCs should be retained as COCs in soil and groundwater.

**Table 6.1: Chemicals of Potential Concern and Proposed Chemicals of Concern**

| | Soil | | | Groundwater | | |
|---|---|---|---|---|---|---|
| **Chemicals of Potential Concern** | **Exceeds Detection Limit** | **Exceeds Method A Soil CUL** | **Retained as Chemical of Concern** | **Exceeds Detection Limit** | **Exceeds Method A Groundwater CUL or MCL** | **Retained as Chemical of Concern** |
| TPH, Gasoline | No | No | No | Yes | No | No |
| TPH, Diesel and Oil | Yes | No | No | Yes | Yes | No |
| TPH, Diesel and Oil with Silica Gel Cleanup | NA | NA | NA | No | No | No |
| Benzene | No | No | No | No | No | No |
| Toluene, ethylbenzene, or xylenes | No | No | No | Yes | No | No |
| MTBE | No | No | No | No | No | No |
| Carcinogenic PAHs | No | No | No | NE | NA | No |
| Naphthalene | No | No | No | No | No | No |
| PCE | Yes | Yes | **Yes** | Yes | Yes | Yes |
| TCE | Yes | Yes | **Yes** | Yes | Yes | Yes |
| cDCE | Yes | NA | No | Yes | Yes | Yes |
| tDCE | No | NA | No | Yes | No | No |
| 1,1-DCE | No | NA | No | Yes | No | No |

**Table 6.1: Chemicals of Potential Concern and Proposed Chemicals of Concern**

| | Soil | | | Groundwater | | |
|---|---|---|---|---|---|---|
| **Chemicals of Potential Concern** | **Exceeds Detection Limit** | **Exceeds Method A Soil CUL** | **Retained as Chemical of Concern** | **Exceeds Detection Limit** | **Exceeds Method A Groundwater CUL or MCL** | **Retained as Chemical of Concern** |
| Vinyl chloride | No | NA | No | Yes | Yes | Yes |
| 1,1,1-TCA | No | No | No | Yes | No | No |
| Methylene chloride | No | No | No | No | No | No |
| Arsenic | Yes | No | No | Yes | Yes | No |
| Barium | Yes | No | No | Yes | No | No |
| Cadmium | No | No | No | No | No | No |
| Chromium | Yes | No | No | Yes | No | No |
| Lead | Yes | No | No | Yes | No | No |
| Mercury | Yes | No | No | Yes | No | No |
| Selenium | No | No | No | No | No | No |
| Silver | No | No | No | No | No | No |

CUL – cleanup level, cDCE – cis-1,2-dichloroethylene, 1,1-DCE – 1,1-dichloroethylene, DCE – dichloroethylene, MCL – maximum contaminant level, MTBE – methyl tert-butyl ether, PAH – polycyclic aromatic hydrocarbon, TPH – total petroleum hydrocarbons, PCE – tetrachloroethylene, TCA – trichloroethane, TCE – trichloroethylene

The maximum detected concentrations of TPH-D and TPH-O were 830 and 950 µg/L, respectively, in MW-9, which exceed the 500 µg/L Method A groundwater CULs (see Table 4.2). However, TPH was not detected in any samples that were prepared with silica gel cleanup to remove the polar compounds. The residual compounds detected by the NWTPH-Dx analysis include ketones, phenols, aldehydes, alcohols, and acids/esters, which may be degradation byproducts that have low and low-to-moderate toxicity.

As described in Section 5.1.4, we recommend that arsenic not be included as a COC for the Site since it is not associated with Site operations, the arsenic exceedances are minor, erratic, and appear to be associated with background conditions, and the Site is potentially within the influence area of the Everett Smelter.

The proposed COCs for soil and groundwater are:

- **Soil:** PCE and TCE
- **Groundwater:** PCE, TCE, cDCE, vinyl chloride

## 6.2 Proposed Cleanup Levels and Points of Compliance

MTCA Method A soil and groundwater CULs are proposed for the proposed COCs.

The Method A groundwater CULs should be the more stringent of the Method A groundwater table values and the state and federal maximum contaminant levels (MCLs) for PCE, TCE, cDCE, and vinyl chloride, as defined in WAC 173-340-720(3). The point of compliance is all potable groundwater at the Site. Potable groundwater is defined as groundwater that is a potential source of future drinking water that has a sustainable yield of at least 0.5 gallons per minute and a total dissolved solids concentration of less than 10,000 mg/L (WAC 173-340-720(2)). The perched groundwater within the weathered till and the groundwater within the hard, relatively impermeable till have not been evaluated for yield and dissolved solids to determine whether they should be classified as a potable groundwater. The perched groundwater within the weathered Vashon Till and the groundwater within the hard, relatively impermeable till are evaluated using Method A groundwater CULs as screening levels.

The Method A soil CULs are the Method A soil table values for PCE and TCE, which are based on groundwater protection. The point of compliance for soil CULs that are based on groundwater protection shall be established for all soil at the Site (WAC 173-340-740(6)(b)).

**Table 6.2: Proposed Chemicals of Concern, Cleanup Levels, and Points of Compliance**

| Chemical of Concern | Maximum Detected Concentration (2015 Data) | Cleanup Level | Point of Compliance |
|---|---|---|---|
| **Soil** | **mg/kg** | **mg/kg** | All soil at the Site |
| PCE | 0.13 | 0.05 | |
| TCE | 4.9 | 0.03 | |
| **Groundwater** | **µg/L** | **µg/L** | Potable groundwater |
| PCE | 110 | 5 | |
| TCE | 410 | 5 | |
| cDCE | 290 | 70 | |
| Vinyl chloride | 6.5 | 0.2 | |

## 6.3 Impacted Media

The impacted media for the Site are soil and groundwater. For the proposed COCs and CULs, Figure 6A shows the lateral extent of soil contamination and Figures 7A and 7B show the lateral extent of groundwater contamination. The lateral of extent of soil and groundwater are based on Site delineation sampling and the CSM as described in Sections 5.1.1 and 5.2.1. Although existing data are sufficient for evaluating remediation

alternatives, additional soil and groundwater sampling may be appropriate to refine the delineation of the treatment area during remedial design.

# 7 Remedial Action Objectives

Site remedial action objectives include:

- Remediate accessible source area to allow natural attenuation of residual contamination in soil and groundwater and to decrease the concentrations of chlorinated VOCs on the Foursquare Church parcel to below the Method A soil and groundwater CULs.
- Implement monitoring program to confirm the stability and attenuation of residual contamination in the Vashon Till formation.
- Protect current and future human receptors from potential exposure pathways.
- Secure a no further action (NFA) determination for the impacted Site parcels owned by Russell Road Industrial Park with an environmental covenant that addresses a groundwater monitoring plan.
- Secure an unrestricted NFA determination for the non-impacted Site parcels.

# 8 Remedial Action Technology Screening

This RI/FS includes identification and evaluation of potentially applicable technologies for addressing COCs at the Site, including:

- Excavation;
- Monitored natural attenuation (MNA);
- Biostimulation;
- ISCO;
- *In situ* and *ex-situ* soil mixing; and
- Air sparging/soil vapor extraction (AS/SVE);

These remediation technologies are briefly described below and evaluated for the Site.

## 8.1 Excavation

Excavation involves removal and off-site disposal of contaminated soil and the backfill of the excavation with clean soil. Site confirmation soil samples are collected from the sidewalls and bottom to confirm that residual contamination is below the remediation levels. Excavation has been performed during previous interim actions, including the excavation of 25 tons of PCS beneath former drain D34 (JPHC, 1996a), the excavation of 20 tons of PCS beneath the former heating oil UST (JPHC, 1995a), and the excavation of soil beneath former floor drains in the former Exotic Tool and former King Machine tenants spaces (JPHC, 1995b).

Soil can be readily excavated beneath the parking lot on the east side of the 4403 Russell Road building. However, the highest detected concentration of TCE was at 15 to 16 feet bgs about 8 feet from the building. An unsupported excavation would need to be offset from the building and then sloped at a 1.5H:1V (horizontal:vertical) slope. Thus, soil at 16 feet bgs could not be excavated within 25 feet from the building without structural support. Excavation adjacent to the building could be performed using engineered shoring systems or a slot cut technique, where a backhoe would excavate about 3-foot-wide trenches to the maximum achievable depth, which would be limited at depth because of leverage and the increasing hardness of the till. The slot cuts would be backfilled with controlled density fill (CDF), and the adjacent soil could be excavated after the CDF has solidified for several hours. Contaminated soil beyond 25 feet from the building could be excavated without structural support.

Additional sampling may be performed to refine the limits of excavation and to pre-characterize the waste. The soil contains RCRA F002 listed waste, and F002 listed dangerous waste would be generated when soil containing the F002 listed waste is excavated from the ground. Ecology can provide a contained-out determination when the concentrations of TCE are below the 12 mg/kg Method B CUL, below the land disposal restriction limit of 60 mg/kg (10 times the universal treatment standard), and below the greater than 20 mg/kg characteristic waste limit (greater than 20 times the 1 mg/L

leachate limit for D040 waste). The contained-out determination would allow the disposal of the soil as non-hazardous waste. The highest concentrations of TCE detected were 1.9 and 4.9 mg/kg in the 15 to 16 foot bgs intervals of MW-16 and MW-16D, which are below the limits for the contained-out determination. Pre-characterization sampling may identify some soil with hazardous concentrations of TCE that would need to be segregated for appropriate disposal. The limits of excavation would be based on PID measurements and confirmation sampling during excavation.

Excavation is retained as a treatment technology for development of cleanup alternatives.

## 8.2 Monitored Natural Attenuation

Chlorinated VOCs can attenuate through sorption, dispersion, and biodegradation processes. TCE contamination is present in the Vashon Till at concentrations below the Method B CULs for direct contact exposure and chlorinated VOC contamination has migrated about 125 feet laterally from the storm drains since its release, estimated to be about 20 to 37 years ago.

Chlorinated VOCs have also bioattenuated at the Site. PCE and TCE typically biodegrade by reductive dechlorination, where chlorine atoms are sequentially removed such that PCE degrades to TCE, which degrades to dichloroethylene (DCE) isomers, which degrade to vinyl chloride. Reductive dechlorination occurs when PCE and TCE are used as electron acceptors in microbial reactions. Natural reductive dechlorination can occur when the groundwater parameters (e.g., pH, temperature, and alkalinity) are favorable, sufficient microbial substrate is available, and the concentrations of competing electron acceptors are low. PCE and TCE degrade once the preferential electron acceptors are reduced in groundwater, including dissolved oxygen, nitrate, ferric iron, and sulfate. Reductive dechlorination reactions are optimized under iron- and sulfate-reducing conditions for the more oxidized compounds (i.e., PCE and TCE). DCE and vinyl chloride can bioattenuate under both anaerobic and aerobic conditions. Under anaerobic conditions, DCE and vinyl chloride can accumulate because PCE and TCE are preferential electron acceptors and their presence can slow the DCE and vinyl chloride biodegradation rates. DCE and vinyl chloride can also bioattenuate through multiple aerobic degradation pathways even under apparent anaerobic conditions. Favorable bioattenuation reactions are apparent at the Site based on the presence of vinyl chloride in MW-16 and MW-12.

MNA is potentially applicable as a standalone or complementary technology at this Site because the:

- Source of contamination is controlled,
- The groundwater plume appears stable and bioattenuation is observed,
- Shallow groundwater within the weathered Vashon Till is not used and not anticipated to be used as a source of drinking water, and
- Closest potential source of drinking water is in the Esperance Sand formation about 175 feet bgs and beneath Vashon Till.

MNA is retained as a treatment technology for development of cleanup alternatives.

## 8.3 Biostimulation

Bioremediation of chlorinated VOCs is normally accomplished under anaerobic conditions using either a biostimulation or bioaugmentation process. Biostimulation involves the injection of carbon substrate and nutrients to enhance microbial growth and reduce the concentrations of competing electron acceptors for anaerobic degradation. Under anaerobic conditions, biostimulation often results in the rapid depletion of PCE and TCE and the accumulation of cDCE and vinyl chloride, which in turn may readily bioattenuate under aerobic conditions beyond the treatment area or when natural groundwater conditions recover. At sites where anaerobic conditions persist, groundwater is sometimes bioaugmented with *dehalococcoides ethenogenes* to promote the anaerobic degradation of vinyl chloride.

Biostimulation is complementary with the natural bioattenuation observed at the Site and can accelerate natural bioattenuation processes. Because biostimulation complements existing processes, as opposed to ISCO, the injected biostimulants can be applied more sparsely than ISCO amendments and are not as reliant on the direct contact of amendments with contaminated soil.

Biostimulation is retained as a treatment technology for development of cleanup alternatives.

## 8.4 *In Situ* Chemical Oxidation

ISCO involves injecting or mixing of a strong oxidizing agent into the subsurface that chemically reacts with and destroys contaminants in soil and groundwater upon contact. ISCO reagents include permanganate, peroxide, persulfate, percarbonate, and ozone. These reagents vary in oxidant strength and persistence and can potentially oxidize dissolved metals and sterilize native bacteria. ISCO oxidants can persist in the treatment area for a period of weeks to months, and multiple rounds of ISCO treatment are commonly required to fully treat impacted soil source areas.

As described in Section 4.2.5, ISCO was performed at the Site using a Fenton's reagent during three injection events in March, April, and October 2006. Stainless steel injection wells MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, and MW-15 were constructed for the interim cleanup action. Hydrochloric acid and ferrous sulfate solution, followed by hydrogen peroxide solution, were injected into stainless steel injection wells in March and April 2006 and acetic acid and ferrous sulfate solution, followed by hydrogen peroxide solution, were injected in PVC monitoring well MW-1 and four stainless steel injection wells in October 2006. Fenton reactions create a strong hydroxyl radical when ferrous iron and hydrogen peroxide react under acidic groundwater conditions. Ideally, the groundwater should be reduced to pH 3 to 6 before hydrogen peroxide is introduced. Fenton's reactions occur quickly, on the order of minutes to hours, and do not leave residual oxidation capacity. The 2006 ISCO injection events appear to have decreased the concentrations of chlorinated VOCs in MW-7, which contained the highest concentrations of PCE and TCE at the Site prior to ISCO treatment. The concentrations of chlorinated VOCs have generally been below or near the detection limits in the seven groundwater sampling events following the three ISCO injection

events in MW-7; however, no monitoring wells were installed to evaluate the effectiveness of ISCO treatment between the injection wells.

Ideally, the ISCO oxidant should be capable of oxidizing chlorinated VOCs, be persistent in soil and groundwater to oxidize contamination that leaches or desorbs from non-treated soil, and not inhibit long-term anaerobic bioattenuation reactions for PCE and TCE. Permanganate is the preferred oxidant because:

- Permanganate oxidizes chlorinated VOCs.
- Permanganate is stable and can persist in groundwater and remain effective for treatment for more than a year.
- Although permanganate is generally ineffective for the treatment of nonaqueous phase liquid (NAPL) and Fenton's reagent is favorable for NAPL treatment, NAPL is not suspected based on the concentrations of TCE currently observed in soil and groundwater. Permanganate is ineffective for NAPL treatment because it reacts with NAPL and forms manganese dioxide precipitant that encrusts the surface and delays the dissolution of NAPL.
- Permanganate reduces to manganese dioxide during oxidation reactions, which does not inhibit reductive dechlorination reactions for PCE and TCE. Permanganate is preferred to Fenton's reagent and persulfate, which respectively leave residual ferric iron and sulfate that are preferred as electron acceptors and inhibit reduction dechlorination reactions for PCE and TCE.

Soil has a natural permanganate oxidant demand, which must be overcome for the excess permanganate to oxidize chlorinated VOCs. Stoichiometric reactions for potassium permanganate with various chlorinated ethylenes include (ITRC, 2005b):

Tetrachloroethylene (PCE)

$$4KMnO_4 + 3C_2Cl_4 + 4H_2O \rightarrow 6CO_2 + 4MnO_{2(s)} + 4K^+ + 12Cl^- + 8H^+$$

Trichloroethylene (TCE)

$$2KMnO_4 + C_2HCl_3 \rightarrow 2CO_2 + 2MnO_{2(s)} + 2K^+ + 3Cl^- + H^+$$

Dichloroethylene (DCE)

$$8KMnO_4 + 3C_2H_2Cl_2 + 2H^+ \rightarrow 6CO_2 + 8MnO_{2(s)} + 8K^+ + 6Cl^- + 4H_2O$$

Vinyl Chloride

$$10KMnO_4 + 3C_2H_3Cl \rightarrow 6CO_2 + 10MnO_{2(s)} + 10K^+ + 3Cl^- + 7OH^- + H_2O$$

The chlorinated ethylenes reduce permanganate to manganese dioxide and generate sodium and chloride ions in groundwater. Oxidation of PCE and TCE drives the groundwater to acidic conditions, whereas oxidation of DCE and vinyl chloride drives the groundwater to basic conditions. When the pH is less than 3.5, aqueous $Mn^{2+}$ is preferential to insoluble $MnO_{2(s)}$. Based on these relationships, the oxidation of PCE and TCE should decrease the concentrations of chlorinated ethylenes, decrease the concentration of permanganate, decrease the pH, increase the conductivity, and increase the total dissolved solids. Additionally, permanganate increases the oxidation-reduction

potential (ORP) and dissolved oxygen in the treatment area, which inhibits reductive dechlorination reactions. The decrease in pH has the potential to mobilize metals in groundwater. Additionally, the high ORP has the potential to oxidize insoluble trivalent chromium to soluble hexavalent chromium (ITRC, 2005b).

Permanganate can be purchased as sodium permanganate or potassium permanganate. Sodium permanganate is typically purchased as a 40 percent solution in a tote (containing 3,000 lbs of sodium permanganate in 263 gallons), which is then diluted in the field and used for ISCO treatment; whereas potassium permanganate is purchased as a powder, which is mixed in the field and used for ISCO treatment.

Permanganate can be applied by injection through direct-push borings and injection wells. The injection of permanganate is retained as a technology for the development of cleanup alternatives.

## 8.5 *In Situ* and *Ex-Situ* Soil Mixing

Permanganate can alternately be applied by mixing the soil with permanganate, which increases the contact between the soil and oxidant, and increases the effectiveness of treatment. Soil mixing can be performed *in situ* or *ex-situ*.

*In situ* mixing can be performed using large-diameter, counter-rotating augers that mix soil and permanganate in place. Specialized equipment can be used to mix the weathered till to at least 10 feet bgs, and mixing can be performed adjacent to the building. *In situ* mixing at the Site may be difficult to implement at depth, as the Vashon Till becomes harder. The MW-16 boring log indicates that till becomes very dense at 10 feet bgs and the maximum blow count was encountered at 15.5 feet bgs.

*Ex-situ* mixing involves the excavation of impacted soil and the application and mixing of permanganate above grade on a liner placed on the parking lot. *Ex-situ* mixing allows more effective and efficient mixing and complementary aeration treatment. The treated soil could be placed back in the excavation and compacted. At the Site, the application of *ex-situ* treatment may be difficult to implement under RCRA. In order to perform *ex-situ* mixing, Ecology would need to:

- Authorize a corrective action management unit (CAMU). Soil can be moved within a CAMU without the generation of solid waste as long as it is not mixed in tanks, such as a pug mill. Impacted soil could be excavated, staged on a liner, treated with permanganate by spray application and mixed by tiller or backhoe, and then placed back into the excavation.
- Pre-characterize impacted soil as contained-out waste and allow the contained-out soil to be treated to below Method A CULs by soil mixing and aeration and then placed back into the excavation.

*Ex-situ* soil mixing is limited by the slope stability requirements next to the building, and the most impacted soil would not be able to be excavated without the installation of shoring.

*In situ* mixing is retained as a treatment technology for development of clean alternatives, but *ex-situ* mixing is not retained for further consideration.

## 8.6 Air Sparging/Soil Vapor Extraction

AS/SVE involves stripping VOCs from both soil and groundwater by injecting air below the water table, and collecting injected air and soil vapor through vadose zone extraction wells or trenches. VOCs sorbed on soil (and dissolved in groundwater) partition into air bubbles rising through the water column. The vapor is then collected by an SVE system and treated before discharge into the atmosphere. AS/SVE can be effective for the removal of chlorinated VOCs, and is most effective in permeable, homogeneous soil. AS is typically applied to treat groundwater, but also can be used to treat impacted soil below the water table. The applicability of AS/SVE as a potential remedial technology is largely dependent on the depth of contamination, the permeability and continuity of the soil, and the depth to the groundwater table.

AS/SVE is not retained as a potential remedial technology at the Site for the following reasons:

- Remediating chlorinated VOCs at the base of the weathered till by AS/SVE would be limited by the low permeability of the hard Vashon Till, which would inhibit air injection below the contamination;
- The depth to the shallow groundwater table ranged from about 4 feet bgs in January 2015 to about 6 feet bgs in August 2015 near MW-16 and MW-12, which means there is limited unsaturated zone available for the collection of the sparged air; and
- Air sparging would adversely impact the natural anaerobic biodegradation of PCE and TCE in soil and groundwater.

# 9 Development of Cleanup Alternatives

This section details five cleanup alternatives that build on previously performed interim actions at the Site.

## 9.1 Interim Actions Completed to Date

Interim actions completed at the Site are summarized in Section 4.2. These include the:

- Removal of the floor drain within the former Intermec and King Machine lease space on June 19, 1995 (JPHC, 1995b);
- Excavation and disposal of 25 tons of PCS under storm drain D34 in September 1996 (JPHC, 1996a) and the subsequent removal of former storm drains D29 and D34; and
- The injection Fenton's reagent into monitoring well MW-1 and remediation wells MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, and MW-15 during three events in March, April, and October 2006 (Riley, 2006).

## 9.2 Cleanup Action Alternatives

Five cleanup alternatives are developed for the Site. All alternatives include the completed actions, summarized in Sections 4.2 and 9.1, and MNA for groundwater until the concentrations of chlorinated VOCs and TPH attenuate to below the Method A groundwater CULs. The additional actions included in the cleanup alternatives include:

- **Alternative 1** – No additional active remediation;
- **Alternative 2** – Injection of biostimulants to enhance natural bioattenuation;
- **Alternative 3** – Injection of sodium permanganate to oxidize chlorinated VOCs in the source area;
- **Alternative 4** – *In situ* mixing of sodium permanganate into the soil to oxidize chlorinated VOCs in the source area; and
- **Alternative 5** – Excavation of accessible impacted soil from the source area.

Table 9.1 summarizes the components and costs of the cleanup alternatives and the cost details are provided in Tables 9.2 to 9.6. The cost estimates include scope and bid contingencies, which are applied consistent with the EPA cost estimation guideline (EPA, 2000). Scope contingencies are applied to the remedial technologies and account for uncertainties in design quantities and unit costs, which are refined during remedial design. Biostimuation in Alternative 2 was assigned a 10 percent scope contingency, permanganate injection in Alternative 3 was assigned a 15 percent scope contingency, and *in situ* soil mixing and excavation in Alternatives 4 and 5 were assigned a 25 percent scope contingency. Bid contingencies account for modifications after contract award due to changed quantities or conditions. A 10 percent bid contingency was assigned for all project costs. Future costs were discounted at the current 10-year real discount rate of 0.9 percent.

### 9.2.1 Alternative 1 – Completed Actions and MNA

This RI identifies that the primary source of chlorinated VOC contamination appears to be former and existing storm drains (D29 and D30, respectively) on the east side of the former Intermec lease space in the 4403 Russell Road building. Although sporadic detections occur on the west side of the 4403 Russell Road building and near the former floor drain, the Method A CUL exceedance area for chlorinated VOCs is restricted to the area east and north of the building. Chlorinated VOCs appear to have been released during Intermec's lease of the property from 1978 through the 1980s and during ACS' lease of the property in the 1990s. Intermec vacated the property 25 years ago and ACS vacated the property more than 10 years ago and before the acquisition of the property by Russell Road Industrial Park, LLC in 2005.

The floor drain was removed in June 1995 (JPHC, 1995b), 25 tons of PCS was removed near former storm drain D34 in September 1996 (JPHC, 1996a), and storm drains D29 and D34 were subsequently removed before the acquisition of the property in 2005. After sampling groundwater from soil boring SP10 on June 14, 2005 and discovering the chlorinated VOC release, the impacted area was treated by injecting Fenton's reagent into eight shallow injection wells during three events in March, April, and October 2006 (Riley, 2006).

This RI/FS defines the vertical and horizontal extent of chlorinated VOC contamination at the Site. The highest concentrations of TCE were detected in soil between 15 and 16 feet bgs at the base of the weathered till in borings MW-16 and MW-16D near former storm drain D29 on the east side of the building. TCE was also detected at depths up to 65 feet bgs in wet soil cuttings from the hard Vashon Till in boring MW-16D. TCE was detected in groundwater from saturated Vashon Till between 80 and 100 feet bgs in MW-16D, where the concentrations ranged from two to five times the Method A groundwater CUL in April and August 2015. The Site is underlain by about 175 feet of Vashon Till, and the residual contamination does not pose an exposure threat to the underlying Esperance Sand formation. There are no current users of groundwater in the Esperance Sand within a half-mile upgradient of the Site and within a mile downgradient of the Site. Groundwater use is not anticipated because the area is served by the City of Mukilteo public water supply.

Chlorinated VOC extends from former storm drain D29 and existing storm drain D30 onto three tax parcels: 4403 Russell Road, 4351 Chennault Beach Road to the east, and 4424 Chennault Beach Road to the north. In boring MW-21 on the Foursquare Church property, the concentration of PCE was below the Method A soil CUL and the concentration of TCE slightly exceeded the Method A soil CUL. Chlorinated VOCs were not detected in the RI soil borings, including AB-1 and AB-3 near the former floor drain, MW-18 on the west side of the ACS lease space, in MW-2D north of the building, in MW-20 on the northeast corner of the parcel, or in MW-17 on the east side of the chlorinated VOC exceedance area.

Chlorinated VOC contamination has migrated about 125 feet from the source area in the shallow groundwater within the weathered Vashon Till since its release 20 to 37 years ago. PCE, TCE, and DCE are biodegrading by reductive dechlorination based on the appearance of TCE, DCE, and vinyl chloride daughter products in groundwater. Reductive dechlorination reactions are favorable in anaerobic groundwater. The

concentrations of nitrate were below the detection limit in the upgradient portions of the plume, but ranged from 7.3 to 8.9 mg/L in MW-2, MW-11, and MW-21 on the north side of the 4403 Russell Road building. The presence of nitrate inhibits reductive dechlorination reactions.

This alternative includes a groundwater sampling plan. The objectives of the groundwater sampling plan would be to evaluate and confirm that the chlorinated VOC plume does not expand and to evaluate and confirm the decreasing trend in chlorinated VOC contamination based on natural attenuation processes.

**Alternative 1 includes:**

- Decommissioning of former remediation wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 (previously abandoned), and MW-15 and construction of monitoring well MW-23 between MW-7, MW-12, and MW-13. Sample results from MW-23 would be representative of residual contamination and not influenced by previous ISCO injection activities in 2006.
- Sampling of chlorinated VOC source area wells MW-16 and MW-23, downgradient wells MW-20 and MW-21, deep well MW-16D, and non-impacted sentinel wells MW-2, MW-22, MW-8, MW-17, MW-6, and MW-18. Groundwater samples would be submitted for the analysis of chlorinated VOCs. These eleven wells would be sampled at an 18 month interval in opposing seasons to confirm the stability and natural attenuation of the chlorinated VOC contamination. For cost estimating purposes, groundwater monitoring is assumed to be conducted for 30 years.
- Decommissioning of monitoring wells MW-4 and MW-5, where VOCs have not been detected above the Method A groundwater CULs after four or more rounds of groundwater sampling.
- Decommissioning of monitoring wells MW-3 and MW-19, where the concentrations of the proposed COCs are below the detection limits, with the exception of low levels of cDCE in MW-3 through five rounds of groundwater sampling.

An environmental covenant would be recorded for the impacted parcels. The environmental covenant would include a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and require the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site. This alternative assumes that the environmental covenant would be recorded after 5 years of MNA sampling in concurrence with a NFA determination from Ecology. Refer to Table 9.2 for the cost details of Alternative 1.

### *9.2.2 Alternative 2 – Completed Actions, Biostimulation, and MNA*

Biostimulation would be performed in Alternative 2 to enhance the natural bioattenuation of chlorinated VOCs. Biostimulants are used to stimulate the intrinsic microbial population and to achieve iron- and sulfate-reducing aquifer conditions, which are more favorable for the anaerobic degradation of the chlorinated VOCs. This alternative

assumes that 3-D Microemulsion® (3DMe®) Factory Emulsified and HRC Primer® products would be used to biostimulate new and existing remediation wells in the chlorinated VOC exceedance area. 3DMe® and HRC Primer® are engineered biostimulants sold by Regenesis. 3DMe® is a blend of lactate, polylactate esters, and free fatty acids and fatty acid esters, which are emulsified prior to shipment and then diluted in the field and injected as a high volume emulsion. 3DMe® provides variable release rates of electron donor to biostimulate the groundwater for periods of up to three years. 3DMe® is slightly viscous and forms colloidal suspensions at concentrations above 300 mg/L. 3DMe® has hydrophilic and lipophilic properties that allow it to bind organic contaminants and be mobile in groundwater. HRC Primer® is a mixture of lactic acid and glycerol, which is injected to provide a short-term release, typically two to three weeks, of lactic acid to jump start bioactivity and reduce the iron and sulfate in groundwater. HRC Primer® can be economically added to the 3DMe® emulsion to quickly improve the reducing conditions for reductive dechlorination of chlorinated VOCs.

**Alternative 2 includes:**

- Construction of seven new injection wells between the source area and the downgradient plume, as shown in Figure 9A.
- Injection of a 250-gallon batch of biostimulants into existing wells MW-1, MW-7, MW-10, MW-11, MW-12, MW-15, MW-16, and MW-16D and the seven new injection wells. Each 250 gallon batch would include 200 lbs of 3DMe® Factory Emulsified and 15 lbs of HRC Primer®.
- A second, contingent round of biostimulant injections would be performed after two years if needed.
- Decommissioning of former remediation wells MW-13 and MW-14 (previously abandoned) and construction of monitoring well MW-23 within the biostimulation treatment area. Sample results from MW-23 would be representative of residual contamination and not influenced by previous ISCO injection activities in 2006, and this well would be used to monitor the effectiveness of biostimulation.
- Sampling of chlorinated VOC source area wells MW-16 and MW-23, downgradient wells MW-20 and MW-21, deep well MW-16D, and non-impacted sentinel wells MW-2, MW-22, MW-8, MW-17, MW-6, and MW-18. Groundwater samples would be submitted for the analysis of chlorinated VOCs. These eleven wells would be sampled at an 18-month interval in opposing seasons to confirm the enhanced attenuation and stability of the chlorinated VOC contamination. For cost estimating purposes, groundwater monitoring is assumed to be conducted for 15 years.
- Decommissioning of monitoring wells MW-4 and MW-5, where VOCs have not been detected above the Method A groundwater CULs after four or more rounds of groundwater sampling.
- Decommissioning of monitoring wells MW-3 and MW-19, where the concentrations of the proposed COCs are below the detection limits, with the

exception of low levels of cDCE in MW-3 through five rounds of groundwater sampling.

An environmental covenant would be recorded for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel (4424 Chennault Beach Road). The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site. This alternative assumes that the environmental covenant would be recorded after 5 years of MNA sampling in concurrence with an NFA determination from Ecology. Refer to Table 9.3 for the cost details of Alternative 2.

### 9.2.3 Alternative 3 – Completed Actions, Permanganate Injection, and MNA

Alternative 3 includes the injection of sodium permanganate into existing remediation and monitoring wells and into direct-push borings. Concentrated sodium permanganate is typically diluted to a 5 to 10 percent solution and injected into the formation. Permanganate is non-selective, and at higher concentrations, may be expended by the natural oxidation demand of the aquifer. Permanganate is more selective for chlorinated ethylenes at lower concentrations, and may persist for longer durations in groundwater.

**Alternative 3 includes:**

- Additional soil sampling to delineate the extent of ISCO treatment based on the concentrations of chlorinated VOCs in soil and to submit a soil sample for the analysis of permanganate soil oxidant demand.
- Purchase of two 263 gallon totes of 40 percent sodium permanganate and injection of 175 gallons of 5 percent sodium permanganate solution into remediation wells MW-11 and MW-12 and in 22 direct-push probe points, as shown in Figure 9B.
- A second round of permanganate injections would be performed after two years.
- Decommissioning of former remediation wells MW-13 and MW-14 (previously abandoned) and construction of monitoring well MW-23 within the ISCO treatment area. Sample results from MW-23 would be representative of residual contamination and not influenced by previous ISCO injection activities in 2006, and this well would be used to monitor the effectiveness of permanganate injections.
- Sampling of chlorinated VOC source area wells MW-16 and MW-23, downgradient wells MW-20 and MW-21, deep well MW-16D, and non-impacted sentinel wells MW-2, MW-22, MW-8, MW-17, MW-6, and MW-18. Groundwater samples would be submitted for the analysis of chlorinated VOCs and samples from MW-16 and MW-23 would be submitted for the analysis of RCRA metals. These eleven wells would be sampled at an 18-month interval in opposing seasons to confirm the enhanced attenuation and stability of the

chlorinated VOC contamination. For cost estimating purposes, groundwater monitoring is assumed to be conducted for 15 years.

- Decommissioning of monitoring wells MW-4 and MW-5, where VOCs have not been detected above the Method A groundwater CULs after four or more rounds of groundwater sampling.
- Decommissioning of monitoring wells MW-3 and MW-19, where the concentrations of the proposed COCs are below the detection limits, with the exception of low levels of cDCE in MW-3 through five rounds of groundwater sampling.

An environmental covenant would be recorded for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel (4424 Chennault Beach Road). The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site. This alternative assumes that the environmental covenant would be recorded after 5 years of MNA sampling in concurrence with an NFA determination from Ecology. Refer to Table 9.4 for the cost details of Alternative 3.

### 9.2.4 Alternative 4 – Completed Actions, In Situ Soil Mixing, and MNA

Potassium permanganate would be mixed with the impacted soil in the east side of the building using 6-foot diameter counter-rotating augers to 15 feet bgs to treat impacted soil beneath former storm drain D29 and existing storm drain D30.

**Alternative 4 includes:**

- Additional soil sampling to delineate the extent of ISCO treatment based on the concentrations of chlorinated VOCs in soil and to submit a soil sample for the analysis of permanganate soil oxidant demand.
- *In situ* soil mixing of a 3,600 sf area using 100 borings, as shown in Figure 9C. Permanganate would be mixed into the soil, using assumed ratio of 3 grams of potassium permanganate per kilogram of soil, to overcome the permanganate soil oxidant demand and to oxidize the chlorinated VOCs. The asphalt surface would be removed and disposed. To allow for soil expansion during mixing, the top 1.5 feet of soil would be excavated, staged, characterized, and disposed as non-hazardous waste with a contained-out determination. The storm drain would be removed and restored after treatment, and the soil mixing area would be covered with gravel bedding and repaved.
- Decommissioning of former remediation wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 (previously abandoned), and MW-15 and construction of monitoring well MW-23 downgradient from the treatment area. MW-23 would be used to monitor the effectiveness of permanganate mixing.
- Sampling of chlorinated VOC source area wells MW-16 and MW-23, downgradient wells MW-20 and MW-21, deep well MW-16D, and non-impacted

sentinel wells MW-2, MW-22, MW-8, MW-17, MW-6, and MW-18. Groundwater samples would be submitted for the analysis of chlorinated VOCs and samples from MW-16 and MW-23 would be submitted for the analysis of RCRA metals. These eleven wells would be sampled at an 18-month interval in opposing seasons to confirm the enhanced attenuation and stability of the chlorinated VOC contamination. For cost estimating purposes, groundwater monitoring is assumed to be conducted for 9 years.

- Decommissioning of monitoring wells MW-4 and MW-5, where VOCs have not been detected above the Method A groundwater CULs after four or more rounds of groundwater sampling.
- Decommissioning of monitoring wells MW-3 and MW-19, where the concentrations of the proposed COCs are below the detection limits, with the exception of low levels of cDCE in MW-3 through five rounds of groundwater sampling.

An environmental covenant would be recorded for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel (4424 Chennault Beach Road). The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site. This alternative assumes that the environmental covenant would be recorded after 5 years of MNA sampling in concurrence with an NFA determination from Ecology. Refer to Table 9.5 for the cost details of Alternative 4.

### *9.2.5 Alternative 5 – Completed Actions, Excavation, and MNA*

Alternative 5 includes the excavation of impacted soil from beneath former storm drain D29 and existing storm drain D30. The remaining contamination would be allowed to naturally attenuate.

**Alternative 5 includes:**

- Additional soil sampling to delineate the extent of excavation, measure the concentrations of chlorinated VOCs, and to request a contained-out determination from Ecology to allow disposal of the soils as non-hazardous waste.
- Decommissioning of former remediation wells MW-1, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 (previously abandoned), and MW-15 and monitoring wells MW-16 and MW-16D.
- Excavation of impacted soil to 15 feet bgs on the east side of the 4403 Russell Road building, as shown in Figure 9D. The excavation would be offset 2 feet from the building and the sidewall would be excavated with a 1.5H:1V slope adjacent to the building and canopy structure and a 1H:1V slope on the remaining sidewalls. The soil wedge against the building would then be excavated using a slot-cut technique where CDF is placed in each slot before excavation of the adjacent slot. Confirmation soil samples would be collected from the bottom and sidewalls to confirm the removal of contamination.

- Excavation of estimated 2,875 tons of soil, with about 800 tons being excavated using the slot-cut technique. Excavated soil would be staged on a lined pad and then loaded on trucks for disposal as non-hazardous waste at Roosevelt Regional Landfill in Klickitat County, Washington.
- Dewatering during excavation. Groundwater would be pumped from a sump within the excavation to manifolded 20,000-gallon tanks. The wastewater would be treated with bag filters and granular activated carbon and then staged and tested before discharge to the sanitary sewer under authorization from the wastewater authority.
- Backfill of excavation, restoration of storm drain, and re-pavement with asphalt surface.
- Construction of monitoring well MW-23 downgradient from the excavation area.
- Sampling of downgradient wells MW-20, MW-21, and MW-23 and non-impacted sentinel wells MW-2, MW-22, MW-8, MW-17, MW-6, and MW-18. Groundwater samples would be submitted for the analysis of chlorinated VOCs. These nine wells would be sampled at an 18-month interval in opposing seasons to confirm the stability and attenuation of the chlorinated VOC contamination. For cost estimating purposes, groundwater monitoring is assumed to be conducted for 9 years.
- Decommissioning of monitoring wells MW-4 and MW-5, where VOCs have not been detected above the Method A groundwater CULs after four or more rounds of groundwater sampling.
- Decommissioning of monitoring wells MW-3 and MW-19, where the concentrations of the proposed COCs are below the detection limits, with the exception of low levels of cDCE in MW-3 through five rounds of groundwater sampling.

An environmental covenant would be recorded for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel (4424 Chennault Beach Road). The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site. This alternative assumes that the environmental covenant would be recorded after 5 years of MNA sampling in concurrence with an NFA determination from Ecology. Refer to Table 9.6 for the cost details of Alternative 5.

# 10 Detailed Evaluation of Cleanup Alternatives

This section provides a comparative evaluation of the five retained alternatives. The retained cleanup alternatives are comparatively evaluated based on the use of permanent solutions to the maximum extent practical and restoration time frames. Tables 10.1 and 10.2 summarize evaluations of the individual cleanup alternatives and apply the appropriate criteria from the WAC 173-340-360.

## 10.1 Evaluation of Performance Requirements

WAC 173-340-360 requires that the cleanup action uses permanent solutions to the maximum extent practicable, based on the development of a disproportionate cost analysis (DCA) that compares the costs and benefits for the following criteria:

- Protectiveness (30%)
- Permanence (20%)
- Cost
- Long-term effectiveness (20%)
- Short-term risks (10%)
- Implementability (10%)
- Public concerns (10%)

These criteria include the discretionary weighting factors (percentages) listed above to facilitate the calculation of an environmental benefit. These weighting factors have been recommended by Ecology's Northwest Regional Office. Table 10.1 summarizes the individual permanence criteria and presents the DCA for Alternatives 1 to 5.

The DCA in Table 10.1 assigns a numerical ranking of 1 to 5 (where 1 meets criterion to a very low degree and 5 meets criterion to a very high degree) for each criterion for each alternative based on the relative degree that the cleanup alternative satisfies the criterion. The environmental benefit for each cleanup alternative is calculated as the sum of the products of the weighting factor and numerical ranking for each criterion. Figure 10 provides a graphical comparison of costs and environmental benefit rankings for the alternatives.

### *10.1.1 Protectiveness*

All alternatives provide adequate protectiveness under the current Site use. The Site is an industrial park and soil contamination is covered by buildings and asphalt pavement. The highest detected concentrations of TCE are in hard till at the base of the weathered till at about 15 to 16 feet bgs. The concentrations of VOCs decrease above the base of the weathered till in MW-16, based on PID measurements, but the concentrations of chlorinated VOCs have not been quantified. Soil contamination was also likely in the borings for SP10, which was sampled by Riley in June 2005, and remediation well MW-7 and MW-10 to MW-15, which were constructed by Riley in 2005 and 2006 for ISCO remediation in 2006. The MW-7 well construction log does not record PID measurements and no well construction logs were prepared for MW-9 to MW-15; and no soil samples

were submitted for analysis from these wells. The concentration of TCE slightly exceeds the Method A soil CUL in the 9 to 10 foot bgs interval of MW-21 on the Foursquare Church property (4424 Chennault Beach Road). Although chlorinated VOCs are suspected to have sporadic exceedances of the Method A soil CULs in the direct contact point of exposure (upper 15 feet of soil), the concentrations are below the Method B soil CULs (protective of direct contact exposure) and the surface is covered to prevent exposure.

Chlorinated VOCs have been detected above the Method A groundwater CULs in groundwater within the shallow weathered till beneath the parking lot, but contamination has migrated about 125 feet from the source area in the 20 to 37 years since its release to the storm drains (former storm drain D29 and existing storm drain D30). TCE has migrated downward through the hard till, and has been detected above the Method A soil CULs at a maximum depth of 65 feet bgs, and TCE was detected at concentrations of 24 and 10 µg/L in wet, hard till between 80 and 100 feet bgs in April and August 2015. The Site is underlain by 177 feet of hard Vashon Till in MW-2D, where the underlying Esperance Sand formation is encountered. The deep layer of Vashon Till has prevented contamination in MW-2D, and is suspected to provide adequate protection for groundwater protection.

The Esperance Sand formation outcrops about 4,000 feet west of the Site and groundwater is suspected to flow west toward the outcrop and Puget Sound. There are no wells completed in the Esperance Sand west and downgradient of the Site. The only wells that penetrate the Esperance Sand within a half-mile of the Site are the 26 geothermal wells owned by the City of Mukilteo within the northwest corner of Section 27 (see Figures 3 and 4), which is not downgradient from the Site. The geothermal wells are completed to 300 feet bgs in a lower formation, and are potentially closed-loop systems that do not exchange groundwater.

Risks posed by contamination at the Site have been reduced by the change of tenants and subsequent interim actions, including the plugging of the floor drain within the former Intermec lease space on June 19, 1995 (JPHC, 1995b), the excavation of 25 tons of PCS under storm drain D34 in September 1996 (JPHC, 1996a), the subsequent removal of former storm drains D29 and D34 on the east side of the building, and the ISCO injections performed in the chlorinated VOC source area in March, April, and October 2006 (Riley, 2006). All alternatives provide MNA to evaluate the stability and attenuation of the groundwater contamination and include the recording of an environmental covenant on the properties, in concurrence with an NFA determination, after the groundwater remedial action objectives are achieved.

Alternatives 2 to 5 decrease the time for reducing risk by enhancing the treatment or removal of residual soil and groundwater contamination beneath the parking lot near the storm drains. Alternative 2 includes biostimulation, which decreases the total mass of chlorinated VOCs and complements natural bioattenuation reactions, but could result in temporarily increased concentrations of vinyl chloride, which continues to attenuate, but with potentially slower bioattenuation rates. Alternately, Alternatives 3 and 4 include permanganate treatment to oxidize all chlorinated VOCs without creating vinyl chloride. Permanganate treatment decreases the total mass of chlorinated VOCs, temporarily increases the concentrations of natural metals, and temporarily inhibits natural

attenuation reactions. Alternative 5 includes the excavation of accessible chlorinated VOC-contaminated soil.

Regarding the time required to attain cleanup standards—Alternative 1 takes the longest, Alternatives 2 and 3 are comparable, and Alternatives 4 and 5 are the fastest. The protectiveness criteria for the DCA were scored as follows: Alternative 1 scored 2, Alternatives 2 and 3 scored 3, and Alternatives 4 and 5 scored 4 (See Table 10.1).

### *10.1.2 Permanence*

The additional cleanup actions in Alternatives 2 to 5 permanently reduce the toxicity or volume of contamination. Biostimulation in Alternative 2 decreases the total volume of chlorinated VOCs, but increases the concentrations of vinyl chloride, which has a higher toxicity than TCE. TCE degrades to DCE isomers by reductive dechlorination, and DCE isomers bioattenuate by multiple pathways, including by reductive dechlorination to vinyl chloride. The enhanced attenuation of PCE, TCE, and DCE results in the accumulation of vinyl chloride, which continues to bioattenuate through aerobic and anaerobic pathways. Biostimulation and natural bioattenuation reactions are irreversible, and the total mass of chlorinated VOCs continue to decrease.

Permanganate treatment in Alternatives 3 and 4 provides rapid oxidation and destruction of all chlorinated VOCs without the creation of more toxic end-products. Oxidation reactions are limited by the interaction of permanganate and the chlorinated VOCs, which means that inaccessible contamination will leach back into groundwater and may increase to concentrations above the Method A groundwater CULs once the permanganate is reduced to manganese dioxide through the natural oxidant demand of the soil. *In situ* mixing in Alternative 3 provides better contact between the permanganate and chlorinated VOCs than injection in Alternative 4. The increased concentrations of some metals (e.g., chromium) in groundwater is a potential by-product of ISCO treatment. ISCO treatment decreases the pH in the short-term, which temporarily increases the concentrations of natural metals in groundwater until the groundwater pH recovers. ISCO treatment can also oxidize natural insoluble trivalent chromium to soluble hexavalent chromium, which is reversible once the available permanganate is reduced. Permanganate treatment oxidizes groundwater for an extended period, which inhibits natural reductive dechlorination bioattenuation reactions.

Excavation in Alternative 5 permanently removes the accessible contamination from the Site. Residual soil contamination would likely remain beneath the building and adjoining excavation sidewall and on the excavation bottom in the hard till.

Alternative 1 has the lowest level of permanence since no additional remediation is performed. Alternatives 2 to 4 have moderate levels of permanence with different end-products and by-products. Alternative 5 has the highest level of permanence; however, residual soil contamination would remain beyond the excavation limits, including under and adjacent to the building, below the excavation depth, and downgradient from the source area.

The permanence criteria for the DCA were scored as follows: Alternative 1 scored 1, Alternative 2 to 4 scored 3, and Alternative 5 scored 4 (See Table 10.1).

### 10.1.3 Cost

Cost estimates for each alternative were prepared in accordance with WAC 173-340-360. The remediation cost estimates are summarized in Table 9.1 and detailed in Tables 9.2 to 9.6. The net present value of the cleanup alternatives are:

- Alternative 1 - $273,000;
- Alternative 2 - $370,000;
- Alternative 3 - $507,000;
- Alternative 4 - $647,000; and
- Alternative 5 - $805,000.

### 10.1.4 Long-Term Effectiveness

All alternatives have a reasonable long-term effectiveness, as magnitude of the residual risk is small after the termination of releases and the natural attenuation of the residual contamination in the Vashon Till beneath the Site. All alternatives include:

- Long-term groundwater monitoring to confirm the stability and attenuation of the chlorinated VOC-contaminated groundwater; and
- Recording of an environmental covenant, in coordination with an NFA determination, after achieving the remedial action objectives.

The alternatives are differentiated by their relative degree of long-term effectiveness. MTCA states that the relative degree of long-term effectiveness can be determined from the following cleanup action components, listed descending order of effectiveness:

- Reuse or recycling;
- Destruction or detoxification;
- Immobilization or solidification;
- On-site or offsite disposal in an engineered, lined, and monitored facility;
- On-site isolation or containment with attendant engineering controls; and
- Institutional controls and monitoring.

Alternatives 2 to 4 have the highest degree of long-term effectiveness because they destroy or detoxify contamination. Alternative 5 has a lower degree of long-term effectiveness because contamination is transported to an offsite disposal facility. Alternative 1 has the lowest degree of long-term effectiveness because it relies on previously performed cleanup actions and institutional controls and monitored.

The long-term effectiveness criteria for the DCA were scored as follows: Alternative 1 scored 2, Alternative 2 to 4 scored 4, and Alternative 5 scored 3 (See Table 10.1).

### 10.1.5 Management of Short-Term Risks

This criteria relates the management of short-term risks to human health and the environment that are associated with the construction and implementation of the alternative, and the effectiveness of measures taken to control these risks.

There no short-term risks associated with Alternative 1. Alternative 2 involves the injection of food-grade biostimulants into wells and has relatively low risks compared to Alternatives 3 to 5. The primary short-term risk in Alternative 2 is the generation of vinyl chloride. Alternative 3 and 4 have higher short-term risks because of the use of hazardous materials (i.e., permanganate) during remediation. Alternative 4 has a higher short-term risk than Alternative 3 because potassium permanganate is a powder that can be dispersed in the wind. The risk of permanganate injection can be minimized by setting limits to the injection pressure to limit the surfacing of permanganate into storm drains and utility bedding or through pavement. *In situ* mixing may have a higher risk than injection because the soil is disrupted during treatment. Excavation in Alternative 5 has a higher risk than injection because the contaminated soil is exposed; workers are subject to inhalation, direct contact, and slope stability risks; and excavated and groundwater can be released to storm drains. These risks can be controlled, however, with proper health and safety and erosion and sedimentation control plans.

The short-term effectiveness criteria for the DCA were scored as follows: Alternative 1 scored 5, Alternative 2 scored 4, and Alternatives 3 to 5 scored 3 (See Table 10.1).

### 10.1.6 Implementability

This criteria relates to the technical and administrative implementability. All alternatives include the implementation of a long-term monitoring plan to confirm the stability and attenuation of chlorinated VOCs in groundwater.

Potential technical implementability problems for Alternatives 2 to 5 include:

- Injection in Alternatives 2 and 3 is limited by the permeability of the weathered till.
- *In situ* soil mixing in Alternative 4 may become ineffective below 10 feet bgs because of the increased hardness of the till where higher concentrations of chlorinated VOCs were encountered.
- Excavation in Alterative 5 is limited by access adjacent to structures because of minimum sloping requirements.

Because these technical implementation problems may limit the treatment of chlorinated VOCs, technologies that complement natural attenuation processes are favorable to ones that inhibit natural attenuation processes.

Alternatives 2 and 3 requirement the registration of the injection wells with the Underground Injection Control (UIC) program with Ecology in accordance with WAC 173-218-070. The injection wells would be Class V underground injection wells that are intended to receive fluid for the purpose of treating contamination, and they would be rule authorized because they meet the non-endangerment standard.

A clearing and grading permit from the City of Mukilteo is required when more than 50 cubic yards of soil are removed or when soil is removed from more than 1 foot bgs. A grading permit would be required for excavation in Alternative 5 and may be required for *in situ* soil mixing in Alternative 4 due to the removal of the top 1.5 feet of soil prior to *in situ* soil mixing. The grading permit submission requires the preparation of an engineered plan set with an erosion and sediment control plan and State Environmental Policy Act (SEPA) approval, which includes a 30-day public comment period. Additionally, Alternative 5 requires obtaining a wastewater discharge authorization from the Mukilteo Water and Wastewater District.

Alternatives 2 and 3 have limited business disruption problems, as injection activities would be performed in less than a week. Alternatives 4 and 5 are disrupting to existing businesses because the sole access the tenant spaces would be cut off during excavation, treatment, backfill, and paving. Because of the anticipated business disruption problems, Alternatives 4 and 5 would likely be implemented when the adjoining tenant spaces are vacant. Additionally, two to three months of planning would be required to implement Alternatives 4 and 5 because of the design, permitting, and contractor scheduling.

Alternatives 2, 3 and 5 can be performed by local remediation contractors with readily accessible drill rigs and construction equipment. The large diameter counter-rotating augers needed for soil mixing in Alternative 4 are less common, and equipment may need to be transported to the northwest and would be subject to additional scheduling delays.

The implementability criteria for the DCA were scored as follows: Alternative 1 scored 5, Alternative 2 and 3 scored 4, Alternative 4 scored 2, and Alternative 5 scored 3 (See Table 10.1).

### *10.1.7 Public Concerns*

The cleanup alternatives would not be anticipated generate significant public concerns. Potential public concerns for each alternative will be addressed in the public comment period. For the purpose of the DCA, all alternatives have been assigned a score of 3.

## 10.2 Disproportionate Cost Analysis

Table 10.1 summarizes the DCA completed in accordance with WAC 173-340-360(3)(e) and Figure 10 compares the environmental benefits and costs for Alternatives 1 to 5. Alternate 1 (no active cleanup) has the lowest benefit ranking (2.5) and lowest cost ($273,000). The application of two rounds of biostimulation in Alternative 2 should decrease in the monitoring period, which results in Alternative 2 (biostimulation) having the second highest benefit ranking (3.4) and second lowest cost ($370,000). Alternative 3 (permanganate injection) has a lower benefit ranking (3.3) than Alternative 2 because of increased short-term risks, and has a higher cost ($507,000). Alternative 4 (*in situ* soil mixing) has an equivalent benefit ranking (3.4) as Alternative 2 (biostimulation), but at a significantly higher cost ($647,000), with a higher protectiveness score but with lower short-term risk and implementation scores. Alternative 5 (excavation) has the highest environmental benefit (3.5) and highest cost ($805,000).

The costs for performing Alternative 5 (excavation) are considered disproportionate to the limited incremental environmental benefit provided over that of Alternative 2 (biostimulation). Additionally, Alternative 5 would not be implementable until the

adjoining tenant spaces are vacated, and two to three months of lead time would be required for design, permitting, and scheduling. Additionally, excavation would ideally be performed during the dry season.

## 10.3 Reasonable Restoration Time Frame Requirements

WAC 173-340-360 requires that the cleanup action provides a reasonable restoration time frame by evaluating the following criteria:

- Potential risks posed to human health and the environment;
- Practicality of achieving a shorter restoration time frame;
- Current use of the site and surrounding properties;
- Potential future use of the site and surrounding areas;
- Availability of alternative water supplies;
- Likely effectiveness and reliability of institutional controls;
- Ability to control and monitor migration of hazardous substances;
- Toxicity of hazardous substances; and
- Natural attenuation processes.

Table 10.2 describes the degree that each cleanup alternative meets the restoration time frame requirements.

**Alternative 1** does not further increase the restoration time frame. However, previous actions have shut down and prevented releases and provided ISCO treatment of the chlorinated VOC source area to increase the restoration time frame. Groundwater restoration time frame is assumed to be 30 years under this alternative.

**Alternatives 2 and 3** decrease the mass of chlorinated VOCs by injecting biostimulants (Alternative 2) or sodium permanganate (Alternative 3) into injection wells and borings in the source area. Since biostimulation complements natural bioattenuation, the placement of biostimulants is less important than the placement of permanganate, which inhibits natural bioattenuation. Two rounds of biostimulation would be anticipated to decrease the concentrations of PCE and TCE to below the cleanup levels, but additional time would be required for the generated vinyl chloride to attenuate. Two rounds of permanganate injection would be anticipated to treat most of the accessible chlorinated VOCs; however, ISCO treatment would inhibit the natural bioattenuation of residual chlorinated VOC contamination that did not react with permanganate. Groundwater restoration time frame is assumed to be reduced to 15 years in Alternatives 2 and 3.

**Alternatives 4 and 5** are assumed to have a shorter groundwater restoration time frame than Alternatives 2 and 3. The *in situ* mixing of potassium permanganate into source area soil ensures better contact between permanganate and chlorinated VOCs, and excavation allows the removal of accessible chlorinated VOC contamination. Neither alternative addresses contamination beneath or adjacent to the foundation, or below the base of the weathered till. Further, the emplaced permanganate inhibits the natural bioattenuation of residual chlorinated VOCs. Groundwater restoration time frame is assumed to be reduced

to 9 years in Alternatives 4 and 5. However, Alternatives 4 and 5 could not be implemented until the adjoining lease spaces are vacated, and these alternatives would require sufficient lead time for design, permitting, SEPA review, and scheduling of contractors. The delayed implementation of Alternatives 4 and 5 could result in a longer restoration time frame than Alternatives 2 and 3.

# 11 Preferred Cleanup Action

Alternative 2 is the preferred cleanup action. The residual concentrations of chlorinated VOCs are fairly low, not indicative of free-phase product, and are amenable to enhanced and natural bioattenuation. Alternative 2 is technically and administratively feasible, complements natural attenuation, and has a lower cost than Alternatives 3 to 5.

Biostimulation under Alternative 2 is appropriate because it treats soil and groundwater in the source area on the northeast side of the 4403 Russell Road building and it enhances and complements the attenuation of chlorinated VOC contamination outside the treatment area. The higher concentrations of TCE in soil are at the base of the weathered till, below 15 feet bgs, and the soil is covered by asphalt pavement and flex facility industrial buildings. Chlorinated VOC contamination is contained vertically and laterally within the Vashon Till at the Site. Chlorinated VOCs have migrated about 125 feet laterally and 100 feet vertically from the source (the former and existing storm drains (D29 and D30, respectively) on the east side of the former Intermec lease space in the 4403 Russell Road building). In MW-20, PCE was detected at 17 and 25 µg/L, exceeding the 5 µg/L cleanup level, and in MW-16D, TCE was detected at 10 and 24 µg/L, exceeding the 5 µg/L cleanup level. The Site is underlain by about 175 feet of Vashon Till, and there are no current groundwater wells completed in the underlying Esperance Sand downgradient from the Site.

Biostimulation would be performed in six existing remediation wells, monitoring wells MW-16 and MW-16D, and in seven new injection wells, as shown in Figure 9A. The biostimulants would be lactate-based chemicals that would migrate with groundwater and stimulate natural anaerobic bacteria for more than a year after injection. Bioremediation is a proven technology and natural reductive dechlorination reactions have been observed at the Site. A second, contingent round of biostimulation would be performed after several years if needed after the depletion of the initial biostimulants.

Alternative 2 includes the decommissioning of non-impacted monitoring wells MW-3, MW-4, MW-5, and MW-19 and the monitoring of impacted and sentinel monitoring wells at 18 month intervals in opposing seasons until the concentrations of the COCs attenuate to below the Method A groundwater cleanup levels.

An environmental covenant would be recorded concurrently with an NFA determination from Ecology for the impacted HERS Industrial Park parcels after the concentrations of chlorinated VOCs attenuate to below the Method A groundwater CULs on the Foursquare Church parcel (4424 Chennault Beach Road). The environmental covenant would require a long-term groundwater monitoring program to confirm that the groundwater plume is stable and shrinking and the notification to Ecology of any soil disrupting activities that might result in the spread of contamination from the Site.

# 12 References

ATC Environmental, Inc., 1994, Phase I Environmental Site Assessment, HERS Industrial Park, Mukilteo, Washington, October 25, 1994.

City of Mukilteo, 2012, 2012 Zoning Map, http://www.ci.mukilteo.wa.us/files/map-Zoning.pdf, website accessed on April 6, 2015.

City of Mukilteo, 2013, City of Mukilteo Drainage Inventory, T28N R04E S21, Map 42, Map Date June 27, 2013.

Ecology, 2012, Opinion on Proposed Remedial Action for HERS Industrial Park, 4403 Russell Road, Mukilteo, WA 98275, VCP No. NW1554, October 18, 2012.

Ecology, 2015a, Everett and Tacoma Smelter Search, https://fortress.wa.gov/ecy/smeltersearch/#epa, searched August 2015.

Ecology, 2015b, Washington State Well Log Viewer, https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/, well records retrieved August 2015.

Environmental Protection Agency (EPA), 2000, A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, Office of Emergency and Remedial Response, EPA/540/R-00/002, July 2000.

Environmental Protection Agency (EPA), 2001, Field Measurement Technologies for Total Petroleum Hydrocarbons in Soil, Dexsil Corporation PetroFLAG System, Office of Research and Development Innovative Technology Verification Report, EPA/600/R-01/092, September 2001.

Gray & Osborne, Inc., 2010, Mukilteo Water & Wastewater District Sewer System and Water System maps, dated October 2010.

Interstate Technology Regulatory Council (ITRC), 2005a, Overview of In Situ Bioremediation of Chlorinated Ethene DNAPL Source Zones, October 2005.

Interstate Technology Regulatory Council (ITRC), 2005b, Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater, Second Edition, January 2005.

James P. Hurley Co. (JPHC), 1995a, Combined UST Removal and Petroleum Contaminated Soil Cleanup Summary Report, 4493 Russell Road, Mukilteo, Washington, Prepared for Colliers Real Estate Services, July 25, 1995.

James P. Hurley Co. (JPHC), 1995b, Summary Report, Level II Environmental Site Assessment, HERS Industrial Park, Prepared for Colliers Real Estate Services, July 26, 1995.

James P. Hurley Co. (JPHC), 1996a, Site Assessment Report, HERS Industrial Park, Prepared for Hawaiian Trust Company, Ltd., September 23, 1996.

James P. Hurley Co. (JPHC), 1996b, Catch Basin Repair and Maintenance Services, HERS Industrial Park, Prepared for Hawaiian Trust Company, Ltd., October 9, 1996.

The Riley Group, Inc., 2005a, Phase I Environmental Site Assessment, HERS Industrial Park, 4403 Russell Road Mukilteo, Washington 98275. Prepared for Sterling Savings Bank. June 20, 2005.

The Riley Group, Inc., 2005b, Supplemental Phase II Subsurface Investigation Hers Industrial Park 4403 Russell Road Mukilteo, Washington 98275, Prepared for Sterling Savings Bank, June 22, 2005.

The Riley Group, Inc., 2005c, Well Installation and Groundwater Sampling Event – Fourth Quarter 2005, Hers Industrial Park, 4403 Russell Road, Mukilteo, Washington 98275, Prepared for Romeo Gonyea, December 27, 2005.

The Riley Group, Inc., 2006, Chemical Injection (ISCO) Daily Field Logs, Hers Industrial Park, March 15 to October 4, 2006.

The Riley Group, Inc., 2007, Groundwater Sampling Event – First Quarter 2007, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington 98275, Prepared for Romeo Gonyea, March 29, 2007.

The Riley Group, Inc., 2008, Groundwater Sampling Event – Second Quarter 2008 Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington 98275, Prepared for Romeo Gonyea, August 20, 2008.

The Riley Group, Inc., 2009, Groundwater Sampling Event – Third Quarter 2009, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington 98275, Prepared for Romeo Gonyea, October 2, 2009.

The Riley Group, Inc., 2012, Groundwater Sampling Event – First Quarter 2012, Russell Road Industrial Park (Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington 98275, Prepared for Romeo Gonyea, February 23, 2012.

Smith, Mackey, 1976, Preliminary Surficial Geologic Map of the Mukilteo and Everett Quadrangles, Snohomish County, Washington, State of Washington Department of Natural Resources, Geologic Map GM-20.

Snohomish County, 2015, Property Tax Records, http://assessor.snoco.org/propertysearch.aspx, website accessed on July 2, 2015.

USGS, 1997, The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington, Water-Resources Investigations Report 96-4312.

Yount, et al., 1993, Geologic Map of Surficial Deposits in the Seattle 30’ x 60’ Quadrangle, Washington. U.S. Department of the Interior, U.S. Geological Survey.

Zemo, D., 2014, Nature and Estimated Toxicity of Polar Metabolite Mixtures in Groundwater Quantified as Extractable “TPH” at Biodegrading Fuel Release Sites, Northwest Environmental Business Council Technical Seminar, October 29, 2014.

# TABLES

## Table 4.1 - Soil Sampling Results

Project # - 140252-HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | | | | Chlorinated Volatile Organic Compounds | | | | | | | | | Petroleum Hydrocarbons (Detected) | | | | | | | | | | RCRA Metals | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Depth (feet below ground surface) | Date | PID (ppm) | Tetrachloro ethylene (mg/kg) | Trichloro ethylene (mg/kg) | cis-1-2-Dichloro ethylene (mg/kg) | trans-1-2-Dichloro ethylene (mg/kg) | 1,1-Dichloro ethylene (mg/kg) | Vinyl Chloride (mg/kg) | 1,1,1-Trichloro ethane (mg/kg) | 1,1-Dichloro ethane (mg/kg) | Methylene Chloride (mg/kg) | TPH-Gasoline (mg/kg) | TPH-Diesel (mg/kg) | TPH-Oil (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl benzene (mg/kg) | m-p-Xylene (mg/kg) | o-Xylene (mg/kg) | Methyl tert-butyl ether (mg/kg) | Naph thalene (mg/kg) | Carcinogenic Polycyclic Aromatic Hydrocarbons (mg/kg) | Arsenic (mg/kg) | Barium (mg/kg) | Cadmium (mg/kg) | Chromium (III) (mg/kg) | Lead (mg/kg) | Mercury (mg/kg) | Selenium (mg/kg) | Silver (mg/kg) |
| Method A Cleanup Level | | | | 0.05 | 0.03 | - | - | - | - | 2 | - | 0.02 | 100 | 2,000 | 2,000 | 0.03 | 7 | 6 | 9 | 9 | 0.1 | 5 | 0.1 | 20 | - | 2 | 2,000 | 250 | 2 | - | - |
| Method B Cleanup Level | | | | 476 | 12 | 160 | 1,600 | 4,000 | 0.67 | 160,000 | 16,000 | 480 | - | - | - | 18.2 | 6,400 | 8,000 | 16,000 | 16,000 | 556 | 1,600 | 0.14 | 0.67 | 16,000 | 80 | 120,000 | - | - | 400 | 400 |
| AB-1 | 2.5 | 7/30/2015 | 6.1 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - |
| AB-3 | 11 | 7/30/2015 | 0.6 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - |
| SP1 | 7-8 | 6/14/2005 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.02 | <0.02 | - | - | - | - | - | - | - | - |
| SP2 | 7-8 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10-11 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP3 | 4-5 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5-6 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7-8 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11-12 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP4 | 7-7.5 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8-9 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP5 | 6-7 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-10 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP6 | 5-6 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-10 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP7 | 9-10 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP8 | 6.5-7 | 6/14/2005 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7.5-8 | | 1.8 | - | - | - | - | - | - | - | - | - | <3 | 33 | 520 | <0.03 | 0.07 | <0.05 | <0.2 | <0.2 | - | - | - | - | - | - | - | - | - | - | - |
| | 11-12 | | 0.7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP9 | 6-6.5 | 6/14/2005 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8.5-9 | | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SP10 | 7-8 | 6/14/2005 | 34 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8-9 | | 57.2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10-11 | | 532 | - | - | - | - | - | - | - | - | - | <3 | <25 | <50 | <0.03 | 0.1 | <0.05 | <0.2 | <0.2 | - | <0.02 | <0.02 | 7.9 | 35 | - | 13 | 13 | 0.04 | - | - |
| MW-2D | 55 | 7/27/2015 | 0.4 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - |
| | 190 | 7/30/2015 | 0 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - |
| MW-16 | 1-1.5 | 1/21/2015 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3-3.5 | | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5.5-6 | | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8-8.5 | | 2.4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10.5-11 | | 12.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 13-13.5 | | 21.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 15.5-16 | | 61.5 | **0.066** | **4.9** | 0.066 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | <0.05 | 2.06 | 24.9 | <1 | 9.75 | 1.63 | <1 | <1 | <1 |
| MW-16D | 15 | 4/9/2015 | 5.0 | **0.13** | **1.9** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - | - |
| | 25 | | 0.0 | <0.025 | **0.042** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - | - |
| | 45 | | 15.4 | 0.037 | **1.3** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - | - |
| | 65 | | 0.0 | <0.025 | **0.067** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - | - |
| | 90 | | 0.0 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | - | - | - | - | - | - | - | - | - |
| MW-17 | 10-11.5 | 1/21/2015 | 0 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.28 | 34.4 | <1 | 19.7 | 2.31 | <1 | <1 | <1 |
| MW-18 | 10.5-11 | 1/21/2015 | 1.8 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.85 | 37.2 | <1 | 23.7 | 2.15 | <1 | <1 | <1 |
| MW-19 | 15-15.5 | 1/21/2015 | 0.2 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.61 | 34.4 | <1 | 16.5 | 2.07 | <1 | <1 | <1 |
| MW-20 | 10 | 4/9/2015 | 0 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.13 | 18.7 | <1 | 8.16 | 1.96 | <1 | <1 | <1 |
| MW-21 | 9-10 | 7/24/2015 | 1.3 | 0.048 | **0.056** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.25 | - | - | - | 2.05 | - | - | - |
| MW-22 | 10-11 | 7/24/2015 | 0 | <0.025 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.05 | - | 2.04 | - | - | - | 2.05 | - | - | - |

Notes:

- Highlighted, bold font indicates that value exceeds MTCA Method A soil Cleanup Level (CUL)
- Gray shaded text is below detection limit and detection does not exceed Method A soil CUL
- "-" indicates that sample not collected or value not given
- TPH was analyzed after silica gel cleanup for soil sample from SP8 on June 14, 2005.

## Table 4.2 - Groundwater Sampling Results and Injection Notes

Project #140252-HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Sample | Date | Chlorinated Volatile Organic Compounds | | | | | | | | | Competing Electron Acceptors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tetrachloroethylene (µg/L) | Trichloroethylene (µg/L) | cis-1-2-Dichloroethylene (µg/L) | trans-1-2-Dichloroethylene (µg/L) | 1-1-Dichloroethylene (µg/L) | Vinyl Chloride (µg/L) | 1,1,1-Trichloroethane (µg/L) | 1-1-Dichloroethane (µg/L) | Methylene Chloride (µg/L) | Nitrate (mg/L) | Sulfate (mg/L) |
| Method A Cleanup Level | | 5 | 5 | - | - | - | 0.2 | 200 | - | 5 | - | - |
| Maximum Contaminant Level | | 5 | 5 | 70 | 100 | 7 | 2 | 200 | - | 5 | 10 | - |
| SP1 | 6/14/2005 | **5** | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP2 | 6/14/2005 | <2 | **7** | 6 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP3 | 6/14/2005 | 2 | 2 | 53 | <2 | <2 | **12** | <2 | <2 | - | - | - |
| SP4 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP5 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP6 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP7 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP8 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP9 | 6/14/2005 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| SP10 | 6/14/2005 | **300** | **42,000** | **290** | 6 | **76** | **21** | **670** | 11 | **84** | - | - |
| MW-1 | 9/13/2005 | <0.2 | 1.3 | 0.25 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | May-06 | <2 | <2 | 2 | <2 | <2 | **0.4** | <2 | <2 | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 1/10/2007 | <0.2 | 3 | 2.5 | <0.2 | 0.56 | **0.59** | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | **6.4** | 3.3 | <0.2 | 0.39 | **0.76** | <0.2 | <0.2 | - | - | - |
| | Mar-09 | <0.2 | **27** | 3.3 | <0.2 | 0.62 | **0.51** | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | <2 | 1.1 | 0.98 | <0.2 | 0.62 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | **15** | **1,100** | 15 | <10 | <10 | <10 | 25 | <10 | - | - | - |
| | 1/22/2015 | 2.3 | **96** | 5.2 | <1 | 1.2 | **4.1** | <1 | <1 | <5 | - | - |
| | 8/10/2015 | **5.3** | **200** | 6.9 | <1 | 1.8 | **4.0** | 1.7 | <1 | <5 | - | - |
| MW-2 | 9/13/2005 | <0.2 | **4.1** | 0.91 | <0.2 | <0.2 | <0.2 | 0.36 | <0.2 | - | - | - |
| | May-06 | <2 | **11** | 5 | <2 | <2 | <0.2 | <2 | <2 | - | - | - |
| | 1/10/2007 | <0.2 | **6.8** | 0.75 | <0.2 | <0.2 | <0.2 | 0.33 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | 3 | 0.35 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | <0.2 | 3.5 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | 4.7 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | 8.94 | 15.6 |
| MW-2D | 8/10/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | 1.51 | 22.1 |
| MW-3 | 9/13/2005 | <0.2 | <0.2 | 0.96 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/10/2007 | <0.2 | <0.2 | 2.9 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | 1.4 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | <1 | <1 | 1.5 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | 1.5 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-4 | 9/13/2005 | <0.2 | <0.2 | 0.96 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | 1.4 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-5 | 9/13/2005 | <0.2 | <0.2 | 0.43 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/10/2007 | <0.2 | <0.2 | 0.61 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-6 | 10/7/2005 | 3.9 | 0.26 | 0.33 | <0.2 | <0.2 | <0.2 | <0.2 | 0.36 | - | - | - |
| | May-06 | <2 | <2 | <2 | <2 | <2 | <0.2 | <2 | <2 | - | - | - |
| | 1/9/2007 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-7 | 10/7/2005 | **460** | **7,000** | **140** | <50 | <50 | <50 | <50 | <50 | - | - | - |
| | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 240 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | May-06 | **10** | **21** | <2 | <2 | <2 | **0.7** | <2 | <2 | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 190 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 1/10/2007 | <0.2 | 0.22 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | 0.33 | 1 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/28/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-8 | 10/7/2005 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | May-06 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | - | - | - |
| | 1/9/2007 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-9 | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 50 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 4/14/2006 | Injected 20 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | 0.43 | 0.27 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/13/2012 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-10 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | May-06 | **23** | <2 | <2 | <2 | <2 | <0.2 | <2 | <2 | - | - | - |
| | 1/10/2007 | **11** | 0.54 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | **22** | 0.6 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | Mar-09 | **18** | 0.53 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | 4 | <0.2 | <0.2 | <0.2 | 6.3 | **4.1** | <0.2 | 5.1 | - | - | - |
| | 1/13/2012 | 3.9 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | **7.5** | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/10/2015 | 3.2 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | <0.025 | 20.4 |
| MW-11 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | May-06 | **58** | **270** | 42 | <2 | 5 | **1.4** | 11 | 6 | - | - | - |
| | 1/9/2007 | **150** | **700** | **140** | <4 | **12** | <4 | 10 | 8.5 | - | - | - |
| | 4/30/2008 | **14** | **130** | 11 | <0.2 | 3.3 | <0.2 | 2.2 | 2 | - | - | - |
| | Mar-09 | **8.4** | **88** | 5.2 | <0.2 | 1.7 | <0.2 | 1.4 | 1 | - | - | - |
| | 9/16/2009 | **220** | **580** | **180** | <0.2 | 1.7 | <0.2 | 5.2 | 1 | - | - | - |
| | 1/13/2012 | **27** | **130** | 9.5 | <1 | 2.2 | <1 | 1.7 | 1.2 | - | - | - |
| | 1/28/2015 | **12** | **54** | 7.4 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/10/2015 | **69** | **190** | 66 | <1 | 2.2 | **1.3** | 1.4 | <1 | <5 | 7.27 | 24.2 |
| MW-12 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | - | | |
| | Jun-06 | **180** | **1,700** | **290** | 4 | **8** | **23** | 9 | 4 | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | - | | |
| | 1/9/2007 | **140** | **480** | **240** | 2.7 | 2.1 | **8.9** | 3 | 2.6 | - | - | - |
| | 4/30/2008 | **99** | **320** | **220** | 3.5 | 3.3 | **17** | <0.2 | 2.7 | - | - | - |
| | Mar-09 | **85** | **230** | **130** | 2.6 | 2.2 | **8.2** | <0.2 | <0.2 | - | - | - |
| | 9/16/2009 | **95** | **230** | **160** | 2.8 | 2.2 | **9.1** | <0.2 | 1.7 | - | - | - |
| | 1/13/2012 | **54** | **99** | 60 | 1.3 | 1.1 | **6.3** | 0.61 | 0.73 | - | - | - |
| | 1/23/2015 | **14** | **20** | 11 | <1 | <1 | **0.3** | <1 | <1 | <5 | - | - |
| | 8/11/2015 | **28** | **59** | 40 | <1 | <1 | **2.8** | <1 | <1 | <5 | <0.025 | 5.76 |
| MW-13 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | Jun-06 | **9** | **270** | 12 | <2 | <2 | **1.4** | 5 | <2 | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 1/9/2007 | **11** | **44** | 9.1 | 0.3 | 1.3 | **1.9** | 1.1 | 1.2 | - | - | - |
| | 4/30/2008 | 4.2 | **25** | 9.6 | 0.28 | 0.94 | **2.9** | <0.2 | 0.49 | - | - | - |
| | 1/23/2015 | Well was full of silty sand, not sampled | | | | | | | | | | |
| MW-14 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | Jun-06 | <2 | **17** | <2 | <2 | <2 | <0.2 | <2 | <2 | - | - | - |
| | 1/9/2007 | <0.2 | 2.6 | 4.3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 4/30/2008 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | Jan-12 | Well was abandoned | | | | | | | | | | |
| MW-15 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | Jun-06 | <2 | **26** | 3 | <2 | <2 | **0.9** | <2 | <2 | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | |
| | 1/9/2007 | **28** | **1,000** | <10 | <10 | <10 | <10 | 11 | <10 | - | - | - |
| | 4/30/2008 | 0.26 | 4.8 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | - | - |
| | 1/22/2015 | <1 | 1.6 | <1 | <1 | <1 | **0.69** | <1 | <1 | <5 | - | - |
| | 8/10/2015 | <1 | **5.8** | 1.5 | <1 | <1 | **0.96** | <1 | <1 | <5 | - | - |
| MW-16 | 1/23/2015 | **100** | **410** | **270** | 2.8 | 1.5 | **5.8** | 1.5 | <1 | <5 | - | - |
| | 8/11/2015 | **110** | **120** | **290** | 3.5 | 1.1 | **6.5** | <1 | <1 | <5 | <0.025 | 11.6 |
| MW-16D | 4/27/2015 | <1 | **24** | 1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | **10** | 1.1 | <1 | <1 | <0.2 | <1 | <1 | <5 | <0.025 | 19.4 |
| MW-17 | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/10/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-18 | 1/23/2015 | 1.2 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | <0.025 | 17.9 |
| MW-19 | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 1/23/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/11/2015 | <1 | 1.2 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-20 | 4/27/2015 | **17** | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| | 8/10/2015 | **25** | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |
| MW-21 | 8/10/2015 | **85** | **280** | 55 | <1 | 2.9 | **1.3** | 2.2 | 1.5 | <5 | 7.54 | 18.4 |
| MW-22 | 8/10/2015 | <1 | <1 | <1 | <1 | <1 | <0.2 | <1 | <1 | <5 | - | - |

Notes:
- Highlighted, bold font indicates that value exceeds MTCA Method A groundwater Cleanup Level (CUL) or Maximum Contaminant Level (MCL)

- Gray shaded text is below detection limit and detection does not exceed Method A groundwater CUL or MCL
- "-" indicates that sample not collected or value not given
- TPH was analyzed after silica gel cleanup for June 14, 2005 groundwater samples.

## Table 4.2 - Groundwater Sampling Results and Injection Notes

Project #140252-HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Sample | Date | Petroleum Hydrocarbons (Detected) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TPH-Gasoline (µg/L) | TPH-Diesel (µg/L) | TPH-Oil (µg/L) | TPH-Gasoline (silica gel cleanup) (µg/L) | TPH-Diesel (silica gel cleanup) (µg/L) | TPH-Oil (silica gel cleanup) (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl benzene (µg/L) | m-p-Xylene (µg/L) | o-Xylene (µg/L) | Methyl tert-butyl ether (µg/L) | Naphthalene (µg/L) |
| Method A Cleanup Level | | 1,000 | 500 | 500 | 1,000 | 500 | 500 | 5 | 1,000 | 700 | 1,000 | 1,000 | 20 | 160 |
| Maximum Contaminant Level | | - | - | - | - | - | - | 5 | 1,000 | 700 | 10,000 | 10,000 | - | - |
| SP1 | 6/14/2005 | - | - | - | <50 | <130 | <250 | <1 | <1 | <1 | <2 | <1 | - | - |
| SP2 | 6/14/2005 | - | - | - | <50 | <140 | <280 | <1 | <1 | <1 | <2 | <1 | - | - |
| SP3 | 6/14/2005 | - | - | - | <50 | <130 | <250 | <1 | <1 | <1 | <2 | <1 | - | - |
| SP4 | 6/14/2005 | - | - | - | <50 | <130 | <250 | <1 | <1 | <1 | <2 | <1 | - | - |
| SP5 | 6/14/2005 | - | - | - | - | - | - | <1 | <1 | <1 | <2 | <1 | - | - |
| SP6 | 6/14/2005 | - | - | - | - | - | - | <1 | <1 | <1 | <2 | <1 | - | - |
| SP7 | 6/14/2005 | - | - | - | <50 | <150 | <300 | <1 | <1 | <1 | <2 | <1 | - | - |
| SP8 | 6/14/2005 | - | - | - | <50 | <130 | <250 | <1 | 3 | <1 | <2 | <1 | - | - |
| SP9 | 6/14/2005 | - | - | - | - | - | - | <1 | <1 | <1 | <2 | <1 | - | - |
| SP10 | 6/14/2005 | - | - | - | 650 | <130 | <250 | <1 | 80 | 4 | 16 | - | - | - |
| MW-1 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | 390 x | 270x | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | 120 x | 330 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-2 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | <100 | <60 | <300 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-2D | 8/10/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-3 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | **600 x** | 350 x | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | **700 x** | 420 x | - | <50 | <250 | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-4 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | 150 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-5 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | 59 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 58 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-6 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | <100 | 84 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | **590 x** | 330 x | - | <50 | <250 | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-7 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 240 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 190 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/28/2015 | <100 | 130 x | 340 x | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 220 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-8 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 73 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-9 | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 50 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 4/14/2006 | Injected 20 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | <100 | 110 x | <250 | - | - | - | <0.35 | 8.7 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | 200 | **830 x** | **950 x** | - | <50 | <250 | <0.35 | 69 | <1 | <2 | <1 | - | - |
| MW-10 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | <100 | 140 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-11 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/28/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | 150 x | 120 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-12 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | <100 | 56 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 110 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-13 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | Well was full of silty sand, not sampled | | | | | | | | | | | | |
| MW-14 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Jan-12 | Well was abandoned | | | | | | | | | | | | |
| MW-15 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | <100 | 370 x | 370 x | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | <100 | 300 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-16 | 1/23/2015 | 280 | 330 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | 120 x | 220 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-16D | 4/27/2015 | <100 | **750 x** | **540 x** | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 460 x | <250 | - | <50 | <250 | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-17 | 1/23/2015 | <100 | 300 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | <100 | 200 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| MW-18 | 1/23/2015 | <100 | 96 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 110 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-19 | 1/23/2015 | <100 | **590 x** | 420 x | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 1/23/2015 | <100 | **660 x** | **500 x** | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/11/2015 | <100 | 450 x | 410 x | - | <50 | <250 | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-20 | 4/27/2015 | <100 | <50 | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | <1 | <1 |
| | 8/10/2015 | <100 | 64 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-21 | 8/10/2015 | 180 x | 130 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |
| MW-22 | 8/10/2015 | <100 | 300 x | <250 | - | - | - | <0.35 | <1 | <1 | <2 | <1 | - | - |

Notes:
- Highlighted, bold font indicates that value exceeds MTCA Method A groundwater CUL or MCL

- Gray shaded text is below detection limit and detection does not exceed Method A groundwater CUL or MCL
- "-" indicates that sample not collected or value not given
- TPH was analyzed after silica gel cleanup for June 14, 2005 groundwater samples.

## Table 4.2 - Groundwater Sampling Results and Injection Notes

Project #140252-HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Sample | Date | RCRA Metals | | | | | | | | | Field Parameters | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dissolved Arsenic (µg/L) | Total Arsenic (µg/L) | Barium (µg/L) | Cadmium (µg/L) | Chromium (µg/L) | Lead (µg/L) | Mercury (µg/L) | Selenium (µg/L) | Silver (µg/L) | Dissolved Oxygen (mg/L) | Oxidation-Reduction Potential (millivolts) | pH |
| Method A Cleanup Level | | 5 | 5 | - | 5 | 50 | 15 | 2 | - | - | - | - | - |
| Maximum Contaminant Level | | 10 | 10 | 2,000 | 5 | 100 | 15 | 2 | 50 | - | - | - | - |
| SP1 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP2 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP3 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP4 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP5 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP6 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP7 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP8 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP9 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| SP10 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| MW-1 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | **23.1** | 25.6 | <1 | 1.57 | <1 | <0.1 | 1.68 | <1 | 0.2 | -44 | 6.7 |
| | 8/10/2015 | **20.4** | **22.4** | - | - | - | - | - | - | - | 0.3 | 28 | 6.6 |
| MW-2 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | - | <1 | 1.86 | <1 | <1 | <1 | <0.1 | <1 | <1 | 2.2 | 87 | 6.3 |
| | 8/11/2015 | <1 | **11.4** | - | - | - | - | - | - | - | 1.9 | 35 | 6.1 |
| MW-2D | 8/10/2015 | **3.33** | **11.4** | - | - | - | - | - | - | - | 0.7 | 110 | 8.4 |
| MW-3 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | **10.6** | 46.2 | <1 | 2.58 | <1 | <0.1 | 1.81 | <1 | 0.7 | -5 | 6.6 |
| | 8/11/2015 | **17.9** | **13.6** | - | - | - | - | - | - | - | 0.6 | 47 | 6.2 |
| MW-4 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | **34.7** | 10.3 | <1 | <1 | <1 | <0.1 | <1 | <1 | 1.3 | -29 | 6.5 |
| | 8/11/2015 | **13.3** | **7.59** | - | - | - | - | - | - | - | - | - | - |
| MW-5 | 9/13/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | **5.56** | 11.1 | <1 | 1.62 | <1 | <0.1 | <1 | <1 | 0.2 | 6 | 6.7 |
| | 8/11/2015 | <1 | 2.70 | - | - | - | - | - | - | - | 0.5 | 16 | 6.5 |
| MW-6 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | - | <1 | 6.43 | <1 | 1.51 | <1 | <0.1 | <1 | <1 | 0.6 | 69 | 5.8 |
| | 8/11/2015 | <1 | <1 | - | - | - | - | - | - | - | 0.9 | 32 | 5.6 |
| MW-7 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 240 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 190 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/28/2015 | - | <1 | 19.1 | <1 | 1.49 | 2.35 | <1 | <1 | <1 | 4.1 | 30 | 6.1 |
| | 8/11/2015 | 2.58 | 2.52 | - | - | - | - | - | - | - | 0.6 | 77 | 5.4 |
| MW-8 | 10/7/2005 | - | - | - | - | - | - | - | - | - | - | - | - |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | <1 | 13.4 | <1 | 1.36 | <1 | <0.1 | <1 | <1 | 0.5 | 65 | 6.4 |
| | 8/11/2015 | <1 | <1 | - | - | - | - | - | - | - | 0.4 | 158 | 6.2 |
| MW-9 | 3/15/2006 | Injected 40 gallons of HCl & $FeSO_4$ solution and then 50 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 4/14/2006 | Injected 20 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | - | 2.73 | 35.4 | <1 | 1.79 | <1 | <0.1 | <1 | <1 | 0.2 | -32 | 6.4 |
| | 8/11/2015 | **5.25** | **5.17** | - | - | - | - | - | - | - | 0.3 | 146 | 6.1 |
| MW-10 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/10/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | 1.11 | 26.7 | <1 | 1.08 | <1 | 0.11 | <1 | <1 | 0.9 | 94 | 5.6 |
| | 8/10/2015 | 3.99 | 4.28 | - | - | - | - | - | - | - | 0.3 | 50 | 6.2 |
| MW-11 | 3/15/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | May-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/28/2015 | - | <1 | 23.9 | <1 | 4.99 | <1 | <1 | <1 | <1 | 1.1 | 53 | 6.2 |
| | 8/10/2015 | 1.44 | 1.44 | - | - | - | - | - | - | - | 0.3 | 63 | 6.1 |
| MW-12 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mar-09 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/13/2012 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | - | <1 | 36.4 | <1 | <1 | <1 | <0.1 | <1 | <1 | 0.5 | 110 | 6.4 |
| | 8/11/2015 | 1.75 | 1.78 | - | - | - | - | - | - | - | 0.3 | 152 | 6.2 |
| MW-13 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/23/2015 | Well was full of silty sand, not sampled | | | | | | | | | | | |
| MW-14 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 120 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Jan-12 | Well was abandoned | | | | | | | | | | | |
| MW-15 | 4/14/2006 | Injected 30 gallons of HCl & $FeSO_4$ solution and then 110 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | Jun-06 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/4/2006 | Injected 50 gallons of acetic acid & $FeSO_4$ solution and then 180 gallons of 18% $H_2O_2$ solution | | | | | | | | | | | |
| | 1/9/2007 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/22/2015 | - | **22.3** | 13.5 | <1 | 1.83 | <1 | <0.1 | <1 | <1 | 0.2 | -37 | 6.3 |
| | 8/10/2015 | **28.1** | **29.4** | - | - | - | - | - | - | - | 0.2 | -12 | 6.1 |
| MW-16 | 1/23/2015 | - | 1.02 | 162 | <1 | <1 | <1 | <0.1 | 1.76 | <1 | 5.7 | 107 | 6.4 |
| | 8/11/2015 | <1 | **8.82** | - | - | - | - | - | - | - | 0.2 | 156 | 6.2 |
| MW-16D | 4/27/2015 | - | 1.22 | 55.5 | <1 | <1 | <1 | <1 | 1.27 | <1 | 0.5 | 118 | 8.1 |
| | 8/11/2015 | 2.71 | 3.36 | - | - | - | - | - | - | - | 1.0 | 113 | 10.9 |
| MW-17 | 1/23/2015 | - | **9.82** | 187 | <1 | 1.72 | <1 | <0.1 | 2.07 | <1 | 1.8 | 34 | 6.6 |
| | 8/10/2015 | **39.4** | **38.5** | - | - | - | - | - | - | - | 0.4 | -8 | 6.4 |
| MW-18 | 1/23/2015 | - | <1 | 47.7 | <1 | <1 | <1 | <0.1 | <1 | <1 | 2.7 | 56 | 6.2 |
| | 8/11/2015 | 2.05 | 3.68 | - | - | - | - | - | - | - | 0.2 | 115 | 6.1 |
| MW-19 | 1/23/2015 | - | 3.75 | 337 | <1 | 2.43 | <1 | <0.1 | 3.61 | <1 | 6.4 | 51 | 6.7 |
| | 1/23/2015 | - | 3.93 | 330 | <1 | 2.59 | <1 | <0.1 | 3.79 | <1 | 6.4 | 51 | 6.7 |
| | 8/11/2015 | **15.0** | **15.5** | | | | | | | | 0.4 | 40 | 6.3 |
| MW-20 | 4/27/2015 | - | 4.99 | 27.5 | <1 | <1 | <1 | <1 | 1.54 | <1 | 0.8 | 120 | 6.8 |
| | 8/10/2015 | 1.24 | 1.25 | - | - | - | - | - | - | - | 0.6 | 34 | 6.5 |
| MW-21 | 8/10/2015 | <1 | <1 | - | - | - | - | - | - | - | 0.6 | 37 | 6.4 |
| MW-22 | 8/10/2015 | <1 | <1 | - | - | - | - | - | - | - | 2.7 | 65 | 6.7 |

Notes:
- Highlighted, bold font indicates that value exceeds MTCA Method A groundwater CUL or MCL

- Gray shaded text is below detection limit and detection does not exceed Method A groundwater CUL or MCL
- "-" indicates that sample not collected or value not given
- TPH was analyzed after silica gel cleanup for June 14, 2005 groundwater samples.

# Table 4.4 - Gore Soil Gas Survey Sample Results

Project #140252 - HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | | Chlorinated Volatile Organic Compounds (Detected) | | | | | | | Petroleum Hydrocarbons (Detected) | | | | | | | | Petroleum Hydrocarbons (Detected) | | | | Non-MTCA Petroleum Hydrocarbons (Detected) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Units | Tetrachloro ethene | Trichloro ethene | cis-1-2-Dichloro ethene | trans-1-2-Dichloro ethene | 1-1-Dichloro ethene | Vinyl Chloride | 1-1-Dichloro ethane | TPH | Benzene | Toluene | Ethyl benzene | m-p-Xylene | o-Xylene | BTEX (total, calculated) | Methyl tert-butyl ether | Naph thalene | 2-Methyl naphthalene | 1-2-4-Trimethyl benzene | 1-3-5-Trimethyl benzene | Octane | Penta decane | Tri decane | Un decane |
| A6 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.79** | <0.02 | **0.11** | <0.02 | <0.02 | <0.02 | **0.11** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| A9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| B15 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.67** | **0.03** | <0.02 | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| C17 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.92** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| F8 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.55** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| F9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.38** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| G8 | UG | **0.1** | **0.03** | **0.07** | <0.02 | <0.02 | <0.20 | **0.03** | **2.35** | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| G9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.93** | **0.02** | **0.03** | <0.02 | <0.02 | <0.02 | **0.05** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| G10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.71** | <0.02 | **0.03** | **0.05** | <0.02 | <0.02 | **0.08** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| G11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **40.12** | **0.1** | **0.6** | **0.08** | **0.05** | **0.03** | **0.86** | <0.02 | <0.05 | <0.05 | **0.02** | <0.02 | **0.22** | <0.05 | <0.05 | **0.11** |
| G17 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.6** | <0.02 | **0.02** | <0.02 | <0.02 | <0.02 | **0.02** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| H2 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.54** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| H9 | UG | <0.02 | <0.02 | **0.09** | **0.02** | <0.02 | <0.20 | <0.02 | **0.95** | **0.11** | **0.14** | **0.02** | **0.06** | **0.03** | **0.36** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| H10 | UG | **0.03** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **33.44** | **0.12** | **0.14** | <0.02 | **0.02** | <0.02 | **0.28** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.14** | <0.05 | <0.05 | <0.05 |
| H11 | UG | **0.06** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **36.86** | **0.05** | **0.18** | **0.04** | <0.02 | <0.02 | **0.27** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.03** | <0.05 | <0.05 | <0.05 |
| I9 | UG | <0.02 | <0.02 | **0.06** | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| I10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.51** | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| I11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.47** | <0.02 | **0.03** | **0.06** | <0.02 | <0.02 | **0.09** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| I12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.04** | **0.03** | **0.08** | <0.02 | **0.04** | <0.02 | **0.14** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| I13 | UG | **0.09** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.43** | **0.02** | **0.03** | <0.02 | <0.02 | <0.02 | **0.06** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| I14 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.09** | **0.02** | **0.03** | <0.02 | <0.02 | <0.02 | **0.05** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **<0.02** | <0.05 | <0.05 | <0.05 |
| J9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.2** | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J13 | UG | **0.34** | **0.27** | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J14 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| J16 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **4.72** | <0.02 | **0.05** | <0.02 | <0.02 | <0.02 | **0.05** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| K9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **4.22** | <0.02 | **0.04** | <0.02 | **0.02** | <0.02 | **0.06** | <0.02 | <0.05 | **0.06** | <0.02 | <0.02 | <0.02 | **0.06** | **0.25** | <0.05 |
| K10 | UG | **0.02** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| K11 | UG | **0.07** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.89** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | **0.07** | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| K12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.62** | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | **0.07** | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| K13 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **3.43** | <0.02 | **0.04** | <0.02 | <0.02 | <0.02 | **0.04** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.03** | <0.05 | <0.05 | <0.05 |
| K14 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **8.55** | **0.02** | **0.09** | <0.02 | <0.02 | <0.02 | **0.11** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.03** | <0.05 | <0.05 | <0.05 |
| L9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| L10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.64** | <0.02 | **0.06** | <0.02 | **0.03** | <0.02 | **0.09** | <0.02 | <0.05 | **0.05** | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| L11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **4.77** | <0.02 | **0.02** | <0.02 | <0.02 | <0.02 | **0.02** | <0.02 | <0.05 | **0.07** | <0.02 | <0.02 | <0.02 | **0.08** | **0.1** | <0.05 |
| L12 | UG | <0.02 | <0.02 | **0.29** | **0.04** | <0.02 | <0.20 | <0.02 | **26.21** | **0.12** | **0.21** | **0.11** | **0.2** | **0.13** | **0.78** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.75** | <0.05 | <0.05 | **0.11** |
| L13 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **8.52** | **0.05** | **0.27** | <0.02 | **0.03** | <0.02 | **0.35** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.46** | <0.05 | **0.06** | <0.05 |
| L14 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **13.26** | **0.02** | <0.02 | <0.02 | <0.02 | <0.02 | **0.02** | <0.02 | <0.05 | **0.06** | <0.02 | <0.02 | **0.03** | <0.05 | <0.05 | <0.05 |
| M9 | UG | **0.1** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **1.42** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| M10 * | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| M11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **3.77** | <0.02 | **0.03** | <0.02 | **0.04** | <0.02 | **0.07** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| M12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **3.18** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | **0.03** | <0.02 | **0.22** | **0.22** | **0.23** | **0.06** | <0.02 | <0.05 | <0.05 | <0.05 |
| M13 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.62** | **0.03** | **0.03** | **0.05** | **0.13** | **0.04** | **0.28** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| M14 | UG | **0.03** | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **5.53** | <0.02 | **0.12** | <0.02 | <0.02 | <0.02 | **0.12** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| M16 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.51** | **0.04** | **0.05** | <0.02 | **0.03** | <0.02 | **0.12** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| N9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **4.12** | **0.06** | **0.04** | <0.02 | <0.02 | <0.02 | **0.09** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.05** | <0.05 | <0.05 | <0.05 |
| N10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **11.47** | **0.04** | **0.03** | <0.02 | **0.03** | <0.02 | **0.1** | <0.02 | <0.05 | **0.06** | <0.02 | <0.02 | **0.03** | **0.18** | **0.17** | **0.05** |
| N11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.37** | **0.02** | **0.09** | <0.02 | <0.02 | <0.02 | **0.11** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| N12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **2.91** | <0.02 | **0.03** | <0.02 | <0.02 | <0.02 | **0.03** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | **0.05** | <0.05 |
| N13 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | <0.50 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |
| O9 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **3** | **0.03** | **0.02** | <0.02 | <0.02 | <0.02 | **0.05** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.02** | <0.05 | <0.05 | <0.05 |
| O10 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **5.86** | **0.04** | **0.07** | **0.08** | **0.03** | <0.02 | **0.22** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | **0.06** | <0.05 | <0.05 | <0.05 |
| O11 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **3.93** | <0.02 | **0.07** | **0.06** | <0.02 | <0.02 | **0.13** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | **0.53** | <0.05 |
| O12 | UG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | <0.02 | **0.62** | <0.02 | **0.02** | <0.02 | <0.02 | <0.02 | **0.02** | <0.02 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 |

Notes: M10 boring was filled with water and results are suspected to be false negative values.
UG - micrograms of chemical adsorbed; not comparable with cleanup level.

# Table 4.5 - Groundwater Elevation Data

Project #140252 - HERS Industrial Park, 4403-4493 Russell Road, Mukilteo, WA
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Well ID | Ref Station Elev | Backsight (BS) | Foresight (FS) | Top of Casing (TOC - Site Datum) | Date Gauged | Depth to Water (feet below TOC) | Water Elevation (feet - Site Datum) |
|---|---|---|---|---|---|---|---|
| MW-1 | 540 | 6.43 | 6.43 | 540.00 | 1/22/15 | 2.71 | 537.29 |
| | | | | | 4/27/15 | 5.79 | 534.21 |
| | | | | | 8/10/15 | 4.97 | 535.03 |
| MW-2 | 540 | 6.43 | 4.37 | 542.06 | 1/23/15 | 8.57 | 533.49 |
| | | | | | 4/27/15 | 5.68 | 536.38 |
| | | | | | 8/10/15 | 7.09 | 534.97 |
| MW-2D | 540.06 | 7.27 | 5.20 | 542.13 | 8/10/15 | 162.75 | 379.38 |
| MW-3 | 542.06 | 5.35 | 5.18 | 542.23 | 1/22/15 | 4.94 | 537.29 |
| | | | | | 4/27/15 | 5.74 | 536.49 |
| | | | | | 8/10/15 | 6.42 | 535.81 |
| MW-4 | 542.23 | 5.16 | 5.21 | 542.18 | 1/22/15 | 3.88 | 538.30 |
| | | | | | 4/27/15 | 6.87 | 535.31 |
| | | | | | 8/10/15 | 6.93 | 535.25 |
| MW-5 | 542.18 | 4.99 | 5.78 | 541.39 | 1/22/15 | 5.81 | 535.58 |
| | | | | | 4/27/15 | 5.84 | 535.55 |
| | | | | | 8/10/15 | 5.83 | 535.56 |
| MW-6 | 540.58 | 6.24 | 6.58 | 540.24 | 1/23/15 | 0.57 | 539.67 |
| | | | | | 4/27/15 | 2.11 | 538.13 |
| | | | | | 8/10/15 | 4.50 | 535.74 |
| MW-7 | 541.83 | 4.37 | 5.88 | 540.32 | 1/28/15 | 7.71 | 532.61 |
| | | | | | 4/27/15 | 2.91 | 537.41 |
| | | | | | 8/10/15 | 4.92 | 535.40 |
| MW-8 | 539.75 | 5.83 | 5.39 | 540.19 | 1/22/15 | 2.64 | 537.55 |
| | | | | | 4/27/15 | 3.33 | 536.86 |
| | | | | | 8/10/15 | 5.52 | 534.67 |
| MW-9 | 541.83 | 4.37 | 5.62 | 540.58 | 1/23/15 | 2.67 | 537.91 |
| | | | | | 4/27/15 | 2.99 | 537.59 |
| | | | | | 8/10/15 | 4.96 | 535.62 |
| MW-10 | 540 | 6.43 | 5.46 | 540.97 | 1/22/15 | 4.02 | 536.95 |
| | | | | | 4/27/15 | 4.10 | 536.87 |
| | | | | | 8/10/15 | 6.10 | 534.87 |
| MW-11 | 540 | 6.43 | 4.50 | 541.93 | 1/28/15 | 5.22 | 536.71 |
| | | | | | 4/27/15 | 5.24 | 536.69 |
| | | | | | 8/10/15 | 6.93 | 535.00 |
| MW-12 | 540 | 6.43 | 5.43 | 541.00 | 1/23/15 | 3.79 | 537.21 |
| | | | | | 4/27/15 | 4.06 | 536.94 |
| | | | | | 8/10/15 | 5.83 | 535.17 |
| MW-13 | 540 | 6.43 | 6.15 | 540.28 | 1/23/15 | 4.20 | 536.08 |
| | | | | | 4/27/15 | Not Accessible* | |
| | | | | | 8/10/15 | Needs Rehab | |
| MW-14 | | | | | | | |
| MW-15 | 540 | 6.43 | 6.30 | 540.13 | 1/22/15 | 2.86 | 537.27 |
| | | | | | 4/27/15 | 3.06 | 537.07 |
| | | | | | 8/10/15 | 5.02 | 535.11 |
| MW-16 | 540 | 6.43 | 4.60 | 541.83 | 1/22/15 | 4.72 | 537.11 |
| | | | | | 4/27/15 | 4.89 | 536.94 |
| | | | | | 8/10/15 | 6.62 | 535.21 |
| MW-16D | 540 | 6.16 | 4.29 | 541.87 | 4/27/15 | 57.65 | 484.22 |
| | | | | | 8/10/15 | 58.55 | 483.32 |
| MW-17 | 540 | 6.43 | 6.68 | 539.75 | 1/23/15 | 2.47 | 537.28 |
| | | | | | 4/27/15 | 2.53 | 537.22 |
| | | | | | 8/10/15 | 4.93 | 534.82 |
| MW-18 | 542.23 | 5.16 | 5.14 | 542.25 | 1/23/15 | 5.18 | 537.07 |
| | | | | | 4/27/15 | 4.58 | 537.67 |
| | | | | | 8/10/15 | 6.27 | 535.98 |
| MW-19 | 542.06 | 5.35 | 7.98 | 539.43 | 1/23/15 | 2.94 | 536.49 |
| | | | | | 4/27/15 | 3.03 | 536.40 |
| | | | | | 8/10/15 | 4.40 | 535.03 |
| MW-20 | 540 | 6.16 | 6.10 | 540.06 | 4/27/15 | 5.09 | 534.97 |
| MW-21 | 540.06 | 7.27 | 6.33 | 541.00 | 8/10/15 | 6.21 | 534.79 |
| MW-22 | 540.06 | 7.27 | 7.24 | 540.09 | 8/10/15 | 5.22 | 534.87 |

Elevation datum of 540 ft. is the non-surveyed estimate of elevation.

Aspect surveyed monitoring well tops-of-casing (TOC) on February 10, 2015, April 27, 2015, and August 10, 2015
Water level measurements on January 22 and 23, 2015 occurred during precipitation events.
Water level measurements on January 28, 2015 occurred after several days of dry weather.
MW-14 was abandoned beneath asphalt pavement.
*MW-13 is unaccessible due to the monument being full of silt.

## Table 9.1 - Summary of Cleanup Alternative Components and Costs

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Cleanup Alternative Components | **Alternative 1** Completed Actions and Monitored Natural Attenuation | **Alternative 2** Completed Actions, Biostimulation, and Monitored Natural Attenuation | **Alternative 3** Completed Actions, Permanganate Injection, and Monitored Natural Attenuation | **Alternative 4** Completed Actions, *In Situ* Soil Mixing, and Monitored Natural Attenuation | **Alternative 5** Completed Actions, Excavation, and Monitored Natural Attenuation |
|---|---|---|---|---|---|
| Excavation and disposal of 25 tons of petroleum-contaminated soil from beneath storm drain D34 in September 1996 | X | X | X | X | X |
| Injection of Fenton's reagent into 9 remediation wells during three events in March, April, and October 2006. | X | X | X | X | X |
| Injection of biostimulants (3DMe® and HRC Primer®) into 7 existing and 7 new injection wells in shallow, weathered till and in MW-16D. Includes contingent repeat application two years later. | | X | | | |
| Injection of sodium permanganate oxidant into 2 existing wells and 22 direct-push borings in shallow, weathered till. Includes contingent repeat application two years later. | | | X | | |
| *In situ* mixing of potassium permanganate into soil to 15 feet bgs using counter-rotating augers to treat a 3,600 square foot area beneath former storm drain D29 and existing storm drain D30. | | | | X | |
| Excavation of about 2,875 tons of contaminated soil with a contained-out determination from beneath former storm drain D29 and existing storm drain D30. | | | | | X |
| Monitored natural attenuation of groundwater in chlorinated VOC exceedance area to confirm plume stability and attenuation. | X | X | X | X | X |
| Environmental covenant after remedial action objectives for groundwater are satisfied. | X | X | X | X | X |
| Present Value of Future Costs[(1,2)] | $273,000 | $370,000 | $507,000 | $647,000 | $805,000 |

Notes:

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent, and estimates are rounded to the nearest $1,000.

## Table 9.2 - Cost Estimate for Alternative 1: Completed Actions and MNA

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | No. of Units | Units | Unit Cost | Year of Expenditure | Itemized Present Value Cost[(1)] | Consolidated Present Value Cost[(1)] |
|---|---|---|---|---|---|---|
| **Project Management** | | | | | | |
| Consulting, negotiation with Ecology, and reporting | 1 | LS | $ 15,000.00 | 2015 | $ 15,000.00 | $ 15,000.00 |
| **Investigation and Decision Reports for Ecology** | | | | | | |
| Confirmation soil and groundwater sampling | 1 | LS | $ 25,000.00 | 2046 | $ 18,937.12 | |
| Request for NFA opinion and environmental covenant | 1 | LS | $ 15,000.00 | 2020 | $ 14,342.85 | |
| Subtotal | | | | | | $ 33,279.97 |
| **Monitored Natural Attenuation** | | | | | | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Well decommissioning | 12 | EA | $ 1,110.00 | 2016 | $ 13,201.19 | |
| Well construction | 1 | EA | $ 1,450.00 | 2016 | $ 1,437.07 | |
| 18-Month sampling of 11 wells for chlorinated VOCs & reporting | 20 | EA | $ 10,000.00 | 2016-2046 | $ 175,029.29 | |
| Driller mobilization for decommissioning | 1 | LS | $ 690.00 | 2046 | $ 522.66 | |
| Well decommissioning | 11 | EA | $ 1,110.00 | 2046 | $ 9,248.89 | |
| Subtotal | | | | | | $ 200,122.94 |
| Bid contingency (10% of project costs) | | | | | | $ 24,840.29 |
| **PRESENT VALUE OF FUTURE COSTS, ROUNDED** | | | | | | **$273,000** |

**Notes:**

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent (current 10 year real discount rate).

3) Scope contingency accounts for uncertainties during design of remedial technology.

4) Bid contingency accounts for modifications after contract award due to changed conditions.

5) Units: EA = each, LB = pounds, LS = lump sum, YR = year.

## Table 9.3 - Cost Estimate for Alternative 2: Completed Actions, Biostimulation, and MNA

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | No. of Units | Units | Unit Cost | Year of Expenditure | Itemized Present Value Cost[(1)] | Consolidated Present Value Cost[(1)] |
|---|---|---|---|---|---|---|
| **Project Management** | | | | | | |
| Consulting, negotiation with Ecology, and reporting | 1 | LS | $ 15,000.00 | 2015 | $ 15,000.00 | $ 15,000.00 |
| **Investigation and Decision Reports for Ecology** | | | | | | |
| Corrective action plan | 1 | LS | $ 10,000.00 | 2016 | $ 9,910.80 | |
| Confirmation soil and groundwater sampling | 1 | LS | $ 25,000.00 | 2031 | $ 21,661.14 | |
| Request for NFA opinion and environmental covenant | 1 | LS | $ 15,000.00 | 2020 | $ 14,342.85 | |
| Subtotal | | | | | | $ 45,914.79 |
| ***In Situ* Biostimulation, First Round** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 20,000.00 | 2016 | $ 19,821.61 | |
| Field oversight | 6 | DAY | $ 1,200.00 | 2016 | $ 7,135.78 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Injection well construction | 7 | EA | $ 1,450.00 | 2016 | $ 10,059.46 | |
| Drilling derived waste drum, F001 | 14 | EA | $ 400.00 | 2016 | $ 5,550.05 | |
| Biostimulant, 3DMe® | 3,000 | LB | $ 4.41 | 2016 | $ 13,111.99 | |
| Biostimulant, HRC Primer® | 225 | LB | $ 3.53 | 2016 | $ 787.17 | |
| Biostimulant, shipping and handling | 1 | LS | $ 1,500.00 | 2016 | $ 1,486.62 | |
| Injection crew, daily rate | 4 | DAY | $ 5,670.00 | 2016 | $ 22,477.70 | |
| Injection crew, mobilization | 1 | LS | $ 1,890.00 | 2016 | $ 1,873.14 | |
| Scope contingency (10% of biostimulation costs) | | | | | $ 8,348.29 | |
| Subtotal | | | | | | $ 91,831.19 |
| ***In Situ* Biostimulation, Second Round** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 20,000.00 | 2018 | $ 19,469.58 | |
| Field oversight | 4 | DAY | $ 1,200.00 | 2018 | $ 4,672.70 | |
| Biostimulant, 3DMe® | 3,000 | LB | $ 4.41 | 2018 | $ 12,879.12 | |
| Biostimulant, HRC Primer® | 225 | LB | $ 3.53 | 2018 | $ 773.19 | |
| Biostimulant, shipping and handling | 1 | LS | $ 1,500.00 | 2018 | $ 1,460.22 | |
| Injection crew, daily rate | 4 | DAY | $ 5,670.00 | 2018 | $ 22,078.50 | |
| Injection crew, mobilization | 1 | LS | $ 1,890.00 | 2018 | $ 1,839.87 | |
| Scope contingency (10% of biostimulation costs) | | | | | $ 6,317.32 | |
| Subtotal | | | | | | $ 69,490.49 |
| **Monitored Natural Attenuation** | | | | | | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Well decommissioning | 6 | EA | $ 1,110.00 | 2016 | $ 6,600.59 | |
| Well construction | 1 | EA | $ 2,050.00 | 2016 | $ 2,031.71 | |
| 18-Month sampling of 11 wells for chlorinated VOCs & reporting | 10 | EA | $ 10,000.00 | 2016-2031 | $ 93,373.59 | |
| Driller mobilization for decommissioning | 1 | LS | $ 690.00 | 2031 | $ 597.85 | |
| Well decommissioning | 11 | EA | $ 1,110.00 | 2031 | $ 10,579.30 | |
| Subtotal | | | | | | $ 113,866.89 |
| Bid contingency (10% of project costs) | | | | | | $ 33,610.34 |
| **PRESENT VALUE OF FUTURE COSTS, ROUNDED** | | | | | | **$370,000** |

**Notes:**

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent (current 10 year real discount rate).

3) Scope contingency accounts for uncertainties during design of remedial technology.

4) Bid contingency accounts for modifications after contract award due to changed conditions.

5) Units: EA = each, LB = pounds, LS = lump sum, YR = year.

## Table 9.4 - Cost Estimate for Alternative 3: Completed Actions, Permanganate Injection, and MNA

Project #140252-HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | No. of Units | Units | Unit Cost | Year of Expenditure | Itemized Present Value Cost[(1)] | Consolidated Present Value Cost[(1)] |
|---|---|---|---|---|---|---|
| **Project Management** | | | | | | |
| Consulting, negotiation with Ecology, and reporting | 1 | LS | $ 15,000.00 | 2015 | $ 15,000.00 | $ 15,000.00 |
| **Investigation and Decision Reports for Ecology** | | | | | | |
| Corrective action plan | 1 | LS | $ 10,000.00 | 2016 | $ 9,910.80 | |
| Confirmation soil and groundwater sampling | 1 | LS | $ 25,000.00 | 2031 | $ 21,661.14 | |
| Request for NFA opinion and environmental covenant | 1 | LS | $ 15,000.00 | 2020 | $ 14,342.85 | |
| Subtotal | | | | | | $ 45,914.79 |
| **Treatment Area Delineation** | | | | | | |
| Project management and reporting | 1 | LS | $ 5,000.00 | 2016 | $ 4,955.40 | |
| Field oversight | 1 | DAY | $ 1,200.00 | 2016 | $ 1,189.30 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Probe rig | 1 | DAY | $ 2,020.00 | 2016 | $ 2,001.98 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Chlorinated VOC analysis | 12 | EA | $ 133.00 | 2016 | $ 1,581.76 | |
| Permanganate soil oxidant demand analysis | 1 | EA | $ 345.00 | 2016 | $ 341.92 | |
| Drilling derived waste drum, F001 | 2 | EA | $ 400.00 | 2016 | $ 792.86 | |
| Subtotal | | | | | | $ 12,042.62 |
| **Permanganate Injection, First Round** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 25,000.00 | 2016 | $ 24,777.01 | |
| Field oversight | 8 | DAY | $ 1,200.00 | 2016 | $ 9,514.37 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Probe rig | 8 | DAY | $ 2,020.00 | 2016 | $ 16,015.86 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Permanganate (3,000 lb $NaMnO_4$/263 gallon tote, 40% solution | 6,000 | LB | $ 3.18 | 2016 | $ 18,909.81 | |
| Permangate, shipping and handling | 1 | LS | $ 1,500.00 | 2016 | $ 1,486.62 | |
| Injection crew, daily rate | 8 | DAY | $ 5,670.00 | 2016 | $ 44,955.40 | |
| Injection crew, mobilization | 1 | LS | $ 1,890.00 | 2016 | $ 1,873.14 | |
| Scope contingency (15% of ISCO costs) | | | | | $ 17,806.74 | |
| Subtotal | | | | | | $ 136,518.33 |
| **Permanganate Injection, Second Round** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 25,000.00 | 2018 | $ 24,336.97 | |
| Field oversight | 8 | DAY | $ 1,200.00 | 2018 | $ 9,345.40 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2018 | $ 671.70 | |
| Probe rig | 8 | DAY | $ 2,020.00 | 2018 | $ 15,731.42 | |
| Utility locate | 1 | LS | $ 500.00 | 2018 | $ 486.74 | |
| Permanganate (3,000 lb $NaMnO_4$/263 gallon tote, 40% solution | 6,000 | LB | $ 3.18 | 2018 | $ 18,573.98 | |
| Permangate, shipping and handling | 1 | LS | $ 1,500.00 | 2018 | $ 1,460.22 | |
| Injection crew, daily rate | 8 | DAY | $ 5,670.00 | 2018 | $ 44,157.00 | |
| Injection crew, mobilization | 1 | LS | $ 1,890.00 | 2018 | $ 1,839.87 | |
| Scope contingency (15% of ISCO costs) | | | | | $ 17,490.49 | |
| Subtotal | | | | | | $ 134,093.79 |
| **Monitored Natural Attenuation** | | | | | | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Well decommissioning | 6 | EA | $ 1,110.00 | 2016 | $ 6,600.59 | |
| Well construction | 1 | EA | $ 2,050.00 | 2016 | $ 2,031.71 | |
| 18-Month sampling of 11 wells for chlorinated VOCs & reporting | 10 | EA | $ 10,000.00 | 2016-2031 | $ 93,373.59 | |
| 18-Month sampling of 2 wells for RCRA metals (analysis only) | 10 | EA | $ 345.00 | 2016-2031 | $ 3,221.39 | |
| Driller mobilization for decommissioning | 1 | LS | $ 690.00 | 2031 | $ 597.85 | |
| Well decommissioning | 11 | EA | $ 1,110.00 | 2031 | $ 10,579.30 | |
| Subtotal | | | | | | $ 117,088.28 |
| Bid contingency (10% of project costs) | | | | | | $ 46,065.78 |
| **PRESENT VALUE OF FUTURE COSTS, ROUNDED** | | | | | | **$507,000** |

**Notes:**

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent (current 10 year real discount rate).

3) Scope contingency accounts for uncertainties during design of remedial technology.

4) Bid contingency accounts for modifications after contract award due to changed conditions.

5) Units: EA = each, LB = pounds, LS = lump sum, YR = year.

## Table 9.5 - Cost Estimate for Alternative 4: Completed Actions, In Situ Soil Mixing, and MNA

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | No. of Units | Units | Unit Cost | Year of Expenditure | Itemized Present Value Cost[(1)] | Consolidated Present Value Cost[(1)] |
|---|---|---|---|---|---|---|
| **Project Management** | | | | | | |
| Consulting, negotiation with Ecology, and reporting | 1 | LS | $ 15,000.00 | 2015 | $ 15,000.00 | $ 15,000.00 |
| **Investigation and Decision Reports for Ecology** | | | | | | |
| Corrective action plan | 1 | LS | $ 10,000.00 | 2016 | $ 9,910.80 | |
| Confirmation soil and groundwater sampling | 1 | LS | $ 25,000.00 | 2025 | $ 22,857.48 | |
| Request for NFA opinion and environmental covenant | 1 | LS | $ 15,000.00 | 2020 | $ 14,342.85 | |
| Subtotal | | | | | | $ 47,111.13 |
| **Treatment Area Delineation** | | | | | | |
| Project management and reporting | 1 | LS | $ 5,000.00 | 2016 | $ 4,955.40 | |
| Field oversight | 1 | DAY | $ 1,200.00 | 2016 | $ 1,189.30 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Probe rig | 1 | DAY | $ 2,020.00 | 2016 | $ 2,001.98 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Chlorinated VOC analysis | 12 | EA | $ 133.00 | 2016 | $ 1,581.76 | |
| Permanganate soil oxidant demand analysis | 1 | EA | $ 345.00 | 2016 | $ 341.92 | |
| Drilling derived waste drum, F001 | 2 | EA | $ 400.00 | 2016 | $ 792.86 | |
| Subtotal | | | | | | $ 12,042.62 |
| **In Situ Soil Mixing** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 35,000.00 | 2016 | $ 34,687.81 | |
| Field oversight | 25 | DAY | $ 1,200.00 | 2016 | $ 29,732.41 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Equipment mobilization | 1 | LS | $ 8,700.00 | 2016 | $ 8,622.40 | |
| Hardscape demolition and disposal | 4,900 | SF | $ 1.10 | 2016 | $ 5,341.92 | |
| Removal and restoration of storm drain | 1 | LS | $ 2,900.00 | 2016 | $ 2,874.13 | |
| Excavate, stage/direct-load contained-out soil | 300 | TON | $ 8.10 | 2016 | $ 2,408.33 | |
| Transport and dispose, contained-out soil | 300 | TON | $ 74.80 | 2016 | $ 22,239.84 | |
| Potassium permanganate (3 g/kg-soil) | 12,600 | LB | $ 4.03 | 2016 | $ 50,325.07 | |
| Permangate, shipping and handling | 1 | LS | $ 4,500.00 | 2016 | $ 4,459.86 | |
| In Situ Mixing, equipment and 3-man crew, Daily Rate | 25 | DAY | $ 6,300.00 | 2016 | $ 156,095.14 | |
| Import, place, and compact gravel borrow | 150 | TON | $ 24.00 | 2016 | $ 3,567.89 | |
| Asphalt resurfacing | 4,900 | SF | $ 3.50 | 2016 | $ 16,997.03 | |
| Re-paint parking surface | 1 | LS | $ 1,730.00 | 2016 | $ 1,714.57 | |
| Scope contingency (25% of in situ mixing costs) | | | | | $ 84,890.49 | |
| Subtotal | | | | | | $ 424,452.43 |
| **Monitored Natural Attenuation** | | | | | | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Well decommissioning | 14 | EA | $ 1,110.00 | 2016 | $ 15,401.39 | |
| Well construction | 1 | EA | $ 2,050.00 | 2016 | $ 2,031.71 | |
| 18-Month sampling of 11 wells for chlorinated VOCs & reporting | 6 | EA | $ 10,000.00 | 2016-2025 | $ 57,519.43 | |
| 18-Month sampling of 2 wells for RCRA metals (analysis only) | 6 | EA | $ 345.00 | 2016-2025 | $ 1,984.42 | |
| Driller mobilization for decommissioning | 1 | LS | $ 690.00 | 2025 | $ 630.87 | |
| Well decommissioning | 11 | EA | $ 1,110.00 | 2025 | $ 11,163.59 | |
| Subtotal | | | | | | $ 89,415.26 |
| Bid contingency (10% of project costs) | | | | | | $ 58,802.14 |
| **PRESENT VALUE OF FUTURE COSTS, ROUNDED** | | | | | | **$647,000** |

**Notes:**

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent (current 10 year real discount rate).

3) Scope contingency accounts for uncertainties during design of remedial technology.

4) Bid contingency accounts for modifications after contract award due to changed conditions.

5) Units: EA = each, LB = pounds, LS = lump sum, YR = year.

## Table 9.6 - Cost Estimate for Alternative 5: Completed Actions, Excavation, and MNA

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| | No. of Units | Units | Unit Cost | Year of Expenditure | Itemized Present Value Cost[(1)] | Consolidated Present Value Cost[(1)] |
|---|---|---|---|---|---|---|
| **Project Management** | | | | | | |
| Consulting, negotiation with Ecology, and reporting | 1 | LS | $ 15,000.00 | 2015 | $ 15,000.00 | $ 15,000.00 |
| **Investigation and Decision Reports for Ecology** | | | | | | |
| Corrective action plan | 1 | LS | $ 10,000.00 | 2016 | $ 9,910.80 | |
| Confirmation soil and groundwater sampling | 1 | LS | $ 25,000.00 | 2025 | $ 22,857.48 | |
| Request for NFA opinion and environmental covenant | 1 | LS | $ 15,000.00 | 2020 | $ 14,342.85 | |
| Subtotal | | | | | | $ 47,111.13 |
| **Treatment Area Delineation** | | | | | | |
| Project management and reporting | 1 | LS | $ 5,000.00 | 2016 | $ 4,955.40 | |
| Field oversight | 1 | DAY | $ 1,200.00 | 2016 | $ 1,189.30 | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Probe rig | 1 | DAY | $ 2,020.00 | 2016 | $ 2,001.98 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Chlorinated VOC analysis | 12 | EA | $ 133.00 | 2016 | $ 1,581.76 | |
| Drilling derived waste drum, F001 | 2 | EA | $ 400.00 | 2016 | $ 792.86 | |
| Subtotal | | | | | | $ 11,700.69 |
| **Excavation** | | | | | | |
| Project management, design, and completion report | 1 | LS | $ 35,000.00 | 2016 | $ 34,687.81 | |
| Field oversight | 10 | DAY | $ 1,200.00 | 2016 | $ 11,892.96 | |
| Confirmation soil sampling | 10 | EA | $ 133.00 | 2016 | $ 1,318.14 | |
| Wastewater compliance sampling | 6 | EA | $ 386.00 | 2016 | $ 2,295.34 | |
| Grading permit allowance | 1 | LS | $ 1,000.00 | 2016 | $ 991.08 | |
| Wastewater discharge permit and fees allowance | 1 | LS | $ 1,000.00 | 2016 | $ 991.08 | |
| Utility locate | 1 | LS | $ 500.00 | 2016 | $ 495.54 | |
| Equipment mobilization | 1 | LS | $ 6,600.00 | 2016 | $ 6,541.13 | |
| Hardscape demolition and disposal | 6,000 | SF | $ 1.10 | 2016 | $ 6,541.13 | |
| Removal and restoration of storm drain | 1 | LS | $ 2,900.00 | 2016 | $ 2,874.13 | |
| Excavate, stage/direct-load contained-out soil | 2,075 | TON | $ 8.10 | 2016 | $ 16,657.58 | |
| Slot-cut with CDF, stage/direct-load contained-out soil | 800 | TON | $ 25.30 | 2016 | $ 20,059.46 | |
| Transport and dispose, contained-out soil | 2,875 | TON | $ 86.30 | 2016 | $ 245,899.41 | |
| Import, place, and compact gravel borrow | 2,875 | TON | $ 24.00 | 2016 | $ 68,384.54 | |
| Asphalt resurfacing | 6,000 | SF | $ 3.50 | 2016 | $ 20,812.69 | |
| Re-paint parking surface | 1 | LS | $ 1,730.00 | 2016 | $ 1,714.57 | |
| Groundwater treatment system | 1 | LS | $ 7,360.00 | 2016 | $ 7,294.35 | |
| 20,000 gallon storage tank | 6 | WK | $ 580.00 | 2016 | $ 3,448.96 | |
| 20,000 gallon storage tank, mob/demob | 3 | EA | $ 460.00 | 2016 | $ 1,367.69 | |
| Disposal of 2,000 lbs of spent carbon | 1 | LS | $ 1,150.00 | 2016 | $ 1,139.74 | |
| Furnish temporary erosion and sediment controls | 1 | LS | $ 920.00 | 2016 | $ 911.79 | |
| Sweeping and site restoration | 1 | LS | $ 920.00 | 2016 | $ 911.79 | |
| Scope contingency (25% of excavation costs) | | | | | $ 114,307.73 | |
| Subtotal | | | | | | $ 571,538.65 |
| **Monitored Natural Attenuation** | | | | | | |
| Driller mobilization | 1 | LS | $ 690.00 | 2016 | $ 683.85 | |
| Well decommissioning | 15 | EA | $ 1,110.00 | 2016 | $ 16,501.49 | |
| Well construction | 1 | EA | $ 2,050.00 | 2016 | $ 2,031.71 | |
| 18-Month sampling of 9 wells for chlorinated VOCs & reporting | 6 | EA | $ 10,000.00 | 2016-2025 | $ 57,519.43 | |
| Driller mobilization for decommissioning | 1 | LS | $ 690.00 | 2025 | $ 630.87 | |
| Well decommissioning | 9 | EA | $ 1,110.00 | 2025 | $ 9,133.85 | |
| Subtotal | | | | | | $ 86,501.19 |
| Bid contingency (10% of project costs) | | | | | | $ 73,185.17 |
| **PRESENT VALUE OF FUTURE COSTS, ROUNDED** | | | | | | **$805,000** |

**Notes:**

1) These FS-level cost estimates have an accuracy of -30/+50 percent.

2) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent (current 10 year real discount rate).

3) Scope contingency accounts for uncertainties during design of remedial technology.

4) Bid contingency accounts for modifications after contract award due to changed conditions.

5) Units: EA = each, LB = pounds, LS = lump sum, YR = year.

## Table 10.1 - Cleanup Alternative Evaluation and Disproportionate Cost Analysis

Project #140252-HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| **Permanence Criteria (Weighting Factor)** | **All Alternatives** Completed Actions and Monitored Natural Attenuation | **Alternative 1** No Additional Active Remediation | **Alternative 2** Biostimulation | **Alternative 3** Permanganate Injection | **Alternative 4** *In Situ* Soil Mixing with Permanganate | **Alternative 5** Excavation of Accessible Source Contamination |
|---|---|---|---|---|---|---|
| Protectiveness (30%) | Depth of Vashon Till, lack of groundwater receptors, and impervious surfaces in industrial park setting provide a high level of protectiveness. All alternatives credited with the previous excavation of PCS in 1996 and ISCO treatment of soil and groundwater in 2006. All alternatives include recording of an environmental covenant once the remedial action objectives for groundwater are satisfied. | (2) Takes longest time to attain cleanup standards. | (3) Biostimulation significantly reduces restoration time frame compared with Alternative 1. | (3) Permanganate injection significantly reduces restoration time frame compared with Alternative 1. | (4) Permanganate soil mixing significantly reduces restoration time frame compared with Alternative 1. | (4) Excavation of accessible source material significantly reduces restoration time frame compared with Alternatives 1 to 4. |
| Permanence (20%) | The completed actions prevent additional contamination and the ISCO treatment has decreased the concentrations of chlorinated VOC in soil and groundwater. | (1) Provides no additional treatment. | (3) Permanently decreases the total mass of chlorinated VOCs. Enhanced reductive dechlorination rapidly degrades PCE and TCE, but results in the accumulation of cDCE and vinyl chloride in groundwater, which would bioattenuate at a slower rate. | (3) Permanganate treatment rapidly oxidizes chlorinated VOCs when contacted with the oxidant, but inhibits the bioattenuation PCE and TCE that were not treated by permanganate. | (3) Permanganate treatment rapidly oxidizes chlorinated VOCs when contacted with the oxidant, but inhibits the bioattenuation PCE and TCE that were not treated by permanganate. | (4) Excavation permanently removes the accessible contaminated soil from the Site, but soil contamination would likely remain beneath the building and adjoining excavation sidewall, at the bottom of the excavation, and downgradient of source area. |
| Long-Term Effectiveness (20%) | All alternatives provide reasonable long-term effectiveness because the magnitude of residual risk is small after the termination of releases and the natural attenuation of chlorinated VOCs in the Vashon Till. All alternatives include long-term groundwater monitoring and the recording of an environmental covenant after the groundwater remedial action objectives are achieved. | (2) Provides no additional treatment. | (4) Provides additional destruction and detoxification of chlorinated VOCs in soil and groundwater. | (4) Provides additional destruction and detoxification of chlorinated VOCs in soil and groundwater. | (4) Provides additional destruction and detoxification of chlorinated VOCs in soil and groundwater. | (3) Provides additional off-site disposal of contaminated soil to an engineered, lined, and monitored facility. |
| Short-Term Risk Management (10%) | Relates to the control of short-term risks during implementation. | (5) No short-term risks are associated with no additional treatment. | (4) Limited risks associated with the injection of food grade biostimulations. Primary short term risk is the generation, accumulation, and eventual attenuation of vinyl chloride. | (3) Injection of hazardous material (permanganate) has higher risk than biostimulants and there is potential for surfacing of permanganate into storm drains, utility trenches, and through asphalt surface. Can be controlled through health and safety plan and injection pressure control limits. Introduces risk of metal mobilization and inhibition of natural bioattenuation. | (3) Potassium permanganate has increased risk from dust dispersion and soil handling. Can be controlled through health and safety plan and wind limits during mixing. Introduces risk of metal mobilization and inhibition of natural bioattenuation. | (3) Excavation has risk associated with soil handling, slope stability, and release of contaminated soil and water to the storm drains. Can be controlled through health and safety plan and erosion and sediment control plan. |
| Implementability (10%) | Relates to technical and administrative implementability. | (5) No additional treatment. | (4) Limited by permeability of till, but sporadic treatment is more permissible with bioremediation.<br><br>Limited business disruption. Requires registration of injection wells with UIC Program. | (4) Limited by permeability of till, which is problematic since ISCO inhibits natural attenuation processes.<br><br>Limited business disruption. Requires registration of injection wells with UIC Program. | (2) May be difficult to mix harder till below 10 feet bgs where higher concentrations were encountered, and ISCO inhibits natural attenuation processes for non-contacted contamination.<br><br>Restricts access to businesses, thus would be performed when vacant. Requires 3 or more months for grading permit, engineering plan set, SEPA approval, and mobilization and scheduling of specialized equipment. Ideally, performed during the dry season. | (3) Excavation is limited adjacent to structures because of minimum sloping requirements.<br><br>Restricts access to businesses, thus would be performed when vacant. Requires up to 3 months for grading permit, engineering plan set, and SEPA approval. Work ideally performed during dry season. |
| Public Concerns (10%) | Public concerns will be addressed in the public comment period. | (3) | (3) | (3) | (3) | (3) |
| **Environmental Benefit[2]** | | 2.5 | 3.4 | 3.3 | 3.4 | 3.5 |
| **Present Value Cost[3]** | | $273,000 | $370,000 | $507,000 | $647,000 | $805,000 |
| **Cost-to-Benefit Ratio** | | $109,200 | $108,824 | $153,636 | $190,294 | $230,000 |

**Notes:**

1) A numeric scale of 1 to 5 (presented in parantheses above e.g, (3)) is used to rate the alternatives with respect to the criteria in WAC 173-240-360(f), as follows:

1 - meets criterion to a very low degree;
2 - meets criterion to a low degree;
3 - meets criterion to a moderate degree;
4 - meets criterion to a high degree; and
5 - meets criterion to a very high degree.

2) The environmental benefit is calculated as the sum of the products of the weighting factor and numerical ranking for each criterion.

3) Present value costs are based on 2015 dollars and are calculated using a discount factor of 0.9 percent, and estimates are rounded to the nearest $1,000. Itemized estimates are provided in Tables 9.2 to 9.6.

bgs = below ground surface
cDCE = cis-1,2-dichloroethylene
ISCO = in situ chemical oxidation
PCE = tetrachloroethylene
PCS = petroleum contaminated soil
SEPA = State Environmental Policy Act
TCE = trichloroethylene
UIC = Underground Injection Control Program
VOC = volatile organic compounds

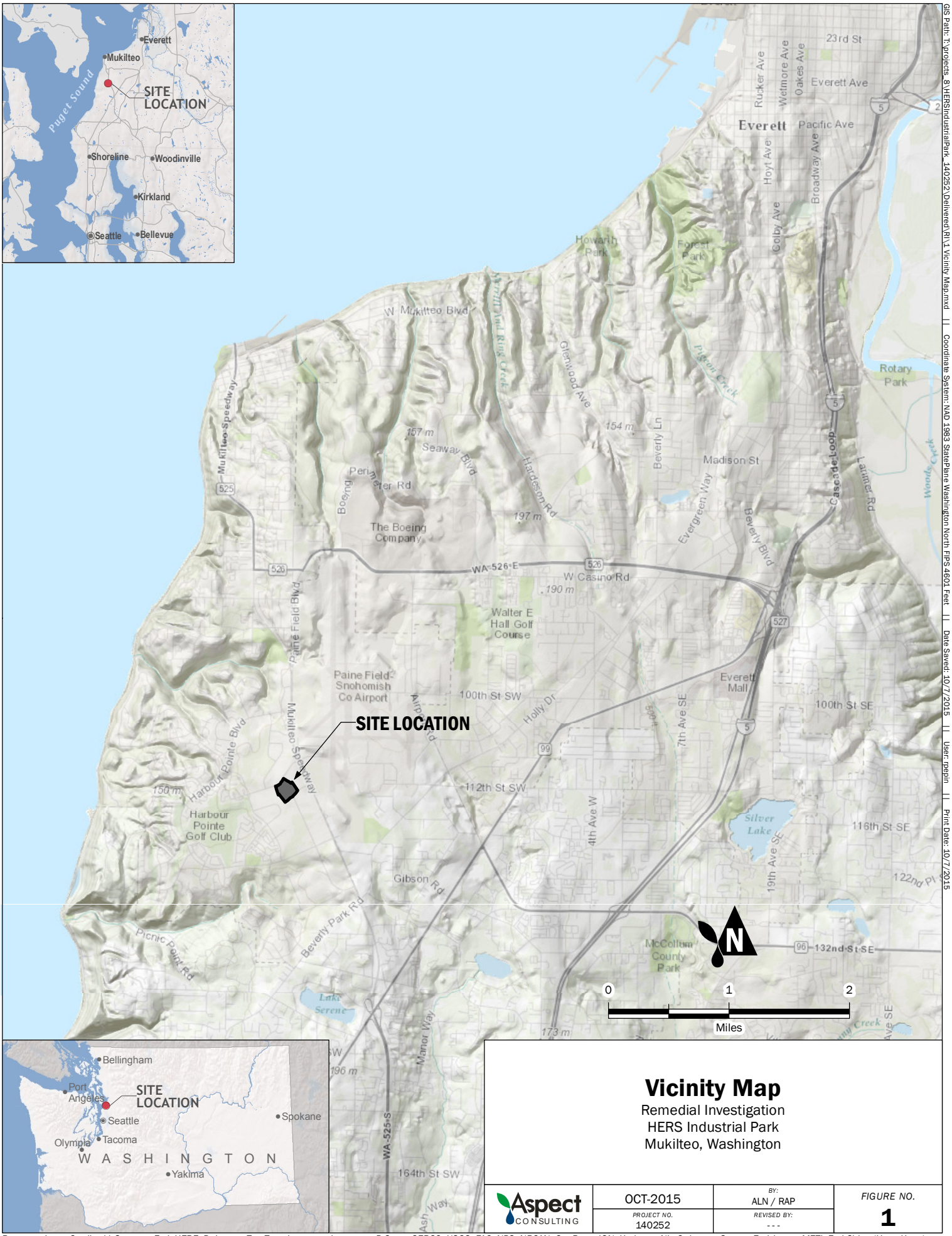
## Table 10.2 - Evaluation of Cleanup Alternatives for Reasonable Restoration Time Frame

Project #140252 - HERS Industrial Park, Mukilteo, Washington
Ecology Facility Site No. 127256, Cleanup Site No. 3971

| Reasonable Restoration Time Frame Criteria | Alternative 1<br>No Additional Action | Alternative 2<br>Biostimulation | Alternative 3<br>Permanganate Injection | Alternative 4<br>*In Situ* Soil Mixing with Permanganate | Alternative 5<br>Excavation of Accessible Source Contamination |
|---|---|---|---|---|---|
| Potential Risk | There is limited risk to human health and the environment because the Site is covered with buildings and asphalt pavement and is underlain by about 175 feet of Vashon Till. Groundwater contamination is generally limited to the weathered till within the upper 15 to 20 feet beneath the pavement and contamination has migrated about 125 feet laterally in the estimated 20 to 37 years since its release. Groundwater within the saturated till and in the underlying Esperance Sand formation are not hydraulically connected to the perched groundwater in the weathered till. Perched groundwater is not used and there are no downgradient wells installed in the underlying Esperance Sand formation, with the exception of MW-2D. Monitored natural attenuation would be performed to confirm the stability and natural attenuation of chlorinated VOCs at the Site and an environmental covenant would be recorded for the properties once groundwater concentrations decrease to below the cleanup levels. | | | | |
| Practicality of Achieving Shorter Time Frame | Not applicable. | Biostimulation enhances and complements the natural bioattenuation reactions occurring at the Site. Vinyl chloride would accumulate during biostimulation, and eventually bioattenuate through aerobic and anaerobic pathways. | Permanganate injection decreases chlorinated VOC contamination, but temporarily mobilizes natural metals and inhibits reductive dechlorination reactions until the groundwater recovers to natural conditions. | Permanganate soil mixing provides more complete contact for chlorinated VOC oxidization, but temporarily mobilizes natural metals and inhibits reductive dechlorination reactions until the groundwater recovers to natural conditions. | Excavation of accessible source contamination removes most of the soil contamination that impacts groundwater. |
| Impact to Current Use | None. | Requires about a week of injection activities outside of tenant space with limited business interruption. | Requires about a week of injection activities outside of tenant space with limited business interruption. | Because of business interruption, soil mixing would need to be performed when adjacent tenant spaces are unoccupied. Three or more months would be needed for design, permitting, and scheduling of specialized equipment. | Because of business interruption, excavation would need to be performed when adjacent tenant spaces are unoccupied. Two to three months would be needed for design, permitting, and scheduling. |
| Impact to Future Use | Provides more clarity of liability. Remaining environmental uncertainty impacts transactions and business decisions. | Provides more clarity of liability and reduces environmental uncertainty. | | | |
| Availability of Alternate Water Supplies | No impact. Properties connected to public water supply. | | | | |
| Likely Effectiveness and Reliability of Institutional Controls | An environmental covenant would be recorded for the impacted parcels once the remedial action objectives are satisfied. The environmental covenant would require a long-term groundwater monitoring plan and would require notification to Ecology for any soil disrupting activities that have the potential to spread contamination. | | | | |
| Ability to Control and Monitor Contaminant Migration | Monitored natural attenuation would be performed to confirm the stability and natural attenuation of chlorinated VOCs at the Site. | | | | |
| Toxicity of Contamination | Does not include additional activities that affect toxicity of contamination. | Enhanced reductive dechlorination of PCE, TCE, and DCE would lead to an accumulation of vinyl chloride, which has higher toxicity than PCE and TCE. Biostimulation decreases total mass of chlorinated VOCs and the concentrations of vinyl choride would decrease after parent compounds attenuate and groundwater recovers allowing degradation through aerobic and anaerobic degradation pathways. | Natural metals are mobilized by the low pH of groundwater during treatment and insoluble trivalent chromium can be oxidized to more toxic and soluble hexavalent chromium. Metals attenuate as pH recovers and hexavalent chromium can be reduced to trivalent chromium as natural groundwater conditions recover. | | Excavation removes, but does not alter, the toxicity of contamination. |
| Potential for Contaminant Degradation Over Time | Reductive dechlorination of PCE and TCE is observed in groundwater with some accumulation of vinyl chloride. The appearance of reductive dechlorination daughter products indicates that natural bioattenuation is occurring in shallow groundwater within the weathered till. The concentrations are anticipated to decrease because of depleted parent compounds, recovering groundwater conditions, sorption, and aneraobic and aerobic degradaton pathways. | Bioattenuation would significantly increase the reductive dechlorination of PCE and TCE and complement natural bioattenuation reactions. Atlhough vinyl chloride would accumulate by PCE and TCE reduction, vinyl chloride concentrations would decrease after depletion of parent compounds and continued bioattenuation. | Chlorinated VOCs would be oxidized when contacted with permanganate, and residual permanganate would remain in groundwater for an extended period to oxidize chlorinated VOCs that desorb, dissolve, leach, or migrate through the treatment area. | | The removal of source contamination would enhance the natural attenuation of residual groundwater contamination outside of the excavation areas. |
| **Conclusions** | Alternative 1 does not increase the restoration time frame. | Alternative 2 increases the restoration time frame by enhancing and complementing the natural bioattenuation of chlorinated VOCs in the source area. | Alternative 3 increases the restoration time frame by rapidly oxidizing accessible contamination with permanganate. Permanganate remains stable for groundwater for an extended period, which allows the oxidization of chlorinated VOCs that desorb, leach, dissolve, or migrate through the treatment area. Permanganate treatment inhibits the natural bioattenuation of residual chlorinated VOCs. | Alternative 4 increases the restoration time frame by rapidly oxidizing accessible contamination with permanganate. *In situ* soil mixing provides better contact between oxidant and contaminant than injection. Permanganate remains stable for groundwater for an extended period, which allows the oxidization of chlorinated VOCs that desorb, leach, dissolve, or migrate through the treatment area. Alternative 4 would be hardest to implement because it would require vacancies in the adjacent lease spaces and three or more months for design, permitting, and scheduling of specialized equipment. | Alternative 5 removes accessible source contamination from beneath the parking lot, but does not address contamination that is beneath the building and adjoing soil or below the excavation bottom. Alternative 5 would be difficult to implement because it would require vacancies in the adjacent lease spaces and two to three months for design, permitting, and scheduling. |

Notes:
DCE = dichloroethylene, PCE = tetrachloroethylene, TCE = trichloroethylene, VOC = volatile organic compounds

# Figures



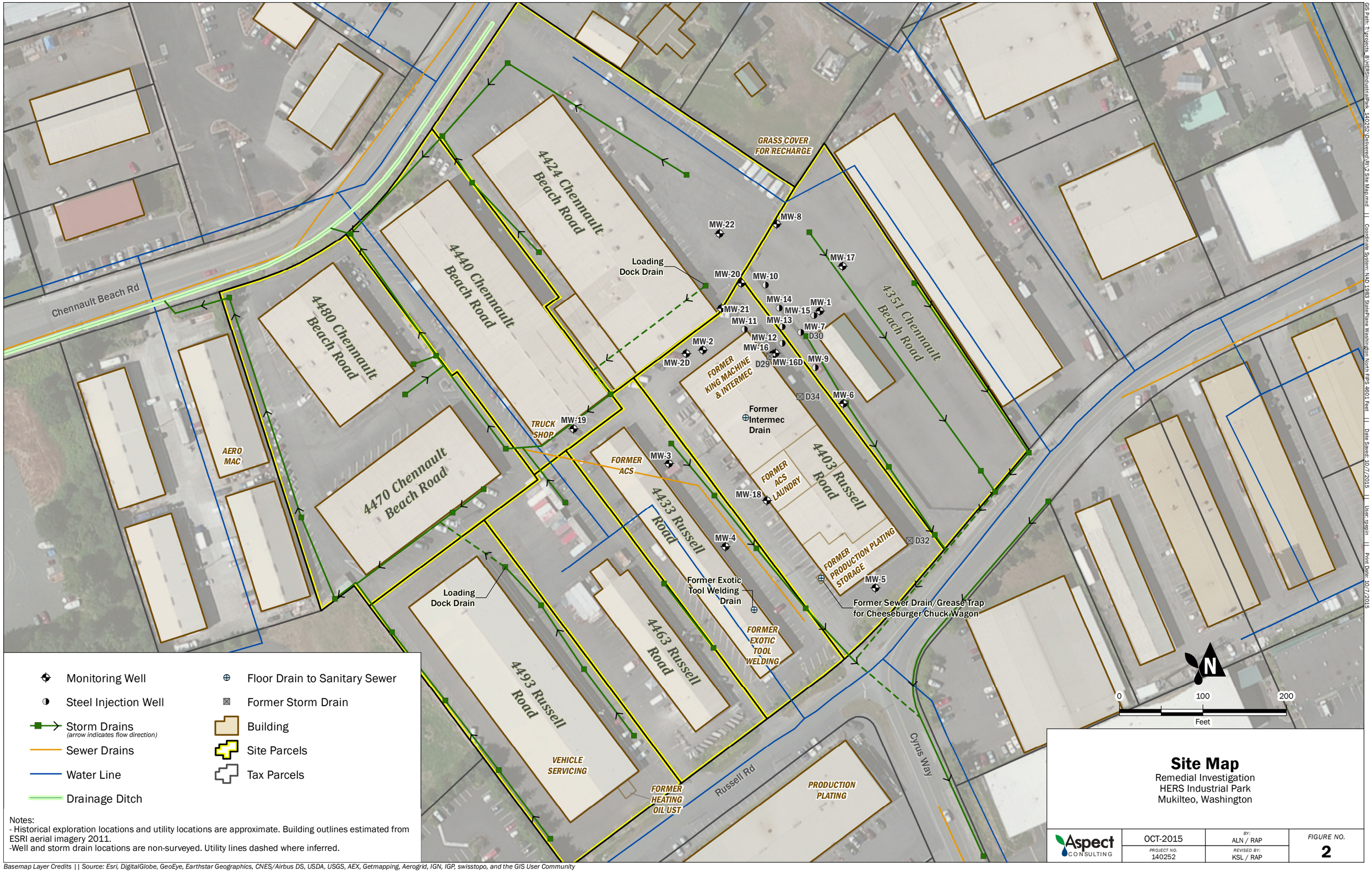

# Vicinity Map

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| | | | |
|---|---|---|---|
| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 1 |
| | PROJECT NO. 140252 | REVISED BY: --- | |

Basemap Layer Credits || Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Copyright:© 2014 Esri

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\RI\4 Vicinity Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpepin || Print Date: 10/7/2015




- Monitoring Well
- Steel Injection Well
- Storm Drains (arrow indicates flow direction)
- Sewer Drains
- Water Line
- Drainage Ditch
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Building
- Site Parcels
- Tax Parcels

Notes:
- Historical exploration locations and utility locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed. Utility lines dashed where inferred.

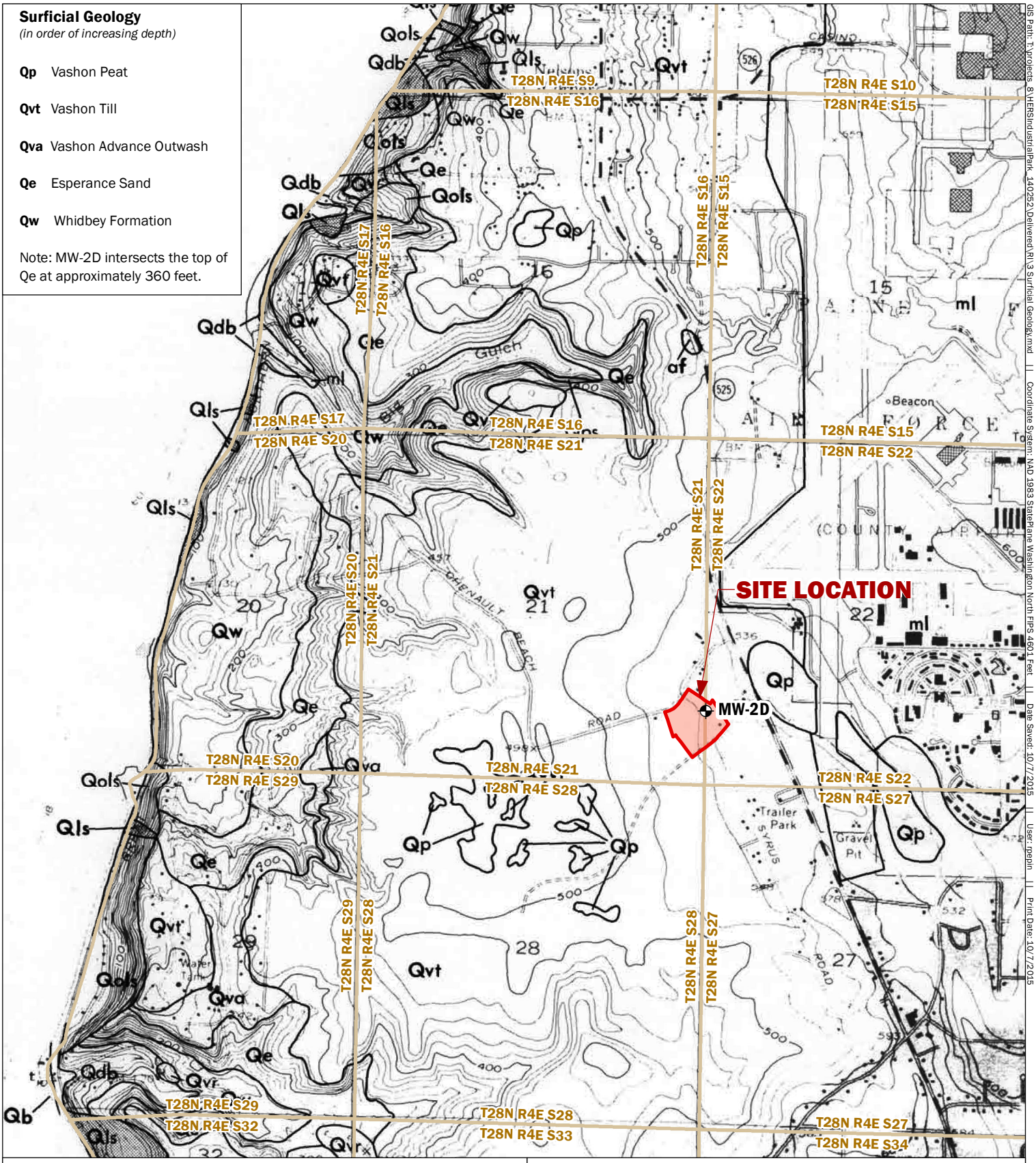
# Site Map

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| | | | |
|---|---|---|---|
| Aspect Consulting | OCT-2015 | BY: ALN / RAP | FIGURE NO. 2 |
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Ph3 Site Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: mgiin || Print Date: 10/7/2015



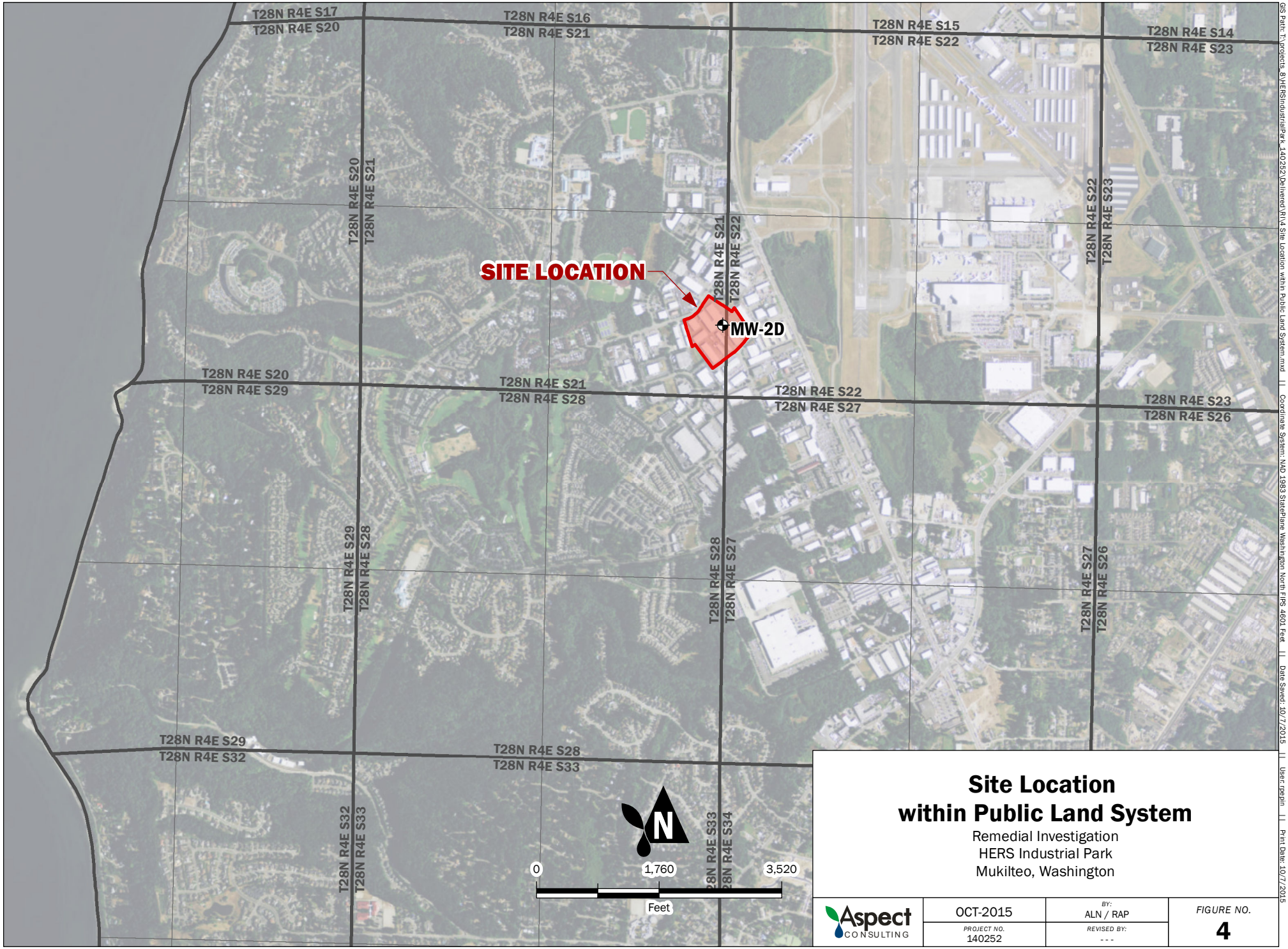

Geology Source: Preliminary Surficial Geologic Map of the Mukilteo and Everett Quandrangles, Snohomish County, Washington. Mackey Smith, 1976

# Surficial Geology

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 3 |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\Industrial Park_140252\Delivered\RI\3 Surficial Geology.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpepin || Print Date: 10/7/2015



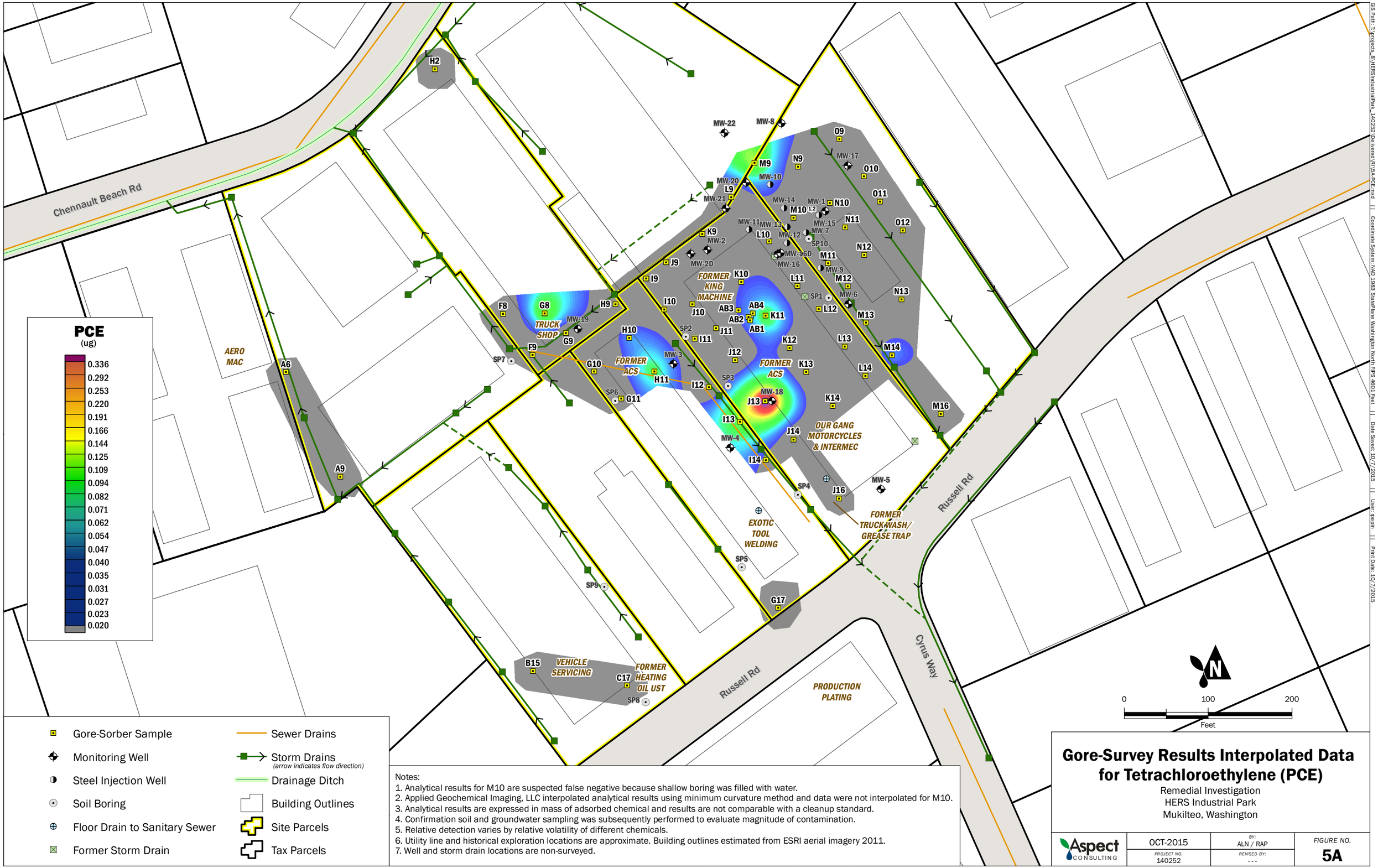

# Site Location within Public Land System

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 4 |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

*Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community*

GIS Path: T:\projects_8\HERSIndustrialPark_140252\Delivered\R\4 Site Location within Public Land System.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpepin || Print Date: 10/7/2015



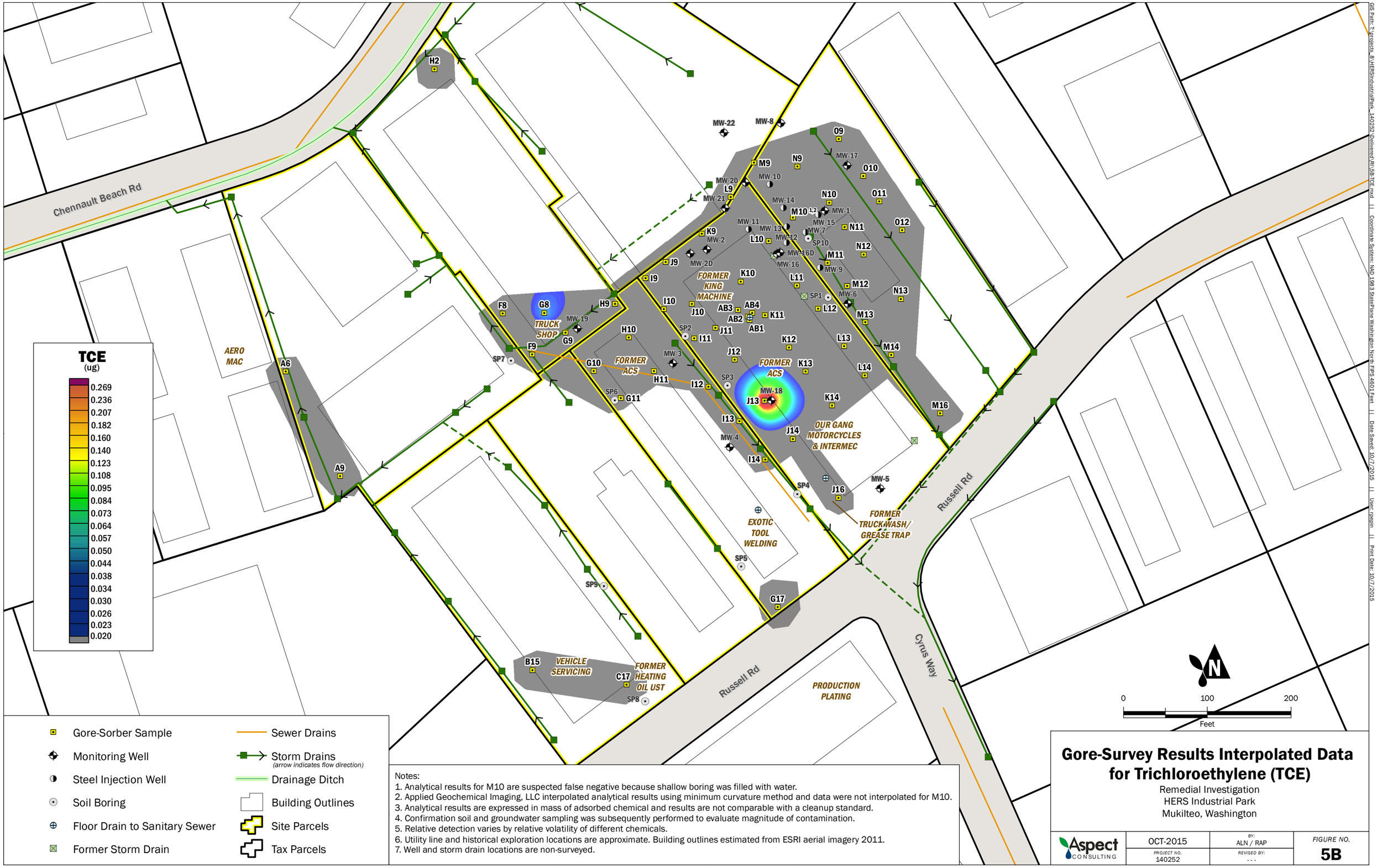

Notes:
1. Analytical results for M10 are suspected false negative because shallow boring was filled with water.
2. Applied Geochemical Imaging, LLC interpolated analytical results using minimum curvature method and data were not interpolated for M10.
3. Analytical results are expressed in mass of adsorbed chemical and results are not comparable with a cleanup standard.
4. Confirmation soil and groundwater sampling was subsequently performed to evaluate magnitude of contamination.
5. Relative detection varies by relative volatility of different chemicals.
6. Utility line and historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
7. Well and storm drain locations are non-surveyed.

# Gore-Survey Results Interpolated Data for Tetrachloroethylene (PCE)

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 5A |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\Industrial\Park_140252\Delivered\RI\SA-PCE.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rapin || Print Date: 10/7/2015



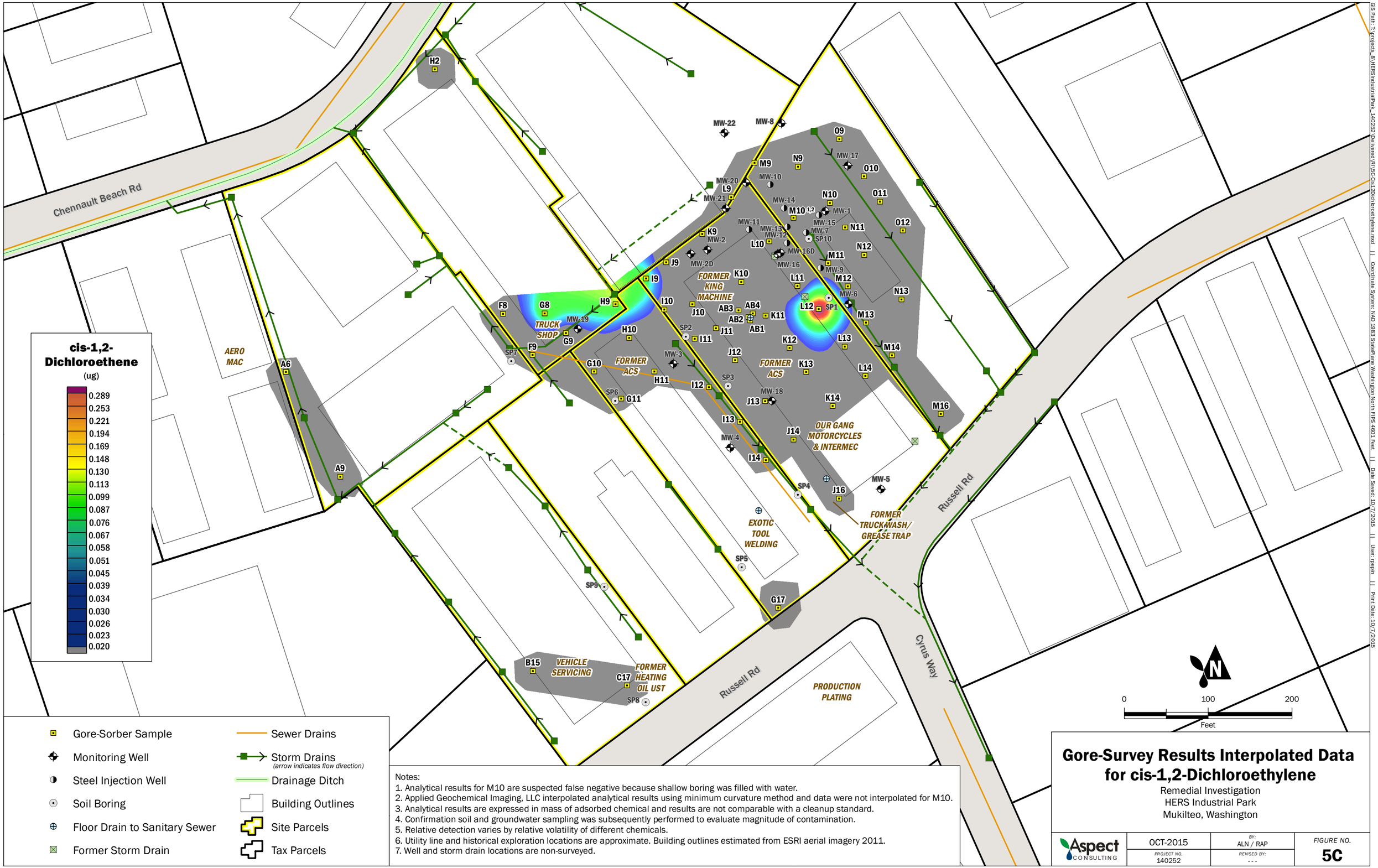

Notes:
1. Analytical results for M10 are suspected false negative because shallow boring was filled with water.
2. Applied Geochemical Imaging, LLC interpolated analytical results using minimum curvature method and data were not interpolated for M10.
3. Analytical results are expressed in mass of adsorbed chemical and results are not comparable with a cleanup standard.
4. Confirmation soil and groundwater sampling was subsequently performed to evaluate magnitude of contamination.
5. Relative detection varies by relative volatility of different chemicals.
6. Utility line and historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
7. Well and storm drain locations are non-surveyed.

# Gore-Survey Results Interpolated Data for Trichloroethylene (TCE)

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect Consulting | OCT-2015 | BY: ALN / RAP | FIGURE NO. 5B |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Pt\SB-TCE.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rjaplin || Print Date: 10/7/2015



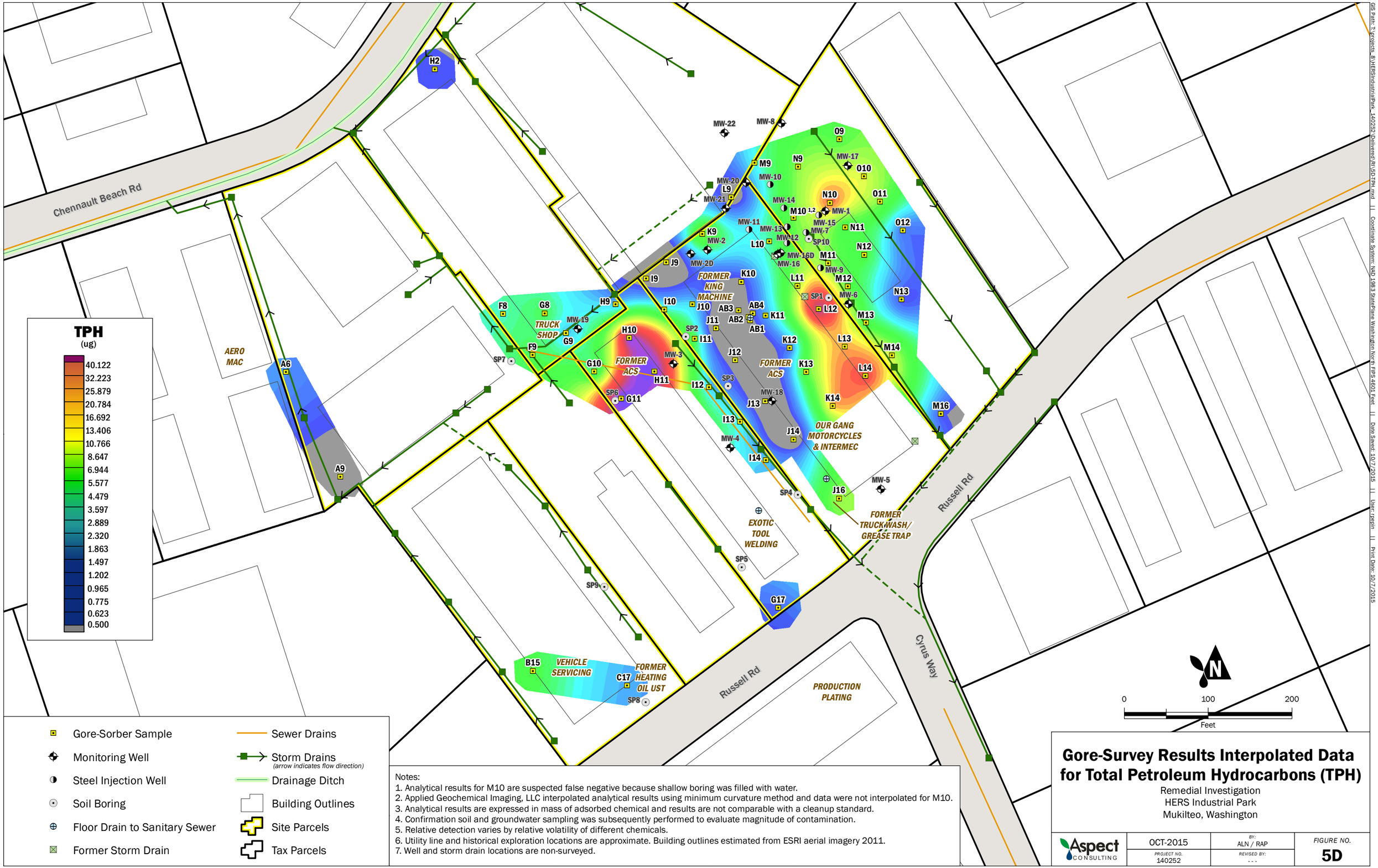

Notes:
1. Analytical results for M10 are suspected false negative because shallow boring was filled with water.
2. Applied Geochemical Imaging, LLC interpolated analytical results using minimum curvature method and data were not interpolated for M10.
3. Analytical results are expressed in mass of adsorbed chemical and results are not comparable with a cleanup standard.
4. Confirmation soil and groundwater sampling was subsequently performed to evaluate magnitude of contamination.
5. Relative detection varies by relative volatility of different chemicals.
6. Utility line and historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
7. Well and storm drain locations are non-surveyed.

# Gore-Survey Results Interpolated Data for cis-1,2-Dichloroethylene

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| | | | |
|---|---|---|---|
| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 5C |
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\Industrial\Park_140252\Delivered\PI\SC\Cis120ichloroethylene.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpapin || Print Date: 10/7/2015



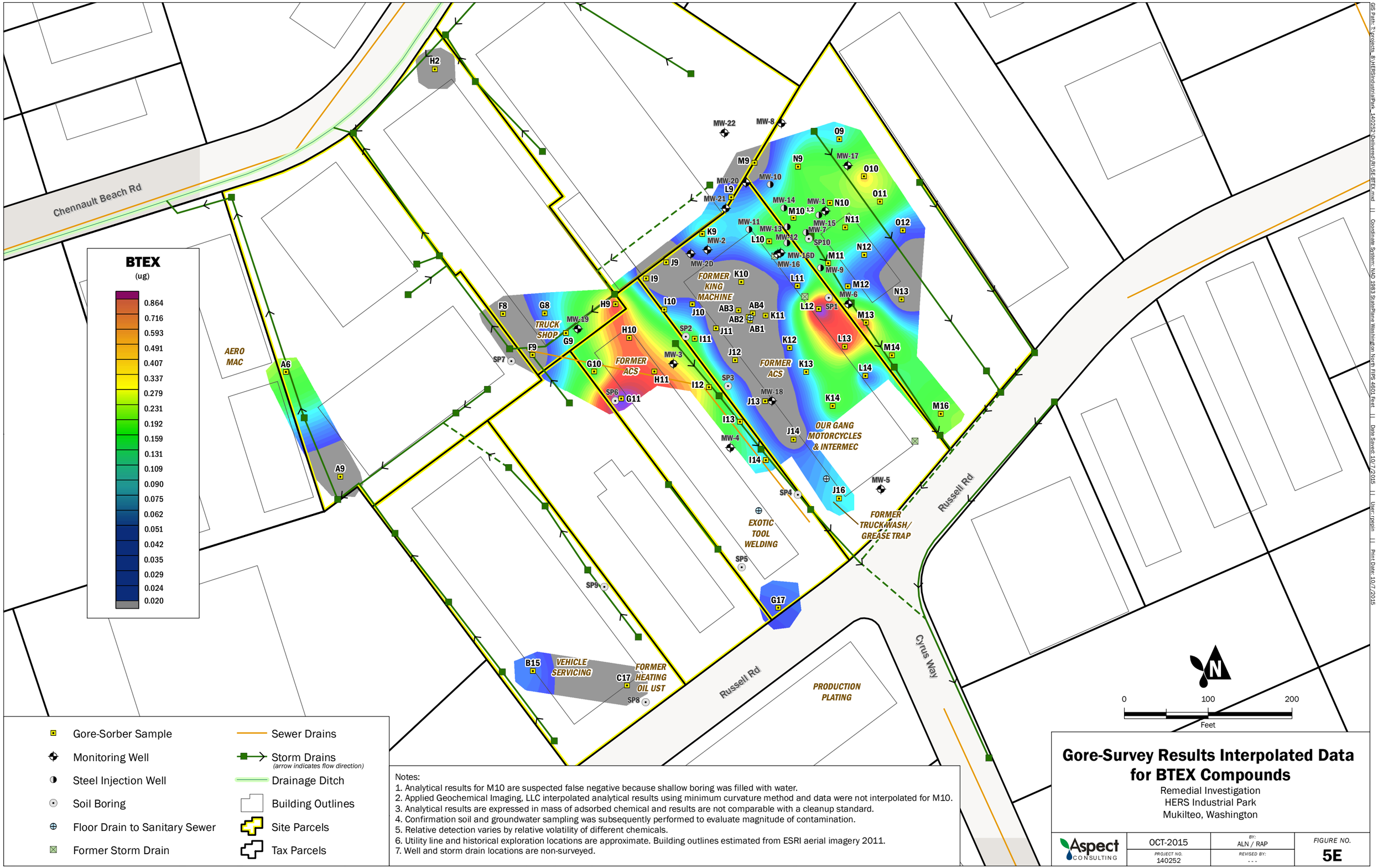

Notes:
1. Analytical results for M10 are suspected false negative because shallow boring was filled with water.
2. Applied Geochemical Imaging, LLC interpolated analytical results using minimum curvature method and data were not interpolated for M10.
3. Analytical results are expressed in mass of adsorbed chemical and results are not comparable with a cleanup standard.
4. Confirmation soil and groundwater sampling was subsequently performed to evaluate magnitude of contamination.
5. Relative detection varies by relative volatility of different chemicals.
6. Utility line and historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
7. Well and storm drain locations are non-surveyed.

# Gore-Survey Results Interpolated Data for Total Petroleum Hydrocarbons (TPH)

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 5D |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\Industrial\Park_140252\Delivered\Ph1SD\TPH.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpelin || Print Date: 10/7/2015




Notes:
1. Analytical results for M10 are suspected false negative because shallow boring was filled with water.
2. Applied Geochemical Imaging, LLC interpolated analytical results using minimum curvature method and data were not interpolated for M10.
3. Analytical results are expressed in mass of adsorbed chemical and results are not comparable with a cleanup standard.
4. Confirmation soil and groundwater sampling was subsequently performed to evaluate magnitude of contamination.
5. Relative detection varies by relative volatility of different chemicals.
6. Utility line and historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
7. Well and storm drain locations are non-surveyed.

# Gore-Survey Results Interpolated Data for BTEX Compounds

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 5E |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: --- | |

GIS Path: T:\projects_8\HERS\Industrial Park_140252\Delivered\Pt\SE-BTEX.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpeplin || Print Date: 10/7/2015

**Gore Survey - Interpolated PCE (µg)**

0.336
0.292
0.253
0.220
0.191
0.166
0.144
0.125
0.109
0.094
0.082
0.071
0.062
0.054
0.047
0.040
0.035
0.031
0.027
0.023
0.020

| MW-22 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jul-15 | 10-11 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-20 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Apr-15 | 10 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-21 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jul-15 | 9-10 | 0.048 | **0.056** | <0.05 | <0.05 |

| MW-16D | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Apr-15 | 15 | **0.13** | **1.9** | <0.05 | <0.05 |
| Apr-15 | 25 | <0.025 | **0.042** | <0.05 | <0.05 |
| Apr-15 | 45 | 0.037 | **1.3** | <0.05 | <0.05 |
| Apr-15 | 65 | <0.025 | **0.067** | <0.05 | <0.05 |
| Apr-15 | 90 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-2D | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jul-15 | 55 | <0.025 | <0.02 | <0.05 | <0.05 |
| Jul-15 | 190 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-16 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jan-15 | 15.5-16 | **0.066** | **4.9** | 0.066 | <0.05 |

| MW-19 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jan-15 | 15-15.5 | <0.025 | <0.02 | <0.05 | <0.05 |

| AB-3 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jul-15 | 11 | <0.025 | <0.02 | <0.05 | <0.05 |

| AB-1 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jul-15 | 2.5 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-17 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jan-15 | 10-11.5 | <0.025 | <0.02 | <0.05 | <0.05 |

| MW-18 | Depth | PCE | TCE | cDCE | VC |
|---|---|---|---|---|---|
| Jan-15 | 10.5-11 | <0.025 | <0.02 | <0.05 | <0.05 |

Notes:
- All results are expressed in milligrams per kilogram. Depths are expressed in feet below ground surface.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL) .
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
-Analytical results for M10 were not interpolated because shllow boring was filled with water.
- Historical exploration locations and utility locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

- Gore-Sorber Sample
- Monitoring Well
- Steel Injection Well
- Soil Boring
- Estimated Chlorinated VOC Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Site Parcels
- Tax Parcels

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 0.05 | 0.03 | - | - |

0 70 140
Feet

# Soil Sampling Results Chlorinated Solvents

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect Consulting | OCT-2015 | BY: ALN / RAP | FIGURE NO. 6A |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\PLbA Soil Results Chlorinated Solvents.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: mepin || Print Date: 10/7/2015

**Gore Survey - Interpolated TPH (µg)**

40.122
32.223
25.879
20.784
16.692
13.406
10.766
8.647
6.944
5.577
4.479
3.597
2.889
2.320
1.863
1.497
1.202
0.965
0.775
0.623
0.500

| MW-22 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jul-15 | 10-11 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-20 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Apr-15 | 10 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-21 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jul-15 | 9-10 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-16D | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Apr-15 | 15 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |
| Apr-15 | 25 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |
| Apr-15 | 45 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |
| Apr-15 | 65 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |
| Apr-15 | 90 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-2D | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jul-15 | 55 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |
| Jul-15 | 190 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-16 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jan-15 | 15.5-16 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-19 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jan-15 | 15-15.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| AB-3 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jul-15 | 11 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |

| AB-1 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jul-15 | 2.5 | - | - | - | <0.03 | <0.05 | <0.05 | <0.1 |

| MW-17 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jan-15 | 10-11.5 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| SP10 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jun-05 | 10-11 | <3 | <25 | <50 | <0.03 | 0.1 | <0.05 | <0.2 |

| MW-18 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jan-15 | 10.5-11 | <2 | <50 | <250 | <0.03 | <0.05 | <0.05 | <0.1 |

| SP8 | Depth | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|---|
| Jun-05 | 7.5-8 | <3 | 33 | 520 | <0.03 | 0.07 | <0.05 | <0.2 |

Notes:
- All results are expressed in milligrams per kilogram. Depths are expressed in feet below ground surface.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
-Analytical results for M10 were not interpolated because shallow boring was filled with water.
- Historical exploration locations are approximate. Utilities are dashed where inferred. Building outlines estimated from ESRI aerial imagery 2011.
-Wells and storm drain locations are non-surveyed.

Gore-Sorber Sample
Monitoring Well
Steel Injection Well
Soil Boring
Floor Drain to Sanitary Sewer
Former Storm Drain
Sewer Drains
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

**Screening Levels**

| | TPH-Gx | TPH-Dx | TPH-Oil | B | T | E | X |
|---|---|---|---|---|---|---|---|
| Method A CUL | 100 | 2,000 | 2,000 | 0.03 | 7 | 6 | 9 |

0 70 140
Feet

# Soil Sampling Results
# Petroleum Hydrocarbons

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING | OCT-2015 | PROJECT NO. 140252 | BY: ALN / RAP | REVISED BY: KSL / RAP | FIGURE NO. 6B

GIS Path: T:\projects_8\HERSIndustrialPark_140252\Delivered\Bit\GB Soil Results TPH.mxd | Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet | Date Saved: 10/7/2015 | User: mpiln | Print Date: 10/7/2015

| MW-22 | Depth | As | Pb |
|---|---|---|---|
| Jul-15 | 10-11 | 2.04 | 2.05 |

| MW-20 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Apr-15 | 10 | 2.13 | 18.7 | 8.16 | 1.96 | <1 |

| MW-21 | Depth | As | Pb |
|---|---|---|---|
| Jul-15 | 9-10 | 2.25 | 2.05 |

| MW-16 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Jan-15 | 15.5-16 | 2.06 | 24.9 | 9.75 | 1.63 | <1 |

| MW-17 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Jan-15 | 10-11.5 | 2.28 | 34.4 | 19.7 | 2.31 | <1 |

| SP10 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Jun-05 | 10-11 | 7.9 | 35 | 13 | 13 | 0.04 |

| MW-19 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Jan-15 | 15-15.5 | 2.61 | 34.4 | 16.5 | 2.07 | <1 |

| MW-18 | Depth | As | Ba | Cr | Pb | Hg |
|---|---|---|---|---|---|---|
| Jan-15 | 10.5-11 | 2.85 | 37.2 | 23.7 | 2.15 | <1 |

Notes:
- All results are expressed in milligrams per kilogram. Depths are expressed in feet below ground surface.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL)
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL
- Historical exploration locations and utility locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

Monitoring Well
Steel Injection Well
Soil Boring
Floor Drain to Sanitary Sewer
Former Storm Drain
Sewer Drains
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

| Screening Levels | As | Ba | Cr (III) | Pb | Hg |
|---|---|---|---|---|---|
| Method A CUL | 20 | NA | 2,000 | 250 | 2 |

N

0 70 140
Feet

# Soil Sampling Results
# RCRA Metals

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 6C
PROJECT NO. 140252 | REVISED BY: KSL / RAP

GIS Path: T:\projects_8\HERSIndustrialPark_140252\Delivered\Pt\GC Soil Results RCRA Metals.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: mpinn || Print Date: 10/7/2015

**Gore Survey - Interpolated PCE (µg)**

0.336
0.292
0.253
0.220
0.191
0.166
0.144
0.125
0.109
0.094
0.082
0.071
0.062
0.054
0.047
0.040
0.035
0.031
0.027
0.023
0.020

| MW-8 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | <0.2 | <0.2 | <0.2 | <0.2 |
| May-06 | <2 | <2 | <2 | <2 |
| Jan-07 | <0.2 | <0.2 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-22 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-2 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | **4.1** | 0.91 | <0.2 |
| May-06 | <2 | **11** | 5 | <0.2 |
| Jan-07 | <0.2 | **6.8** | 0.75 | <0.2 |
| Apr-08 | <0.2 | 3 | 0.35 | <0.2 |
| Jan-12 | <0.2 | 3.5 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | 4.7 | <1 | <0.2 |

| MW-2D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | <1 | <1 | <1 | <0.2 |

| SP2 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | **7** | 6 | <2 |

| MW-19 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | 1.2 | <1 | <0.2 |

| SP7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

| SP6 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

| MW-3 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | <0.2 | 0.96 | <0.2 |
| Jan-07 | <0.2 | <0.2 | 2.9 | <0.2 |
| Apr-08 | <0.2 | <0.2 | 1.4 | <0.2 |
| Jan-15 | <1 | <1 | 1.5 | <0.2 |
| Aug-15 | <1 | <1 | 1.5 | <0.2 |

| SP3 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | 2 | 2 | 53 | **12** |

| SP9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

| MW-4 | PCE | TCE | | |
|---|---|---|---|---|
| Sep-05 | <0.2 | <0.2 | 0.96 | <0.2 |
| Apr-08 | <0.2 | <0.2 | 1.4 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| SP8 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Analytical results for M10 were not interpolated because shallow boring was filled with water.
- Historical exploration locations are approximate. Utility locations are dashed where inferred. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

- Gore-Sorber Sample
- Monitoring Well
- Steel Injection Well
- Soil Boring
- Estimated Chlorinated VOC Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Site Parcels
- Tax Parcels

See Figure 7B for Detail

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-6 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | 3.9 | 0.26 | 0.33 | <0.2 |
| May-06 | <2 | <2 | <2 | <0.2 |
| Jan-07 | <0.2 | <0.2 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| SP1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | **5** | <2 | <2 | <2 |

| MW-18 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | 1.2 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-5 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | <0.2 | 0.43 | <0.2 |
| Jan-07 | <0.2 | <0.2 | 0.61 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| SP4 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

| SP5 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | <2 | <2 | <2 | <2 |

N

0 70 140
Feet

# Groundwater Sampling Results Chlorinated Solvents

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING

| OCT-2015 | BY: ALN / RAP | FIGURE NO. 7A |
|---|---|---|
| PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Pt1\TA\GW Results Chorinated Solvents.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rrepin || Print Date: 10/7/2015

**Gore Survey - Interpolated PCE (µg)**

0.336
0.292
0.253
0.220
0.191
0.166
0.144
0.125
0.109
0.094
0.082
0.071
0.062
0.054
0.047
0.040
0.035
0.031
0.027
0.023
0.020

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-20 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | 17 | <1 | <1 | <0.2 |
| Aug-15 | 25 | <1 | <1 | <0.2 |

| MW-21 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | 85 | 280 | 55 | 1.3 |

| MW-11 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | 58 | 270 | 42 | 1.4 |
| Jan-07 | 150 | 700 | 140 | <4 |
| Apr-08 | 14 | 130 | 11 | <0.2 |
| Mar-09 | 8.4 | 88 | 5.2 | <0.2 |
| Sep-09 | 220 | 580 | 180 | <0.2 |
| Jan-12 | 27 | 130 | 9.5 | <1 |
| Jan-15 | 12 | 54 | 7.4 | <0.2 |
| Aug-15 | 69 | 190 | 66 | 1.3 |

| MW-13 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | 9 | 270 | 12 | 1.4 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 11 | 44 | 9.1 | 1.9 |
| Apr-08 | 4.2 | 25 | 9.6 | 2.9 |
| Jan-15 | Well was full of silty sand, not sampled | | | |

| MW-12 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | 180 | 1,700 | 290 | 23 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 140 | 480 | 240 | 8.9 |
| Apr-08 | 99 | 320 | 220 | 17 |
| Mar-09 | 85 | 230 | 130 | 8.2 |
| Sep-09 | 95 | 230 | 160 | 9.1 |
| Jan-12 | 54 | 99 | 60 | 6.3 |
| Jan-15 | 14 | 20 | 11 | 0.3 |
| Aug-15 | 28 | 59 | 40 | 2.8 |

| MW-16 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | 110 | 410 | 270 | 5.8 |
| Aug-15 | 110 | 120 | 290 | 6.5 |

| MW-16D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | <1 | 24 | 1 | <0.2 |
| Aug-15 | <1 | 10 | 1.1 | <0.2 |

| SP10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | 300 | 42,000 | 290 | 21 |

| MW-10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | 23 | <2 | <2 | <0.2 |
| Jan-07 | 11 | 0.54 | <0.2 | <0.2 |
| Apr-08 | 22 | 0.6 | <0.2 | <0.2 |
| Mar-09 | 18 | 0.53 | <0.2 | <0.2 |
| Sep-09 | 4 | <0.2 | <0.2 | 4.1 |
| Jan-12 | 3.9 | <0.2 | <0.2 | <0.2 |
| Jan-15 | 7.5 | <1 | <1 | <0.2 |
| Aug-15 | 3.2 | <1 | <1 | <0.2 |

| MW-14 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | 17 | <2 | <0.2 |
| Jan-07 | <0.2 | 2.6 | 4.3 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | Well was abandoned | | | |

| MW-15 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | 26 | 3 | 0.9 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 28 | 1,000 | <10 | <10 |
| Apr-08 | 0.26 | 4.8 | <0.2 | <0.2 |
| Jan-15 | <1 | 1.6 | <1 | 0.69 |
| Aug-15 | <1 | 5.8 | 1.5 | 0.96 |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | 1.3 | 0.25 | <0.2 |
| May-06 | <2 | <2 | 2 | 0.4 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 3 | 2.5 | 0.59 |
| Apr-08 | <0.2 | 6.4 | 3.3 | 0.76 |
| Mar-09 | <0.2 | 27 | 3.3 | 0.51 |
| Sep-09 | <2 | 1.1 | 0.98 | <0.2 |
| Jan-12 | 15 | 1,100 | 15 | <10 |
| Jan-15 | 2.3 | 96 | 5.2 | 4.1 |
| Aug-15 | 5.3 | 200 | 6.9 | 4.0 |

| MW-7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | 460 | 7,000 | 140 | <50 |
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| May-06 | 10 | 21 | <2 | 0.7 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 0.22 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.33 | 1 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

MW-20, MW-21, MW-11, MW-13, MW-12, MW-16, MW-16D, MW-10, MW-14, MW-15, MW-17, MW-1, MW-7, MW-9, SP10, SP1, SP2, AB-3, D29, D30, D34, L9, L10, L12, M10, M11, N9, N10, N11, I9, I10, I11, J9, J11, O11

- Gore-Sorber Sample
- Monitoring Well
- Soil Boring
- Steel Injection Well
- Estimated Chlorinated VOC Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Site Parcels
- Tax Parcels

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Analytical results for M10 were not interpolated because shallow boring was filled with water.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

0 25 50 Feet

# Groundwater Sampling Results Detail Chlorinated Solvents

HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING

| OCT-2015 | BY: ALN / RAP | FIGURE NO. 7B |
|---|---|---|
| PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\RI\TB GW Results Chorinated Solvents detail.mxd | | Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet | | Date Saved: 10/7/2015 | | User: rpepin | | Print Date: 10/7/2015

**Gore Survey - Interpolated TPH (µg)**

40.122
32.223
25.879
20.784
16.692
13.406
10.766
8.647
6.944
5.577
4.479
3.597
2.889
2.320
1.863
1.497
1.202
0.965
0.775
0.623
0.500

| MW-22 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Aug-15 | <100 | 300 x | <250 | - | - | - |

| MW-10 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | <50 | <250 | - | - | - |
| Aug-15 | <100 | 140 x | <250 | - | - | - |

| MW-20 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Apr-15 | <100 | <50 | <250 | - | - | - |
| Aug-15 | <100 | 64 x | <250 | - | - | - |

| MW-21 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Aug-15 | 180 x | 130 x | <250 | - | - | - |

| MW-11 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | <50 | <250 | - | - | - |
| Aug-15 | 150 x | 120 x | <250 | - | - | - |

| MW-2 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | <60 | <300 | - | - | - |
| Aug-15 | <100 | <50 | <250 | - | - | - |

| MW-2D | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Aug-15 | <100 | <50 | <250 | - | - | - |

| MW-16 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | 280 | 330 x | <250 | - | - | - |
| Aug-15 | 120 x | 220 x | <250 | - | - | - |

| MW-16D | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Apr-15 | <100 | **750 x** | **540 x** | - | - | - |
| Aug-15 | <100 | 460 x | <250 | - | <50 | <250 |

| MW-19 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | **660 x** | **500 x** | - | - | - |
| Aug-15 | <100 | 450 x | 410 x | - | <50 | <250 |

| SP7 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <150 | <300 |

| SP2 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <140 | <280 |

| SP6 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | - | - | - |

| MW-3 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | **600 x** | 350 x | - | - | - |
| Aug-15 | <100 | **700 x** | 420 x | - | <50 | <250 |

| SP3 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <130 | <250 |

| MW-4 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 150 x | <250 | - | - | - |
| Aug-15 | <100 | <50 | <250 | - | - | - |

| SP9 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | - | - | - |

| SP5 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | - | - | - |

| SP8 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <130 | <250 |

| MW-8 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | <50 | <250 | - | - | - |
| Aug-15 | <100 | 73 x | <250 | - | - | - |

| MW-17 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 300 x | <250 | - | - | - |
| Aug-15 | <100 | 200 x | <250 | - | - | - |

| MW-1 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 390 x | 270x | - | - | - |
| Aug-15 | 120 x | 330 x | <250 | - | - | - |

| MW-15 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 370 x | 370 x | - | - | - |
| Aug-15 | <100 | 300 x | <250 | - | - | - |

| MW-7 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 130 x | 340 x | - | - | - |
| Aug-15 | <100 | 220 x | <250 | - | - | - |

| SP10 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | 650 | <130 | <250 |

| MW-12 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 56 x | <250 | - | - | - |
| Aug-15 | <100 | 110 x | <250 | - | - | - |

| MW-9 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 110 x | <250 | - | - | - |
| Aug-15 | 200 | **830 x** | **950 x** | - | <50 | <250 |

| MW-6 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 84 x | <250 | - | - | - |
| Aug-15 | <100 | **590 x** | 330 x | - | <50 | <250 |

| SP1 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <130 | <250 |

| MW-18 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 96 x | <250 | - | - | - |
| Aug-15 | <100 | 110 x | <250 | - | - | - |

| MW-5 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jan-15 | <100 | 59 x | <250 | - | - | - |
| Aug-15 | <100 | 58 x | <250 | - | - | - |

| SP4 | TPH-Gx | TPH-Dx | TPH-Oil | TPH-Gx (silica) | TPH-Dx (silica) | TPH-Oil (silica) |
|---|---|---|---|---|---|---|
| Jun-05 | - | - | - | <50 | <130 | <250 |

## Screening Levels

| | TPH-Gx | TPH-Dx | TPH-Oil |
|---|---|---|---|
| **Method A CUL** | **1,000** | **500** | **500** |

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Analytical results for M10 were not interpolated because shallow boring was filled with water.
- Historical exploration locations are approximate. Utility locations are dashed where inferred. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

- Gore-Sorber Sample
- Monitoring Well
- Soil Boring
- Steel Injection Well
- Approximate TPH Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Client Properties
- Tax Parcels

N

0 70 140
Feet

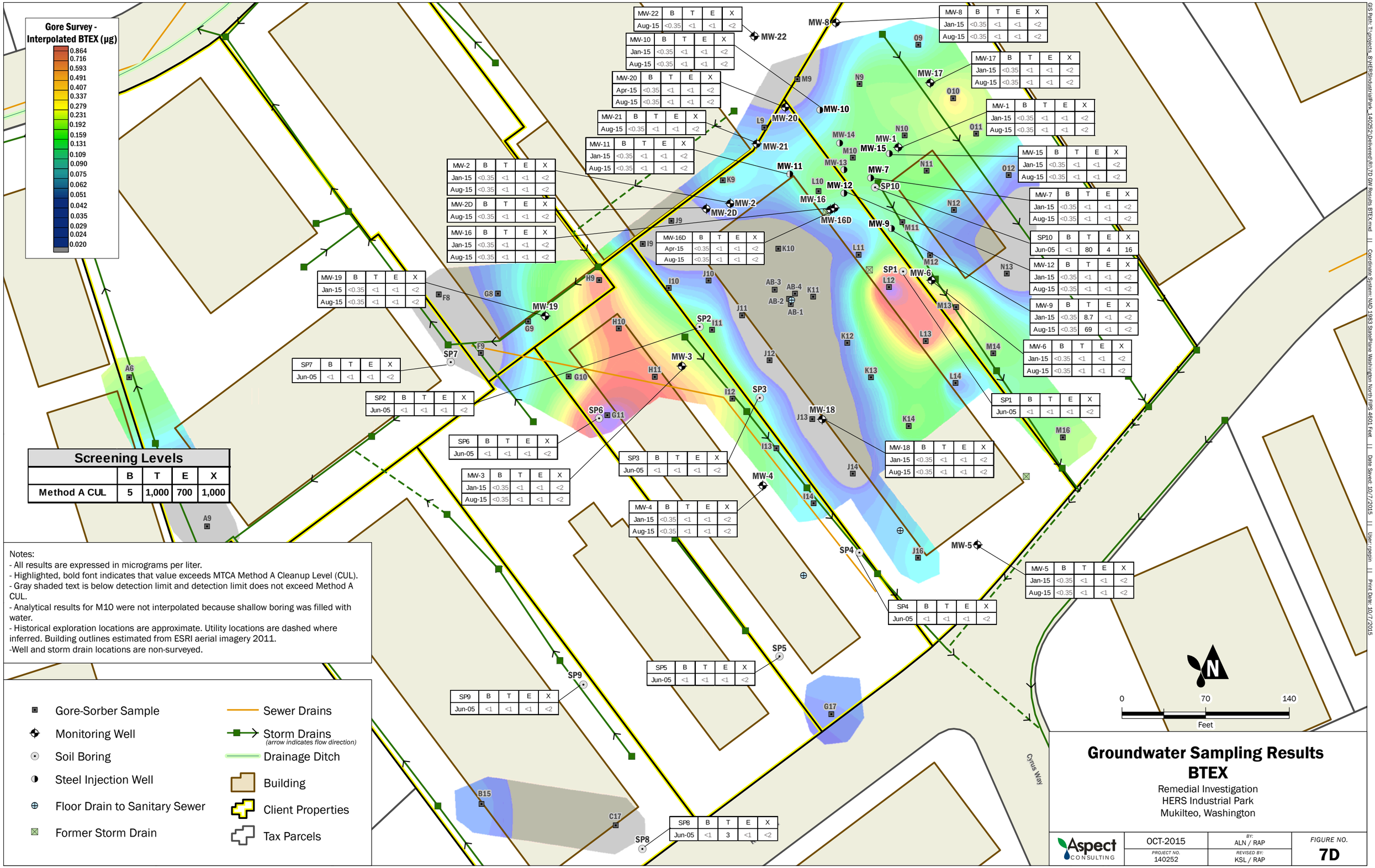
Cyrus Way
Russell Rd

# Groundwater Sampling Results
# Petroleum Hydrocarbons

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect Consulting | OCT-2015 | BY: ALN / RAP | FIGURE NO. 7C |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERSIndustrialPark_140252\Delivered\BI\TC GW Results TPH.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rhejin || Print Date: 10/7/2015




## Screening Levels

| | B | T | E | X |
|---|---|---|---|---|
| Method A CUL | 5 | 1,000 | 700 | 1,000 |

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Analytical results for M10 were not interpolated because shallow boring was filled with water.
- Historical exploration locations are approximate. Utility locations are dashed where inferred. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

- Gore-Sorber Sample
- Monitoring Well
- Soil Boring
- Steel Injection Well
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Client Properties
- Tax Parcels

# Groundwater Sampling Results
# BTEX

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| | | | |
|---|---|---|---|
| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 7D |
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\R\TD GW Results BTEX.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rrepin || Print Date: 10/7/2015

| MW-22 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Aug-15 | <1 | <1 | 2.7 | 65 | 6.7 |

| MW-20 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Apr-15 | - | 4.99 | 0.8 | 120 | 6.8 |
| Aug-15 | 1.24 | 1.25 | 0.6 | 34 | 6.5 |

| MW-21 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Aug-15 | <1 | <1 | 0.6 | 37 | 6.4 |

| MW-12 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 0.5 | 110 | 6.4 |
| Aug-15 | 1.75 | 1.78 | 0.3 | 152 | 6.2 |

| MW-11 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 1.1 | 53 | 6.2 |
| Aug-15 | 1.44 | 1.44 | 0.3 | 63 | 6.1 |

| MW-2 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 2.2 | 87 | 6.3 |
| Aug-15 | <1 | **11.4** | 1.9 | 35 | 6.1 |

| MW-2D | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Aug-15 | **3.33** | **11.4** | 0.7 | 110 | 8.4 |

| MW-16 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | 1.02 | 5.67 | 106.7 | 6.4 |
| Aug-15 | <1 | **8.82** | 0.2 | 156 | 6.2 |

| MW-16D | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Apr-15 | - | 1.22 | 0.5 | 118 | 8.1 |
| Aug-15 | 2.71 | 3.36 | 1.0 | 113 | 10.9 |

| MW-19 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | 3.93 | 6.4 | 51 | 6.7 |
| Aug-15 | **15.0** | **15.5** | 0.4 | 40 | 6.3 |

| MW-3 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **10.6** | 0.7 | -5 | 6.62 |
| Aug-15 | **17.9** | **13.6** | 0.6 | 47 | 6.2 |

| MW-4 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **34.7** | 1.3 | -29 | 6.5 |
| Aug-15 | **13.3** | **7.59** | - | - | - |

| MW-8 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 0.5 | 65 | 6.4 |
| Aug-15 | <1 | <1 | 0.4 | 158 | 6.2 |

| MW-17 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **9.82** | 1.84 | 34.4 | 6.6 |
| Aug-15 | **39.4** | **38.5** | 0.4 | -8 | 6.4 |

| MW-10 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | 1.11 | 0.9 | 94 | 5.6 |
| Aug-15 | 3.99 | 4.28 | 0.3 | 50 | 6.2 |

| MW-1 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **23.1** | 0.2 | -44 | 6.7 |
| Aug-15 | **20.4** | **22.4** | 0.3 | 28 | 6.6 |

| MW-15 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **22.3** | 0.2 | -37 | 6.3 |
| Aug-15 | **28.1** | **29.4** | 0.2 | -12 | 6.1 |

| MW-7 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 4.1 | 30 | 6.1 |
| Aug-15 | 2.58 | 2.52 | 0.6 | 77 | 5.4 |

| MW-9 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | 2.73 | 0.2 | -32 | 6.4 |
| Aug-15 | **5.25** | **5.17** | 0.3 | 146 | 6.1 |

| MW-6 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 0.6 | 69 | 5.8 |
| Aug-15 | <1 | <1 | 0.9 | 32 | 5.6 |

| MW-18 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | <1 | 2.7 | 56 | 6.2 |
| Aug-15 | 2.05 | 3.68 | 0.2 | 115 | 6.1 |

| MW-5 | Dissolved Arsenic | Total Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|---|
| Jan-15 | - | **5.56** | 0.2 | 6 | 6.7 |
| Aug-15 | <1 | 2.70 | 0.5 | 16 | 6.5 |

| Screening Levels | Arsenic | DO (mg/L) | ORP (mV) | pH |
|---|---|---|---|---|
| Method A CUL | 5 | - | - | - |

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Historical exploration locations are approximate. Utility locations are dashed where inferred. Building outlines estimated from ESRI aerial imagery 2011.

Monitoring Well
Soil Boring
Steel Injection Well
Floor Drain to Sanitary Sewer
Former Storm Drain
Sewer Drains
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Client Properties
Tax Parcels

0 70 140
Feet

# Groundwater Sampling Results
# Arsenic and Water Quality Parameters

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 7E |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERSIndustrialPark_140252\Delivered\BI\TE GW Results Arsenic and Water Quality.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: mpahn || Print Date: 10/7/2015

GRASS COVER FOR RECHARGE

DEPRESSION FOR LOADNG DOCK AT FINISHED FLOOR NEAR GROUND SURFACE

MW-8 537.55
MW-17 537.28
MW-10 536.95
MW-15 537.27
MW-1 537.29
MW-11 536.71
MW-13 536.08
MW-12 537.21
MW-7 532.61
D30
MW-2 533.49
D29
MW-16 537.11
MW-9 537.91
D34
MW-6 539.67
MW-19 536.49
MW-3 537.29
MW-18 537.07
MW-4 538.30
D32
MW-5 535.58

534 535 536 537 538 539

Notes:
- Storm drains are perforated for low impact development.
- Water levels measured January 22 & 23, 2015 during precipitaion events.Water levels in MW-7 and MW-11 measured on January 28, 2015 after several days of dry weather and are not contoured. MW-7 water level appears to decrease in absence of recharge.
- Water Levels are expressed in feet. NS indicates Not Sampled.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.
-Ground surface elevation in NGVD29, estimated from Preliminary Surficial Geologic Map of the Mukilteo and Everett Quandrangles, Snohomish County, Washington. Mackey Smith, 1976

Monitoring Well
Steel Injection Well
Groundwater Contours
Estimated Chlorinated VOC Exceedance Area
Former Storm Drain
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

Well Name
MW-2
533.49
Water Elevation (in feet, NGVD29)

N

0 60 120
Feet

# Groundwater Potentiometric Map January 2015

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| | | | |
|---|---|---|---|
| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 8A |
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Ph8A GW Potentiometric Map January2015.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpepin || Print Date: 10/7/2015

GRASS COVER FOR RECHARGE

DEPRESSION FOR LOADNG DOCK AT FINISHED FLOOR NEAR GROUND SURFACE

MW-8 536.86
MW-17 537.22
MW-20 536.77
MW-10 536.87
MW-14 NS
MW-1 534.21
MW-15 537.07
MW-7 537.41
D30
MW-13 NS
MW-11 536.69
MW-12 536.94
MW-2 536.38
MW-16 536.94
MW-16D 484.22
D29
MW-9 537.59
D34
MW-6 538.13
MW-19 536.40
MW-3 536.49
537
538
MW-18 537.67
536
MW-4 535.31
D32
MW-5 535.55

Notes:
- Storm drains are perforated for low impact development.
- Water levels measured January 22 & 23, 2015 during precipitaion events.Water levels in MW-7 and MW-11 measured on January 28, 2015 after several days of dry weather and are not contoured. MW-7 water level appears to decrease in absence of recharge.
- Water Levels are expressed in feet. NS indicates Not Sampled.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.
-Ground surface elevation in NGVD29, estimated from Preliminary Surficial Geologic Map of the Mukilteo and Everett Quandrangles, Snohomish County, Washington. Mackey Smith, 1976

Monitoring Well
Steel Injection Well
Groundwater Contours
Estimated Chlorinated VOC Exceedance Area
Former Storm Drain
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

Well Name
MW-2
536.38
Water Elevation (in feet, NGVD29)

N
0 60 120
Feet

# Groundwater Potentiometric Map April 2015

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 8B |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Ph 8B GW Potentiometric Map April2015.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpapin || Print Date: 10/7/2015

GRASS COVER FOR RECHARGE

DEPRESSION FOR LOADNG DOCK AT FINISHED FLOOR NEAR GROUND SURFACE

MW-8 534.67
MW-22 534.87
MW-17 534.82
MW-20 534.97
MW-10 534.87
MW-21 534.79
MW-1 535.03
MW-15 535.11
MW-11 535
MW-7 535.4
D30
MW-12 535.17
MW-2 534.97
MW-16 535.21
MW-16D 483.32
D29
MW-2D 379.38 379.38
MW-9 535.62
D34
MW-6 535.74
MW-19 535.03
MW-3 535.81
MW-18 535.98
D32
MW-4 535.25
MW-5 535.56

534.75
535.00
535.25
535.50
535.75
536.00

Notes:
- Storm drains are perforated for low impact development.
- Water levels measured January 22 & 23, 2015 during precipitaion events.Water levels in MW-7 and MW-11 measured on January 28, 2015 after several days of dry weather and are not contoured. MW-7 water level appears to decrease in absence of recharge.
- Water Levels are expressed in feet. NS indicates Not Sampled.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.
-Ground surface elevation in NGVD29, estimated from Preliminary Surficial Geologic Map of the Mukilteo and Everett Quandrangles, Snohomish County, Washington. Mackey Smith, 1976

Monitoring Well
Steel Injection Well
Wells not likely in Hydraulic Connectivity
Groundwater Contours
Estimated Chlorinated VOC Exceedance Area
Former Storm Drain
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

Well Name
MW-2
534.97
Water Elevation (in feet, NGVD29)

N
0 60 120
Feet

# Groundwater Potentiometric Map August 2015

Remedial Investigation
HERS Industrial Park
Mukilteo, Washington

| Aspect CONSULTING | OCT-2015 | BY: ALN / RAP | FIGURE NO. 8C |
|---|---|---|---|
| | PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\Ph8C GW Potentiometric Map August2015.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpapin || Print Date: 10/7/2015

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-20 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | **17** | <1 | <1 | <0.2 |
| Aug-15 | **25** | <1 | <1 | <0.2 |

| MW-21 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | **85** | **280** | 55 | **1.3** |

| MW-11 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **58** | **270** | 42 | **1.4** |
| Jan-07 | **150** | **700** | **140** | <4 |
| Apr-08 | **14** | **130** | 11 | <0.2 |
| Mar-09 | **8.4** | **88** | 5.2 | <0.2 |
| Sep-09 | **220** | **580** | **180** | <0.2 |
| Jan-12 | **27** | **130** | 9.5 | <1 |
| Jan-15 | **12** | **54** | 7.4 | <0.2 |
| Aug-15 | **69** | **190** | 66 | **1.3** |

| MW-13 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **9** | **270** | 12 | **1.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **11** | **44** | 9.1 | **1.9** |
| Apr-08 | 4.2 | **25** | 9.6 | **2.9** |
| Jan-15 | Well was full of silty sand, not sampled | | | |

| MW-12 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **180** | **1,700** | **290** | **23** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **140** | **480** | **240** | **8.9** |
| Apr-08 | **99** | **320** | **220** | **17** |
| Mar-09 | **85** | **230** | **130** | **8.2** |
| Sep-09 | **95** | **230** | **160** | **9.1** |
| Jan-12 | **54** | **99** | 60 | **6.3** |
| Jan-15 | **14** | **20** | 11 | **0.3** |
| Aug-15 | **28** | **59** | 40 | **2.8** |

| MW-16 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | **110** | **410** | **270** | **5.8** |
| Aug-15 | **110** | **120** | **290** | **6.5** |

| MW-16D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | <1 | **24** | 1 | <0.2 |
| Aug-15 | <1 | **10** | 1.1 | <0.2 |

| SP10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | **300** | **42,000** | **290** | **21** |

| MW-10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **23** | <2 | <2 | <0.2 |
| Jan-07 | **11** | 0.54 | <0.2 | <0.2 |
| Apr-08 | **22** | 0.6 | <0.2 | <0.2 |
| Mar-09 | **18** | 0.53 | <0.2 | <0.2 |
| Sep-09 | 4 | <0.2 | <0.2 | **4.1** |
| Jan-12 | 3.9 | <0.2 | <0.2 | <0.2 |
| Jan-15 | **7.5** | <1 | <1 | <0.2 |
| Aug-15 | 3.2 | <1 | <1 | <0.2 |

| MW-14 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **17** | <2 | <0.2 |
| Jan-07 | <0.2 | 2.6 | 4.3 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | Well was abandoned | | | |

| MW-15 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **26** | 3 | **0.9** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **28** | **1,000** | <10 | <10 |
| Apr-08 | 0.26 | 4.8 | <0.2 | <0.2 |
| Jan-15 | <1 | 1.6 | <1 | **0.69** |
| Aug-15 | <1 | **5.8** | 1.5 | **0.96** |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | 1.3 | 0.25 | <0.2 |
| May-06 | <2 | <2 | 2 | **0.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 3 | 2.5 | **0.59** |
| Apr-08 | <0.2 | **6.4** | 3.3 | **0.76** |
| Mar-09 | <0.2 | **27** | 3.3 | **0.51** |
| Sep-09 | <2 | 1.1 | 0.98 | <0.2 |
| Jan-12 | **15** | **1,100** | 15 | <10 |
| Jan-15 | 2.3 | **96** | 5.2 | **4.1** |
| Aug-15 | **5.3** | **200** | 6.9 | **4.0** |

| MW-7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | **460** | **7,000** | **140** | <50 |
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| May-06 | **10** | **21** | <2 | **0.7** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 0.22 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.33 | 1 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

MW-20, MW-21, MW-11, MW-13, MW-12, MW-16, MW-16D, MW-10, MW-14, MW-15, MW-17, MW-1, MW-7, MW-9, SP10, SP1, SP2, AB-3, D29, D30, D34, L9, L10, L12, M10, M11, N9, N10, N11, I9, I10, I11, J9, J11

- Proposed Biostimulation Well
- Gore-Sorber Sample
- Monitoring Well
- Soil Boring
- Steel Injection Well
- Estimated Chlorinated VOC Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Site Parcels
- Tax Parcels

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

0 25 50 Feet

# Alternative 2 Biostimulation Wells

HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING

| OCT-2015 | BY: ALN / RAP | FIGURE NO. 9A |
|---|---|---|
| PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\R\9A Alternative 2 Biostimulation Wells.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rjeglin || Print Date: 10/7/2015

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-20 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | **17** | <1 | <1 | <0.2 |
| Aug-15 | **25** | <1 | <1 | <0.2 |

| MW-21 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | **85** | **280** | 55 | **1.3** |

| MW-11 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **58** | **270** | 42 | **1.4** |
| Jan-07 | **150** | **700** | **140** | <4 |
| Apr-08 | **14** | **130** | 11 | <0.2 |
| Mar-09 | **8.4** | **88** | 5.2 | <0.2 |
| Sep-09 | **220** | **580** | **180** | <0.2 |
| Jan-12 | **27** | **130** | 9.5 | <1 |
| Jan-15 | **12** | **54** | 7.4 | <0.2 |
| Aug-15 | **69** | **190** | 66 | **1.3** |

| MW-13 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **9** | **270** | 12 | **1.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **11** | **44** | 9.1 | **1.9** |
| Apr-08 | 4.2 | **25** | 9.6 | **2.9** |
| Jan-15 | Well was full of silty sand, not sampled | | | |

| MW-12 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **180** | **1,700** | **290** | **23** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **140** | **480** | **240** | **8.9** |
| Apr-08 | **99** | **320** | **220** | **17** |
| Mar-09 | **85** | **230** | **130** | **8.2** |
| Sep-09 | **95** | **230** | **160** | **9.1** |
| Jan-12 | **54** | **99** | 60 | **6.3** |
| Jan-15 | **14** | **20** | 11 | **0.3** |
| Aug-15 | **28** | **59** | 40 | **2.8** |

| MW-16 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | **110** | **410** | **270** | **5.8** |
| Aug-15 | **110** | **120** | **290** | **6.5** |

| MW-16D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | <1 | **24** | 1 | <0.2 |
| Aug-15 | <1 | **10** | 1.1 | <0.2 |

| SP10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | **300** | **42,000** | **290** | **21** |

| MW-10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **23** | <2 | <2 | <0.2 |
| Jan-07 | **11** | 0.54 | <0.2 | <0.2 |
| Apr-08 | **22** | 0.6 | <0.2 | <0.2 |
| Mar-09 | **18** | 0.53 | <0.2 | <0.2 |
| Sep-09 | 4 | <0.2 | <0.2 | **4.1** |
| Jan-12 | 3.9 | <0.2 | <0.2 | <0.2 |
| Jan-15 | **7.5** | <1 | <1 | <0.2 |
| Aug-15 | 3.2 | <1 | <1 | <0.2 |

| MW-14 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **17** | <2 | <0.2 |
| Jan-07 | <0.2 | 2.6 | 4.3 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | Well was abandoned | | | |

| MW-15 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **26** | 3 | **0.9** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **28** | **1,000** | <10 | <10 |
| Apr-08 | 0.26 | 4.8 | <0.2 | <0.2 |
| Jan-15 | <1 | 1.6 | <1 | **0.69** |
| Aug-15 | <1 | **5.8** | 1.5 | **0.96** |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | 1.3 | 0.25 | <0.2 |
| May-06 | <2 | <2 | 2 | **0.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 3 | 2.5 | **0.59** |
| Apr-08 | <0.2 | **6.4** | 3.3 | **0.76** |
| Mar-09 | <0.2 | **27** | 3.3 | **0.51** |
| Sep-09 | <2 | 1.1 | 0.98 | <0.2 |
| Jan-12 | **15** | **1,100** | 15 | <10 |
| Jan-15 | 2.3 | **96** | 5.2 | **4.1** |
| Aug-15 | **5.3** | **200** | 6.9 | **4.0** |

| MW-7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | **460** | **7,000** | **140** | <50 |
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| May-06 | **10** | **21** | <2 | **0.7** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 0.22 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.33 | 1 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

MW-20, MW-21, MW-10, MW-11, MW-14, MW-13, MW-15, MW-1, MW-17, MW-12, MW-16, MW-16D, MW-7, SP10, MW-9, SP1, SP2, AB-3, D29, D30, D34, M10, M11, N10, N11, L9, L10, L12, I9, I10, I11, J9, J11, N9, O11

Proposed Permanganate Injection Borings/Wells
Gore-Sorber Sample
Monitoring Well
Soil Boring
Steel Injection Well
Estimated Chlorinated VOC Exceedance Area
Floor Drain to Sanitary Sewer
Former Storm Drain
Sewer Drains
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

0 25 50 Feet

# Alternative 3
# Permanganate Injection Wells & Borings
HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING | OCT-2015 | PROJECT NO. 140252 | BY: ALN / RAP | REVISED BY: KSL / RAP | FIGURE NO. 9B

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\RI\9B Alternative 3 Permanganate Injection Wells.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: mepin || Print Date: 10/8/2015

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-20 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | 17 | <1 | <1 | <0.2 |
| Aug-15 | 25 | <1 | <1 | <0.2 |

| MW-21 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | 85 | 280 | 55 | 1.3 |

| MW-11 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | 58 | 270 | 42 | 1.4 |
| Jan-07 | 150 | 700 | 140 | <4 |
| Apr-08 | 14 | 130 | 11 | <0.2 |
| Mar-09 | 8.4 | 88 | 5.2 | <0.2 |
| Sep-09 | 220 | 580 | 180 | <0.2 |
| Jan-12 | 27 | 130 | 9.5 | <1 |
| Jan-15 | 12 | 54 | 7.4 | <0.2 |
| Aug-15 | 69 | 190 | 66 | 1.3 |

| MW-13 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | 9 | 270 | 12 | 1.4 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 11 | 44 | 9.1 | 1.9 |
| Apr-08 | 4.2 | 25 | 9.6 | 2.9 |
| Jan-15 | Well was full of silty sand, not sampled | | | |

| MW-12 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | 180 | 1,700 | 290 | 23 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 140 | 480 | 240 | 8.9 |
| Apr-08 | 99 | 320 | 220 | 17 |
| Mar-09 | 85 | 230 | 130 | 8.2 |
| Sep-09 | 95 | 230 | 160 | 9.1 |
| Jan-12 | 54 | 99 | 60 | 6.3 |
| Jan-15 | 14 | 20 | 11 | 0.3 |
| Aug-15 | 28 | 59 | 40 | 2.8 |

| MW-16 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | 110 | 410 | 270 | 5.8 |
| Aug-15 | 110 | 120 | 290 | 6.5 |

| MW-16D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | <1 | 24 | 1 | <0.2 |
| Aug-15 | <1 | 10 | 1.1 | <0.2 |

| SP10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | 300 | 42,000 | 290 | 21 |

| MW-10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | 23 | <2 | <2 | <0.2 |
| Jan-07 | 11 | 0.54 | <0.2 | <0.2 |
| Apr-08 | 22 | 0.6 | <0.2 | <0.2 |
| Mar-09 | 18 | 0.53 | <0.2 | <0.2 |
| Sep-09 | 4 | <0.2 | <0.2 | 4.1 |
| Jan-12 | 3.9 | <0.2 | <0.2 | <0.2 |
| Jan-15 | 7.5 | <1 | <1 | <0.2 |
| Aug-15 | 3.2 | <1 | <1 | <0.2 |

| MW-14 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | 17 | <2 | <0.2 |
| Jan-07 | <0.2 | 2.6 | 4.3 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | Well was abandoned | | | |

| MW-15 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | 26 | 3 | 0.9 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | 28 | 1,000 | <10 | <10 |
| Apr-08 | 0.26 | 4.8 | <0.2 | <0.2 |
| Jan-15 | <1 | 1.6 | <1 | 0.69 |
| Aug-15 | <1 | 5.8 | 1.5 | 0.96 |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | 1.3 | 0.25 | <0.2 |
| May-06 | <2 | <2 | 2 | 0.4 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 3 | 2.5 | 0.59 |
| Apr-08 | <0.2 | 6.4 | 3.3 | 0.76 |
| Mar-09 | <0.2 | 27 | 3.3 | 0.51 |
| Sep-09 | <2 | 1.1 | 0.98 | <0.2 |
| Jan-12 | 15 | 1,100 | 15 | <10 |
| Jan-15 | 2.3 | 96 | 5.2 | 4.1 |
| Aug-15 | 5.3 | 200 | 6.9 | 4.0 |

| MW-7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | 460 | 7,000 | 140 | <50 |
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| May-06 | 10 | 21 | <2 | 0.7 |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 0.22 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.33 | 1 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

MW-20 MW-21 MW-10 MW-11 MW-14 MW-13 MW-12 MW-16 MW-16D MW-7 MW-15 MW-1 MW-17 MW-9 SP10 SP1 SP2 AB-3 D29 D30 D34 M10 N10 N11 L9 L10 L12 I9 I10 I11 J9 J11 M11 N9 O11

Proposed 6-ft Diameter In Situ Mixing Boring
Gore-Sorber Sample
Monitoring Well
Soil Boring
Steel Injection Well
Estimated Chlorinated VOC Exceedance Area
Floor Drain to Sanitary Sewer
Former Storm Drain
Sewer Drains
Storm Drains (arrow indicates flow direction)
Drainage Ditch
Building
Site Parcels
Tax Parcels

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

0 25 50 Feet

# Alternative 4
# In Situ Soil Mixing Borings
HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING | OCT-2015 | PROJECT NO. 140252 | BY: ALN / RAP | REVISED BY: KSL / RAP | FIGURE NO. 9C

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\RI\9C Alternative 4 In Situ Soil Mixing Borings.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpepin || Print Date: 10/8/2015

| Screening Levels | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Method A CUL | 5 | 5 | - | 0.2 |
| MCL | 5 | 5 | 70 | 2 |

| MW-20 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | **17** | <1 | <1 | <0.2 |
| Aug-15 | **25** | <1 | <1 | <0.2 |

| MW-21 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Aug-15 | **85** | **280** | 55 | **1.3** |

| MW-11 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **58** | **270** | 42 | **1.4** |
| Jan-07 | **150** | **700** | **140** | <4 |
| Apr-08 | **14** | **130** | 11 | <0.2 |
| Mar-09 | **8.4** | **88** | 5.2 | <0.2 |
| Sep-09 | **220** | **580** | **180** | <0.2 |
| Jan-12 | **27** | **130** | 9.5 | <1 |
| Jan-15 | **12** | **54** | 7.4 | <0.2 |
| Aug-15 | **69** | **190** | 66 | **1.3** |

| MW-13 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **9** | **270** | 12 | **1.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **11** | **44** | 9.1 | **1.9** |
| Apr-08 | 4.2 | **25** | 9.6 | **2.9** |
| Jan-15 | Well was full of silty sand, not sampled | | | |

| MW-12 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | **180** | **1,700** | **290** | **23** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **140** | **480** | **240** | **8.9** |
| Apr-08 | **99** | **320** | **220** | **17** |
| Mar-09 | **85** | **230** | **130** | **8.2** |
| Sep-09 | **95** | **230** | **160** | **9.1** |
| Jan-12 | **54** | **99** | 60 | **6.3** |
| Jan-15 | **14** | **20** | 11 | **0.3** |
| Aug-15 | **28** | **59** | 40 | **2.8** |

| MW-16 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | **110** | **410** | **270** | **5.8** |
| Aug-15 | **110** | **120** | **290** | **6.5** |

| MW-16D | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-15 | <1 | **24** | 1 | <0.2 |
| Aug-15 | <1 | **10** | 1.1 | <0.2 |

| SP10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jun-05 | **300** | **42,000** | **290** | **21** |

| MW-10 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| May-06 | **23** | <2 | <2 | <0.2 |
| Jan-07 | **11** | 0.54 | <0.2 | <0.2 |
| Apr-08 | **22** | 0.6 | <0.2 | <0.2 |
| Mar-09 | **18** | 0.53 | <0.2 | <0.2 |
| Sep-09 | 4 | <0.2 | <0.2 | **4.1** |
| Jan-12 | 3.9 | <0.2 | <0.2 | <0.2 |
| Jan-15 | **7.5** | <1 | <1 | <0.2 |
| Aug-15 | 3.2 | <1 | <1 | <0.2 |

| MW-14 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **17** | <2 | <0.2 |
| Jan-07 | <0.2 | 2.6 | 4.3 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-12 | Well was abandoned | | | |

| MW-15 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Apr-06 | ISCO Injection | | | |
| Jun-06 | <2 | **26** | 3 | **0.9** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | **28** | **1,000** | <10 | <10 |
| Apr-08 | 0.26 | 4.8 | <0.2 | <0.2 |
| Jan-15 | <1 | 1.6 | <1 | **0.69** |
| Aug-15 | <1 | **5.8** | 1.5 | **0.96** |

| MW-17 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-1 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Sep-05 | <0.2 | 1.3 | 0.25 | <0.2 |
| May-06 | <2 | <2 | 2 | **0.4** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 3 | 2.5 | **0.59** |
| Apr-08 | <0.2 | **6.4** | 3.3 | **0.76** |
| Mar-09 | <0.2 | **27** | 3.3 | **0.51** |
| Sep-09 | <2 | 1.1 | 0.98 | <0.2 |
| Jan-12 | **15** | **1,100** | 15 | <10 |
| Jan-15 | 2.3 | **96** | 5.2 | **4.1** |
| Aug-15 | **5.3** | **200** | 6.9 | **4.0** |

| MW-7 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Oct-05 | **460** | **7,000** | **140** | <50 |
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| May-06 | **10** | **21** | <2 | **0.7** |
| Oct-06 | ISCO Injection | | | |
| Jan-07 | <0.2 | 0.22 | <0.2 | <0.2 |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.33 | 1 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

| MW-9 | PCE | TCE | cDCE | VC |
|---|---|---|---|---|
| Mar-06 | ISCO Injection | | | |
| Apr-06 | ISCO Injection | | | |
| Apr-08 | <0.2 | <0.2 | <0.2 | <0.2 |
| Mar-09 | <0.2 | <0.2 | <0.2 | <0.2 |
| Sep-09 | 0.43 | 0.27 | <0.2 | <0.2 |
| Jan-12 | <0.2 | <0.2 | <0.2 | <0.2 |
| Jan-15 | <1 | <1 | <1 | <0.2 |
| Aug-15 | <1 | <1 | <1 | <0.2 |

MW-20, MW-21, MW-11, MW-13, MW-12, MW-16, MW-16D, MW-10, MW-14, MW-15, MW-17, MW-1, MW-7, MW-9, SP10, SP1, SP2, AB-3, D29, D30, D34, M10, M11, N9, N10, N11, L9, L10, I9, I10, I11, J9, J11, K11, L12

- Proposed Excavation Area
- Gore-Sorber Sample
- Monitoring Well
- Soil Boring
- Steel Injection Well
- Estimated Chlorinated VOC Exceedance Area
- Floor Drain to Sanitary Sewer
- Former Storm Drain
- Sewer Drains
- Storm Drains (arrow indicates flow direction)
- Drainage Ditch
- Building
- Site Parcels
- Tax Parcels

Notes:
- All results are expressed in micrograms per liter.
- Highlighted, bold font indicates that value exceeds MTCA Method A Cleanup Level (CUL).
- Gray shaded text is below detection limit and detection limit does not exceed Method A CUL.
- Historical exploration locations are approximate. Building outlines estimated from ESRI aerial imagery 2011.
-Well and storm drain locations are non-surveyed.

0 25 50 Feet

# Alternative 5 Excavation Area

HERS Industrial Park
Mukilteo, Washington

Aspect CONSULTING

| OCT-2015 | BY: ALN / RAP | FIGURE NO. 9D |
|---|---|---|
| PROJECT NO. 140252 | REVISED BY: KSL / RAP | |

GIS Path: T:\projects_8\HERS\IndustrialPark_140252\Delivered\R\9D Alternative 5 Excavation Area.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 10/7/2015 || User: rpapin || Print Date: 10/8/2015

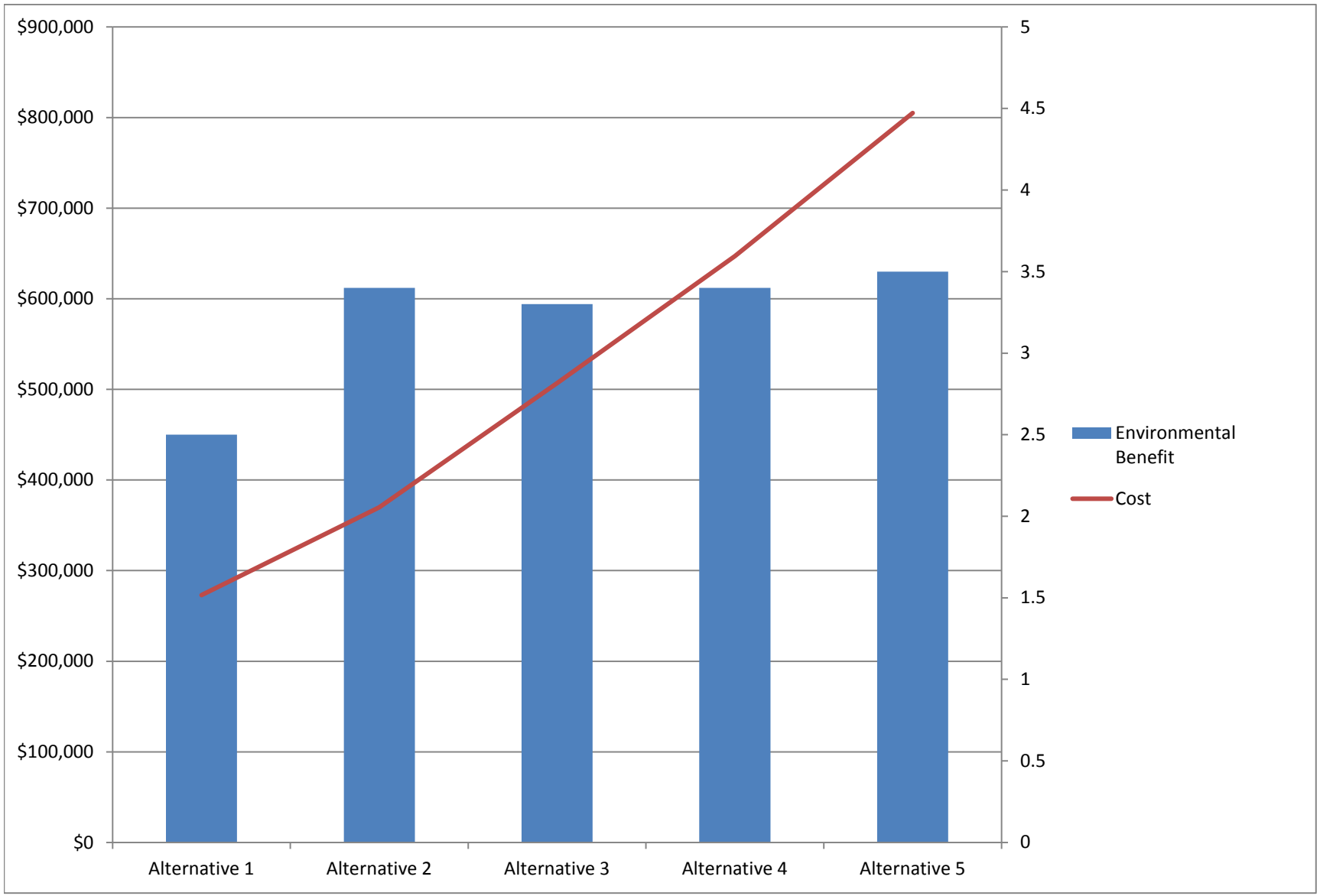



**Figure 10**
**Disproportionate Cost Evaluation**
HERS Industrial Park, Mukilteo, WA
FS No. 127256, CS No. 3971
RI/FS Report, Nov. 2015

# Appendix A – 2012 Ecology Opinion Letter

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
*Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000*
*711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341*

October 18, 2012

Mr. Romeo Gonyea
17600 147th Street SE PMB 22
Monroe, Washington 98275

**Re: Opinion pursuant to WAC 173-340-515(5) on Proposed Remedial Action for the following Hazardous Waste Site:**

- Name: Hers Industrial Park
- Address: 4403 Russell Road, Mukilteo, WA 98275
- Facility/Site No.: 127256
- VCP No.: NW 1554
- Cleanup Site ID: 3971

Dear Mr. Gonyea:

Thank you for submitting documents regarding your characterization and remedial action for the **Hers Industrial Park** facility (Site) for review by the Washington State Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in pursuing this administrative option for cleaning up hazardous waste sites under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This letter constitutes an advisory opinion regarding a review of submitted documents/reports pursuant to requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the following release(s) at the Site:

- Total petroleum hydrocarbons in the gasoline (TPH-g), diesel (TPH-d) and heavy oil (TPH-o) ranges in Soil;
- Tetrachloroethylene (PCE), trichloroethylene (TCE) and related degradation products in Ground Water;

Ecology is providing this advisory opinion under the specific authority of RCW 70.105D.030(1)(i) and WAC 173-340-515(5).

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in

accordance with RCW 70.105D.040(4). The opinion is advisory only and not binding on Ecology.

Ecology's Toxics Cleanup Program has reviewed the following information regarding your Site characterization and remediation action(s):

1. The Riley Group, 2012. *Groundwater Sampling Event, 1st Quarter 2012, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington.* February 23.

2. The Riley Group, 2009. *Groundwater Sampling Event – Third Quarter 2009, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington.* October 2.

3. The Riley Group, 2009. *Groundwater Sampling Event – First Quarter 2009, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington.* March 26.

4. The Riley Group, 2008. *Groundwater Sampling Event – Second Quarter 2008, Russell Road Industrial Park (aka Hers Industrial Park), 4403 Russell Road, Mukilteo, Washington.* August 20.

5. The Riley Group, 2005. *Well Installation and Groundwater Sampling Event – Fourth Quarter 2005, HERS Industrial Park, 4403 Russell Road, Mukilteo, Washington.* December 27.

6. The Riley Group, 2005. *Supplemental Phase II Subsurface Investigation, Hers Industrial Park, 4403 Russell Road, Mukilteo, Washington.* June 22.

7. The Riley Group, 2005. *Phase I Environmental Site Assessment, Hers Industrial Park, 4403 Russell Road, Mukilteo, Washington.* June 20.

8. James P. Hurley Company, 1996. *Site Assessment Report, HERS Industrial Park, 4403 to 4493 Russell Road and 4424 to 4480 Chennault Beach Road, Mukilteo, Washington.* September 25.

9. James P. Hurley Company, 1995. *Phase II Environmental Site Assessment Report, 4403 to 4493 Russell Road and 4424 to 4480 Chennault Beach Road, Mukilteo, Washington.* August 3.

10. James P. Hurley Company, 1995. *Combined UST Removal and Petroleum Contaminated Soil Cleanup Summary Report, 4493 Russell Road, Mukilteo, Washington.* July 24.

11. ATC Environmental, Inc. 1994. *Phase I Environmental Site Assessment, Hers Industrial Park, Mukilteo, Washington.* October 25.

The reports listed above will be kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Appointments can be made by calling the NWRO resource contact at (425) 649-7235 or sending an email to: nwro_public_request@ecy.wa.gov.

Based on a review of supporting documentation listed above, pursuant to **requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the following release(s) at the Site, Ecology has determined:**

- All previous Site characterization activities should be compiled and described in a Remedial Investigation (RI) summary report. Ecology's suggested outline for a Remedial Investigation report is included as Enclosure A. In addition to the outline, the following comments should be considered during preparation of the RI report.

- The depiction of the Property in Figure 2 of the most recent (2012) ground water monitoring report as well as the 2008 and 2009 ground water monitoring reports is inconsistent with the description in the text of these reports as well as what is provided in the VCP application for this Site.

- The location of the Property line east of Building 4403 shown in Figure 3 of the 2012 ground water monitoring report appears to be incorrect as compared with the Snohomish County parcel map and Figure 2 of the same report. As shown, the figure indicates off-Property migration of the TCE plume, which may not be the case.

- The Site conceptual model is incomplete with regard to geological conditions. A 2005 Supplemental Phase II Subsurface Investigation report states that soils consisting of fine- to medium-grained sand with silt and gravel interpreted as fill materials underlie the Site to a depth of about 12 feet. The report states that a dense glacial till underlies the fill and shallow ground water is perched above the till. The report does not provide borehole logs of the ten direct-push borings that this information is based on. A Well Installation report dated December 27, 2005 contains boring logs for 8 monitoring well drilled to depths of 15 feet below the ground surface that do not match the lithology described in the Phase II report. The

presence, depth and attitude of the top of the dense glacial till horizon is important as it may influence the horizontal migration and/or aid in limiting the vertical migration of chlorinated solvents or DNAPL.

- Ecology's project file for the Site is missing documentation of the installation of injection wells MW-9 through MW-15 which would have occurred between October 2005 and April 2006. The borehole logs and well installation diagrams as well as the analytical results of any soil samples collected in the boreholes should be included in the Remedial Investigation report.

- Based on field screening (photo-ionization detector) results, only 4 out of 22 soil samples collected in 10 direct-push boring locations advanced in 2005 were submitted for laboratory analysis. Ecology does not consider field screening an empirical demonstration of the absence of contamination in soil. However, 11 ground water samples collected in each of the 10 boring locations and analyzed for petroleum hydrocarbons and BTEX suggest that the leaching pathway for petroleum hydrocarbons in soil is incomplete. Ground water samples from the 15 Site monitoring/injection wells should be analyzed for petroleum hydrocarbons and BTEX in order to confirm this as well as rule out other potential sources.

- The source of the chlorinated solvents in ground water on the Site has been attributed to releases via catch basins #34 and #29. Only one soil sample collected on the Site has ever been analyzed for VOCs. To complete the Site conceptual model, the mechanism needs to be established for how the solvents, which were reportedly used and stored in Building 4403 by previous tenants, got into the stormwater system and reached the catch basins. If a VOC source is determined to be present in the subsurface, it should be delineated and removed.

- In 2005, discrete ground water samples were collected from SP10 such that a sample collected at the top of the water table was analyzed for petroleum hydrocarbons and a sample collected just above the glacial till contact was analyzed for VOCs. The sample analyzed for VOCs contained contained PCE at a concentration of 300 µg/L and TCE at a concentration of 42,000 µg/L. Since the sample was reportedly collected just above the till interface and the concentration of TCE was nearly 4% of the solubility (1,100,000 µg/L), the potential for TCE as a DNAPL exists. The Site conceptual model should take this possibility into account as well as the potential for migration. The vertical extent of the VOC contamination in ground water has not been determined.

- Since the 2006 injections, concentrations of VOCs have generally declined in wells that have been monitored however monitoring and injection wells MW-1 through

MW-15 have been sampled inconsistently. In particular, samples from MW-13 and MW-15 both previously demonstrated exceedences of Method A cleanup for VOCs but were not sampled in 2009 or 2012. These data points are important for defining the current position and maximum levels of the chlorinated solvent plume as these wells are closer to catch basin #29 than MW-1.

- Injection well MW-14 could be located, uncovered and the casing extended and resurveyed in order to restore it as a monitoring and potential injection point.

- Future sampling of monitoring wells MW-3, MW-4 and MW-5 should be included to insure that the delineated west and south lateral boundaries of the plume are maintained and to assess potential impacts to ground water from the former heating oil UST or other potential sources on the Site.

- The Site characterization to date has identified a potential source of chlorinated solvents in ground water resulting in a plume that is approximately coincident with a ground water mound. Ground water flow in the vicinity of the mound is semi-radial, with flow to the northeast, southeast and southwest. The lateral extent of the VOC plume delineated previously appears to be stable however the January 2012 ground water sample collected from MW-1 suggests that the plume may now extend eastward laterally. Future sampling may demonstrate a need to further delineate the plume in that direction.

- One potential source on the Site (former 550-gallon heating oil UST) was identified and removed. Petroleum-contaminated soil associated with the UST was excavated with confirmational sampling indicating soil where the former tank was located is compliant with MTCA.

- Metals in soil and ground water on the Site have not been fully characterized. The historical uses and types of metals in various machining operations conducted on the Site needs to be researched and documented. Based on the likely use and possible disposal of metals, the potential exists for metals to occur in soil however it appears that only one soil sample on the Site has been analyzed for metals.

**This opinion does not represent a determination by Ecology that a proposed remedial action will be sufficient to characterize and address the specified contamination at the Site or that no further remedial action will be required at the Site upon completion of the proposed remedial action.** To obtain either of these opinions, you must submit appropriate documentation to Ecology and request such an opinion under the VCP. **This letter also does not provide an opinion regarding the sufficiency of any other remedial action proposed for or conducted at the Site.**

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or conducted at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at (425) 649-7064 or via email at hvic461@ecy.wa.gov.

Sincerely,

Heather Vick, LHg
NWRO Toxics Cleanup Program

Enclosures: (1) A – Remedial Investigation Outline

**Remedial Investigation Outline**
January 2011

*The following annotated outline is a suggested schematic for elements to be included in a Remedial Investigation report. It is not intended to replace MTCA's specific requirements as presented in 173-340-350(7) WAC.*

*The main purpose of the outline is to facilitate the preparation of a document that is clear, comprehensive, and to the point. A secondary, but important, purpose is to make document preparation and review more efficient.*

INTRODUCTION
(*concise, bulleted if possible*)

- Site name,VCP number, Name, address, and phone number of project consultant, Current owner/operator
- Purpose of document *(very brief restatement of what an RI is for, reference the WAC)*

SITE IDENTIFICATION AND LOCATION
(*focus on defining the site in the context of its' location*)

- Site discovery and regulatory status (*describe how the site was identified and where it is in the MTCA process)*
- Site and property location/definition (*define actual MTCA site location relative to property or study area*)
- Neighborhood setting

Figure – Vicinity Map (*preferably with topography*)
Figure – Property/Site Map (*preferably with topography*)

Appendix – Legal description of property, present owner and operator, chronological listing of past owners and operators

ENVIRONMENTAL INVESTIGATION/INTERIM ACTION SUMMARY
(***Concise*** *summary presentation of the investigations that have been done at the site, along with prior remedial actions. Focused mostly on figures and tables. Eliminate the extensive descriptions of prior work commonly put in environmental reports, or put them in an appendix*)

- Constituents of Concern (*brief discussion about which specific compounds were chosen for analysis and why)*
- Soil
- Surface water
- Ground water
- Sediment
- Air/soil vapor
- Natural resources/wildlife

- Cultural history/archeology
- Interim actions (*brief intro to prior remediation activities*)

Figure – Soil investigation data points (*show potential source areas*)
Figure – Surface water/groundwater investigation data points (*show potential source areas*)
Figure – Air investigation data points (*show potential source areas*)
Figure – Prior remediation activities

Table – Exploration Summary
Table – Analytical Schedule per media (*include analytical methods and reporting limits,as possible)*

Appendix – Previous Investigations (*detailed discussion goes here)*
Appendix - Exploration and sampling methodology (*may combine with Previous Investigations)*
Appendix – Boring/ Well logs
Appendix - Prior Interim Actions

PROPERTY DEVELOPMENT AND HISTORY

(*this section focuses on the built environment, both current and historical, and presents the sources of contamination and release mechanisms*)

- Past site uses and facilities
- Current site use and facilities
- Proposed or potential future site uses
- Zoning (*if appropriate)*
- Transportation/roads
- Utilities, water supply
- Potential sources of site contamination
- Potential sources of contamination from neighboring properties (*discuss nearby sources if known)*

Figure – Historical site features (*may be combined with Figure 2*)
Figure – Potential contaminant sources
Figure – Utilities (*may be combined with Figure 2*)

Table – Potential Contaminants

NATURAL CONDITIONS

- Physiographic setting/topography

- Geology
  (*focus on interpretation*)

  - Regional Setting (*brief*)
  - Property Geologic Conditions (*synthesis, not regurgitation of boring logs, provide cross sections*)

- Physical Properties (*unlikely to need this section, but in some cases may be useful to present data on soil adsorptive capacity, organic content, strength, etc.)*

Figure – Plan view of geologic unit distribution (*if helpful*)
Figure - Cross section A-A' (*show borings, wells, screened intervals, water levels*)
Figure – Cross section B-B' (*if necessary*)

- Surface Water
  (*brief description of the surface water system, include elements of the built system as it might relate to contaminant transport*)

- Property drainage (*for storm drains, focus on how deep the drains are relative to ground water)*
- Area surface water/floodplain issues
- Regulatory classifications, if any (*e.g surface water classification)*

Figure – Surface water Conditions (*only if information not already in a prior figure*)

- Ground Water
  (*focus on interpretation, show on cross sections*)

- Occurrence (*aquifers, water levels, confinement, geometry, continuity, physical properties*)
- Movement (*directions, gradient if important, seasonal fluctuations, tidal influence*)
- Discharge
- Recharge (*if significant for site*)
- Regulatory classifications, if any (*e.g. sole source aquifer*)

Figure – Cross section with ground water information (*if not already included above*)
Figure – Water table/potentiometric surface maps (*for various seasons or tidal conditions, show surface water*)

Appendix – Ground water elevation data (*a table)*

- Natural Resources and Ecological Receptors
  (*preparatory to a TEE*)

- Greenbelts and other natural habitat
- Wildlife
- Other Information required to conduct evaluations under -7491, -7492, or if necessary -7493

Figure – showing natural areas, as appropriate

CONTAMINANT OCCURRENCE AND MOVEMENT

(*very little text, mostly figures and tables, main point is to provide easy-to-understand figures showing the depth and breadth of contamination, relate contaminant distribution to release mechanisms and subsurface geologic/hydrogeologic conditions*)

- Waste Material (*sludges, fluids, stockpiles)*
- Soil
- Surface Water
- Ground Water
- Sediment
- Air/Soil Vapor

Figures – Cross sections showing soil contamination with depth
Figures – Plan views showing soil contamination across site (*relative to releases if known*)
Figures – Cross section showing ground water contamination with depth (*if appropriate*)
Figures – Plan views showing ground water contamination in each aquifer (*relative to soil contamination and P-head map*)
Figures – XY plots of specific contaminants with time (*as appropriate*)
Figures – Others as appropriate to show the distribution of surface water, ground water, or air data

Tables – All of the analytical data against final cleanup levels (*exceedances highlighted, no need to develop screening levels*)
Tables – Summary of exceedances (*if helpful*)

Appendix – QA report
Appendix – Analytical lab reports

CONCEPTUAL MODEL
(*putting the whole story together, graphic illustrations are best*)

- Contaminant release/fate and transport/potential or actual receptors (*re-summarize how the releases occurred and how site physical conditions affected the ultimate distribution of contaminants at the surface and in the subsurface)*
- Data gaps (*is anything missing)*

CLEANUP STANDARDS
(*developing appropriate cleanup standards based on receptors and pathways*)

- Soil
  - Reasonable maximum exposure
  - Cleanup levels protective of contact, ground water, inhalation, terrestrial species, surface water, sediment
  - Points of compliance
  - Regulatory classifications (*classification of soil as dangerous or solid waste)*
- Ground Water
  - Highest beneficial use/reasonable maximum exposure
  - Cleanup levels protective of potable use, inhalation, surface water, sediment
  - Points of compliance
- Other Media as appropriate

- Cleanup levels protective of ....
- Points of compliance

Table – Cleanup Levels (*all potentially applicable values with final selected cleanup level noted*)

AREAS REQUIRING CLEANUP

(*the final story detailing where the contamination exceeds an applicable cleanup standard, brief text, mostly tables, figures*)

- Constitutuents of Concern (*a brief summary of compounds that exceed cleanup levels or "indicator hazardous substances" under MTCA. For most service station sites, the COCs should be the same)*
- Soil – vertical and lateral
- Ground water – vertical and later
- Sediment –
- Surface Water
- Soil Vapor/air

Figures – Plan view and vertical sections of areas requiring cleanup

REFERENCES

# Appendix B – Occupancy Maps from Phase I Environmental Site Assessments

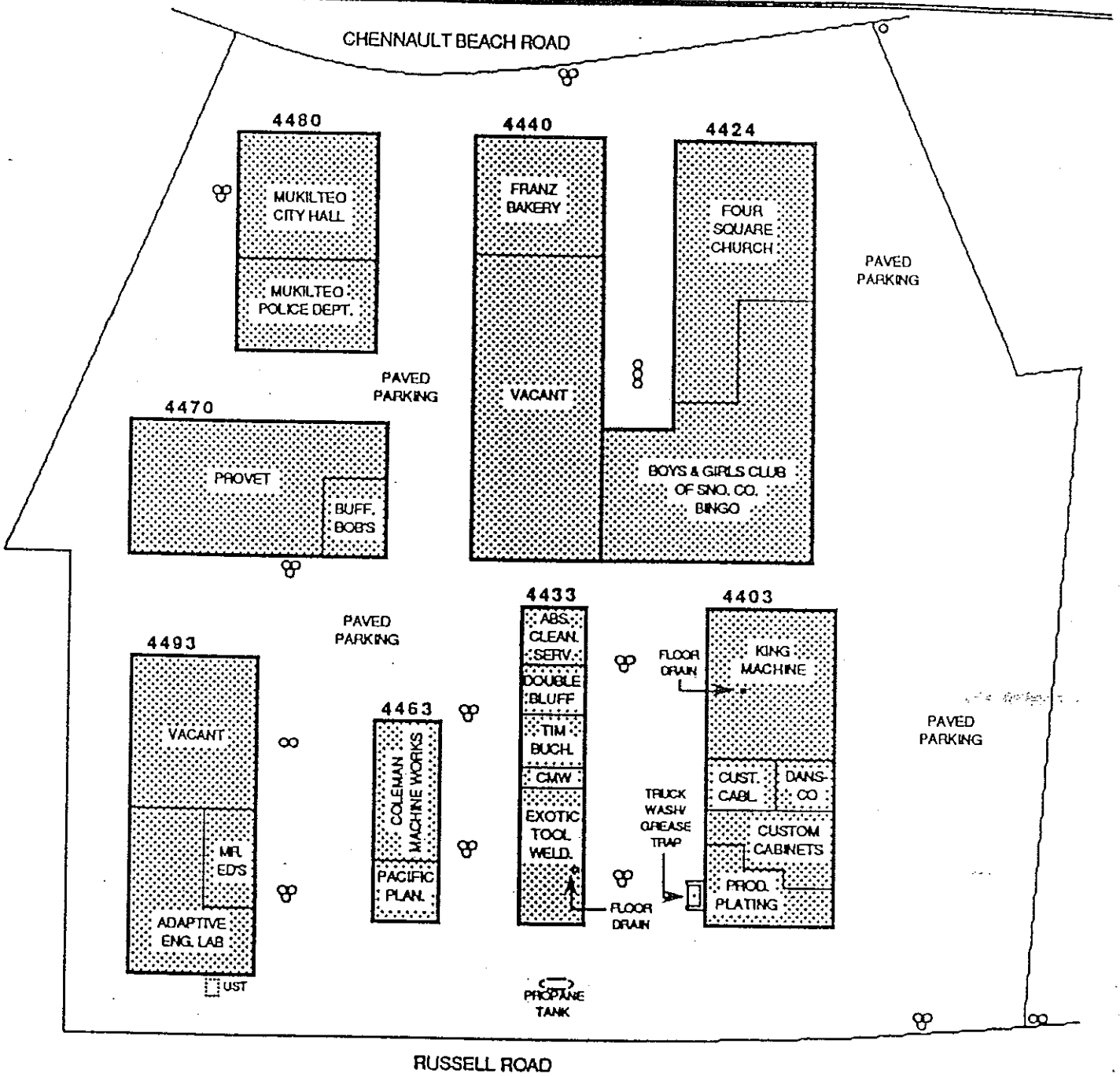
B.1 – 1994 Occupancy Map for Site (ATC, 1994)

B.2 – 1994 Occupancy Map for Nearby Offsite Properties (ATC, 1994)

B.3 – 1995 Occupancy Map for Site (Riley, 2005a)

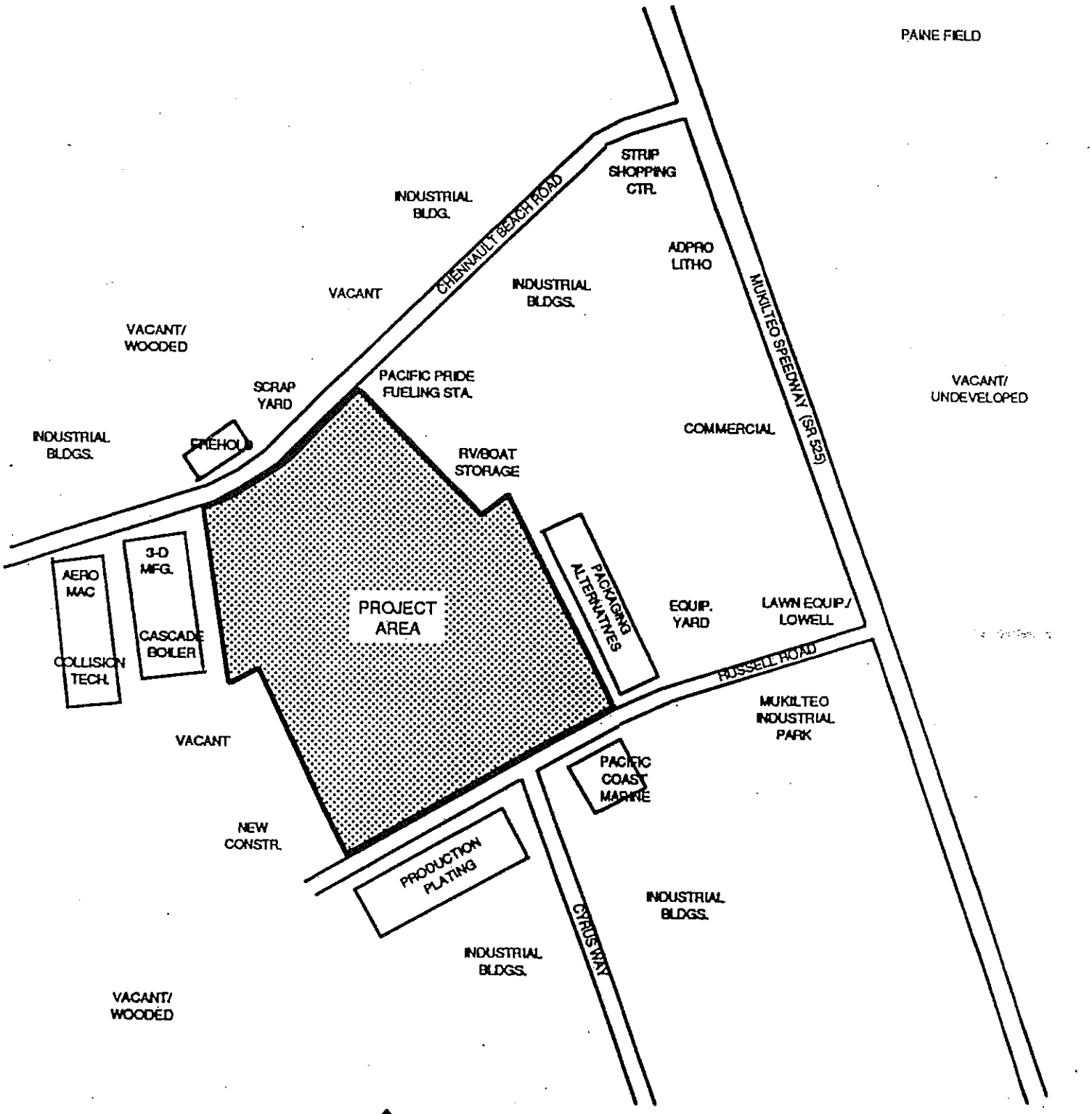
B.4 – 2005 Occupancy Map for Site (Riley, 2005a)

PHASE I ENVIRONMENTAL SITE ASSESSMENT
CB COMMERCIAL
HERS INDUSTRIAL PARK
MUKILTEO, WASHINGTON




SITE PLAN
NOT TO SCALE

PROJECT AREA BUILDINGS
POLE-MTD. TRANSFORMER

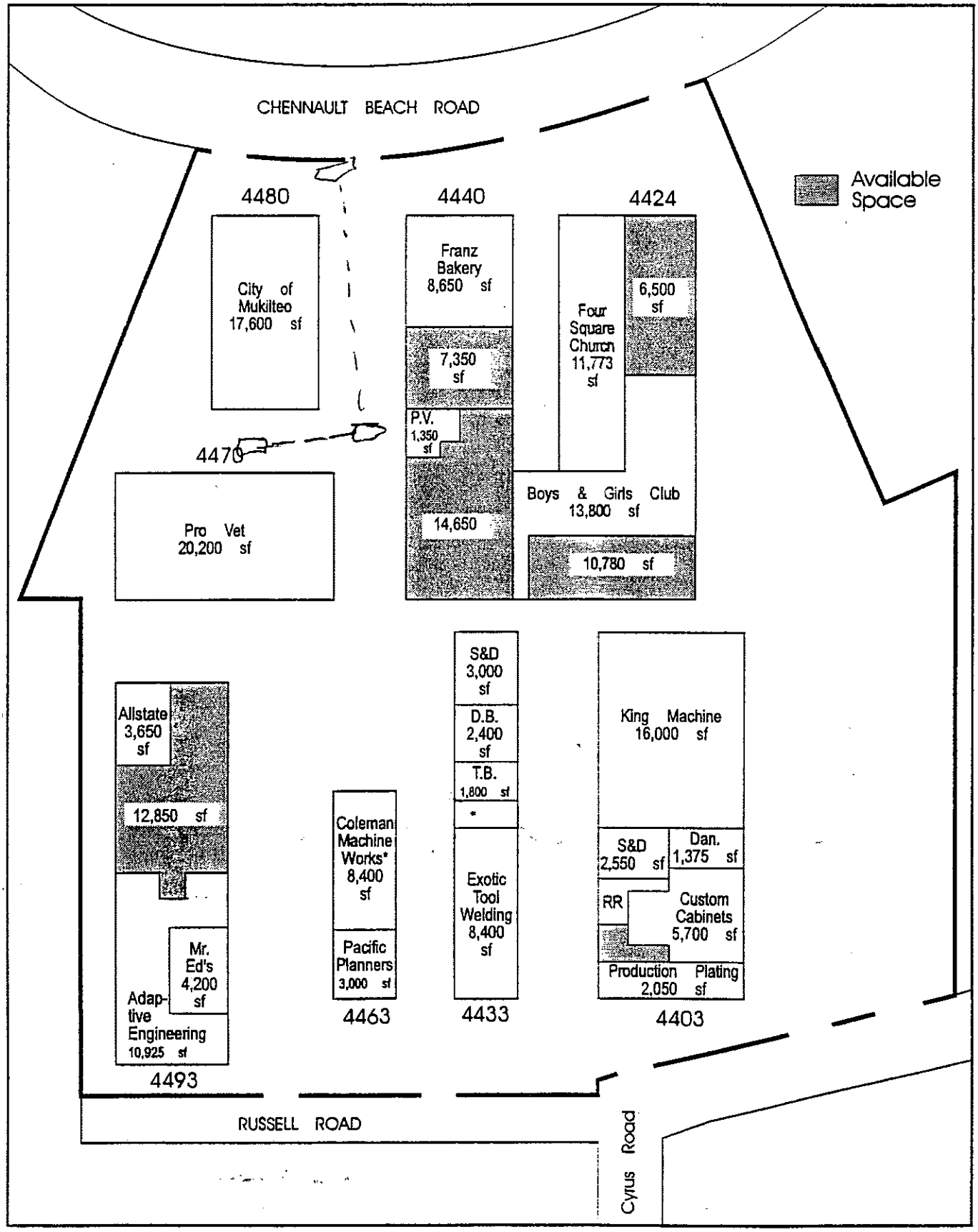



## VICINITY PLAN
NOT TO SCALE

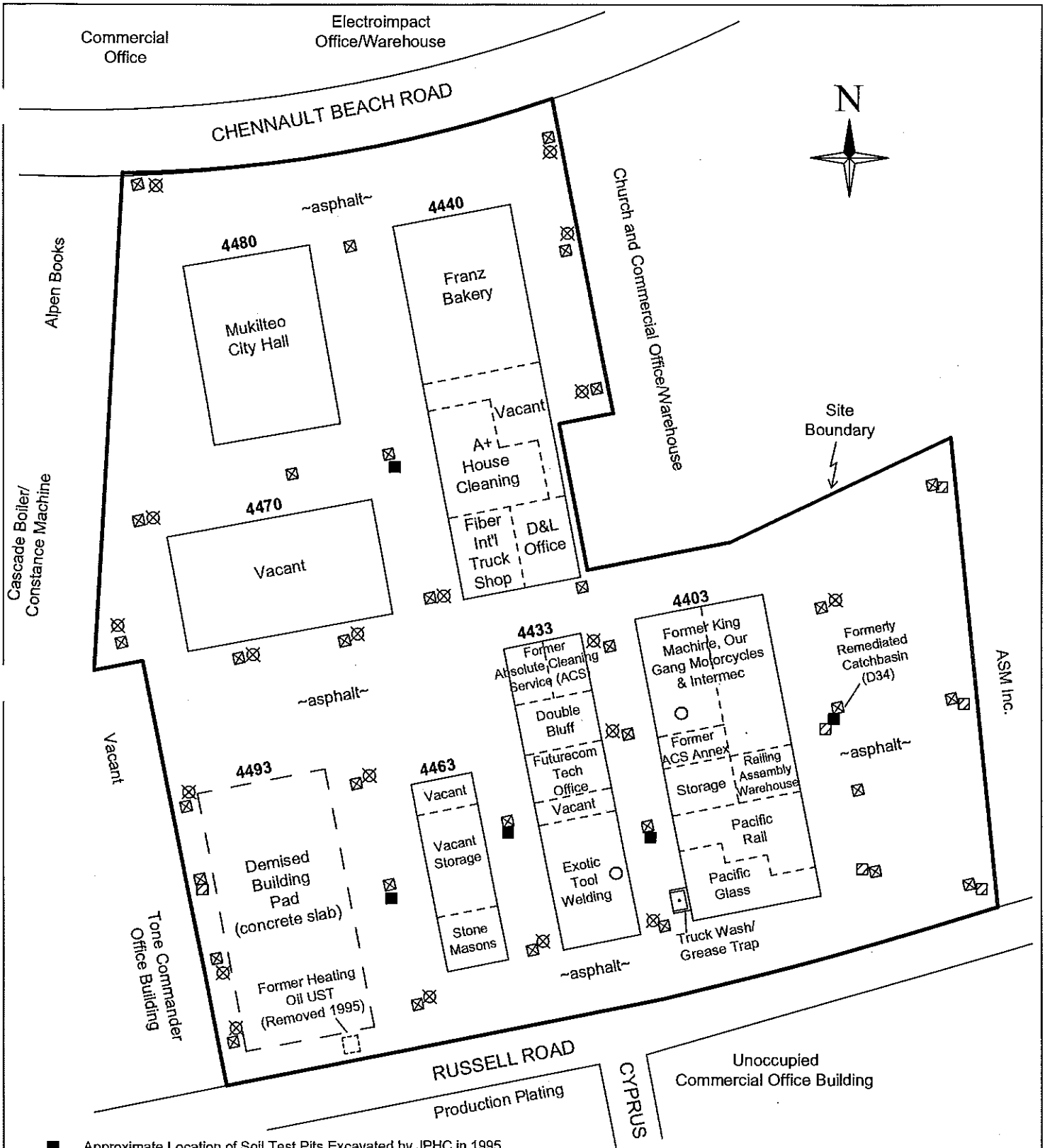
# HERS INDUSTRIAL PARK

B.3

## Site Plan




Ex 486-1896




■ Approximate Location of Soil Test Pits Excavated by JPHC in 1995
○ Approximate Location of Suspect Drains (1995 JPHC Investigation)
⊠ Approximate Location of Soil Borings Advanced by JPHC in 1996
▨ Approximate Location of Soil Test Pits Excavated by JPHC in 1996
⊠ Approximate Location of Stormwater Catchbasin

*Drawing is not to Scale*

**The Riley Group, Inc.**
17522 BOTHELL WAY NE, SUITE A
BOTHELL, WASHINGTON 98011

*Hers Industrial Park*

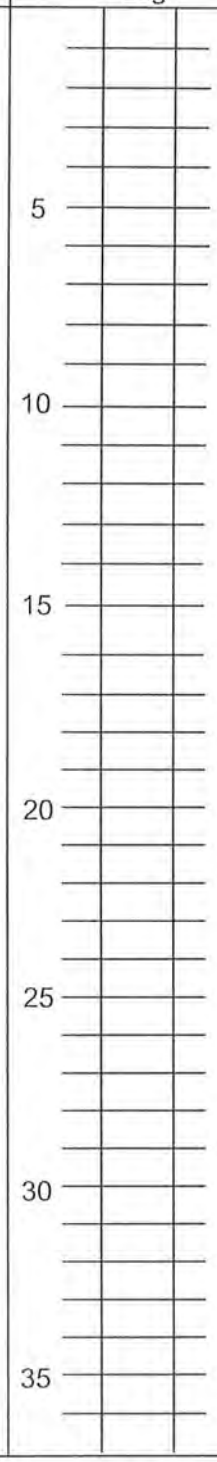
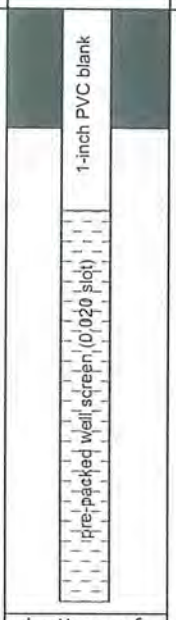
| *Project # 2005-087* | *Site Plan* | *Figure 2* |
|---|---|---|

*Site Address: 4403 Russell Road, Mukilteo, Washington*

# Appendix C – Well Construction and Boring Logs

C.1 – Well Construction Logs for MW-1 to MW-8 (Riley, 2005c)
C.2 – Well Construction Logs for MW-9 to MW-15 (NOT AVAILABLE)
C.3 – Soil Boring Logs AB-1 to AB-4
C.4 – Well Construction Logs for MW-2D, MW-16, MW-16D, and MW-17 to MW-22

| | |
|---|---|
| BORING/WELL NO. MW-1 | TOP OF CASING (TOC) ELEVATION: 100 |
| LOCATION : east 4403 Warehouse | START DATE: 9/11/05 START TIME: 8:30 AM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

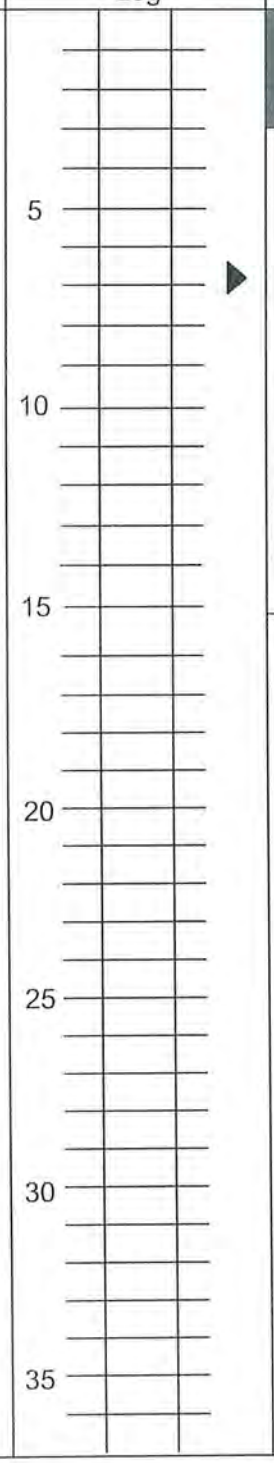
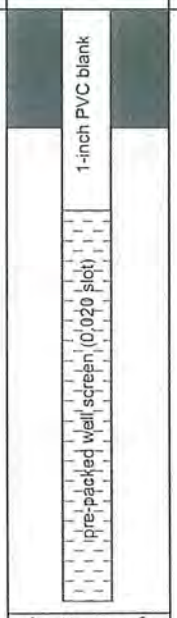
*The Riley Group, Inc.*
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown) — — — — — —

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-2 | TOP OF CASING (TOC) ELEVATION: 100 |
| LOCATION : north of 4403 Warehouse | START DATE: 9/11/05 START TIME: 10:30 AM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

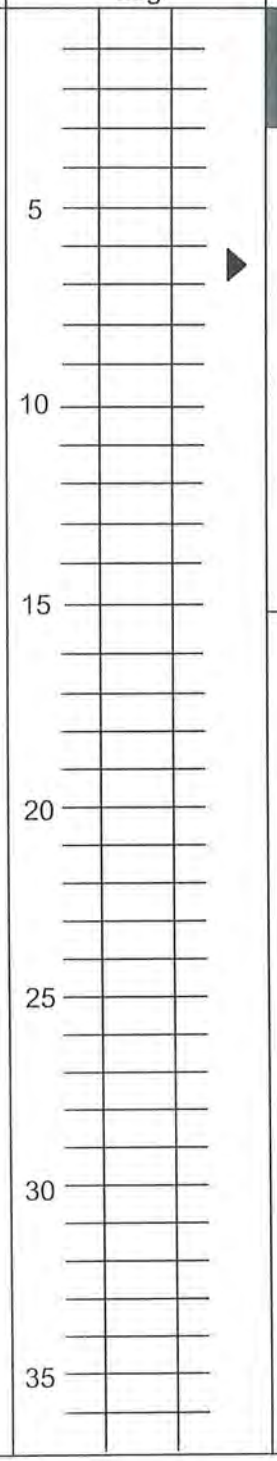
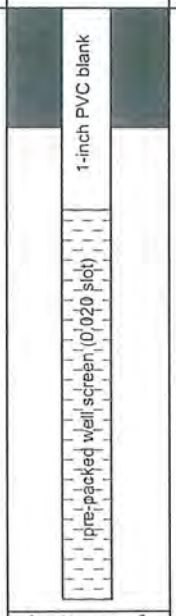
**The Riley Group, Inc.**
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-3 | TOP OF CASING (TOC) ELEVATION: 102.56 |
| LOCATION : west of 4403 Warehouse | START DATE: 9/11/05 START TIME: 12:30 PM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

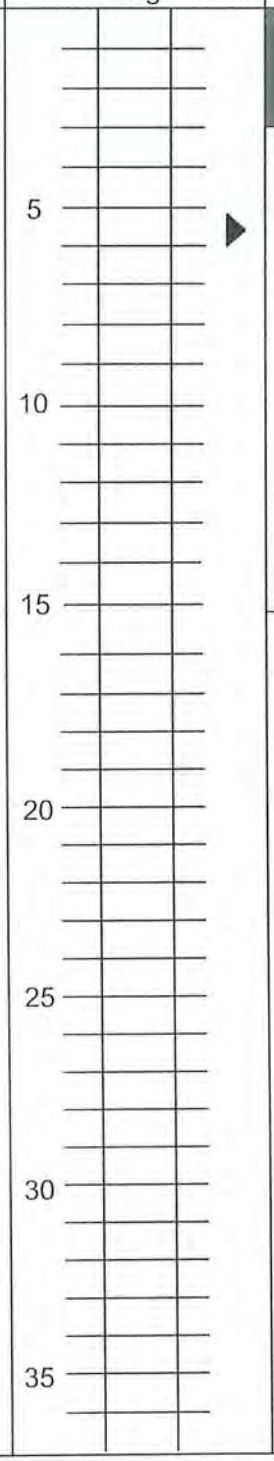
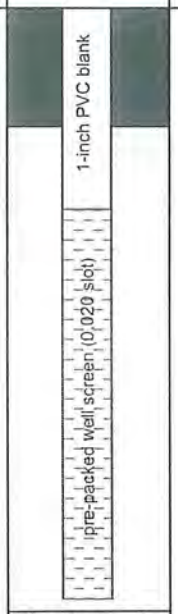

***The Riley Group, Inc.***
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011


*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-4 | TOP OF CASING (TOC) ELEVATION: 105.33 |
| LOCATION : west of 4403 Warehouse | START DATE: 9/11/05 START TIME: 2:30 PM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

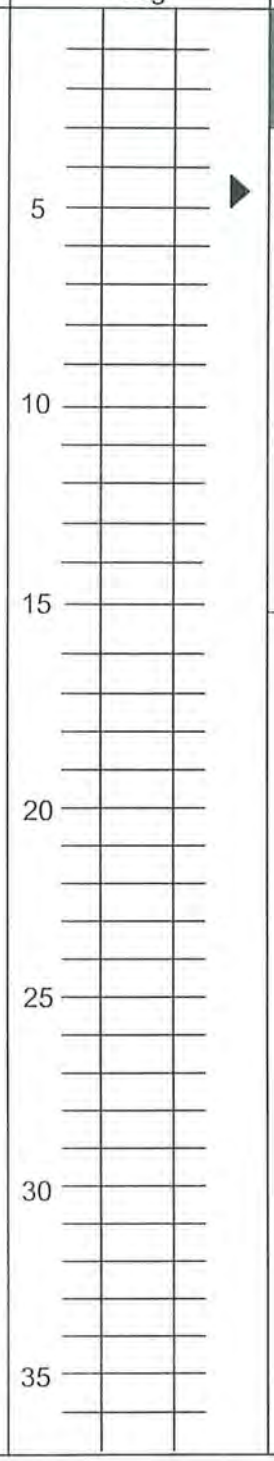
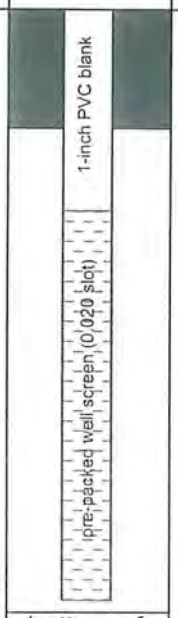
**The Riley Group, Inc.**
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-5 | TOP OF CASING (TOC) ELEVATION: 103.69 |
| LOCATION : south of 4403 Warehouse | START DATE: 9/11/05 START TIME: 4:30 PM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

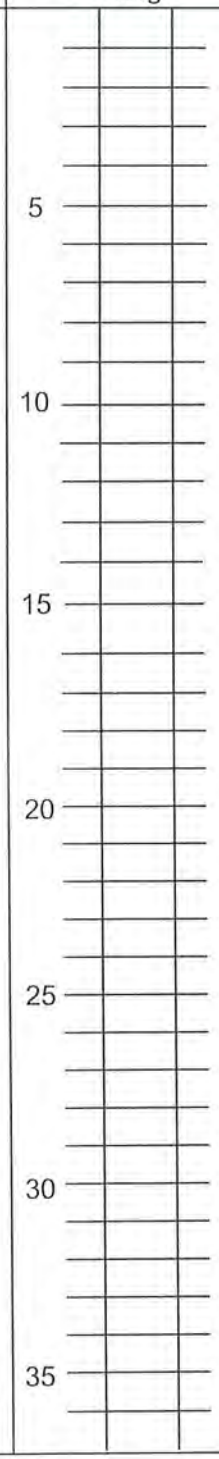
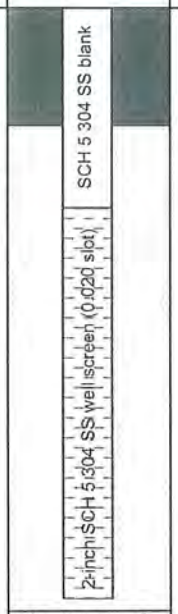

***The Riley Group, Inc.***
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011


*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-6 | TOP OF CASING (TOC) ELEVATION: 99.46 |
| LOCATION : east of 4403 Warehouse | START DATE: 10/4/05 START TIME: 8:30 AM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

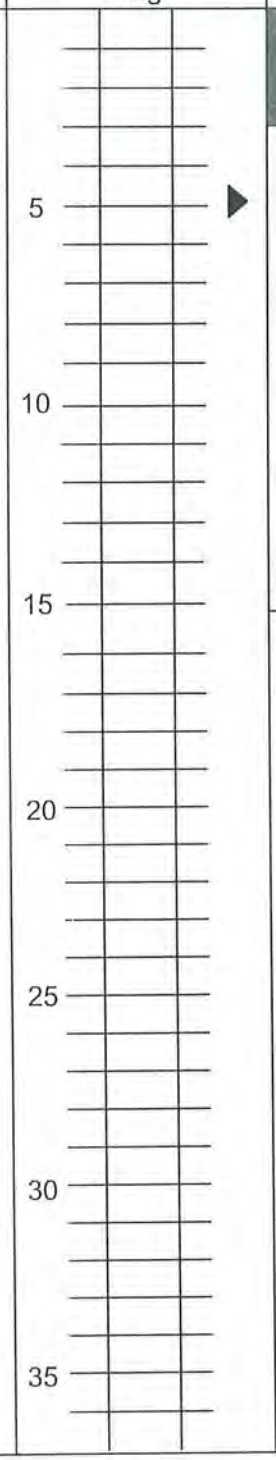
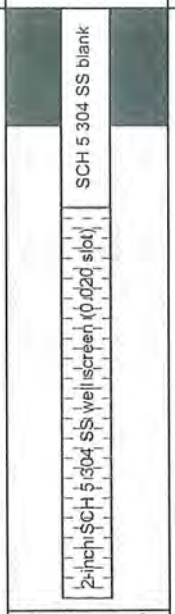
**The Riley Group, Inc.**
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-7 | TOP OF CASING (TOC) ELEVATION: 99.76 |
| LOCATION : east of 4403 Warehouse | START DATE: 10/4/05 START TIME: 11:30 AM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

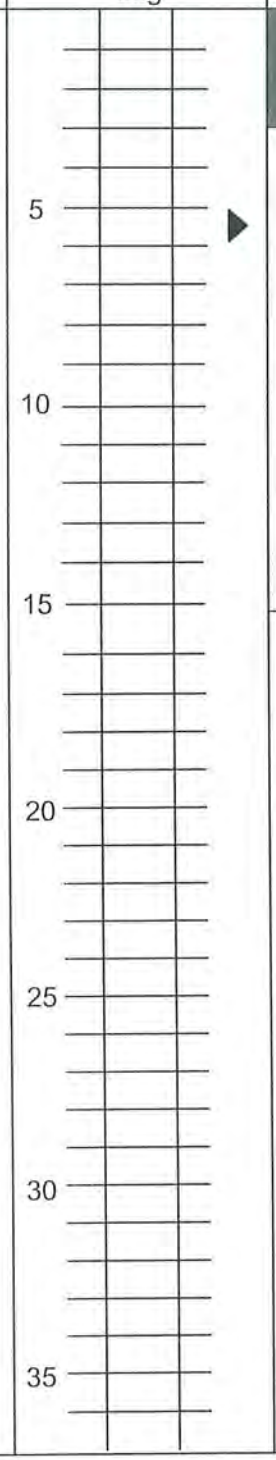
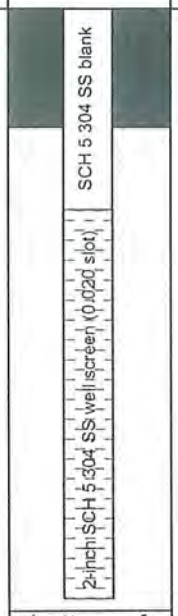
**The Riley Group, Inc.**
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

| | |
|---|---|
| BORING/WELL NO. MW-8 | TOP OF CASING (TOC) ELEVATION: 99.97 |
| LOCATION : northeast of 4403 Warehouse | START DATE: 10/4/05 START TIME: 2:30 PM |
| DRILLING SUBCONTRACTOR: Northwest Probe, Inc. | WEATHER: Partly cloudy |
| DRILLING METHOD/EQPMT: Truck mounted hollow stem auger | logged by: TN |

| Sample # | Graphic Log | Construction of Well Detail | SPT | PID (ppm) | Soil Description & Other Notes |
|---|---|---|---|---|---|
| |  |  | n/a | n/a | silty SAND with gravel |



KEY

- groundwater encountered during drilling
- groundwater encountered during sampling
- silica sand pack
- bentonite plug
- 2-inch PVC well screen (20 slot)

**The Riley Group, Inc.**
17522 BOTHELL WAY NE
BOTHELL, WASHINGTON 98011

*Groundwater Monitoring Well Log*

Lithologic Contact (where shown)

Site Address: 4403 Russell Road, Mukilteo, Washington

Aspect CONSULTING

# Boring Log

| Project Number | Boring Number | Sheet |
|---|---|---|
| 140252 | AB-1 | 1 of 1 |

Project Name: HERS Industrial Park
Ground Surface Elev.:
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Geoprobe - Direct Push
Depth to Water (ft BGS):
Sampling Method: Continuous Core
Start/Finish Date: 7/30/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | Concrete surface repair | | | | | | Concrete overlying crushed gravel | 0 |
| 1 | | | | 4.0 | | | Moist, brown, gravelly, sandy SILT (ML); fine sand, fine subrounded gravel, no odor | 1 |
| 2 | Backfilled with bentonite chips | | | 6.1 | | | | 2 |
| 3 | | S1 | Soil: AB-1-2.5 | 5.5 | | | | 3 |
| 4 | | | | | | | | 4 |
| 5 | | | | | | | Bottom of boring at 5', not enough overhead clearance to go deeper | 5 |
| 6 | | | | | | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | | | | | | | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | | | | | | | | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
○ No Recovery
▮ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
▼ Static Water Level
▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_ENV BORING LOG_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Boring Log

Aspect CONSULTING

| Project Number | Boring Number | Sheet |
|---|---|---|
| 140252 | AB-2 | 1 of 1 |

Project Name: HERS Industrial Park
Ground Surface Elev.:
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Geoprobe - Direct Push
Depth to Water (ft BGS):
Sampling Method: Continuous Core
Start/Finish Date: 7/30/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | Concrete surface repair | | | | | | Concrete overlying crushed gravel | 0 |
| 1 | | | | 0.0 | | | Moist, brown, sandy SILT (ML); fine sand, trace fine rounded gravel | 1 |
| 2 | Backfilled with bentonite chips | S1 | | 0.0 | | | | 2 |
| 3 | | | | 0.0 | | | | 3 |
| 4 | | | | 0.0 | | | | 4 |
| 5 | | | | 0.0 | | | | 5 |
| 6 | | | | 0.0 | | | Moist, brown SAND (SP); trace silt, predominantly medium sand, no odor | 6 |
| 7 | | S2 | | 0.0 | | | Moist, brown, sandy SILT (ML) to silty SAND (SM); fine sand, trace fine rounded gravel | 7 |
| 8 | | | | 0.0 | | | | 8 |
| 9 | | | | 0.0 | | | | 9 |
| 10 | | | | 0.0 | | | Brown, wet, silty SAND (SM); predominantly medium sand | 10 |
| 11 | | | | 0.0 | | | Moist, brown, sandy SILT (ML) to silty SAND (SM); fine sand, trace fine rounded gravel | 11 |
| 12 | | S3 | | 0.0 | | | | 12 |
| 13 | | | | 0.0 | | | | 13 |
| 14 | | | | 0.0 | | | | 14 |
| 15 | | | | | | | Bottom of boring, refusal at 14.5' bgs | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_ENV BORING LOG_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Boring Log

Aspect CONSULTING

| Project Number | Boring Number | Sheet |
|---|---|---|
| 140252 | AB-3 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Geoprobe - Direct Push
Sampling Method: Continuous Core

Ground Surface Elev.:
Depth to Water (ft BGS):
Start/Finish Date: 7/30/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | Concrete surface repair | | | | | | Concrete overlying crushed gravel | |
| 1 | | | | 0.0 | | | Moist, brown, gravelly sandy SILT (ML) to silty SAND (SM); fine sand, trace coarse sand, fine subrounded gravel, no odor | 1 |
| 2 | Backfilled with bentonite chips | S1 | | 0.0 | | | | 2 |
| 3 | | | | 0.0 | | | | 3 |
| 4 | | | | | | | | 4 |
| 5 | | | | | | | Orange mottling, no odor at 6' bgs | 5 |
| 6 | | | | 0.0 | | | | 6 |
| 7 | | S2 | | 0.0 | | | | 7 |
| 8 | | | | 0.0 | | | | 8 |
| 9 | | | | 0.0 | | | | 9 |
| 10 | | | | 0.0 | | | No odor at 10' bgs | 10 |
| 11 | | S3 | Soil: AB-3-11 | 0.1<br>0.6 | | | | 11 |
| 12 | | | | 0.4<br>0.0 | | | | 12 |
| 13 | | | | 0.0 | | | | 13 |
| 14 | | | | | | | Bottom of boring, refusal at 13.5' bgs | 14 |
| 15 | | | | | | | | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_ENV BORING LOG_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Boring Log

Aspect CONSULTING

| Project Number | Boring Number | Sheet |
|---|---|---|
| 140252 | AB-4 | 1 of 1 |

Project Name: HERS Industrial Park
Ground Surface Elev.:
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Geoprobe - Direct Push
Depth to Water (ft BGS):
Sampling Method: Continuous Core
Start/Finish Date: 7/30/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | Concrete surface repair | | | | | | Concrete overlying crushed gravel | 0 |
| 1 | | | | 0.0 | | | Moist, brown, sandy SILT (ML) to silty SAND (SM); trace fine rounded gravel, no odor | 1 |
| 2 | Backfilled with bentonite chips | S1 | | 0.0 | | | | 2 |
| 3 | | | | 0.0 | | | | 3 |
| 4 | | | | | | | | 4 |
| 5 | | | | | | | | 5 |
| 6 | | | | 0.0 | | | | 6 |
| 7 | | S2 | | 0.0 | | | | 7 |
| 8 | | | | 0.0 | | | | 8 |
| 9 | | | | 0.0 | | | | 9 |
| 10 | | | | | | | Wet, brown SAND (SP); trace silt, no odor | 10 |
| 11 | | | | 0.0 | | | | 11 |
| 12 | | S3 | | 0.0 | | | Moist, brown, sandy SILT (ML) to silty SAND (SM); trace fine rounded gravel, no odor | 12 |
| 13 | | | | 0.0 | | | | 13 |
| 14 | | | | | | | Bottom of boring, refusal at 13.5' bgs | 14 |
| 15 | | | | | | | | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_ENV BORING LOG_HERS INDUSTRIAL PARK.GPJ August 17, 2015

Aspect CONSULTING

# Monitoring Well Construction Log

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 1 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8" Flushmount monument in concrete 0' - 1' bgs<br>Thermos style cap | | | | | | Asphalt | 0 |
| 1 | | | | | | | **WEATHERED VASHON TILL**<br>Medium dense, moist, brown, gravelly, sandy, SILT (ML); fine to medium sand, trace coarse sand, fine subrounded to subangular gravel, oxide staining around gravels, diamict fabric, no odor | 1 |
| 2 | | | | | | | | 2 |
| 3 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 3 |
| 4 | | | | | | | | 4 |
| 5 | 2" Schedule 40 PVC casing 0'-176' bgs | | | | | | | 5 |
| 6 | | S1 | | 0.2 | 9<br>16<br>23 | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | | | | | | Becomes very dense at 10' bgs | 10 |
| 11 | | S2 | | 0.0 | 16<br>26<br>40 | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | | S3 | | 0.0 | 50/6" | | **VASHON TILL**<br>Very dense, moist, gray, gravelly, sandy, SILT (ML); fine to medium sand, trace coarse sand, fine subrounded - subangular gravel, diamict fabric, no odor | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 2 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 21 | | S4 | | 0.0 | 50/4" | | Very dense, moist, gray, gravelly, sandy, SILT (ML); predominantly fine sand, trace coarse sand, fine subrounded - subangular gravel, diamict fabric, no odor | 21 |
| 22 | | | | | | | | 22 |
| 23 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 23 |
| 24 | | | | | | | | 24 |
| 25 | 2" Schedule 40 PVC casing 0'-176' bgs | S5 | | 0.0 | 50/4" | | Fine to coarse sand, no odor at 25' bgs | 25 |
| 26 | | | | | | | | 26 |
| 27 | | | | | | | | 27 |
| 28 | | | | | | | | 28 |
| 29 | | | | | | | | 29 |
| 30 | | S6 | | 0.0 | 50/4" | | Coarse sand content becomes trace fraction, no odor at 30' bgs | 30 |
| 31 | | | | | | | | 31 |
| 32 | | | | | | | | 32 |
| 33 | | | | | | | | 33 |
| 34 | | | | | | | | 34 |
| 35 | | S7 | | 0.0 | 50/4" | | | 35 |
| 36 | | | | | | | | 36 |
| 37 | | | | | | | | 37 |
| 38 | | | | | | | | 38 |
| 39 | | | | | | | | 39 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 3 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 41 | | S8 | | 0.0 | 50/4" | | Very dense, moist, gray, gravelly, sandy, SILT (ML); fine to medium sand, trace coarse sand, fine subrounded - subangular gravel, diamict fabric, no odor | 41 |
| 42 | | | | | | | Scattered small pockets of medium sand, no odor | 42 |
| 43 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 43 |
| 44 | | | | | | | | 44 |
| 45 | 2" Schedule 40 PVC casing 0'-176' bgs | S9 | | 0.2 | 50/5" | | | 45 |
| 46 | | | | | | | | 46 |
| 47 | | | | | | | | 47 |
| 48 | | | | | | | | 48 |
| 49 | | | | | | | | 49 |
| 50 | | S10 | | 0.0 | 50/5" | | | 50 |
| 51 | | | | | | | | 51 |
| 52 | | | | | | | | 52 |
| 53 | | | | | | | | 53 |
| 54 | | | | | | | | 54 |
| 55 | | S11 | Soil: MW-2D-55 | 0.4 | 50/4" | | | 55 |
| 56 | | | | | | | | 56 |
| 57 | | | | | | | | 57 |
| 58 | | | | | | | | 58 |
| 59 | | | | | | | | 59 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 4 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 61 | | S12 | | 0.1 | 50/3" | | Very dense, moist, gray, gravelly, sandy, SILT (ML); fine to medium sand, trace coarse sand, fine subrounded - subangular gravel, diamict fabric, no odor | 61 |
| 62 | | | | | | | | 62 |
| 63 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 63 |
| 64 | | | | | | | | 64 |
| 65 | 2" Schedule 40 PVC casing 0'-176' bgs | S13 | | 0.1 | 50/3" | | | 65 |
| 66 | | | | | | | | 66 |
| 67 | | | | | | | | 67 |
| 68 | | | | | | | | 68 |
| 69 | | | | | | | | 69 |
| 70 | | S14 | | 0.0 | 50/1" | | Crushed coarse gravel in sampler shoe | 70 |
| 71 | | | | | | | | 71 |
| 72 | | | | | | | | 72 |
| 73 | | | | | | | | 73 |
| 74 | | | | | | | | 74 |
| 75 | | S15 | | 0.0 | 50/2" | | Becomes slightly gravelly, no odor at 75' bgs | 75 |
| 76 | | | | | | | | 76 |
| 77 | | | | | | | | 77 |
| 78 | | | | | | | | 78 |
| 79 | | | | | | | | 79 |

Sampler Type:
- ◯ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 5 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 81 | | S16 | | 0.0 | 50/2" | | Very dense, moist, gray, gravelly, sandy, SILT (ML); fine to medium sand, trace coarse sand, fine subrounded - subangular gravel, diamict fabric, no odor | 81 |
| 82 | | | | | | | | 82 |
| 83 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 83 |
| 84 | | | | | | | | 84 |
| 85 | 2" Schedule 40 PVC casing 0'-176' bgs | S17 | | 0.0 | 50/2" | | Very dense, very moist, gray, slightly gravelly, very silty SAND (SM); fine to medium sand, trace coarse sand, fine subrounded gravel, no odor | 85 |
| 86 | | | | | | | | 86 |
| 87 | | | | | | | | 87 |
| 88 | | | | | | | | 88 |
| 89 | | | | | | | | 89 |
| 90 | | S18 | | 0.0 | 50/4" | | Predominantly fine sand, no odor at 90' bgs | 90 |
| 91 | | | | | | | | 91 |
| 92 | | | | | | | | 92 |
| 93 | | | | | | | | 93 |
| 94 | | | | | | | | 94 |
| 95 | | S19 | | 0.0 | 50/1" | | No recovery, crushed coarse gravel in sampler shoe | 95 |
| 96 | | | | | | | | 96 |
| 97 | | | | | | | | 97 |
| 98 | | | | | | | | 98 |
| 99 | | | | | | | | 99 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 6 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 101 | | S20 | | 0.0 | 50/1" | | Very dense, moist, gray slightly gravelly, sandy SILT (ML); fine to medium sand, trace coarse sand, fine subrounded gravel, no odor | 101 |
| 102 | | | | | | | | 102 |
| 103 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 103 |
| 104 | | | | | | | | 104 |
| 105 | 2" Schedule 40 PVC casing 0'-176' bgs | S21 | | 0.0 | 50/2" | | Crushed coarse gravel in sampler shoe | 105 |
| 106 | | | | | | | | 106 |
| 107 | | | | | | | | 107 |
| 108 | | | | | | | | 108 |
| 109 | | | | | | | | 109 |
| 110 | | S22 | | 0.0 | 50/2" | | | 110 |
| 111 | | | | | | | | 111 |
| 112 | | | | | | | | 112 |
| 113 | | | | | | | | 113 |
| 114 | | | | | | | | 114 |
| 115 | | S23 | | 0.0 | 50/2" | | Very dense, wet, gray brown, gravelly, very silty SAND (SM); fine sand, trace medium to coarse sand, trace coarse sand, fine to coarse subrounded gravel diamict fabric, no odor | 115 |
| 116 | | | | | | | | 116 |
| 117 | | | | | | | | 117 |
| 118 | | | | | | | | 118 |
| 119 | | | | | | | | 119 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 7 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 121 | | S24 | | 0.0 | 50/1" | | Very dense, wet, gray brown, gravelly, very silty SAND (SM); fine sand, trace medium to coarse sand, trace coarse sand, fine to coarse subrounded gravel diamict fabric, no odor | 121 |
| 122 | | | | | | | | 122 |
| 123 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 123 |
| 124 | | | | | | | | 124 |
| 125 | 2" Schedule 40 PVC casing 0'-176' bgs | S25 | | 0.0 | 50/2" | | | 125 |
| 126 | | | | | | | | 126 |
| 127 | | | | | | | | 127 |
| 128 | | | | | | | | 128 |
| 129 | | | | | | | | 129 |
| 130 | | S26 | | 0.0 | 50/4" | | | 130 |
| 131 | | | | | | | | 131 |
| 132 | | | | | | | | 132 |
| 133 | | | | | | | | 133 |
| 134 | | | | | | | | 134 |
| 135 | | S27 | | 0.0 | 50/5" | | | 135 |
| 136 | | | | | | | | 136 |
| 137 | | | | | | | | 137 |
| 138 | | | | | | | | 138 |
| 139 | | | | | | | | 139 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 8 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 141 | | S28 | | 0.0 | 50/6" | | Very dense, wet, gray brown, gravelly, very silty SAND (SM); fine sand, trace medium to coarse sand, trace coarse sand, fine to coarse subrounded gravel diamict fabric, no odor | 141 |
| 142 | | | | | | | | 142 |
| 143 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 143 |
| 144 | | | | | | | | 144 |
| 145 | 2" Schedule 40 PVC casing 0'-176' bgs | | | | | | | 145 |
| 146 | | S29 | | 0.0 | 35<br>42<br>50/6" | | | 146 |
| 147 | | | | | | | | 147 |
| 148 | | | | | | | | 148 |
| 149 | | | | | | | | 149 |
| 150 | | S30 | | 0.0 | 50/1" | | | 150 |
| 151 | | | | | | | | 151 |
| 152 | | | | | | | | 152 |
| 153 | | | | | | | | 153 |
| 154 | | | | | | | | 154 |
| 155 | | S31 | | 0.0 | 50/3" | | | 155 |
| 156 | | | | | | | | 156 |
| 157 | | | | | | | | 157 |
| 158 | | | | | | | | 158 |
| 159 | | | | | | | | 159 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 9 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 161 | | S32 | | 0.0 | 65<br>110/6" | | Very dense, wet, gray brown, gravelly, very silty SAND (SM); fine sand, trace medium to coarse sand, trace coarse sand, fine to coarse subrounded gravel diamict fabric, no odor | 161 |
| 162 | ▼ 8/10/2015 | | | | | | | 162 |
| 163 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 163 |
| 164 | | | | | | | | 164 |
| 165 | 2" Schedule 40 PVC casing 0'-176' bgs | S33 | | 0.0 | 100/3" | | Very dense, moist, gray brown SAND (SP); fine sand, trace silt, no odor | 165 |
| 166 | | | | | | | | 166 |
| 167 | | | | | | | | 167 |
| 168 | | | | | | | | 168 |
| 169 | | | | | | | | 169 |
| 170 | | S34 | | 0.0 | 100/3" | | Very dense, moist, gray brown, gravelly, silty SAND (SM); fine sand, trace coarse sand, fine subrounded gravel, scattered very thin laminae of medium sand, vague stratification features, no odor | 170 |
| 171 | | | | | | | | 171 |
| 172 | | | | | | | | 172 |
| 173 | 10/20 Colorado silica sand 173'-196' bgs | | | | | | | 173 |
| 174 | | | | | | | | 174 |
| 175 | | S35 | | 0.0 | 100/3" | | Very thin medium sand laminae become frequent with stronger stratification features | 175 |
| 176 | | | | | | | | 176 |
| 177 | 2" Schedule 40 PVC 20-slot screen 176'-196' bgs | | | | | | **ESPERANCE SAND**<br>Very dense, very moist, brown, slightly silty SAND (SP-SM); predominantly medium sand, silt in ~4mm clasts, no odor | 177 |
| 178 | | | | | | | | 178 |
| 179 | | | | | | | | 179 |

Sampler Type:
- ○ No Recovery
- Standard Penetration Test (ASTM D1586)
- Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 10 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 181 | | S36 | | 0.0 | 44<br>50/5" | | Very dense, very moist, brown, slightly silty SAND (SP-SM); predominantly medium sand, no odor | 181 |
| 182 | | | | | | | | 182 |
| 183 | Backfilled with bentonite chips 1'-173' bgs | | | | | | | 183 |
| 184 | | | | | | | | 184 |
| 185 | 2" Schedule 40 PVC casing 0'-196' bgs | | | | | | Trace silt and iron oxide mottling, no odor at 185' bgs | 185 |
| 186 | | | | | | | | 186 |
| 187 | | | | | | | | 187 |
| 188 | | | | | | | | 188 |
| 189 | | | | | | | | 189 |
| 190 | | S37 | Soil: MW-2D-190 | 0.0 | 47<br>50/3" | | | 190 |
| 191 | | | | | | | | 191 |
| 192 | | | | | | | | 192 |
| 193 | | | | | | | | 193 |
| 194 | | | | | | | | 194 |
| 195 | | | | | | | | 195 |
| 196 | Threaded PVC endcap | | | | | | | 196 |
| 197 | Native soil | | | | | | Very dense, moist, gray, slightly clayey, silty SAND (SM); fine sand, homogenous, no odor | 197 |
| 198 | | | | | | | | 198 |
| 199 | | | | | | | | 199 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)
- ⧓ Modified California Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-2D | 11 of 11 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Mud Rotary with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 162.25 - 8/10/2015
Start/Finish Date: 7/27/2015 - 7/31/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 201 | | S38 | | 0.0 | 17<br>35<br>50/5" | | | 201 |
| | | | | | | | Bottom of boring at 200.5' bgs, well tag: BJE-570 | |
| 202 | | | | | | | | 202 |
| 203 | | | | | | | | 203 |
| 204 | | | | | | | | 204 |
| 205 | | | | | | | | 205 |
| 206 | | | | | | | | 206 |
| 207 | | | | | | | | 207 |
| 208 | | | | | | | | 208 |
| 209 | | | | | | | | 209 |
| 210 | | | | | | | | 210 |
| 211 | | | | | | | | 211 |
| 212 | | | | | | | | 212 |
| 213 | | | | | | | | 213 |
| 214 | | | | | | | | 214 |
| 215 | | | | | | | | 215 |
| 216 | | | | | | | | 216 |
| 217 | | | | | | | | 217 |
| 218 | | | | | | | | 218 |
| 219 | | | | | | | | 219 |

Sampler Type:
- No Recovery
- Standard Penetration Test (ASTM D1586)
- Modified California Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 6.62 - 8/10/2015
Start/Finish Date: 1/21/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 5" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock | 0 |
| 1 | | | | 0.1 | | | Moist, brown, silty, gravelly SAND (SM); crushed rock gravel | 1 |
| 2 | Backfilled with bentonite chips | | | | | | Moist, brown gray, gravelly, silty SAND (SM); fine sand, fine subrounded gravel, trace wood at 1' | 2 |
| 3 | | S1 | | 0.4 | 4<br>5<br>10 | | | 3 |
| 4 | Colorado silica sand 4'-15' bgs | | | | | | | 4 |
| 5 | ▽1/21/2015 | | | | | | Becomes very moist, iron oxide staining | 5 |
| 6 | | S2 | | 1.5 | 3<br>5<br>5 | | | 6 |
| 7 | ▼8/20/2015 | | | | | | | 7 |
| 8 | 1-inch Schedule 40 PVC casing, 10 slot screen 5'-15' bgs in prepacked sand | S3 | | 2.4 | 4<br>8<br>30 | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | | | | | | Chemical odor at 10' bgs | 10 |
| 11 | | S4 | | 12.5 | 30<br>34<br>50/5.5" | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | S5 | | 21.3 | 19<br>34<br>43 | | Becomes wet between 12.5' to 13' bgs and brown with iron oxide staining<br>Becomes gray at 13.25 | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded end-cap | S6 | Soil: MW-16-15.5 | 61.5 | 19<br>50/6" | | | 15 |
| 16 | | | | | | | Bottom of boring at 16 ft bgs | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 1 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock | 0 |
| 1 | | | | | | | Very moist, dark brown, silty SAND (SM); predominantly fine sand, trace fine subangular gravel, iron oxide staining | 1 |
| 2 | | | | | | | | 2 |
| 3 | | | | | | | | 3 |
| 4 | Backfilled with bentonite chips 1.5'-12' bgs | | | | | | | 4 |
| 5 | | S1 | | 0.1 | 3 | | Becomes loose, moist, and gray brown with diamict fabric at 5' bgs | 5 |
| 6 | | | | 0.1 | 4<br>5 | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | S2 | | 2.7 | 10 | | Becomes very dense | 10 |
| 11 | | | | 2.9 | 20<br>38 | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | Backfilled with bentonite grout 12'-77.5' bgs | | | | | | | 14 |
| 15 | | S3 | Soil: MW-16D-10 | 5.0 | 37<br>50/5" | | Becomes blue gray at 15' bgs<br>1 inch pocket of brown, silty sand at 15.5' bgs | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 2 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 21 | Backfilled with bentonite grout 12'-77.5' bgs | S4 | | 0.3 | 22<br>50/4" | | | 21 |
| 22 | | | | | | | | 22 |
| 23 | | | | | | | | 23 |
| 24 | | | | | | | | 24 |
| 25 | | S5 | Soil: MW-16D-25 | 0.0 | 50/6" | | | 25 |
| 26 | | | | | | | | 26 |
| 27 | | | | | | | | 27 |
| 28 | | | | | | | | 28 |
| 29 | | | | | | | | 29 |
| 30 | | S6 | | 0.0 | 50/4" | | | 30 |
| 31 | | | | | | | | 31 |
| 32 | | | | | | | | 32 |
| 33 | | | | | | | | 33 |
| 34 | | | | | | | | 34 |
| 35 | | S7 | | 0.5 | 37<br>50/5" | | | 35 |
| 36 | | | | | | | | 36 |
| 37 | | | | | | | | 37 |
| 38 | | | | | | | | 38 |
| 39 | | | | | | | | 39 |

Sampler Type:
- ◯ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 3 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 40 | | S8 | | 0.0 | 50/5" | | | 40 |
| 41 | Backfilled with bentonite grout 12'-77.5' bgs | | | | | | | 41 |
| 42 | | | | | | | | 42 |
| 43 | | | | | | | | 43 |
| 44 | | | | | | | | 44 |
| 45 | | S9 | Soil: MW-16D-45 | 15.4 | 50/5" | | | 45 |
| 46 | | | | | | | | 46 |
| 47 | | | | | | | | 47 |
| 48 | | | | | | | | 48 |
| 49 | | | | | | | | 49 |
| 50 | | S10 | | 10.1 | 50/3" | | | 50 |
| 51 | | | | | | | | 51 |
| 52 | | | | | | | | 52 |
| 53 | | | | | | | | 53 |
| 54 | | | | | | | | 54 |
| 55 | | S11 | | 0.4 | 50/3" | | | 55 |
| 56 | | | | | | | | 56 |
| 57 | | | | | | | | 57 |
| 58 | ▼ 4/27/2015<br>▼ 8/10/2015 | | | | | | | 58 |
| 59 | | | | | | | | 59 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_ HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 4 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 61 | Backfilled with bentonite grout 12'-77.5' bgs | S12 | | 0.3 | 50/3" | | | 61 |
| 62 | | | | | | | | 62 |
| 63 | | | | | | | | 63 |
| 64 | | | | | | | | 64 |
| 65 | | S13 | Soil: MW-16D-65 | 0.0 | 50/3" | | Cuttings become a wet slurry | 65 |
| 66 | | | | | | | | 66 |
| 67 | | | | | | | | 67 |
| 68 | | | | | | | | 68 |
| 69 | | | | | | | | 69 |
| 70 | | S14 | | 0.0 | 50/3" | | Broken gravel in sampler shoe | 70 |
| 71 | | | | | | | | 71 |
| 72 | | | | | | | | 72 |
| 73 | | | | | | | | 73 |
| 74 | | | | | | | | 74 |
| 75 | | S15 | | 0.0 | 50/4" | | | 75 |
| 76 | | | | | | | | 76 |
| 77 | | | | | | | | 77 |
| 78 | Colorado silica sand 77.5-100.33' bgs | | | | | | | 78 |
| 79 | | | | | | | | 79 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 5 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 81 | 2-inch Schedule 40 PVC casing, 10 slot screen 80'-100' bgs | S16 | | 0.0 | 50/4" | | | 81 |
| 82 | | | | | | | | 82 |
| 83 | | | | | | | | 83 |
| 84 | | | | | | | | 84 |
| 85 | | S17 | | 0.0 | 50/4" | | 2-inch pocket of silty medium sand at 85.25' bgs | 85 |
| 86 | | | | | | | | 86 |
| 87 | | | | | | | | 87 |
| 88 | | | | | | | | 88 |
| 89 | | | | | | | | 89 |
| 90 | | S18 | Soil: MW-16D-90 | 0.0 | 50/5" | | | 90 |
| 91 | | | | | | | | 91 |
| 92 | | | | | | | | 92 |
| 93 | | | | | | | | 93 |
| 94 | | | | | | | | 94 |
| 95 | | S19 | | 0.0 | 50/3" | | | 95 |
| 96 | | | | | | | | 96 |
| 97 | | | | | | | | 97 |
| 98 | | | | | | | | 98 |
| 99 | Threaded end-cap | | | | | | | 99 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-16D | 6 of 6 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 57.65 - 8/10/2015
Start/Finish Date: 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| | | S20 | | 0.0 | 50/4" | | Very dense, moist to very moist, gray, very sandy SILT (ML); fine sand | |
| 101 | | | | | | | Bottom of boring at 100.33' bgs | 101 |
| 102 | | | | | | | | 102 |
| 103 | | | | | | | | 103 |
| 104 | | | | | | | | 104 |
| 105 | | | | | | | | 105 |
| 106 | | | | | | | | 106 |
| 107 | | | | | | | | 107 |
| 108 | | | | | | | | 108 |
| 109 | | | | | | | | 109 |
| 110 | | | | | | | | 110 |
| 111 | | | | | | | | 111 |
| 112 | | | | | | | | 112 |
| 113 | | | | | | | | 113 |
| 114 | | | | | | | | 114 |
| 115 | | | | | | | | 115 |
| 116 | | | | | | | | 116 |
| 117 | | | | | | | | 117 |
| 118 | | | | | | | | 118 |
| 119 | | | | | | | | 119 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_ HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-17 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 4.93 - 8/10/2015
Start/Finish Date: 1/21/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 5" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock | 0 |
| 1 | | | | | | | Moist, brown, slightly gravelly, sandy SILT (ML); predominantly fine sand, fine subangular to subrounded gravel | 1 |
| 2 | Backfilled with bentonite chips; ▽ 1/21/2015 | | | | | | | 2 |
| 3 | | | | | | | | 3 |
| 4 | Colorado silica sand 4'-15' bgs | | | | | | | 4 |
| 5 | ▼ 8/10/2015 | | | | | | | 5 |
| 6 | 1-inch Schedule 40 PVC casing, 10 slot screen 5'-15' bgs in prepacked sand | | | | | | Becomes gray brown at 6' bgs | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | S1 | Soil: MW-17-10 | 0.0 | 6<br>26<br>43 | | Becomes wet at 10' bgs | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded end-cap | | | | | | Bottom of boring at 15 ft bgs | 15 |
| 16 | | | | | | | | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-18 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 6.27 - 8/10/2015
Start/Finish Date: 1/21/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 5" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock | 0 |
| 1 | | S1 | | 0.0 | 1<br>1<br>2 | | Moist, brown, gravelly, sandy SILT (ML); predominantly fine sand, fine subrounded to rounded gravel, scattered clasts of gray sandy silt, no odor | 1 |
| 2 | Backfilled with bentonite chips | | | | | | | 2 |
| 3 | | S2 | | 0.3 | 1<br>2<br>2 | | Becomes very moist at 2.5' bgs with iron oxide staining and trace gravel content | 3 |
| 4 | Colorado silica sand 4'-15' bgs | | | | | | | 4 |
| 5 | ▽1/21/2015 | S3 | | 0.0 | 0<br>0<br>1 | | Becomes wet at 5' bgs, no odor | 5 |
| 6 | ▼8/10/2015 | | | | | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | 1-inch Schedule 40 PVC casing, 10 slot screen 5'-15' bgs in prepacked sand | S4 | | 0.1 | 5<br>19<br>24 | | Becomes very moist, brown and gray, and gravelly at 7.5' bgs with no odor | 8 |
| 9 | | | | | | | | 9 |
| 10 | | S5 | Soil: MW-18-10.5 | 1.8 | 9<br>14<br>29 | | | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | S6 | | 0.4 | 10<br>33<br>50/5" | | Becomes wet and very sandy at 12.5' bgs | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded end-cap | S7 | | 0.0 | 28<br>50/5" | | Wet, brown, gravelly, very sandy SILT (ML) to very silty SAND (SM); fine to medium sand, fine subrounded gravel | 15 |
| 16 | | | | | | | Bottom of boring at 15.9' bgs | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ◯ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_ HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-19 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): - 1/23/2015
Start/Finish Date: 1/21/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 5" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock | 0 |
| 1 | | | | | | | Moist, brown, slightly gravelly, sandy SILT (ML); fine sand, fine subangular to subrounded grave, trace partially burned wood organics | 1 |
| 2 | Backfilled with bentonite chips | | | | | | | 2 |
| 3 | 1/23/2015 | | | | | | Becomes gray brown at 3' bgs | 3 |
| 4 | Colorado silica sand 4'-15' bgs | | | | | | | 4 |
| 5 | | | | | | | Returns to brown at 5' bgs | 5 |
| 6 | 1-inch Schedule 40 PVC casing, 10 slot screen 5'-15' bgs in prepacked sand | | | | | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | | | | | | Becomes wet at 10' bgs | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | Becomes moist and gray at 13' bgs | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded end-cap | | | | | | | 15 |
| 16 | | | | | | | Bottom of boring at 16' bgs | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
○ No Recovery

PID - Photoionization Detector
▼ Static Water Level
▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-20 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / Truck Mounted HSA
Sampling Method: Split Spoon / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.
Top of Casing Elev.
Depth to Water (ft BGS)
Start/Finish Date 4/9/2015 - 4/10/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 5" Flushmount monument in concrete, thermos cap | | | | | | Asphalt overlying crushed rock gravel | 0 |
| 1 | | | | | | | Moist, brown, silty SAND (SM); predominantly fine sand, trace subangular gravel, diamict fabric | 1 |
| 2 | Backfilled with bentonite chips | | | | | | | 2 |
| 3 | | | | | | | | 3 |
| 4 | Colorado silica sand 4'-15' bgs | | | | | | | 4 |
| 5 | | S1 | | 0.0 | 3 | | Becomes medium dense at 5' bgs | 5 |
| 6 | 1-inch Schedule 40 PVC casing, 10 slot screen 5'-15' bgs in prepacked sand | | | 0.0 | 12 | | | 6 |
| 7 | | | | | 15 | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | | S2 | Soil: MW-20-10 | 0.0 | 7 | | Becomes dense and wet at 10' bgs | 10 |
| 11 | | | | 0.0 | 22 | | | 11 |
| 12 | | | | | 50/6" | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded end-cap | S3 | | 0.0 | 28 | | Becomes very dense, moist, and gray at 15' bgs | 15 |
| 16 | | | | 0.0 | 50/3" | | Bottom of boring at 15.75' bgs | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-21 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / HSA with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 6.21 - 8/10/2015
Start/Finish Date: 7/24/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8" Flushmount monument in concrete 0' - 1' bgs<br>Thermos style cap | | | | | Asphalt | Asphalt | 0 |
| 1 | Bentonite chips 1'-3' bgs | | | | | Dense, moist, brown, sandy, gravelly SILT (ML); fine to medium sand, trace coarse sand, fine subrounded to subangular gravel, diamict fabric, no odor | | 1 |
| 2 | | | | | | | | 2 |
| 3 | Colorado silica sand 3'-15' bgs | | | | | | | 3 |
| 4 | | | | | | | | 4 |
| 5 | 2" Schedule 40 PVC casing 0'-15' bgs | S1 | | 0.0 | 4<br>14<br>24 | | | 5 |
| 6 | 8/10/2015 | | | | | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | S2 | Soil: MW-21-9-10 | 1.3 | 10<br>25<br>50/5" | | Becomes very dense at 9' bgs | 9 |
| 10 | 2" Prepack screen 5'-15' bgs | | | | | | | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded PVC endcap<br>Native soil | S3 | | 0.1 | 50/5.5" | | Becomes gray at 15' bgs | 15 |
| 16 | | | | | | | Bottom of boring at 15.5' bgs, well tag: BJE-599 | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_ HERS INDUSTRIAL PARK.GPJ August 17, 2015

# Monitoring Well Construction Log

Aspect CONSULTING

| Project Number | Well Number | Sheet |
|---|---|---|
| 140252 | MW-22 | 1 of 1 |

Project Name: HERS Industrial Park
Location: 4403 Russell Rd, Mukilteo, Washington
Driller/Method: Holt Drilling,Inc / HSA with CME 85
Sampling Method: SPT / Hammer Weight: 140 lbs / Hammer Drop: 30" Drop

Ground Surface Elev.:
Top of Casing Elev.:
Depth to Water (ft BGS): 5.22 - 8/10/2015
Start/Finish Date: 7/24/2015

| Depth / Elevation (feet) | Borehole Completion | Sample Type/ID | Tests | PID (ppm) | Blows/ 6" | Material Type | Description | Depth (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8" Flushmount monument in concrete 0' - 1' bgs<br>Thermos style cap<br>Bentonite chips 1'-3' bgs | | | | | | Asphalt | 0 |
| 1 | | | | | | | Medium dense, moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine subrounded to subangular gravel, trace orange mottling, no odor | 1 |
| 2 | | | | | | | | 2 |
| 3 | Colorado silica sand 3'-15' bgs | S1 | | 0.0 | 6<br>9<br>12 | | Dense, moist, brown, gravelly, sandy SILT (ML); fine to medium sand, fine subrounded to subangular gravel, trace orange mottling, oxidation on gravels, diamict fabric, no odor | 3 |
| 4 | 2" Schedule 40 PVC casing 0'-15' bgs | | | | | | | 4 |
| 5 | ▼ 8/10/2015 | S2 | | 0.0 | 9<br>19<br>21 | | | 5 |
| 6 | | | | | | | | 6 |
| 7 | | | | | | | | 7 |
| 8 | | | | | | | | 8 |
| 9 | | | | | | | | 9 |
| 10 | 2" Prepack screen 5'-15' bgs | S3 | Soil: MW-22-10-11 | 0.0 | 17<br>33<br>50/4" | | Becomes very dense at 10' bgs | 10 |
| 11 | | | | | | | | 11 |
| 12 | | | | | | | | 12 |
| 13 | | | | | | | | 13 |
| 14 | | | | | | | | 14 |
| 15 | Threaded PVC endcap<br>Native soil | S4 | | 0.0 | 33<br>50/4" | | Becomes gray at 15' bgs | 15 |
| 16 | | | | | | | Bottom of boring at 16' bgs, well tag: BJE-598 | 16 |
| 17 | | | | | | | | 17 |
| 18 | | | | | | | | 18 |
| 19 | | | | | | | | 19 |

Sampler Type:
- ○ No Recovery
- ◪ Standard Penetration Test (ASTM D1586)

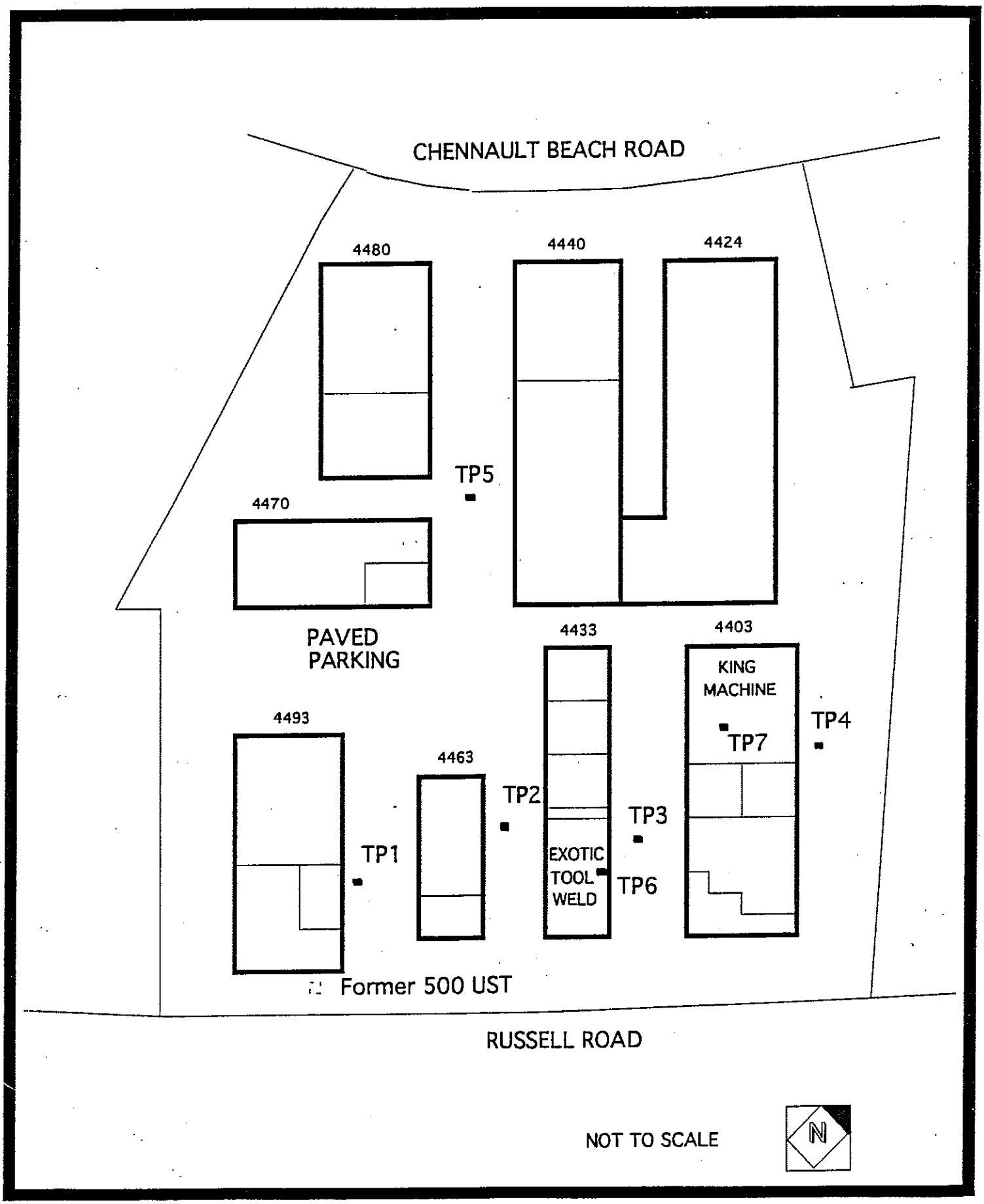
PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MML
Approved by: AN
Figure No.

_MONITORING WELL_HERS INDUSTRIAL PARK.GPJ August 17, 2015

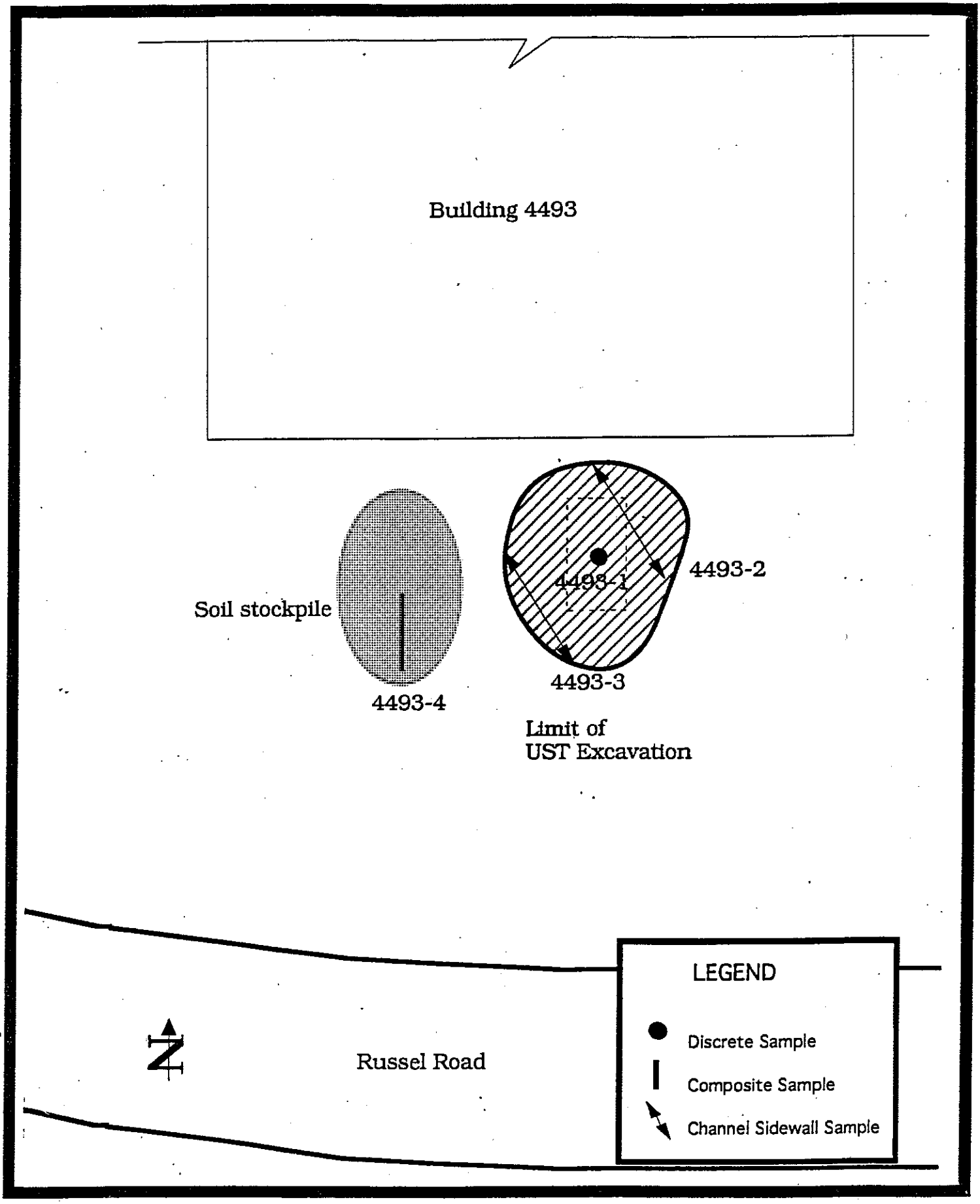
# Appendix D – Investigation Maps from Previous Environmental Reports

D.1 – Locations of Test Pits TP1 to TP6 (JPHC, 1995b)
D.2 – Sampling Plan for Former Heating Oil UST (JPHC, 1995a)
D.3 – Catch Basin Sample Locations (JPHC, 1996b)
D.4 – Phase II ESA Soil Boring Locations (Riley, 2005b)



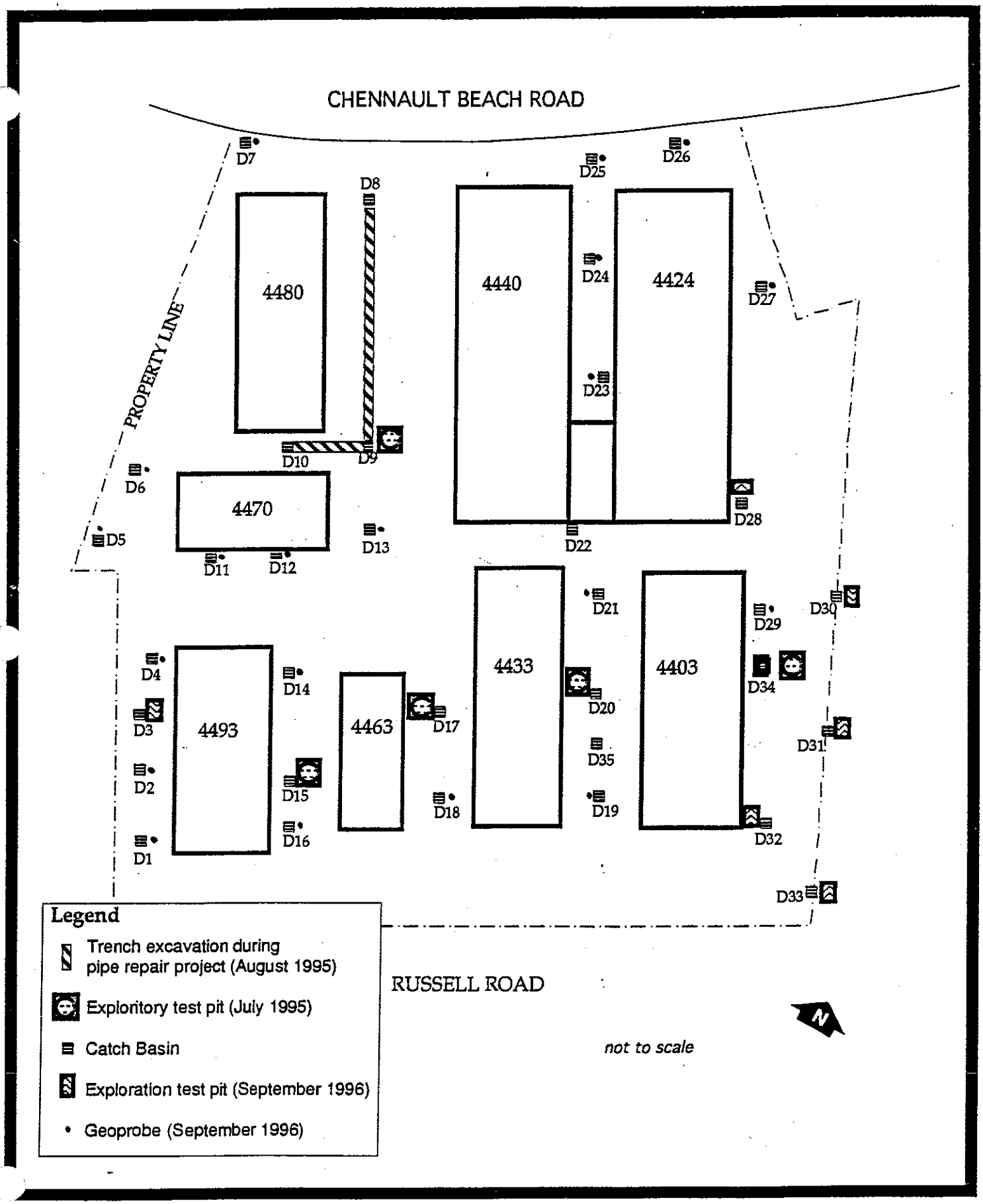

Real Estate Graphics Inc ©COPYRIGHT 1976

**EXHIBIT B**
SITE PLAN



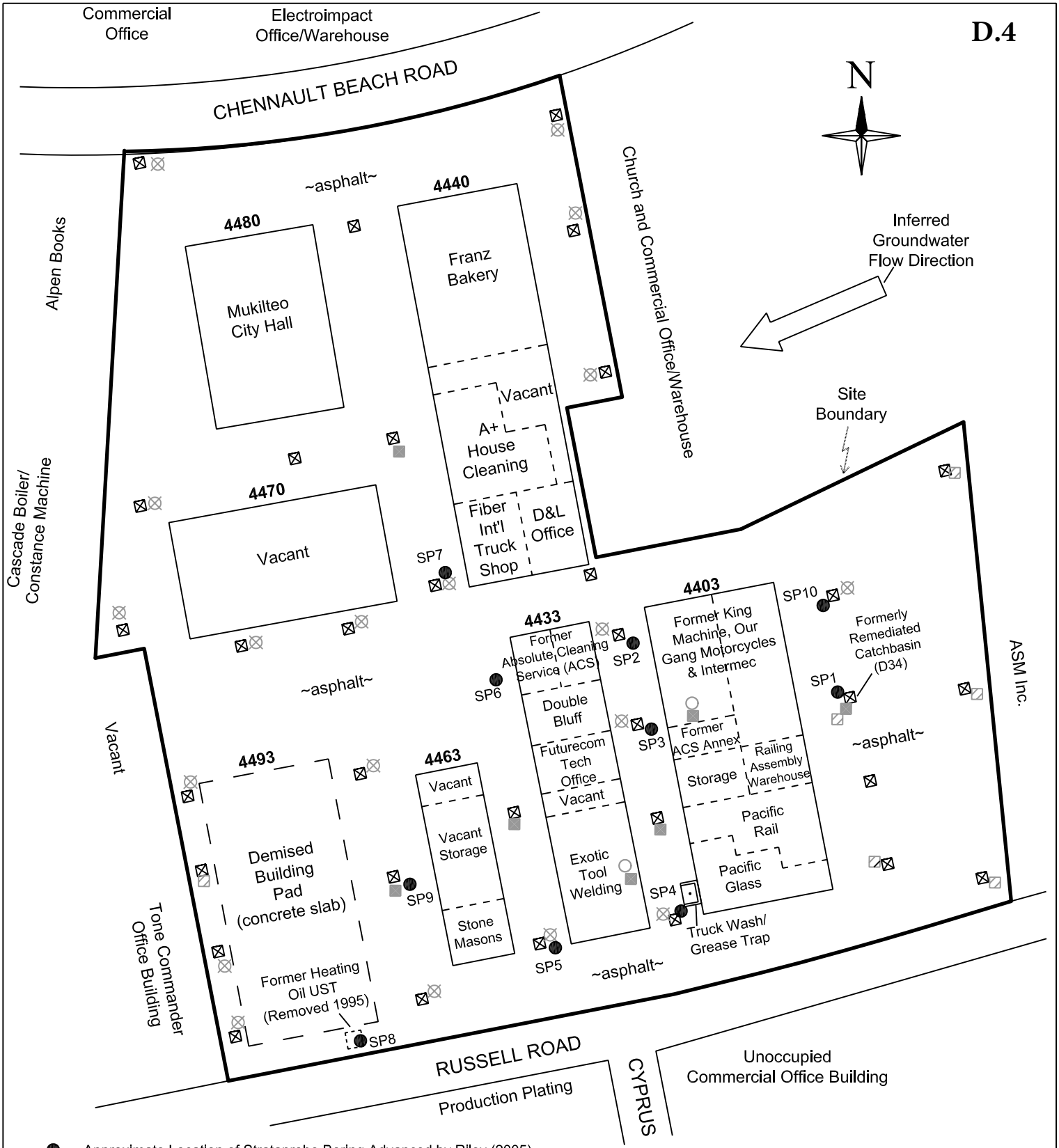

Real Estate Graphics, Inc ©COPYRIGHT 1976

**Exhibit B**
UST Sampling Plan




Real Estate Graphics, Inc ©COPYRIGHT 1976

**Site Plan**




- Approximate Location of Strataprobe Boring Advanced by Riley (2005)
- Approximate Location of Soil Test Pits Excavated by JPHC (1995)
- Approximate Location of Suspect Drains
- Approximate Location of Soil Borings Advanced by JPHC (1996)
- Approximate Location of Soil Test Pits Excavated by JPHC (1996)
- Approximate Location of Stormwater Catchbasin

*Drawing is not to Scale*

**The Riley Group, Inc.**
17522 BOTHELL WAY NE, SUITE A
BOTHELL, WASHINGTON 98011

*Hers Industrial Park*

| *Project # 2005-087b* | *Site Plan* | *Figure 2* |
|---|---|---|

*Site Address: 4403 Russell Road, Mukilteo, Washington*

# Appendix E - Gore-Survey Report

AMPLIFIED GEOCHEMICAL IMAGING, LLC

# Laboratory Report

## Site: 4403 to 4493 Russell Road

Prepared for:

Aspect Consulting
401 2nd Ave South Suite 201
Seattle, Washington
UNITED STATES

Prepared on:
December 02, 2014 (Revised December 11, 2014)

© 2014 Amplified Geochemical Imaging, LLC.

## Project Summary and Objective

Amplified Geochemical Imaging, LLC. (AGI) provided the AGI Environmental Survey used at:

**4403 to 4493 Russell Road**

The service provided by AGI included delivery of the required quantity of AGI Universal Samplers, analysis by the method described below for the requested organic compounds, reporting of the data, and contour mapping (as needed).

This report includes results for only the samples noted under the Laboratory Sample Report section. If contour maps are part of the project deliverable, the maps will be prepared and issued under a separate report cover, upon receipt of a usable sitemap (electronic) and compound choices for contouring.

Written/submitted by:

**Jim E Whetzel**

Project Manager

Reviewed/approved by:

**Don D'Apolito**

Manager of Environmental Services

Analytical data approved by:

**Kelly J Stringham**

Chemist

© 2014 Amplified Geochemical Imaging, LLC.

## Quality Assurance Statement

The AGI Laboratory, at Amplified Geochemical Imaging's facility in Elkton, MD USA, operates under the guidelines of its ISO Standard 17025 DoD ELAP accreditation, and its Quality Assurance Manual, Operating Procedures, and Methods (SPG-SOP-0462).

For this project, the analytical method, results, and observations reported do [ ] do not [ √ ] fall within the scope of AGI's ISO 17025 accreditation.

**Screening/Concentration Method**

The AGI Universal Samplers are analyzed at AGI's fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following U.S. EPA Method 8260 (SPG-WI-0292) which includes the following:

- **BFB Tuning Frequency:** A BFB tune is analyzed at the start of each analytical run and after every 30 samples.
- **Initial Calibration:** A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- **Linearity of Target Compounds:** If the RSD of any target analyte is less than or equal to 25% then average response factor can be used for quantitation. If the RSD exceeds 25% for a target compound a regression equation can be used for quantitation.
- **Continuing Calibration Verification:** After every 10 samples, and at the end of each analytical batch, and a second-source Reference Standard is analyzed near the mid point of the calibration curve. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- **Method Blank:** Analyzed prior to the analysis of field samples and every 30 samples.

**Note:** Analyte levels reported for the field-deployed AGI Universal Samplers that exceed trip and method blank levels, and/or the reporting limit, are more likely to have originated from on-site sources.

| | |
|---|---|
| Media Sampled: | SOIL GAS |
| Chemist - sample analysis: | Jasmine Smith |
| Chemist - data processor: | Jasmine Smith |
| Chemist - data review: | Kelly J Stringham |

Method deviations: None.

Please note that data file names ending with R are rerun samples using the second pair of sorbers, in which the original results were not reported. Data file names ending in D are duplicate analysis results for the second set of sorbers from the same sampler, and are reported.

© 2014 Amplified Geochemical Imaging, LLC.

## Additional Report Information

- Comments
- Laboratory Sample Report
- Chain of Custody
- Installation and Retrieval Log
- Analytical Results and Key
- Total Ion Chromatograms

## Project Specific Comments

The report was initially issued on December 2, 2014. Field IDs and installation and retrieval dates and times were not available at the time of report generation. The report was revised on December 9, 2014 to include this information.

An updated installation and retrieval log was provided on December 11, 2014. This report revision includes the updated log.

According to Aspect Consulting, the sample located at M10, 743832, was found to be saturated with water at the time of retrieval. Results for this sample are suspected to biased low due to suppression of soil vapors.

| | |
|---|---|
| Survey period [1] | The samplers were deployed on October 30 and 31, 2014, and retrieved on November 10 and 11, 2014. |
| Tamper seal intact: | Yes |
| Date received: | 11/14/2014 10:35 AM By: Scott Kirlin |
| COC returned: | Yes |

Comments:

Information on sample installation and retrieval was provided by Aspect Consulting in a Microsoft Excel file. A copy of the table has been included in this report.

1 - Installation start to end of retrieval, as reported. See installation and retrieval log for individual deployment and retrieval dates and times (i.e., sampler exposure time).

© 2014 Amplified Geochemical Imaging, LLC.

# General Comments

## Analytical QA/QC

Laboratory instrumentation consists of gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation involves cutting the tip off the bottom of the AGI Universal Sampler, and transferring one or more "sorbers" to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from coming in contact with the adsorbent . No further sample preparation is required. Any replicate sorbers not consumed in the initial analysis will be discarded fifteen (15) days from the date of the laboratory report.

Data are archived and stored in a secure manner as per AGI's Quality Assurance program (SPG-SOP-0462).

Total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), and/or diesel range petroleum hydrocarbons (DRPH), when reported, are calculated using the area under the peaks observed in m/z 55 and 57 selected ion chromatograms. Quantitation of the mass values was performed using the response factor for a specific alkane (present in the calibration standards). TPH values include the entire chromatogram and provide estimates for aliphatic hydrocarbon ranges of C4 to C20. GRPH and DRPH include only the relevant regions of the chromatograms and provide estimates for C4 to C10 and C10 to C20 aliphatic hydrocarbons, respectively.

Trip blanks were provided to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation and/or retrieval, and storage). The trip blanks are identically manufactured and packaged AGI Universal Samplers to those samplers deployed in the field . The trip blanks remain unopened during all phases of the project. Levels reported on the trip blanks may indicate potential impact to the samplers other than the contaminant source of interest.

Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. UPEs may be indicative of complex fluid mixtures. UPEs observed early in the chromatograms are considered to indicate presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.

Total ion chromatograms (TICs) are included in the Attachments. The eight-digit serial number of each sampler is incorporated in the TIC identification (e.g., 12345678.D represents AGI Universal Sampler 12345678).

© 2014 Amplified Geochemical Imaging, LLC.

# General Comments

## Soil Gas Sampling

For soil gas sampling, the AGI Environmental Survey reports mass levels migrating through the open pore spaces of the soil and diffusing through the sampler membrane for sorption by the engineered, hydrophobic adsorbents, housed within the membrane tube. During the migration of the soil gas away from the source to the AGI Universal Sampler, the vapors are subject to a variety of attenuation factors. The soil gas masses reported on the samplers compare favorably with the concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels to other sampled locations on the site, the matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.

Soil gas concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Soil gas signals reported by this method cannot be correlated specifically to soil adsorbed, groundwater, and /or free-phase contamination. The soil gas signal reported from each AGI Universal Sampler can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).

## Air Sampling

For indoor, outdoor, and crawlspace air sampling, the AGI Environmental Survey reports mass levels present in the air and diffusing through the sampler membrane for sorption by the engineered adsorbents housed within the membrane tube.

Air concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

## Groundwater and Sediment Porewater Sampling

For groundwater and sediment porewater sampling, the AGI Environmental Survey reports the mass levels of compounds present in the water which, when coming in contact with the sampler membrane, partitions out of solution, and diffuses through the sampler membrane for sorption by the engineered adsorbents.

Water concentrations (µg/L) are calculated using the quantified mass, exposure period and the compound specific uptake rate. The rates were measured under controlled experimental conditions. The uptake rates are corrected for water pressure (depth of the AGI Universal Sampler below the water table), water temperature and the aquifer flow rate. For sediment porewater, the uptake rate is corrected for the reduced volume of water in the sediment, by multiplying the uptake rate by the pore water fraction.

# LABORATORY SAMPLE REPORT

**Project: ENV 01244** **Site Name: 4403 to 4493 Russell Road** **Module Type: SPG0001**

| Module ID | Sample Type | Field ID |
|---|---|---|
| 00743776 | FIELD_SAMPLE | A6 |
| 00743777 | FIELD_SAMPLE | A9 |
| 00743778 | FIELD_SAMPLE | B15 |
| 00743779 | FIELD_SAMPLE | C17 |
| 00743780 | FIELD_SAMPLE | F8 |
| 00743781 | FIELD_SAMPLE | F9 |
| 00743782 | FIELD_SAMPLE | G8 |
| 00743783 | FIELD_SAMPLE | G9 |
| 00743784 | FIELD_SAMPLE | G10 |
| 00743785 | FIELD_SAMPLE | G11 |
| 00743786 | FIELD_SAMPLE | G17 |
| 00743787 | FIELD_SAMPLE | H2 |
| 00743788 | FIELD_SAMPLE | H9 |
| 00743789 | FIELD_SAMPLE | H10 |
| 00743790 | FIELD_SAMPLE | H11 |
| 00743791 | FIELD_SAMPLE | I9 |
| 00743792 | FIELD_SAMPLE | I10 |
| 00743793 | FIELD_SAMPLE | I11 |
| 00743794 | FIELD_SAMPLE | I12 |
| 00743795 | FIELD_SAMPLE | I13 |
| 00743796 | FIELD_SAMPLE | I14 |
| 00743797 | FIELD_SAMPLE | J9 |
| 00743798 | FIELD_SAMPLE | J10 |
| 00743799 | FIELD_SAMPLE | J11 |
| 00743800 | FIELD_SAMPLE | J12 |
| 00743801 | FIELD_SAMPLE | J13 |
| 00743802 | FIELD_SAMPLE | J14 |
| 00743803 | FIELD_SAMPLE | J16 |
| 00743804 | FIELD_SAMPLE | K9 |
| 00743805 | FIELD_SAMPLE | K10 |
| 00743806 | FIELD_SAMPLE | K11 |
| 00743807 | FIELD_SAMPLE | K12 |
| 00743808 | FIELD_SAMPLE | K13 |
| 00743809 | FIELD_SAMPLE | K14 |
| 00743810 | FIELD_SAMPLE | L9 |
| 00743811 | FIELD_SAMPLE | L10 |
| 00743812 | FIELD_SAMPLE | L11 |
| 00743813 | FIELD_SAMPLE | L12 |
| 00743814 | FIELD_SAMPLE | L13 |
| 00743815 | FIELD_SAMPLE | L14 |
| 00743816 | FIELD_SAMPLE | M9 |
| 00743817 | LOST | Not Provided |
| 00743818 | FIELD_SAMPLE | M11 |
| 00743819 | FIELD_SAMPLE | M12 |

| | | |
|---|---|---|
| 00743820 | FIELD_SAMPLE | M13 |
| 00743821 | FIELD_SAMPLE | M14 |
| 00743822 | FIELD_SAMPLE | M16 |
| 00743823 | FIELD_SAMPLE | N9 |
| 00743824 | FIELD_SAMPLE | N10 |
| 00743825 | FIELD_SAMPLE | N11 |
| 00743826 | FIELD_SAMPLE | N12 |
| 00743827 | FIELD_SAMPLE | N13 |
| 00743828 | FIELD_SAMPLE | O9 |
| 00743829 | FIELD_SAMPLE | O10 |
| 00743830 | FIELD_SAMPLE | O11 |
| 00743831 | FIELD_SAMPLE | O12 |
| 00743832 | FIELD_SAMPLE | M10 |
| 00743833 | TRIP_BLANK | Not Provided |
| 00743834 | TRIP_BLANK | Not Provided |
| 00743835 | TRIP_BLANK | Not Provided |

| Total # "FIELD SAMPLES" | Total # "TRIP BLANKS" | Total # "UNUSED" | Total # "LOST" |
|---|---|---|---|
| 56 | 3 | 0 | 1 |

**Duplicate samples:** **0**

AMPLIFIED GEOCHEMICAL IMAGING, LLC

210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

## *AGI Universal Passive Sampler Chain of Custody*
## *Soil gas and/or Air Sampling*

**Production Order #:** 01244

Customer Name: Aspect Consulting
Address: 401 2nd Ave South Suite 201
Seattle, Washington 98104
USA

Site Name: 4403 to 4493 Russell road (50)
Site Address:

Project Manager:

Serial # of Samplers Shipped
00743776 - 00743835

| | | | |
|---|---|---|---|
| # of Samplers for Installation | 56.00 | # of Trip Blanks | 4 |
| Total Samplers Shipped | 60.00 | | Pieces |
| Total Samplers Received | | | Pieces |
| Total Samplers Installed | | | Pieces |

Serial # of Trip Blanks (Client Decides)

| | | |
|---|---|---|
| ~~00743834~~ 00743834 | 00743835 | 00743833 |

**Prepared By:** Clarence Ughrn
**Verified By:**

**Installation Method: (Circle those that apply)**
Slide Hammer (Hammer Drill) Auger
Other

**Installation Performed By:**
**Name:** Simon Butler, Eric Geissinger
**Company:** Aspect Consulting, LLC

**Retrieval Performed By:**
**Name:** Simon Butler, Matthew Lewis
**Company:** Aspect Consulting, LLC

**Installation Start Date / Time:** 10/30/14 @ 1120
**Installation Complete Date / Time:** 10/31/14 @ 1440

**Retrieval Start Date / Time:** 11/10/14 @ 0945
**Retrieval Complete Date / Time:** 11/11/14 @

**Total Samplers Retrieved:** 56 +3 Trip blanks
**Total Samplers Lost In Field:** 1
**Total Unused Samplers Returned:** Ø

| | | | |
|---|---|---|---|
| **Relinquished By** | Clarence Ughrn | **Received By:** | Eric Geissinger |
| **Date/Time** | 10/17/14 10:00 | **Date/Time** | 10/21/14 1300 |
| **Company:** | AGI | **Company:** | Aspect |
| **Relinquished By** | Matt M. Lewis | **Received By:** | |
| **Date/Time** | 10/6/14 1600 | **Date/Time** | 11-4-14 10:35 AM |
| **Company:** | Aspect | **Company:** | AGI |

*Insertion rods were damaged upon receipt.*

© 2013 Amplified Geochemical Imaging, LLC.

# Hers Industrial Park

*Project 140252*

| Serial Number | Location | Date Installed | Time Installed | Date Collected | Time Collected | Comments |
|---|---|---|---|---|---|---|
| 743776 | A6 | 10/31/2014 | 14:25 | 11/11/2014 | 13:50 | Moist |
| 743777 | A9 | 10/31/2014 | 14:30 | 11/11/2014 | 13:55 | Wet |
| 743778 | B15 | 10/31/2014 | 14:50 | 11/11/2014 | 13:35 | Wet |
| 743779 | C17 | 10/31/2014 | 14:40 | 11/11/2014 | 13:30 | Moist |
| 743780 | F8 | 10/31/2014 | 14:00 | 11/11/2014 | 9:45 | Wet |
| 743781 | F9 | 10/31/2014 | 13:50 | 11/11/2014 | 9:30 | Wet |
| 743782 | G8 | 10/30/2014 | 11:00 | 11/11/2014 | 10:10 | Moist |
| 743783 | G9 | 10/31/2014 | 13:40 | 11/11/2014 | 9:25 | Moist |
| 743784 | G10 | 10/31/2014 | 13:35 | 11/11/2014 | 9:35 | Moist |
| 743785 | G11 | 10/31/2014 | 13:30 | 11/11/2014 | 9:40 | Moist |
| 743786 | G17 | 10/31/2014 | 13:20 | 11/11/2014 | 9:05 | Moist |
| 743787 | H2 | 10/31/2014 | 14:15 | 11/11/2014 | 14:15 | Wet |
| 743788 | H9 | 10/31/2014 | 13:45 | 11/11/2014 | 9:20 | Moist |
| 743789 | H10 | 10/30/2014 | 11:20 | 11/11/2014 | 10:40 | Moist |
| 743790 | H11 | 10/30/2014 | 11:50 | 11/11/2014 | 10:55 | Moist |
| 743791 | I9 | 10/31/2014 | 12:15 | 11/10/2014 | 13:45 | Moist |
| 743792 | I10 | 10/31/2014 | 12:10 | 11/10/2014 | 13:35 | Moist |
| 743793 | I11 | 10/31/2014 | 12:35 | 11/10/2014 | 13:55 | Moist |
| 743794 | I12 | 10/31/2014 | 12:45 | 11/10/2014 | 14:05 | Moist |
| 743795 | I13 | 10/31/2014 | 13:00 | 11/10/2014 | 14:15 | Moist |
| 743796 | I14 | 10/31/2014 | 13:05 | 11/10/2014 | 14:30 | Moist |
| 743797 | J9 | 10/31/2014 | 11:40 | 11/10/2014 | 13:20 | Moist |
| 743798 | J10 | 10/31/2014 | 11:50 | 11/10/2014 | 13:30 | Moist |
| 743799 | J11 | 10/31/2014 | 12:40 | 11/10/2014 | 14:00 | Moist |
| 743800 | J12 | 10/31/2014 | 12:50 | 11/10/2014 | 14:10 | Moist |
| 743801 | J13 | 10/31/2014 | 12:55 | 11/10/2014 | 14:20 | Moist |
| 743802 | J14 | 10/31/2014 | 13:10 | 11/10/2014 | 14:35 | Moist |
| 743803 | J16 | 10/31/2014 | 13:15 | 11/11/2014 | 8:55 | Moist |
| 743804 | K9 | 10/31/2014 | 11:25 | 11/10/2014 | 13:25 | Moist |
| 743805 | K10 | 10/30/2014 | 13:25 | 11/11/2014 | 11:40 | Moist |
| 743806 | K11 | 10/30/2014 | 13:15 | 11/11/2014 | 11:35 | Moist |
| 743807 | K12 | 10/30/2014 | 12:40 | 11/11/2014 | 11:30 | Moist |
| 743808 | K13 | 10/30/2014 | 12:15 | 11/11/2014 | 12:00 | Moist |
| 743809 | K14 | 10/30/2014 | 12:30 | 11/11/2014 | 13:00 | Moist |
| 743810 | L9 | 10/31/2014 | 11:05 | 11/10/2014 | 11:05 | Moist |
| 743811 | L10 | 10/31/2014 | 10:55 | 11/10/2014 | 11:05 | Moist |
| 743812 | L11 | 10/31/2014 | 10:50 | 11/10/2014 | 10:45 | Moist |
| 743813 | L12 | 10/30/2014 | 13:35 | 11/10/2014 | 10:35 | Moist |
| 743814 | L13 | 10/31/2014 | 10:35 | 11/10/2014 | 10:25 | Moist |
| 743815 | L14 | 10/30/2014 | 13:50 | 11/10/2014 | 10:00 | Moist |
| 743816 | M9 | 10/30/2014 | 16:20 | 11/10/2014 | 11:20 | Moist |
| 743816 | | | | | | No sample collected |
| 743818 | M11 | 10/31/2014 | 9:45 | 11/10/2014 | 10:50 | Moist |
| 743819 | M12 | 10/30/2014 | 16:50 | 11/10/2014 | 11:35 | Moist |
| 743820 | M13 | 10/31/2014 | 10:25 | 11/10/2014 | 10:30 | Moist |
| 743821 | M14 | 10/30/2014 | 14:00 | 11/10/2014 | 9:55 | Moist |
| 743822 | M16 | 10/31/2014 | 10:05 | 11/10/2014 | 9:45 | Moist |
| 743823 | N9 | 10/30/2014 | 14:15 | 11/10/2014 | 11:40 | Moist |
| 743824 | N10 | 10/30/2014 | 14:50 | 11/10/2014 | 11:50 | Moist |
| 743825 | N11 | 10/30/2014 | 15:00 | 11/10/2014 | 12:00 | Moist |
| 743826 | N12 | 10/30/2014 | 15:10 | 11/10/2014 | 12:10 | Moist |
| 743827 | N13 | 10/30/2014 | 15:50 | 11/10/2014 | 13:05 | Moist |
| 743828 | O9 | 10/30/2014 | 14:40 | 11/10/2014 | 12:25 | Moist |
| 743829 | O10 | 10/30/2014 | 16:05 | 11/10/2014 | 12:35 | Moist |
| 743830 | O11 | 10/30/2014 | 15:25 | 11/10/2014 | 12:45 | Moist |
| 743831 | O12 | 10/30/2014 | 15:30 | 11/10/2014 | 12:55 | Moist |
| 743832 | M10 | 10/30/2014 | 16:35 | 11/10/2014 | 11:30 | Boring filled with water |

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743776 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: A6 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:25:00PM

Retrieval Date: 11/11/2014 1:50:00PM Date Analyzed: 11/20/2014 7:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.11** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743776 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: A6 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:25:00PM

Retrieval Date: 11/11/2014 1:50:00PM Date Analyzed: 11/20/2014 7:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.79** | **0.50** |
| **BTEX** | | **0.11** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743777 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: A9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:30:00PM

Retrieval Date: 11/11/2014 1:55:00PM Date Analyzed: 11/20/2014 12:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743777 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: A9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:30:00PM

Retrieval Date: 11/11/2014 1:55:00PM Date Analyzed: 11/20/2014 12:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743778 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: B15 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:50:00PM

Retrieval Date: 11/11/2014 1:35:00PM Date Analyzed: 11/20/2014 12:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.03** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743778 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: B15
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 2:50:00PM
Retrieval Date: 11/11/2014 1:35:00PM
Date Analyzed: 11/20/2014 12:45:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.67** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743779 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: C17 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:40:00PM

Retrieval Date: 11/11/2014 1:30:00PM Date Analyzed: 11/20/2014 11:15:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743779 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: C17 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:40:00PM

Retrieval Date: 11/11/2014 1:30:00PM Date Analyzed: 11/20/2014 11:15:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.92** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743780 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: F8 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:00:00PM

Retrieval Date: 11/11/2014 9:45:00AM Date Analyzed: 11/20/2014 12:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743780 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: F8 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:00:00PM

Retrieval Date: 11/11/2014 9:45:00AM Date Analyzed: 11/20/2014 12:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.55** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743781 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: F9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:50:00PM

Retrieval Date: 11/11/2014 9:30:00AM Date Analyzed: 11/20/2014 9:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| **Octane** | **111-65-9** | **0.02** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743781 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: F9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:50:00PM

Retrieval Date: 11/11/2014 9:30:00AM Date Analyzed: 11/20/2014 9:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.38** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743782 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001
Dilution Factor: 1 Field ID: G8 Porosity: Water Filled Voids:
Installation Date: 10/30/2014 11:00:00AM
Retrieval Date: 11/11/2014 10:10:00AM Date Analyzed: 11/20/2014 3:15:00PM
**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**
**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| **1,1-Dichloroethane** | **75-34-3** | **0.03** | **0.02** |
| **cis-1,2-Dichloroethene** | **156-59-2** | **0.07** | **0.02** |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| **Trichloroethene** | **79-01-6** | **0.03** | **0.02** |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.10** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743782 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G8 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 11:00:00AM

Retrieval Date: 11/11/2014 10:10:00AM Date Analyzed: 11/20/2014 3:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.35** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743783 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:40:00PM

Retrieval Date: 11/11/2014 9:25:00AM Date Analyzed: 11/20/2014 9:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743783 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:40:00PM

Retrieval Date: 11/11/2014 9:25:00AM Date Analyzed: 11/20/2014 9:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.93** | **0.50** |
| **BTEX** | | **0.05** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743784 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G10 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:35:00PM

Retrieval Date: 11/11/2014 9:35:00AM Date Analyzed: 11/20/2014 3:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.05** | **0.02** |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743784 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: G10
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 1:35:00PM
Retrieval Date: 11/11/2014 9:35:00AM
Date Analyzed: 11/20/2014 3:40:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.71** | **0.50** |
| **BTEX** | | **0.08** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743785 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:30:00PM

Retrieval Date: 11/11/2014 9:40:00AM Date Analyzed: 11/20/2014 1:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.10** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.60** | **0.02** |
| **Octane** | **111-65-9** | **0.22** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.08** | **0.02** |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.05** | **0.02** |
| **o-Xylene** | **95-47-6** | **0.03** | **0.02** |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | 0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| **Undecane** | **1120-21-4** | **0.11** | **0.05** |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:**
Seattle, Washington 98104
USA

**SAMPLER ID:** 00743785 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: G11
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 1:30:00PM
Retrieval Date: 11/11/2014 9:40:00AM
Date Analyzed: 11/20/2014 1:45:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **40.12** | **0.50** |
| **BTEX** | | **0.86** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743786 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G17 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:20:00PM

Retrieval Date: 11/11/2014 9:05:00AM Date Analyzed: 11/20/2014 5:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.02** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743786 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: G17 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:20:00PM

Retrieval Date: 11/11/2014 9:05:00AM Date Analyzed: 11/20/2014 5:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.60** | **0.50** |
| **BTEX** | | **0.02** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743787 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H2 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:15:00PM

Retrieval Date: 11/11/2014 2:15:00PM Date Analyzed: 11/19/2014 11:40:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743787 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H2 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 2:15:00PM

Retrieval Date: 11/11/2014 2:15:00PM Date Analyzed: 11/19/2014 11:40:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.54** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743788 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:45:00PM

Retrieval Date: 11/11/2014 9:20:00AM Date Analyzed: 11/20/2014 9:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| **trans-1,2-Dichloroethene** | **156-60-5** | **0.02** | **0.02** |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **0.09** | **0.02** |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.11** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.14** | **0.02** |
| **Octane** | **111-65-9** | **0.02** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.02** | **0.02** |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.06** | **0.02** |
| **o-Xylene** | **95-47-6** | **0.03** | **0.02** |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743788 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:45:00PM

Retrieval Date: 11/11/2014 9:20:00AM Date Analyzed: 11/20/2014 9:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.95** | **0.50** |
| **BTEX** | | **0.36** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743789 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 11:20:00AM

Retrieval Date: 11/11/2014 10:40:00AM Date Analyzed: 11/19/2014 6:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.12** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.14** | **0.02** |
| **Octane** | **111-65-9** | **0.14** | **0.02** |
| **Tetrachloroethene** | **127-18-4** | **0.03** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.02** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743789 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: H10
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 11:20:00AM
Retrieval Date: 11/11/2014 10:40:00AM
Date Analyzed: 11/19/2014 6:41:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **33.44** | **0.50** |
| **BTEX** | | **0.28** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743790 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: H11 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 11:50:00AM

Retrieval Date: 11/11/2014 10:55:00AM Date Analyzed: 11/20/2014 2:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.05** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.18** | **0.02** |
| **Octane** | **111-65-9** | **0.03** | **0.02** |
| **Tetrachloroethene** | **127-18-4** | **0.06** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.04** | **0.02** |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743790 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: H11
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 11:50:00AM
Retrieval Date: 11/11/2014 10:55:00AM
Date Analyzed: 11/20/2014 2:40:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **36.86** | **0.50** |
| **BTEX** | | **0.27** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743791 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:15:00PM

Retrieval Date: 11/10/2014 1:45:00PM Date Analyzed: 11/19/2014 10:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **0.06** | **0.02** |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743791 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:15:00PM

Retrieval Date: 11/10/2014 1:45:00PM Date Analyzed: 11/19/2014 10:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743792 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I10 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:10:00PM

Retrieval Date: 11/10/2014 1:35:00PM Date Analyzed: 11/20/2014 4:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | 0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743792 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: I10
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 12:10:00PM
Retrieval Date: 11/10/2014 1:35:00PM
Date Analyzed: 11/20/2014 4:15:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.51** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743793 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:35:00PM

Retrieval Date: 11/10/2014 1:55:00PM Date Analyzed: 11/19/2014 2:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.06** | **0.02** |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743793 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: I11
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 12:35:00PM
Retrieval Date: 11/10/2014 1:55:00PM
Date Analyzed: 11/19/2014 2:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.47** | **0.50** |
| **BTEX** | | **0.09** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743794 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I12 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:45:00PM

Retrieval Date: 11/10/2014 2:05:00PM Date Analyzed: 11/20/2014 4:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.03** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.08** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.04** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743794 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I12 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:45:00PM

Retrieval Date: 11/10/2014 2:05:00PM Date Analyzed: 11/20/2014 4:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.04** | **0.50** |
| **BTEX** | | **0.14** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743795 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:00:00PM

Retrieval Date: 11/10/2014 2:15:00PM Date Analyzed: 11/19/2014 7:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | 0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.09** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743795 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: I13
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 1:00:00PM
Retrieval Date: 11/10/2014 2:15:00PM
Date Analyzed: 11/19/2014 7:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.43** | **0.50** |
| **BTEX** | | **0.06** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743796 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: I14 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:05:00PM

Retrieval Date: 11/10/2014 2:30:00PM Date Analyzed: 11/20/2014 2:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743796 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: I14
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 1:05:00PM
Retrieval Date: 11/10/2014 2:30:00PM
Date Analyzed: 11/20/2014 2:45:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.09** | **0.50** |
| **BTEX** | | **0.05** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743797 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:40:00AM

Retrieval Date: 11/10/2014 1:20:00PM Date Analyzed: 11/20/2014 10:16:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743797 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:40:00AM

Retrieval Date: 11/10/2014 1:20:00PM Date Analyzed: 11/20/2014 10:16:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743798 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J10 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:50:00AM

Retrieval Date: 11/10/2014 1:30:00PM Date Analyzed: 11/19/2014 5:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743798 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J10 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:50:00AM

Retrieval Date: 11/10/2014 1:30:00PM Date Analyzed: 11/19/2014 5:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.20** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743799 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:40:00PM

Retrieval Date: 11/10/2014 2:00:00PM Date Analyzed: 11/20/2014 8:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743799 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:40:00PM

Retrieval Date: 11/10/2014 2:00:00PM Date Analyzed: 11/20/2014 8:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743800 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J12 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:50:00PM

Retrieval Date: 11/10/2014 2:10:00PM Date Analyzed: 11/19/2014 11:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743800 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J12 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:50:00PM

Retrieval Date: 11/10/2014 2:10:00PM Date Analyzed: 11/19/2014 11:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743801 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:55:00PM

Retrieval Date: 11/10/2014 2:20:00PM Date Analyzed: 11/20/2014 1:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| **Trichloroethene** | **79-01-6** | **0.27** | **0.02** |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.34** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743801 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 12:55:00PM

Retrieval Date: 11/10/2014 2:20:00PM Date Analyzed: 11/20/2014 1:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743802 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J14 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:10:00PM

Retrieval Date: 11/10/2014 2:35:00PM Date Analyzed: 11/20/2014 10:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743802 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J14 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:10:00PM

Retrieval Date: 11/10/2014 2:35:00PM Date Analyzed: 11/20/2014 10:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743803 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J16 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:15:00PM

Retrieval Date: 11/11/2014 8:55:00AM Date Analyzed: 11/20/2014 7:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.05** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743803 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: J16 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 1:15:00PM

Retrieval Date: 11/11/2014 8:55:00AM Date Analyzed: 11/20/2014 7:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **4.72** | **0.50** |
| **BTEX** | | **0.05** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743804 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:25:00AM

Retrieval Date: 11/10/2014 1:25:00PM Date Analyzed: 11/20/2014 3:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.04** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.02** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.25** | **0.05** |
| **2-Methylnaphthalene** | **91-57-6** | **0.06** | **0.05** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743804 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:25:00AM

Retrieval Date: 11/10/2014 1:25:00PM Date Analyzed: 11/20/2014 3:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| **Pentadecane** | **629-62-9** | **0.06** | **0.05** |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **4.22** | **0.50** |
| **BTEX** | | **0.06** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743805 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 1:25:00PM

Retrieval Date: 11/11/2014 11:40:00AM Date Analyzed: 11/19/2014 9:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | 0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743805 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: K10
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 1:25:00PM
Retrieval Date: 11/11/2014 11:40:00AM
Date Analyzed: 11/19/2014 9:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743806 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K11 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 1:15:00PM

Retrieval Date: 11/11/2014 11:35:00AM Date Analyzed: 11/19/2014 7:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.07** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| **Naphthalene** | **91-20-3** | **0.07** | **0.05** |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743806 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: K11
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 1:15:00PM
Retrieval Date: 11/11/2014 11:35:00AM
Date Analyzed: 11/19/2014 7:41:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.89** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743807 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 12:40:00PM

Retrieval Date: 11/11/2014 11:30:00AM Date Analyzed: 11/20/2014 6:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| **Naphthalene** | **91-20-3** | **0.07** | **0.05** |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:**
Seattle, Washington 98104
USA

**SAMPLER ID:** 00743807 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: K12
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 12:40:00PM
Retrieval Date: 11/11/2014 11:30:00AM
Date Analyzed: 11/20/2014 6:40:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.62** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743808 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K13 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 12:15:00PM

Retrieval Date: 11/11/2014 12:00:00PM Date Analyzed: 11/19/2014 3:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.04** | **0.02** |
| **Octane** | **111-65-9** | **0.03** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743808 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: K13
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 12:15:00PM
Retrieval Date: 11/11/2014 12:00:00PM
Date Analyzed: 11/19/2014 3:41:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **3.43** | **0.50** |
| **BTEX** | | **0.04** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743809 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K14 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 12:30:00PM

Retrieval Date: 11/11/2014 1:00:00PM Date Analyzed: 11/20/2014 8:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.09** | **0.02** |
| **Octane** | **111-65-9** | **0.03** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743809 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: K14 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 12:30:00PM

Retrieval Date: 11/11/2014 1:00:00PM Date Analyzed: 11/20/2014 8:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **8.55** | **0.50** |
| **BTEX** | | **0.11** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743810 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:05:00AM

Retrieval Date: 11/10/2014 11:05:00AM Date Analyzed: 11/20/2014 4:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743810 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L9 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 11:05:00AM

Retrieval Date: 11/10/2014 11:05:00AM Date Analyzed: 11/20/2014 4:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743811 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L10 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:55:00AM

Retrieval Date: 11/10/2014 11:05:00AM Date Analyzed: 11/20/2014 6:45:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.06** | **0.02** |
| **Octane** | **111-65-9** | **0.02** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | 0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743811 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: L10
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 10:55:00AM
Retrieval Date: 11/10/2014 11:05:00AM
Date Analyzed: 11/20/2014 6:45:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.64** | **0.50** |
| **BTEX** | | **0.09** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743812 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:50:00AM

Retrieval Date: 11/10/2014 10:45:00AM Date Analyzed: 11/20/2014 1:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.02** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.10** | **0.05** |
| **2-Methylnaphthalene** | **91-57-6** | **0.07** | **0.05** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743812 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:50:00AM

Retrieval Date: 11/10/2014 10:45:00AM Date Analyzed: 11/20/2014 1:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| **Pentadecane** | **629-62-9** | **0.08** | **0.05** |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **4.77** | **0.50** |
| **BTEX** | | **0.02** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743813 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 1:35:00PM

Retrieval Date: 11/10/2014 10:35:00AM Date Analyzed: 11/19/2014 4:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| **trans-1,2-Dichloroethene** | **156-60-5** | **0.04** | **0.02** |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **0.29** | **0.02** |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.12** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.21** | **0.02** |
| **Octane** | **111-65-9** | **0.75** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.11** | **0.02** |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.20** | **0.02** |
| **o-Xylene** | **95-47-6** | **0.13** | **0.02** |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| **Undecane** | **1120-21-4** | **0.11** | **0.05** |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:**
Seattle, Washington 98104
USA

**SAMPLER ID:** 00743813 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: L12
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 1:35:00PM
Retrieval Date: 11/10/2014 10:35:00AM
Date Analyzed: 11/19/2014 4:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **26.21** | **0.50** |
| **BTEX** | | **0.78** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743814 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:35:00AM

Retrieval Date: 11/10/2014 10:25:00AM Date Analyzed: 11/19/2014 9:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.05** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.27** | **0.02** |
| **Octane** | **111-65-9** | **0.46** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.06** | **0.05** |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743814 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:35:00AM

Retrieval Date: 11/10/2014 10:25:00AM Date Analyzed: 11/19/2014 9:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **8.52** | **0.50** |
| **BTEX** | | **0.35** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743815 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: L14 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 1:50:00PM

Retrieval Date: 11/10/2014 10:00:00AM Date Analyzed: 11/19/2014 6:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| **Octane** | **111-65-9** | **0.03** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| **2-Methylnaphthalene** | **91-57-6** | **0.06** | **0.05** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743815 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: L14
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 1:50:00PM
Retrieval Date: 11/10/2014 10:00:00AM
Date Analyzed: 11/19/2014 6:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **13.26** | **0.50** |
| **BTEX** | | **0.02** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743816 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:20:00PM

Retrieval Date: 11/10/2014 11:20:00AM Date Analyzed: 11/19/2014 1:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.10** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743816 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:20:00PM

Retrieval Date: 11/10/2014 11:20:00AM Date Analyzed: 11/19/2014 1:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **1.42** | **0.50** |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743818 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M11 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 9:45:00AM

Retrieval Date: 11/10/2014 10:50:00AM Date Analyzed: 11/20/2014 2:15:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.04** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743818 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: M11
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 9:45:00AM
Retrieval Date: 11/10/2014 10:50:00AM
Date Analyzed: 11/20/2014 2:15:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **3.77** | **0.50** |
| **BTEX** | | **0.07** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743819 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:50:00PM

Retrieval Date: 11/10/2014 11:35:00AM Date Analyzed: 11/19/2014 8:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| **1,3,5-Trimethylbenzene** | **108-67-8** | **0.06** | **0.02** |
| **1,2,4-Trimethylbenzene** | **95-63-6** | **0.23** | **0.02** |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| **Naphthalene** | **91-20-3** | **0.22** | **0.05** |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| **2-Methylnaphthalene** | **91-57-6** | **0.22** | **0.05** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743819 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: M12
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 4:50:00PM
Retrieval Date: 11/10/2014 11:35:00AM
Date Analyzed: 11/19/2014 8:41:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **3.18** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743820 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:25:00AM

Retrieval Date: 11/10/2014 10:30:00AM Date Analyzed: 11/19/2014 12:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.03** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.05** | **0.02** |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.13** | **0.02** |
| **o-Xylene** | **95-47-6** | **0.04** | **0.02** |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743820 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M13 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:25:00AM

Retrieval Date: 11/10/2014 10:30:00AM Date Analyzed: 11/19/2014 12:41:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.62** | **0.50** |
| **BTEX** | | **0.28** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743821 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M14 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:00:00PM

Retrieval Date: 11/10/2014 9:55:00AM Date Analyzed: 11/20/2014 10:46:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.12** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| **Tetrachloroethene** | **127-18-4** | **0.03** | **0.02** |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:**
Seattle, Washington 98104
USA

**SAMPLER ID:** 00743821 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: M14
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 2:00:00PM
Retrieval Date: 11/10/2014 9:55:00AM
Date Analyzed: 11/20/2014 10:46:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **5.53** | **0.50** |
| **BTEX** | | **0.12** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743822 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M16 Porosity: Water Filled Voids:

Installation Date: 10/31/2014 10:05:00AM

Retrieval Date: 11/10/2014 9:45:00AM Date Analyzed: 11/20/2014 1:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.04** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.05** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743822 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: M16
Porosity:
Water Filled Voids:
Installation Date: 10/31/2014 10:05:00AM
Retrieval Date: 11/10/2014 9:45:00AM
Date Analyzed: 11/20/2014 1:40:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.51** | **0.50** |
| **BTEX** | | **0.12** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743823 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:15:00PM

Retrieval Date: 11/10/2014 11:40:00AM Date Analyzed: 11/20/2014 10:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.06** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.04** | **0.02** |
| **Octane** | **111-65-9** | **0.05** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743823 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:15:00PM

Retrieval Date: 11/10/2014 11:40:00AM Date Analyzed: 11/20/2014 10:14:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **4.12** | **0.50** |
| **BTEX** | | **0.09** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743824 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:50:00PM

Retrieval Date: 11/10/2014 11:50:00AM Date Analyzed: 11/19/2014 3:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.04** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| **Octane** | **111-65-9** | **0.03** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | 0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.17** | **0.05** |
| **2-Methylnaphthalene** | **91-57-6** | **0.06** | **0.05** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743824 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:50:00PM

Retrieval Date: 11/10/2014 11:50:00AM Date Analyzed: 11/19/2014 3:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| **Pentadecane** | **629-62-9** | **0.18** | **0.05** |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **11.47** | **0.50** |
| **BTEX** | | **0.10** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743825 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N11 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:00:00PM

Retrieval Date: 11/10/2014 12:00:00PM Date Analyzed: 11/20/2014 8:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.02** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.09** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104
USA

**SAMPLER ID:** 00743825 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: N11
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 3:00:00PM
Retrieval Date: 11/10/2014 12:00:00PM
Date Analyzed: 11/20/2014 8:10:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.37** | **0.50** |
| **BTEX** | | **0.11** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743826 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:10:00PM

Retrieval Date: 11/10/2014 12:10:00PM Date Analyzed: 11/19/2014 1:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.03** | **0.02** |
| Octane | 111-65-9 | 0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.05** | **0.05** |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244 **FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:** Seattle, Washington 98104

USA

**SAMPLER ID:** 00743826 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: N12
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 3:10:00PM
Retrieval Date: 11/10/2014 12:10:00PM
Date Analyzed: 11/19/2014 1:11:00PM
**Analyst:** Jasmine Smith **Method:** SPG-WI-0292 **Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **2.91** | **0.50** |
| **BTEX** | | **0.03** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743827 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: N13 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:50:00PM

Retrieval Date: 11/10/2014 1:05:00PM Date Analyzed: 11/19/2014 8:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743827 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: N13
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 3:50:00PM
Retrieval Date: 11/10/2014 1:05:00PM
Date Analyzed: 11/19/2014 8:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743828 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:40:00PM

Retrieval Date: 11/10/2014 12:25:00PM Date Analyzed: 11/20/2014 3:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.03** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | 0.02 | 0.02 |
| **Octane** | **111-65-9** | **0.02** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743828 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O9 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 2:40:00PM

Retrieval Date: 11/10/2014 12:25:00PM Date Analyzed: 11/20/2014 3:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **3.00** | **0.50** |
| **BTEX** | | **0.05** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743829 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:05:00PM

Retrieval Date: 11/10/2014 12:35:00PM Date Analyzed: 11/19/2014 12:11:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| **Benzene** | **71-43-2** | **0.04** | **0.02** |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.07** | **0.02** |
| **Octane** | **111-65-9** | **0.06** | **0.02** |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.08** | **0.02** |
| **m,p-Xylene** | **108-38-3/106-42-3** | **0.03** | **0.02** |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743829 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: O10
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 4:05:00PM
Retrieval Date: 11/10/2014 12:35:00PM
Date Analyzed: 11/19/2014 12:11:00PM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **5.86** | **0.50** |
| **BTEX** | | **0.22** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743830 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O11 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:25:00PM

Retrieval Date: 11/10/2014 12:45:00PM Date Analyzed: 11/20/2014 7:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.07** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| **Ethylbenzene** | **100-41-4** | **0.06** | **0.02** |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| **Tridecane** | **629-50-5** | **0.53** | **0.05** |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743830 FIELD_SAMPLE
Matrix: SOIL GAS
Product: SPG0001
Dilution Factor: 1
Field ID: O11
Porosity:
Water Filled Voids:
Installation Date: 10/30/2014 3:25:00PM
Retrieval Date: 11/10/2014 12:45:00PM
Date Analyzed: 11/20/2014 7:10:00AM
**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **3.93** | **0.50** |
| **BTEX** | | **0.13** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743831 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:30:00PM

Retrieval Date: 11/10/2014 12:55:00PM Date Analyzed: 11/20/2014 2:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| **Toluene** | **108-88-3** | **0.02** | **0.02** |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743831 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: O12 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 3:30:00PM

Retrieval Date: 11/10/2014 12:55:00PM Date Analyzed: 11/20/2014 2:10:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| **TPH** | | **0.62** | **0.50** |
| **BTEX** | | **0.02** | **0.02** |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743832 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:35:00PM

Retrieval Date: 11/10/2014 11:30:00AM Date Analyzed: 11/20/2014 7:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743832 FIELD_SAMPLE** Matrix: SOIL GAS Product: SPG0001

Dilution Factor: 1 Field ID: M10 Porosity: Water Filled Voids:

Installation Date: 10/30/2014 4:35:00PM

Retrieval Date: 11/10/2014 11:30:00AM Date Analyzed: 11/20/2014 7:44:00PM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**

**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743833 TRIP_BLANK
Dilution Factor: 1

Matrix: SOIL GAS
Porosity:

Product: SPG0001
Water Filled Voids:

Date Analyzed: 11/19/2014 2:41:00PM

**Analyst:** Jasmine Smith
**Reviewer:** Kelly J Stringham

**Method:** SPG-WI-0292

**Batch:** ENV-141117-1

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743833 TRIP_BLANK
Dilution Factor: 1

Matrix: SOIL GAS
Porosity:

Product: SPG0001
Water Filled Voids:

Date Analyzed: 11/19/2014 2:41:00PM

**Analyst:** Jasmine Smith
**Reviewer:** Kelly J Stringham

**Method:** SPG-WI-0292

**Batch:** ENV-141117-1

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743834 TRIP_BLANK
Dilution Factor: 1

Matrix: SOIL GAS
Porosity:

Product: SPG0001
Water Filled Voids:

Date Analyzed: 11/20/2014 9:39:00AM

**Analyst:** Jasmine Smith
**Reviewer:** Kelly J Stringham

**Method:** SPG-WI-0292

**Batch:** ENV-141117-1

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**FOR:** Aspect Consulting

**SITE NAME:** 4403 to 4493 Russell Road

**SITE ADDRESS:**
Seattle, Washington 98104
USA

**SAMPLER ID:** 00743834 TRIP_BLANK
Dilution Factor: 1
Matrix: SOIL GAS
Porosity:
Product: SPG0001
Water Filled Voids:

Date Analyzed: 11/20/2014 9:39:00AM

**Analyst:** Jasmine Smith
**Method:** SPG-WI-0292
**Batch:** ENV-141117-1
**Reviewer:** Kelly J Stringham

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER: ENV 01244** **FOR: Aspect Consulting**

**SITE NAME: 4403 to 4493 Russell Road**

**SITE ADDRESS:** **Seattle, Washington 98104**

**USA**

**SAMPLER ID: 00743835 TRIP_BLANK** Matrix: SOIL GAS Product: SPG0001
Dilution Factor: 1 Porosity: Water Filled Voids:

Date Analyzed: 11/20/2014 8:40:00AM

**Analyst: Jasmine Smith** **Method: SPG-WI-0292** **Batch: ENV-141117-1**
**Reviewer: Kelly J Stringham**

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Vinyl Chloride | 75-01-4 | <0.20 | 0.20 |
| Methyl tert-butyl ether | 1634-04-4 | <0.02 | 0.02 |
| 1,1-Dichloroethene | 75-35-4 | <0.02 | 0.02 |
| trans-1,2-Dichloroethene | 156-60-5 | <0.02 | 0.02 |
| 1,1-Dichloroethane | 75-34-3 | <0.02 | 0.02 |
| cis-1,2-Dichloroethene | 156-59-2 | <0.02 | 0.02 |
| Chloroform | 67-66-3 | <0.02 | 0.02 |
| 1,1,1-Trichloroethane | 71-55-6 | <0.02 | 0.02 |
| 1,2-Dichloroethane | 107-06-2 | <0.02 | 0.02 |
| Benzene | 71-43-2 | <0.02 | 0.02 |
| Carbon Tetrachloride | 56-23-5 | <0.02 | 0.02 |
| Trichloroethene | 79-01-6 | <0.02 | 0.02 |
| 1,1,2-Trichloroethane | 79-00-5 | <0.02 | 0.02 |
| Toluene | 108-88-3 | <0.02 | 0.02 |
| Octane | 111-65-9 | <0.02 | 0.02 |
| Tetrachloroethene | 127-18-4 | <0.02 | 0.02 |
| Chlorobenzene | 108-90-7 | <0.02 | 0.02 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.02 | 0.02 |
| Ethylbenzene | 100-41-4 | <0.02 | 0.02 |
| m,p-Xylene | 108-38-3/106-42-3 | <0.02 | 0.02 |
| o-Xylene | 95-47-6 | <0.02 | 0.02 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.02 | 0.02 |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.02 | 0.02 |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.02 | 0.02 |
| 1,3-Dichlorobenzene | 541-73-1 | <0.02 | 0.02 |
| 1,4-Dichlorobenzene | 106-46-7 | <0.02 | 0.02 |
| 1,2-Dichlorobenzene | 95-50-1 | <0.02 | 0.02 |
| Undecane | 1120-21-4 | <0.05 | 0.05 |
| Naphthalene | 91-20-3 | <0.05 | 0.05 |
| Tridecane | 629-50-5 | <0.05 | 0.05 |
| 2-Methylnaphthalene | 91-57-6 | <0.05 | 0.05 |


© 2014 Amplified Geochemical Imaging, LLC.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 Executive Drive, Suite 1
Newark, DE 19702-3335 USA
ph: +1-302-266-2428
www.agisurveys.net

**PROJECT NUMBER:** ENV 01244
**SITE NAME:** 4403 to 4493 Russell Road
**SITE ADDRESS:**

**FOR:** Aspect Consulting

Seattle, Washington 98104
USA

**SAMPLER ID:** 00743835 TRIP_BLANK
Dilution Factor: 1

Matrix: SOIL GAS
Porosity:

Product: SPG0001
Water Filled Voids:

Date Analyzed: 11/20/2014 8:40:00AM

**Analyst:** Jasmine Smith
**Reviewer:** Kelly J Stringham

**Method:** SPG-WI-0292

**Batch:** ENV-141117-1

| Compound | CAS # | Result (ug) | RL (ug) |
|---|---|---|---|
| Acenaphthylene | 208-96-8 | <0.05 | 0.05 |
| Pentadecane | 629-62-9 | <0.05 | 0.05 |
| Acenaphthene | 83-32-9 | <0.05 | 0.05 |
| Fluorene | 86-73-7 | <0.05 | 0.05 |
| TPH | | <0.50 | 0.50 |
| BTEX | | <0.02 | 0.02 |


© 2014 Amplified Geochemical Imaging, LLC.

## KEY TO DATA TABLE

**UNITS**

| | |
|---|---|
| µg | micrograms, relative mass value |
| µg/mˆ3 | micrograms per cubic meter; estimated soil gas concentration |
| µg/L | micrograms per Liter; calculated water concentration |

**DATA QUALIFIERS**

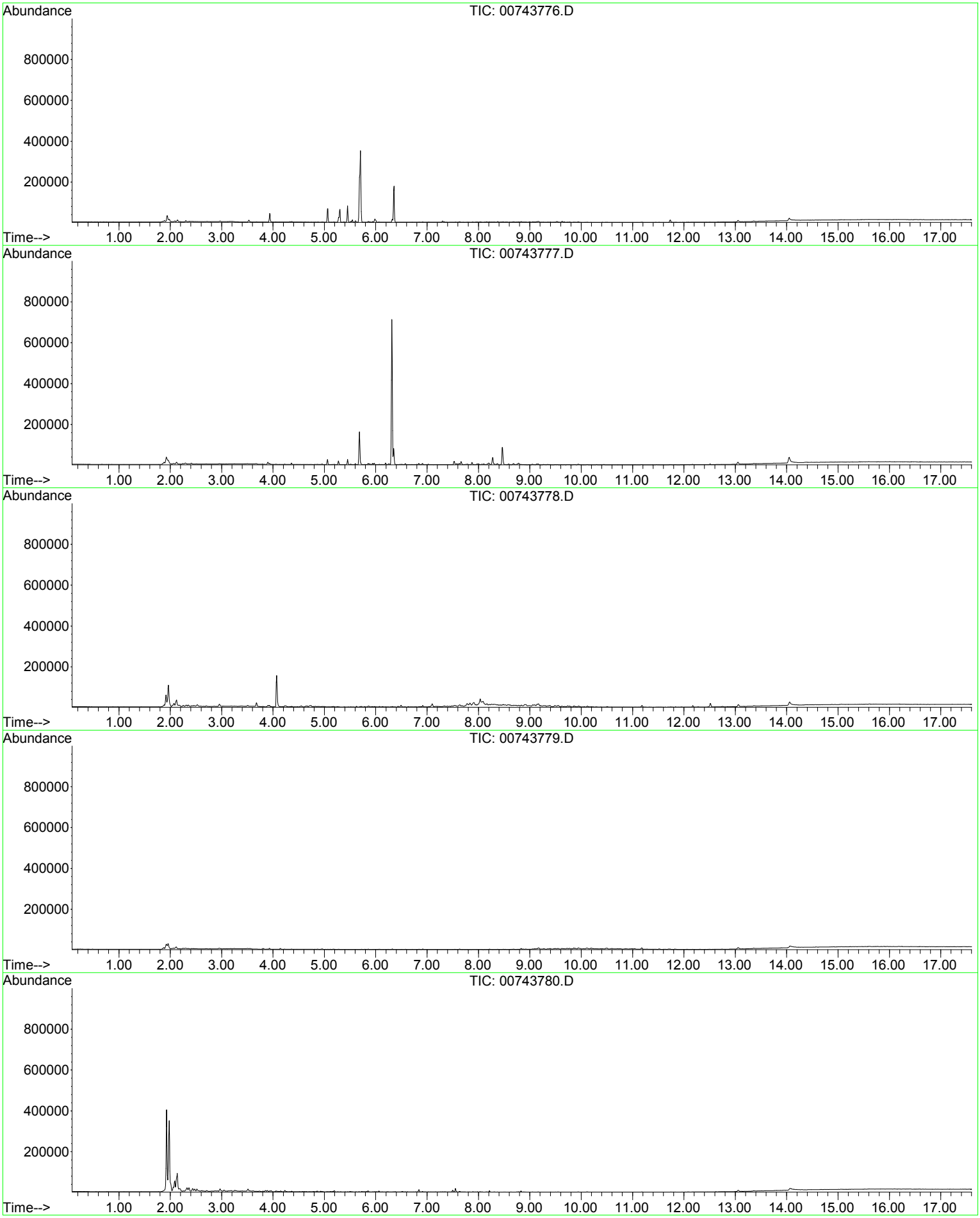
| | |
|---|---|
| > | greater than; value exceeds calibration range, estimated value |
| < | less than; compound value is below the LOD and RL |
| J | mass value below LOQ or RL, but above LOD, estimated mass value |
| E | mass value exceeds upper calibration level, estimated mass value |
| Q | one or more quality control parameters failed for the compound |

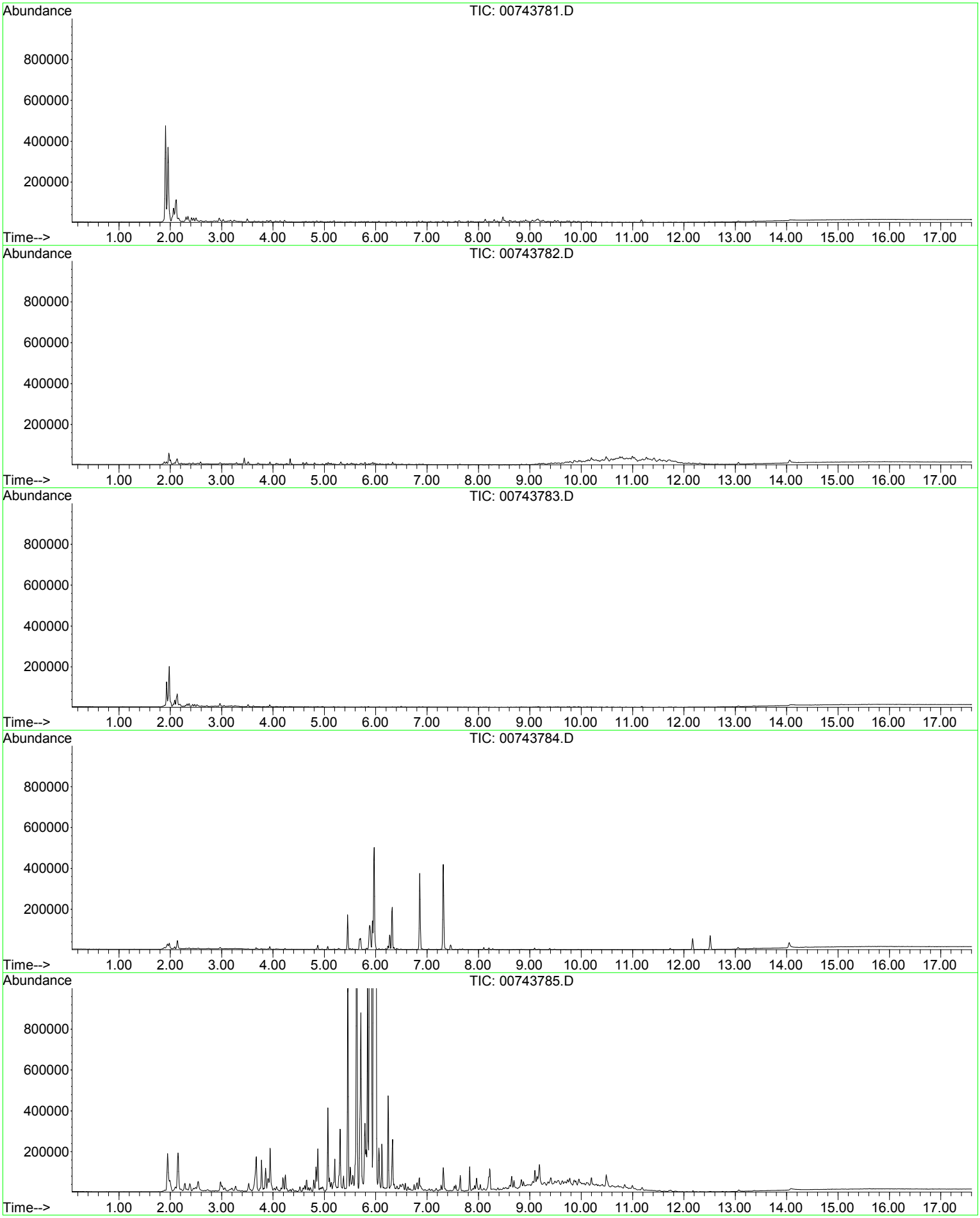
**ABBREVIATIONS**

| | |
|---|---|
| AVG RL | average reporting limit; calculated based on individual field sample RLs |
| LOD | limit of detection |
| LOQ | limit of quantification |
| MDL | method detection limit |
| RL | reporting limit |

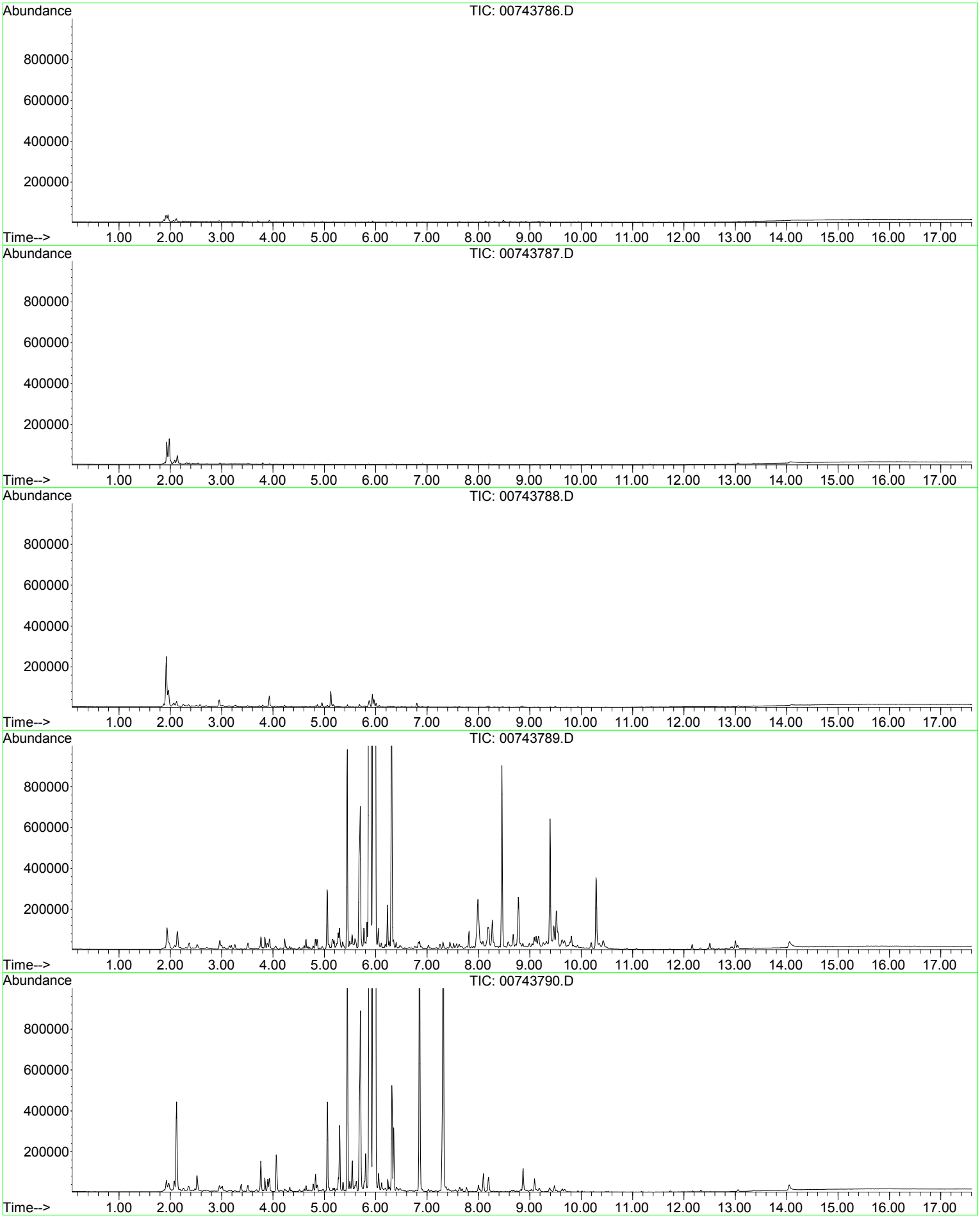
| | |
|---|---|
| 1112TetCA | 1,1,1,2-tetrachloroethane |
| 111TCA | 1,1,1-trichloroethane |
| 1122TetCA | 1,1,2,2-tetrachloroethane |
| 112TCA | 1,1,2-trichloroethane |
| 11DCA | 1,1-dichloroethane |
| 11DCE | 1,1-dichloroethene |
| 124TMB | 1,2,4-trimethylbenzene |
| 12DCA | 1,2-dichloroethane |
| 12DCB | 1,2-dichlorobenzene |
| 135TMB | 1,3,5-trimethylbenzene |
| 13DCB | 1,3-dichlorobenzene |
| 14DCB | 1,4-dichlorobenzene |
| 2MeNAPH | 2-methyl naphthalene |
| BENZ | benzene |
| BTEX | combined masses of benzene, toluene, ethylbenzene, and total xylenes (Gasoline Range Aromatics) |
| C11,C13&C15 | combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes) |
| c12DCE | cis-1,2-dichloroethene |
| CCl4 | carbon tetrachloride |
| CHC13 | chloroform |
| ClBENZ | chlorobenzene |
| ct12DCE | cis- & trans-1,2-dichloroethene |
| EtBENZ | ethylbenzene |
| mpXYL | m-, p-xylene |
| MTBE | methyl t-butyl ether |
| NAPH | naphthalene |
| OCT | octane |
| oXYL | o-xylene |
| PCE | tetrachloroethene |
| PENTADEC | pentadecane |
| PHEN | phenanthrene |
| t12DCE | trans-1,2-dichloroethene |
| TCE | trichloroethene |
| TMBs | combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene |
| TOL | toluene |
| TPH | total petroleum hydrocarbons |
| TRIDEC | tridecane |
| UNDEC | undecane |
| VC | vinyl chloride |

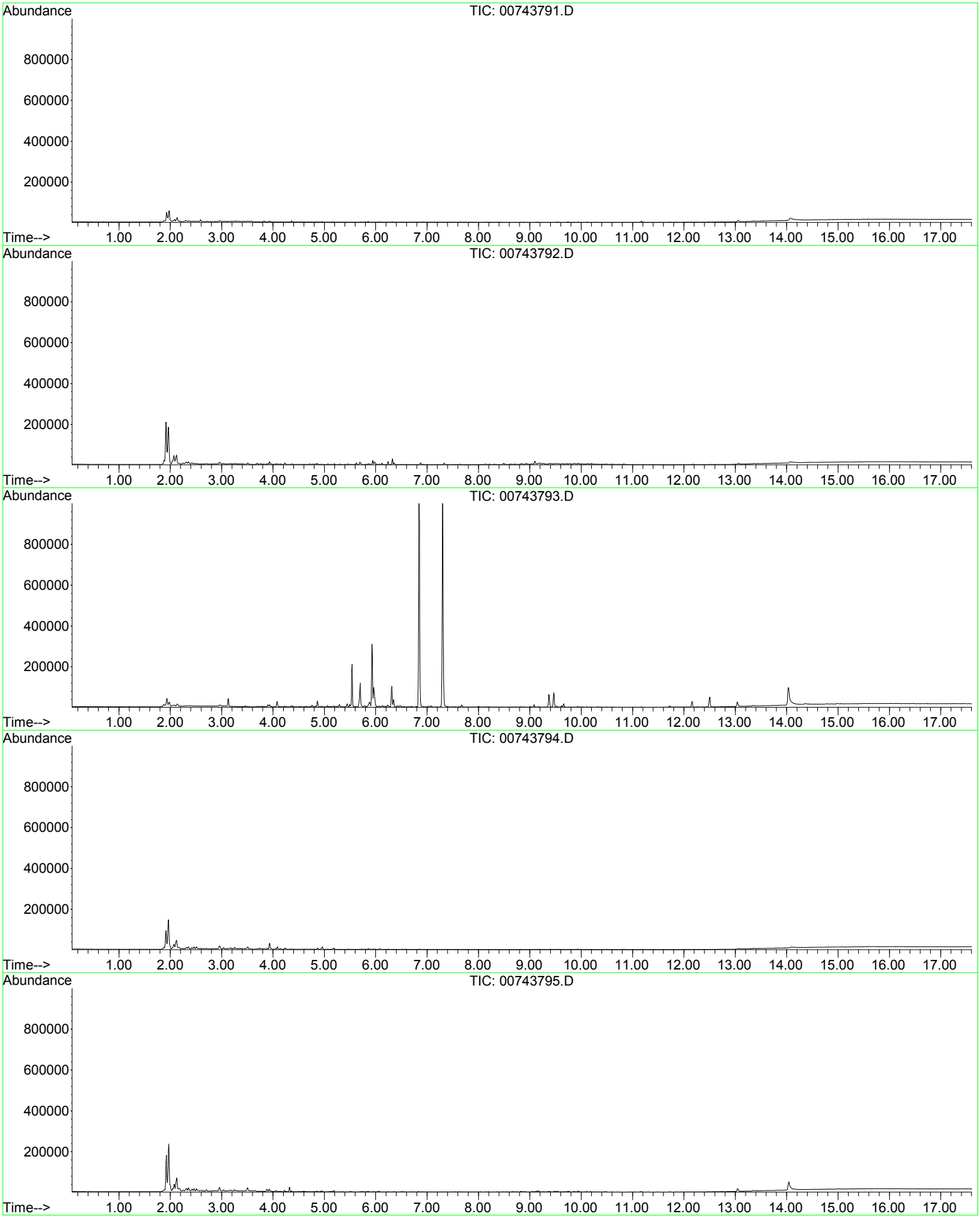
TICS - 01244
In Numerical Order

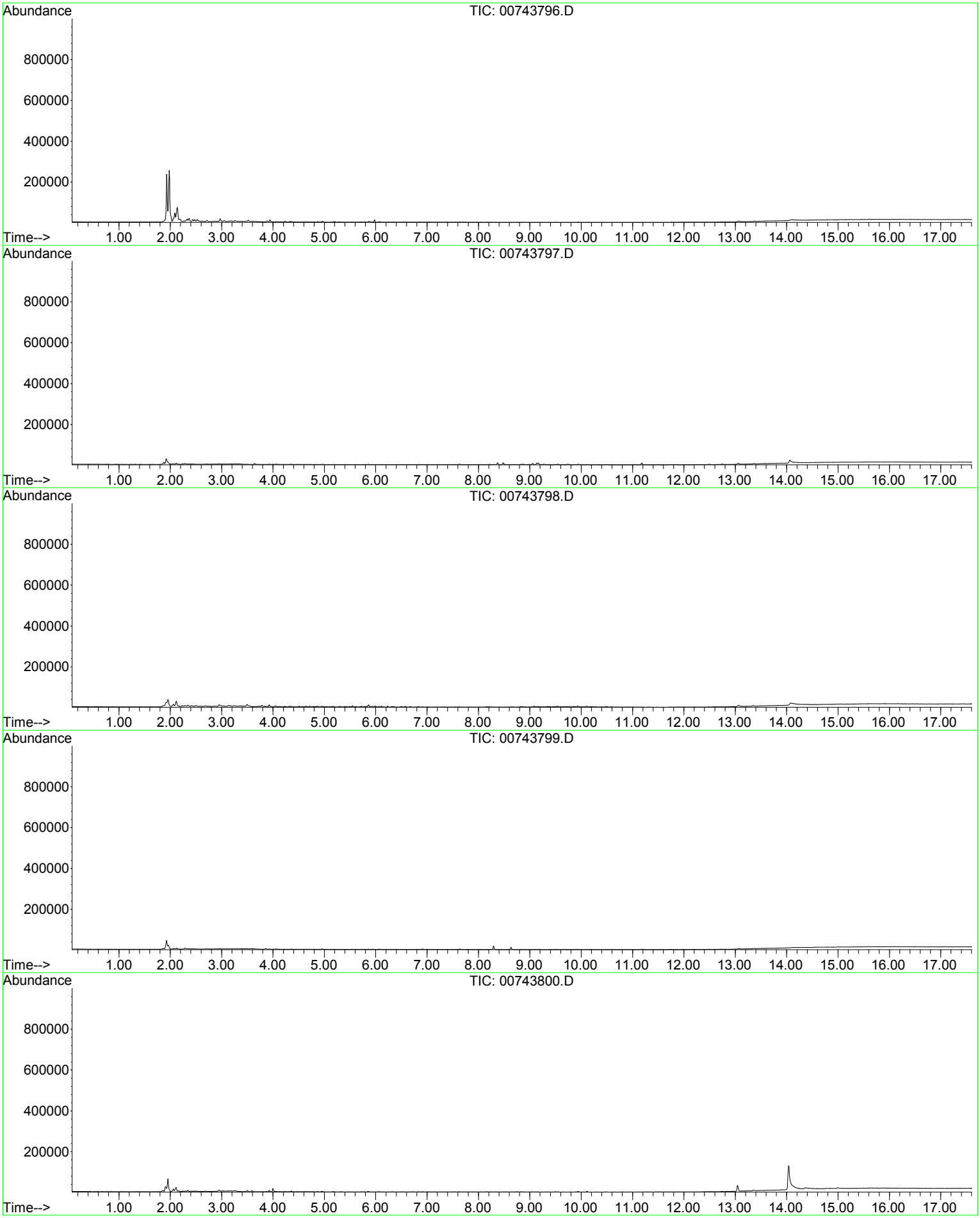



Abundance
TIC: 00743781.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743782.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743783.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743784.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743785.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

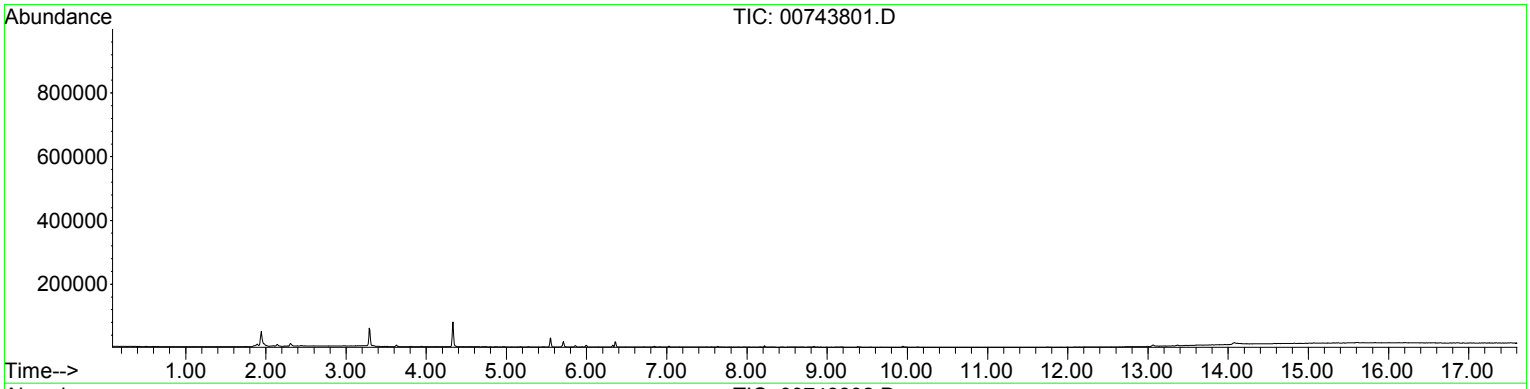
TICS - 01244
In Numerical Order

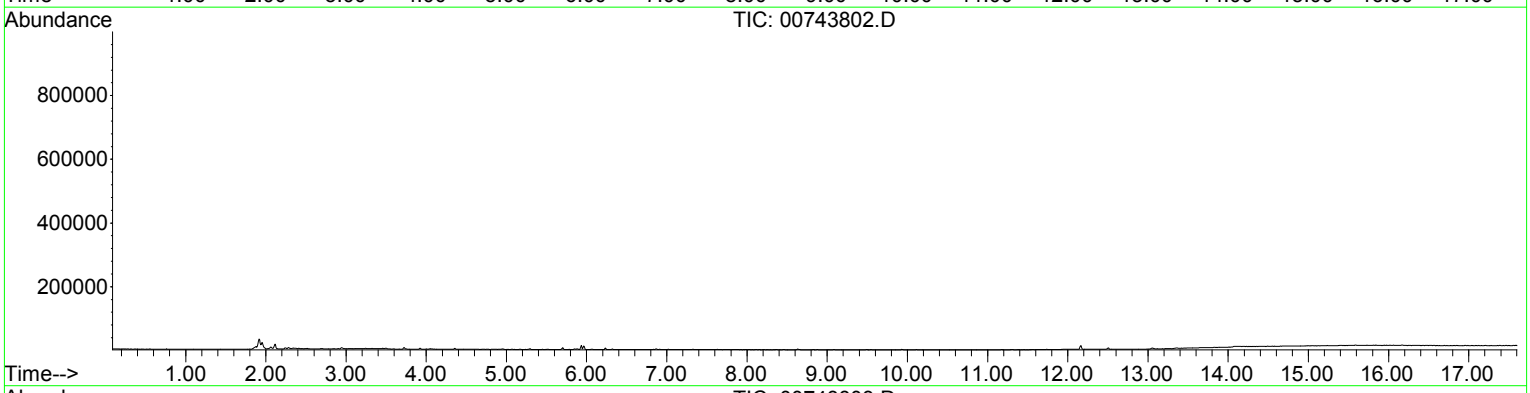


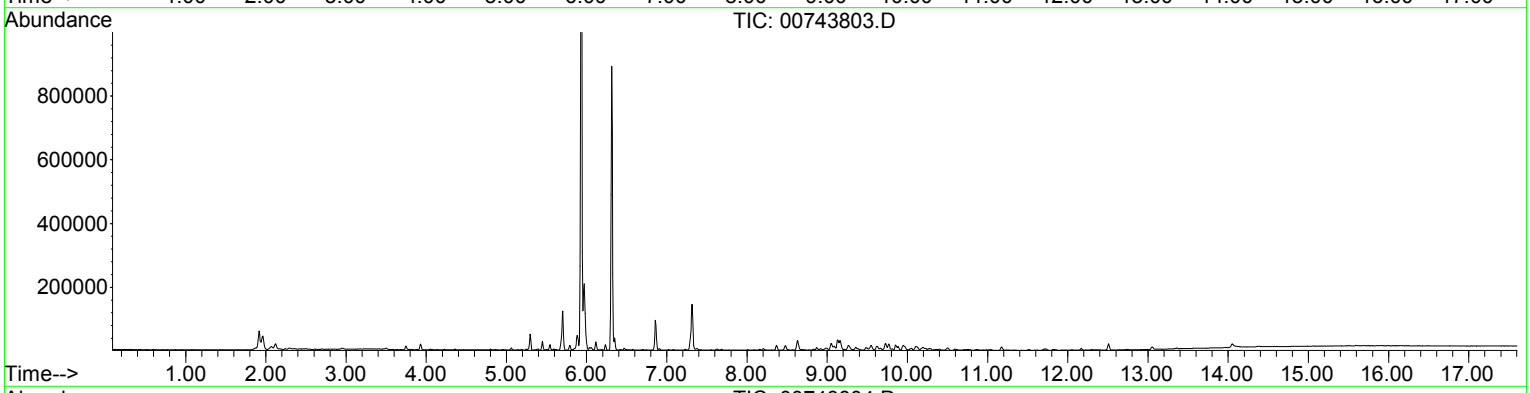

Abundance
TIC: 00743791.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743792.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743793.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743794.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743795.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

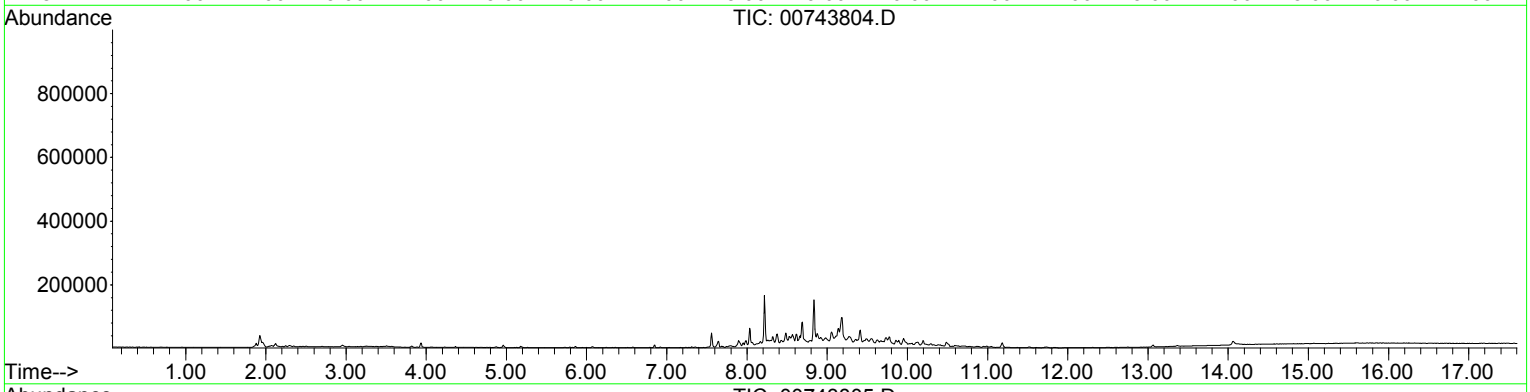

Abundance
TIC: 00743796.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743797.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743798.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743799.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743800.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

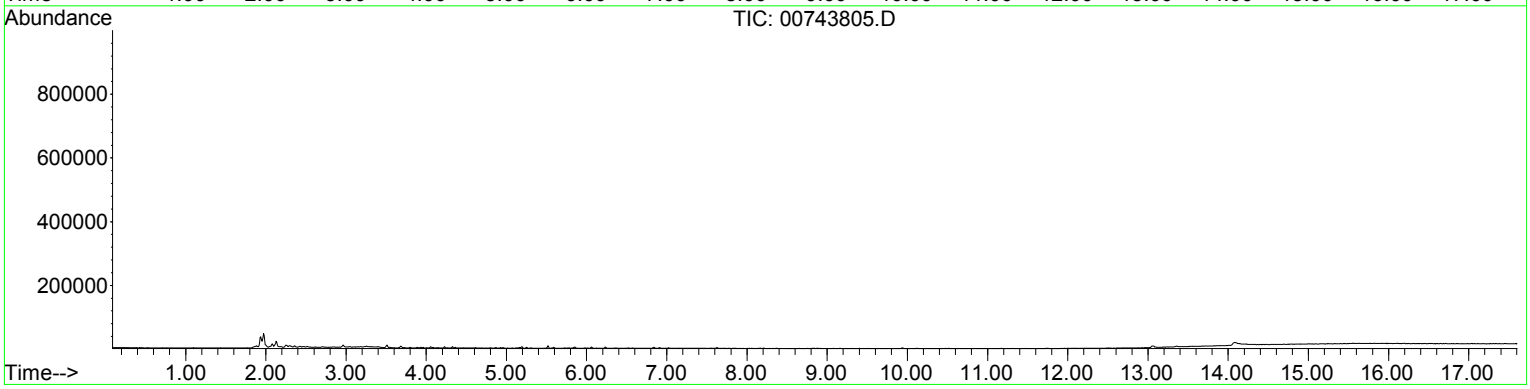
TICS - 01244
In Numerical Order

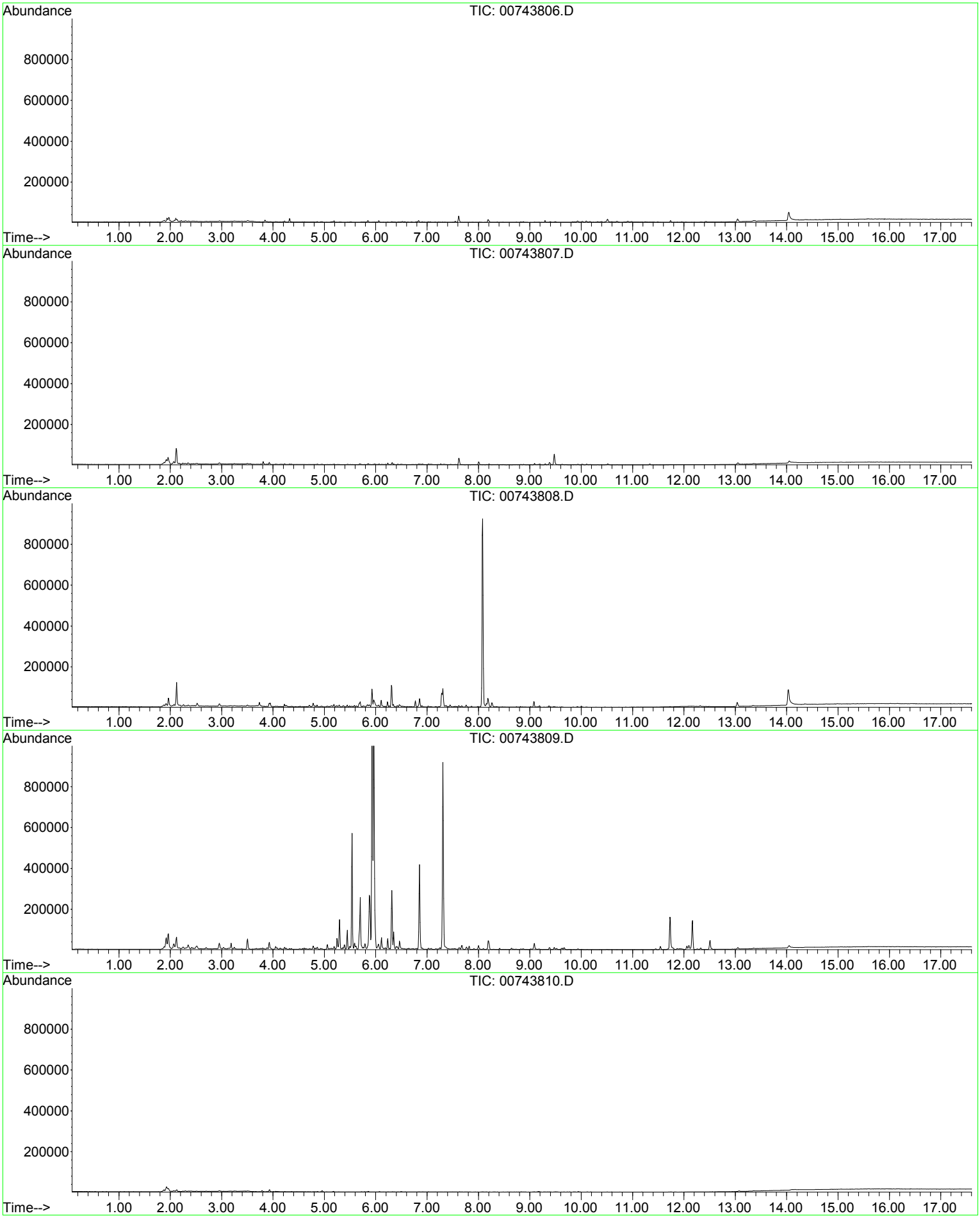


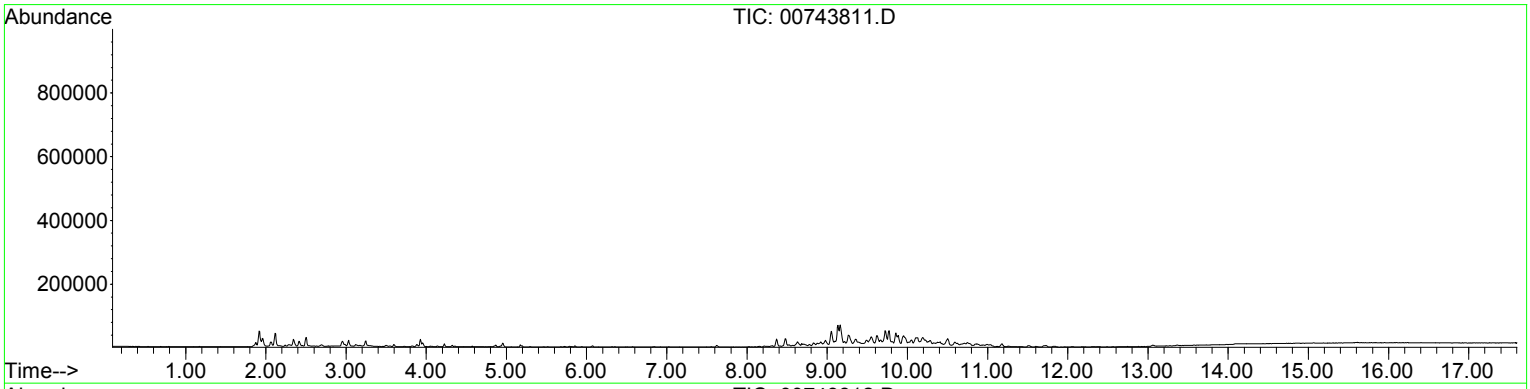



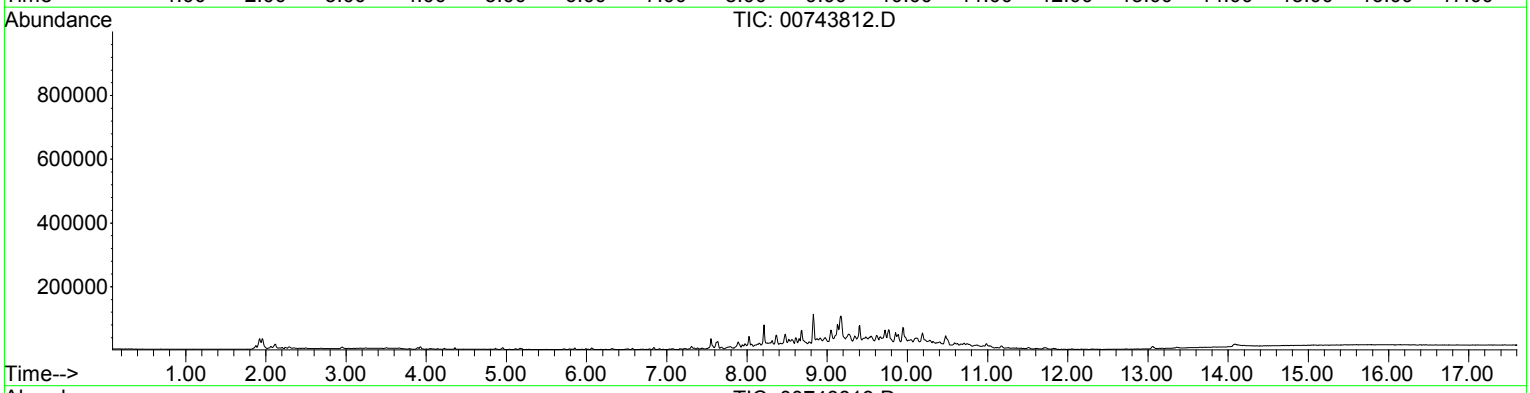



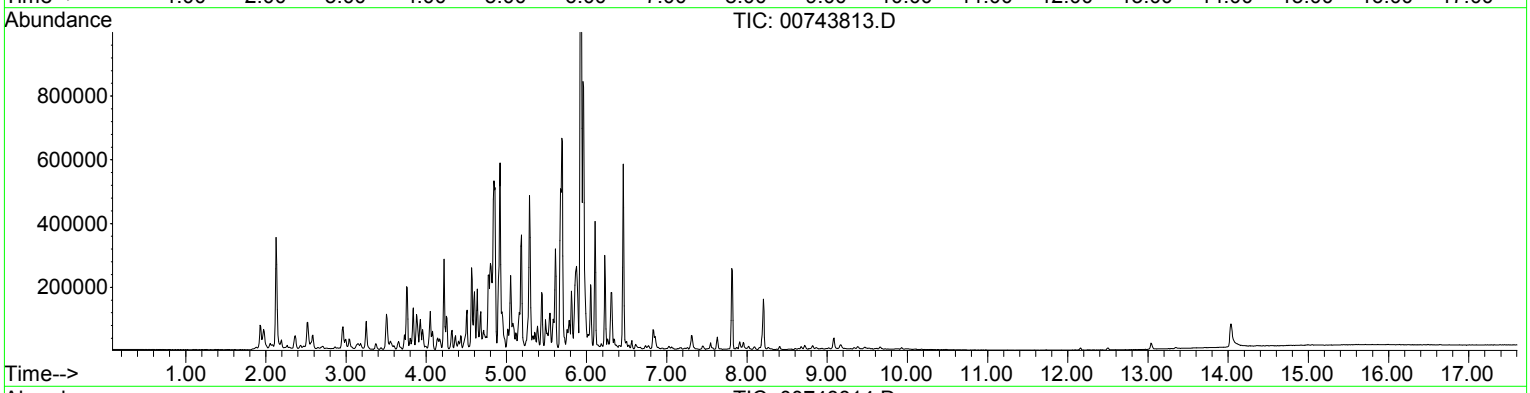



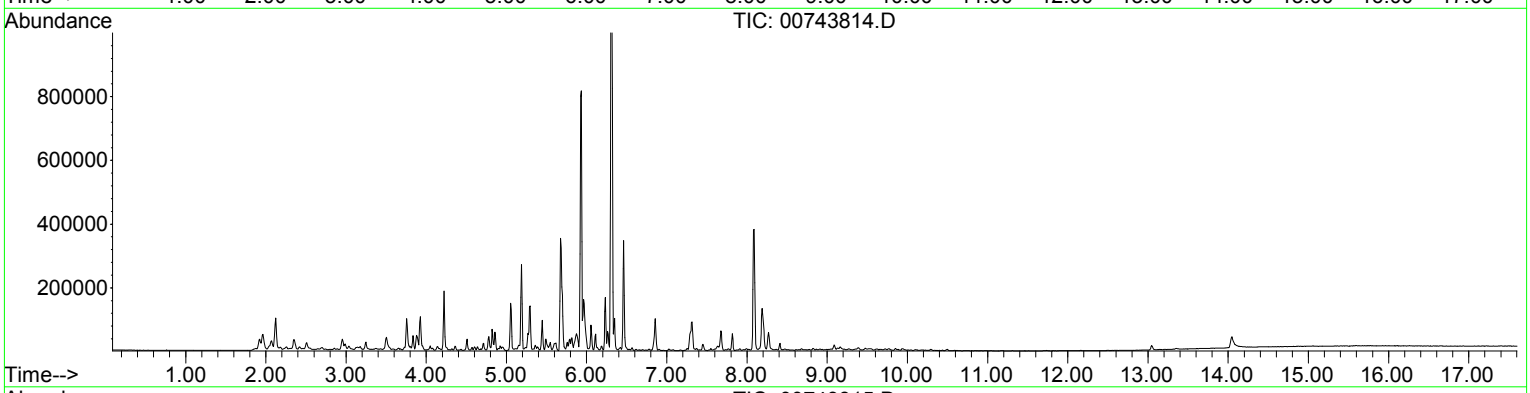



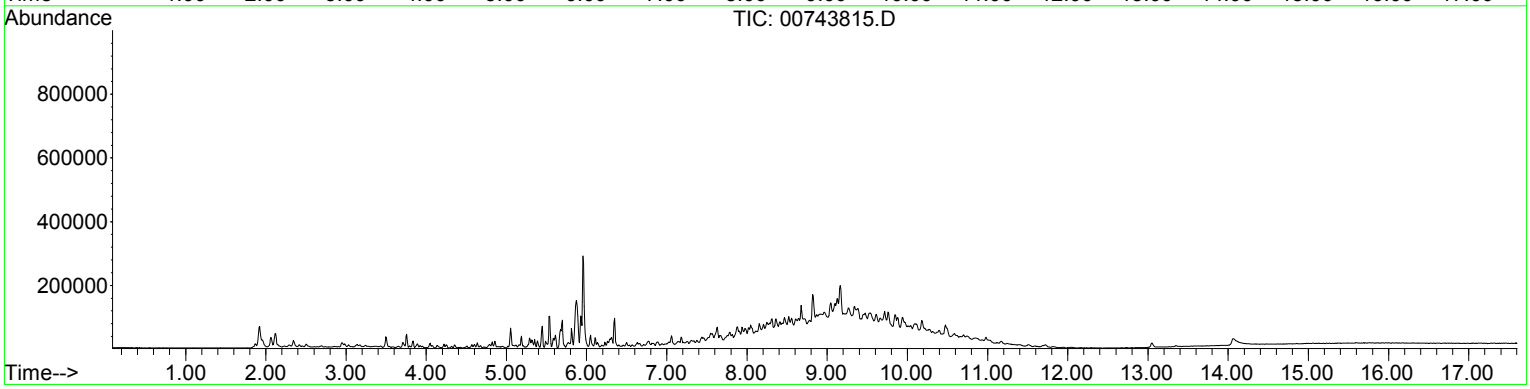

Abundance
TIC: 00743806.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743807.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743808.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743809.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743810.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

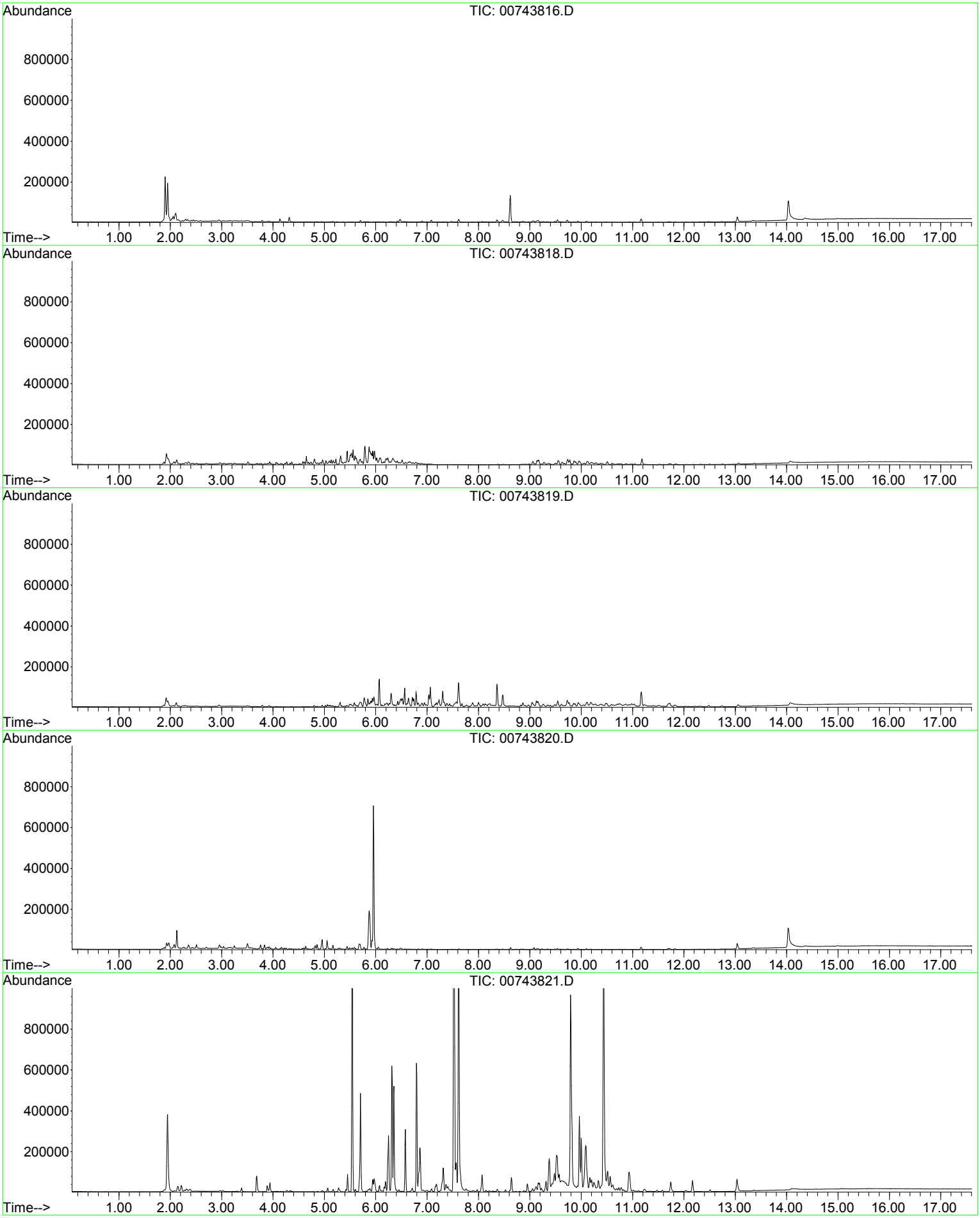

Abundance
TIC: 00743811.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

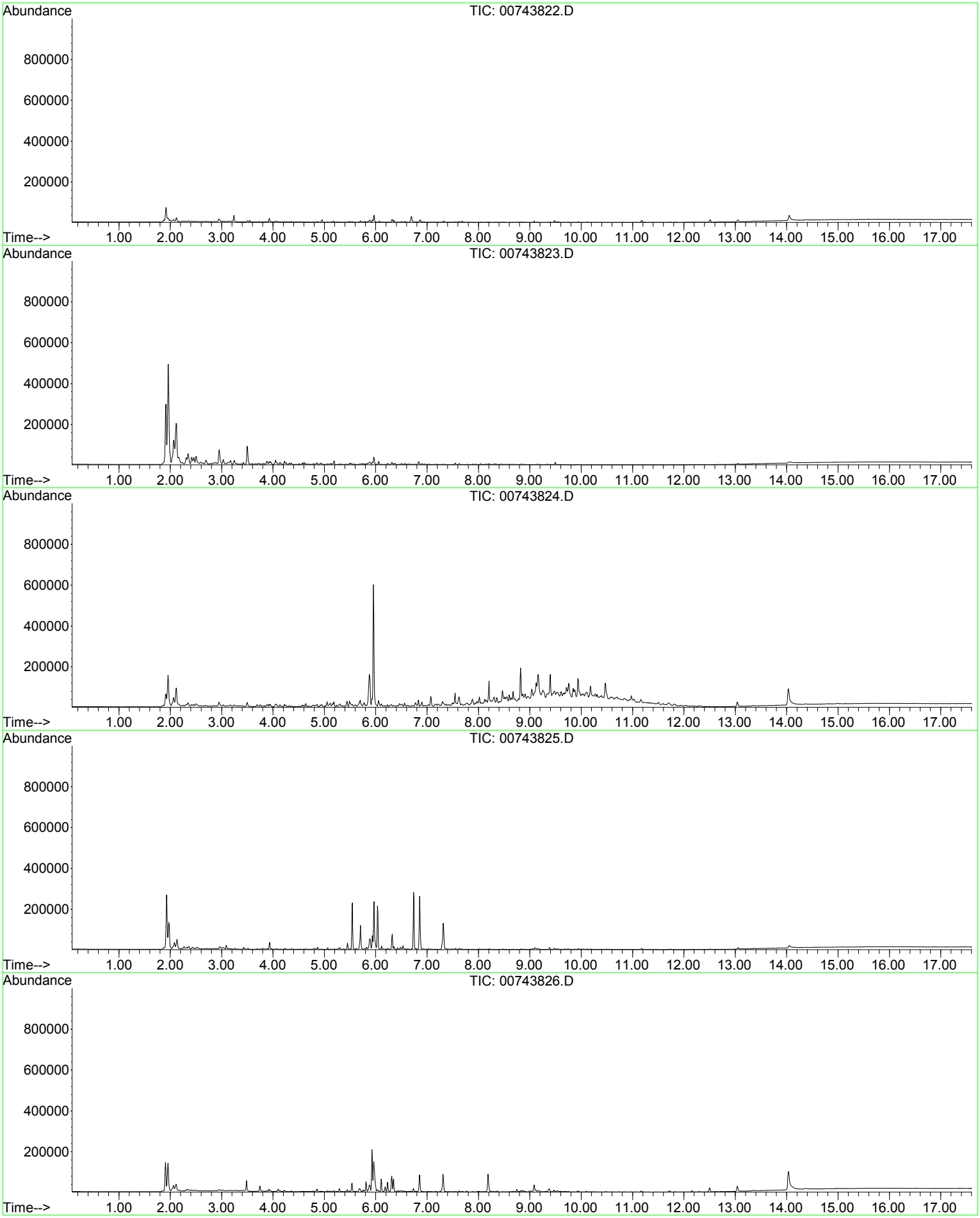

Abundance
TIC: 00743812.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00


Abundance
TIC: 00743813.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

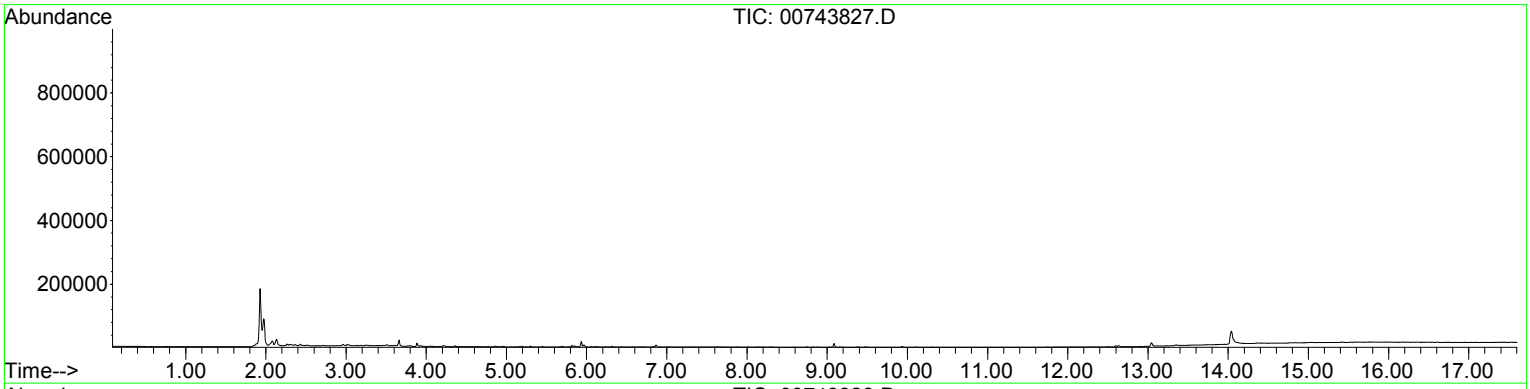

Abundance
TIC: 00743814.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

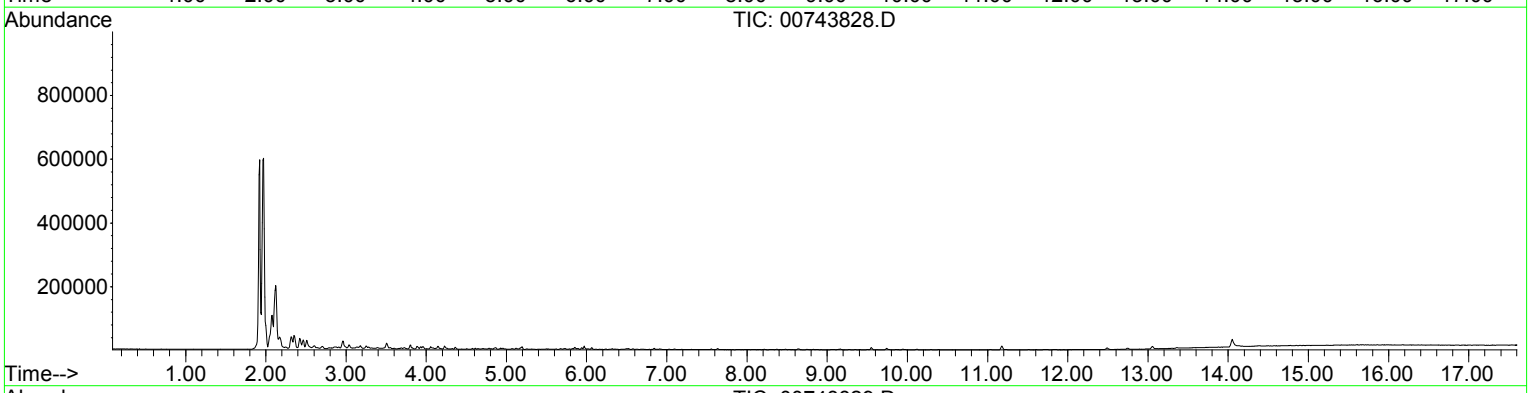

Abundance
TIC: 00743815.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

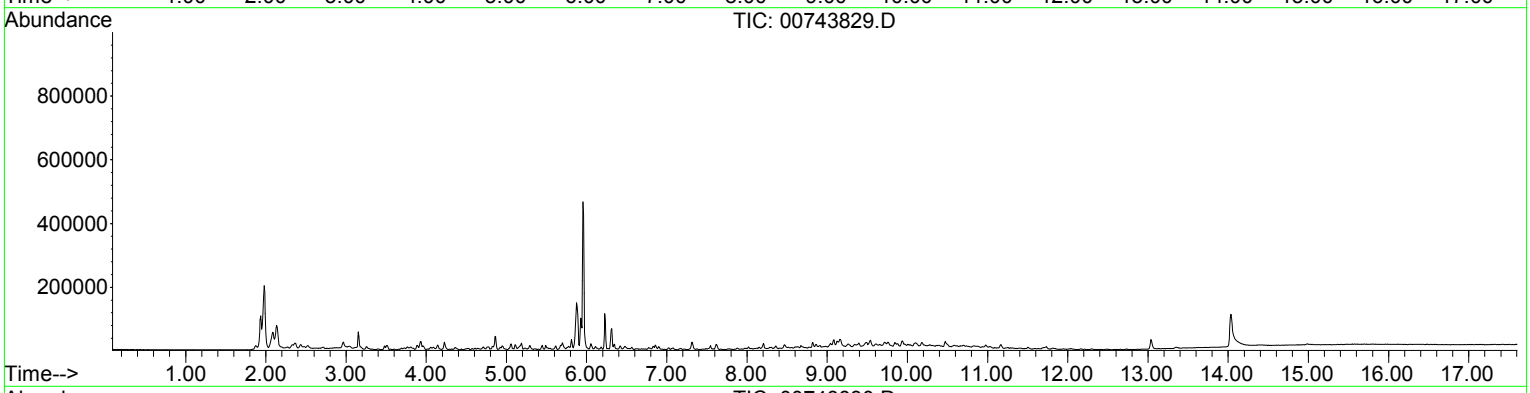

Abundance
TIC: 00743816.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743818.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743819.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743820.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743821.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

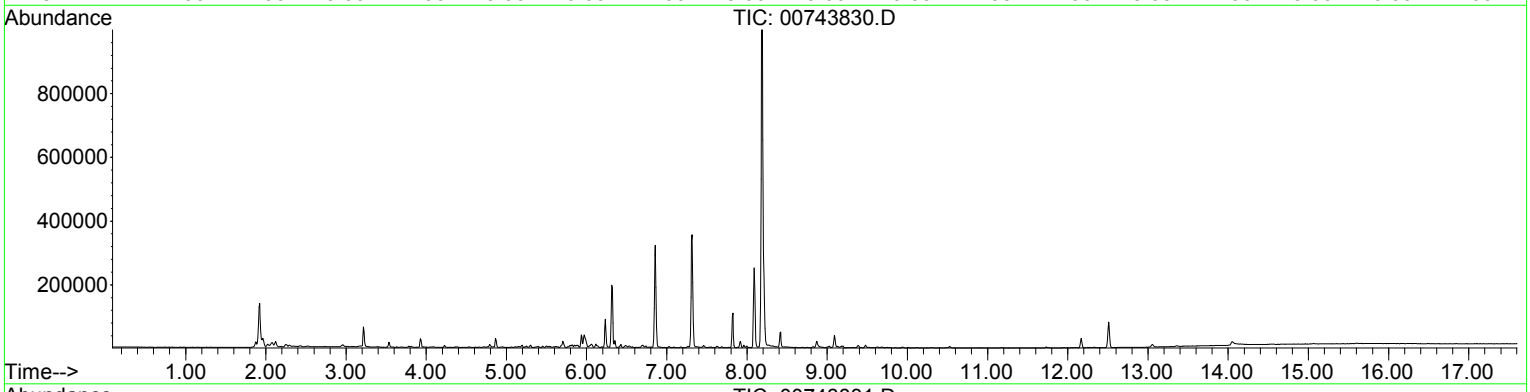

Abundance
TIC: 00743822.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743823.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743824.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743825.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00
Abundance
TIC: 00743826.D
800000
600000
400000
200000
Time-->
1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00

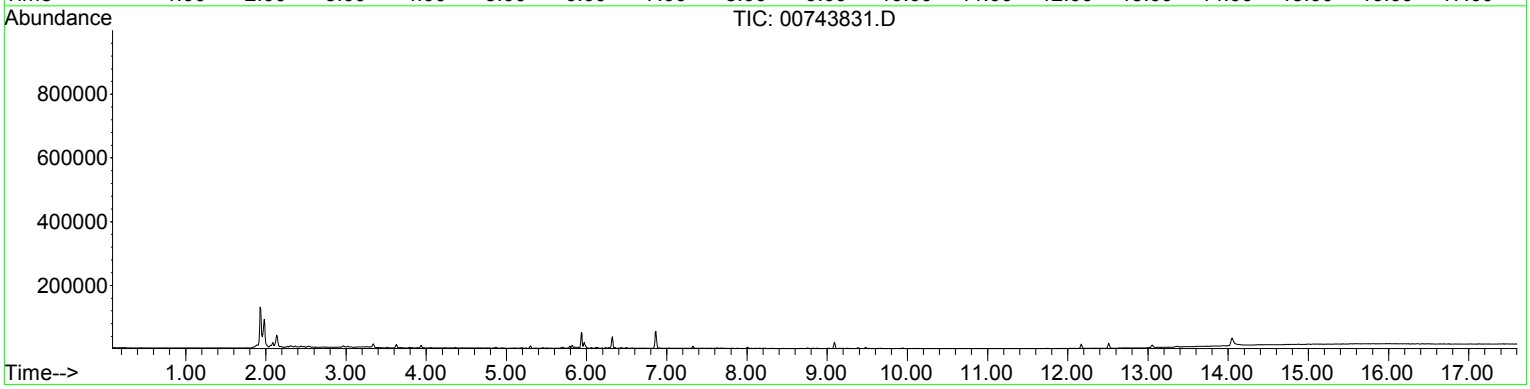
TICS - 01244
In Numerical Order



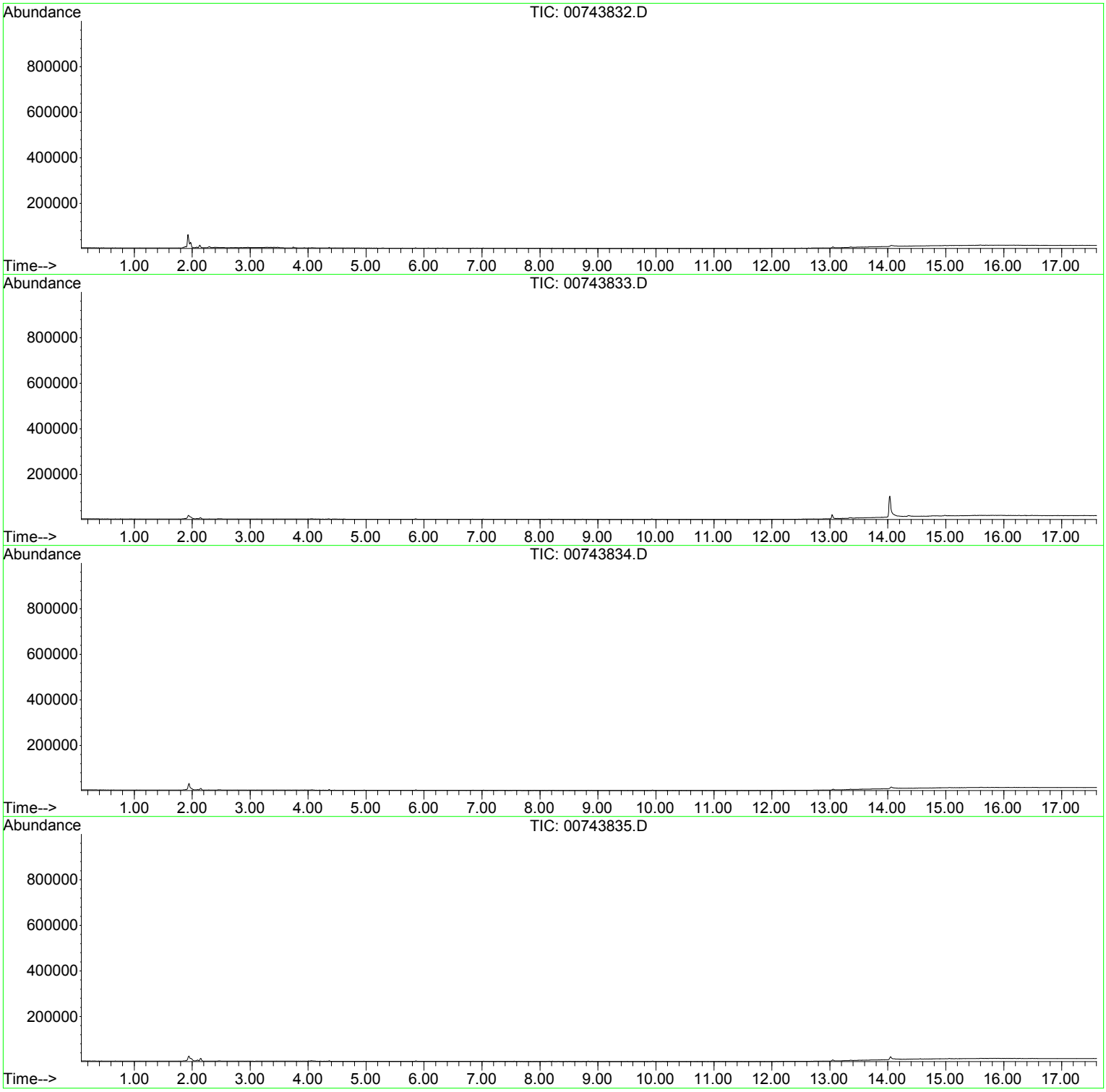



TICS - 01244
In Numerical Order






***Delaware Office and AGI Laboratory:***
210 Executive Drive, Suite 1
Newark, Delaware 19702-3335 USA
Phone: +1-302-266-2428
Fax: +1-302-266-2429

***German Sales Office:***
Amplified Geochemical Imaging GmbH
Alte Landstraße 25,
D-85521 Ottobrunn GERMANY
Phone: +49 89 6387927-12
Fax: +49 89 6387927-10

***Corporate Office:***
8369 SouthPark Lane, Suite B
Littleton, CO 80120 USA
Phone: +1-303-988-1968
Fax: +1-303-986-2898

www.agisurveys.net

AMPLIFIED GEOCHEMICAL IMAGING, LLC

Mapping Report

# Site: 4403 to 4493 Russell Road

Prepared for:

Aspect Consulting
401 2nd Ave South Suite 201
Seattle, Washington
UNITED STATES

Prepared on:

December 08, 2014

©2014 Amplified Geochemical Imaging, LLC.

## Project Summary

Amplified Geochemical Imaging, LLC. (AGI) provided the AGI Environmental Survey used at:
**4403 to 4493 Russell Road**

The service provided by AGI included delivery of the required quantity of AGI Universal Samplers, analysis by the method described for the requested organic compounds, and reporting of the data. A Laboratory Report was issued previously which summarized the field sampling and analytical procedures, and contained the

Normally, when printed at scale, the maps are 11 x 17 inch in size. Other sizes are available upon request. General and project specific comments on the contouring and mapping can be found on the next page.

Maps prepared by:

**Jim E Whetzel**

Project Manager

Maps reviewed/approved by:

**Jay W Hodny**

Project Manager

©2014 Amplified Geochemical Imaging, LLC.

## General Comments

A minimum curvature algorithm was used to interpolate the data from the sample locations to a regularly-spaced grid. The resulting surface is considered to be the smoothest possible surface that will fit the observed values at each sample location (i.e., data honoring). The interpolation is performed in log space, with grid cell sizes approximately one-tenth the average distance between sample locations. For example, when AGI Universal Samplers are placed about 50 feet apart, the grid cell size is set to five feet.

Where observations trend from lower to higher values, and moving towards the edge of the area sampled, the contour surface will continue to rise (showing warmer colors) as no additional data exist to constrain the interpolation. Where observations trend from high to low, towards the edge of the area sampled, the opposite is true.

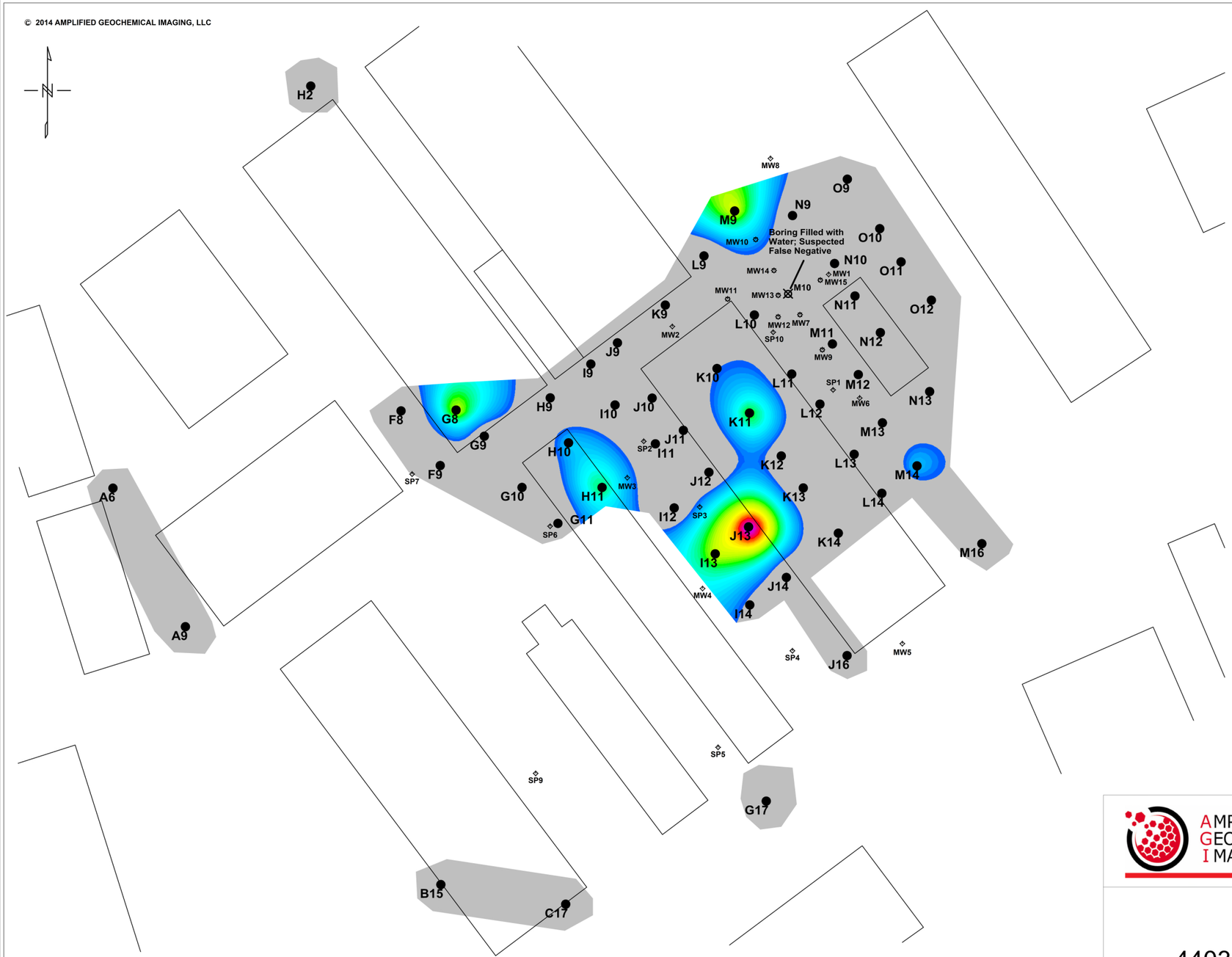
Contour minimums and maximums used in the color interval assignment are established based on the QA blank levels (trip and method blanks), method detection limits, and maximum values observed. The minimum contour level (gray color) is established using the maximum QA blank level or method detection limit, whichever is greater, per compound or groups of compounds . The maximum contour level is set at the maximum value observed, per compound or groups of compounds. Contour interval assignments can be modified at the client's request.

## Project Specific Comments

A sample location was found to be saturated with water. At the request of Aspect Consulting, the location was not included in contouring. A note was placed on the map to indicate that data was not included in contouring.

©2014 Amplified Geochemical Imaging, LLC.

© 2014 AMPLIFIED GEOCHEMICAL IMAGING, LLC




0.336
0.292
0.253
0.220
0.191
0.166
0.144
0.125
0.109
0.094
0.082
0.071
0.062
0.054
0.047
0.040
0.035
0.031
0.027
0.023
0.020

**PCE**
[µg]

Scale 1:1200

50 0 50 100 150 200 250

US survey foot

*NAD83 / *NAD 1983 StatePlane Washington North FIPS 4601 Feet*

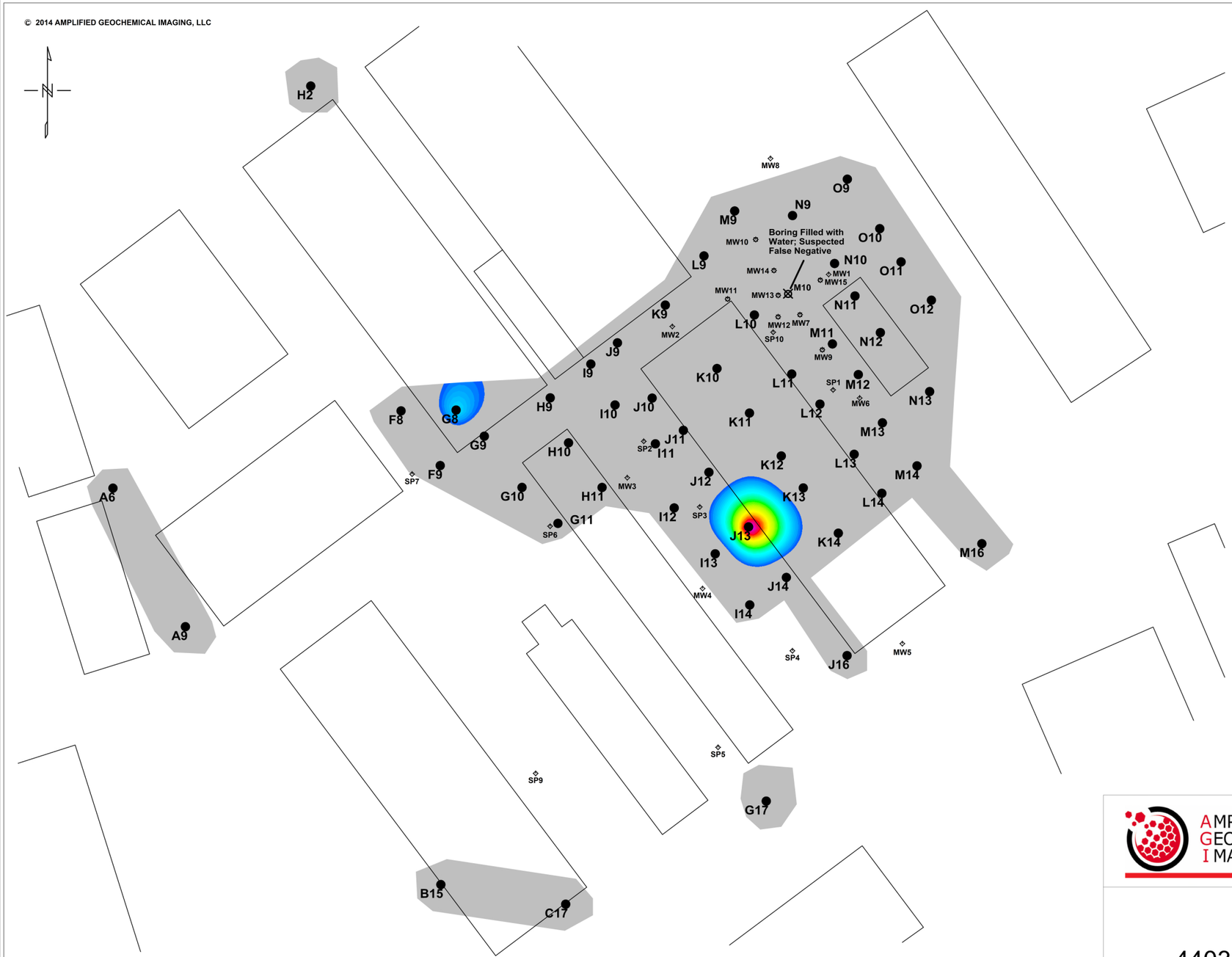
THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

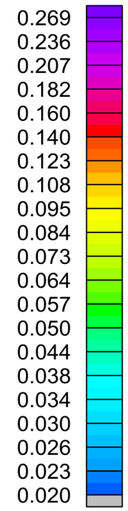
AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

# Aspect Consulting, Seattle, WA
# 4403 to 4493 Russell Road, Mukilteo, WA
# Tetrachloroethene

| | | | |
|---|---|---|---|
| **DATE DRAWN: 04 Dec 2014** | **DRAWN BY: JW** | **ORIG. CAD:** | **SITE CODE:** |
| **REV. DATE:** | **REV. #:** | **PROJECT NUMBER: 01244** | |

© 2014 AMPLIFIED GEOCHEMICAL IMAGING, LLC




Scale 1:1200

50 0 50 100 150 200 250

US survey foot

*NAD83 / *NAD 1983 StatePlane Washington North FIPS 4601 Feet*

THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

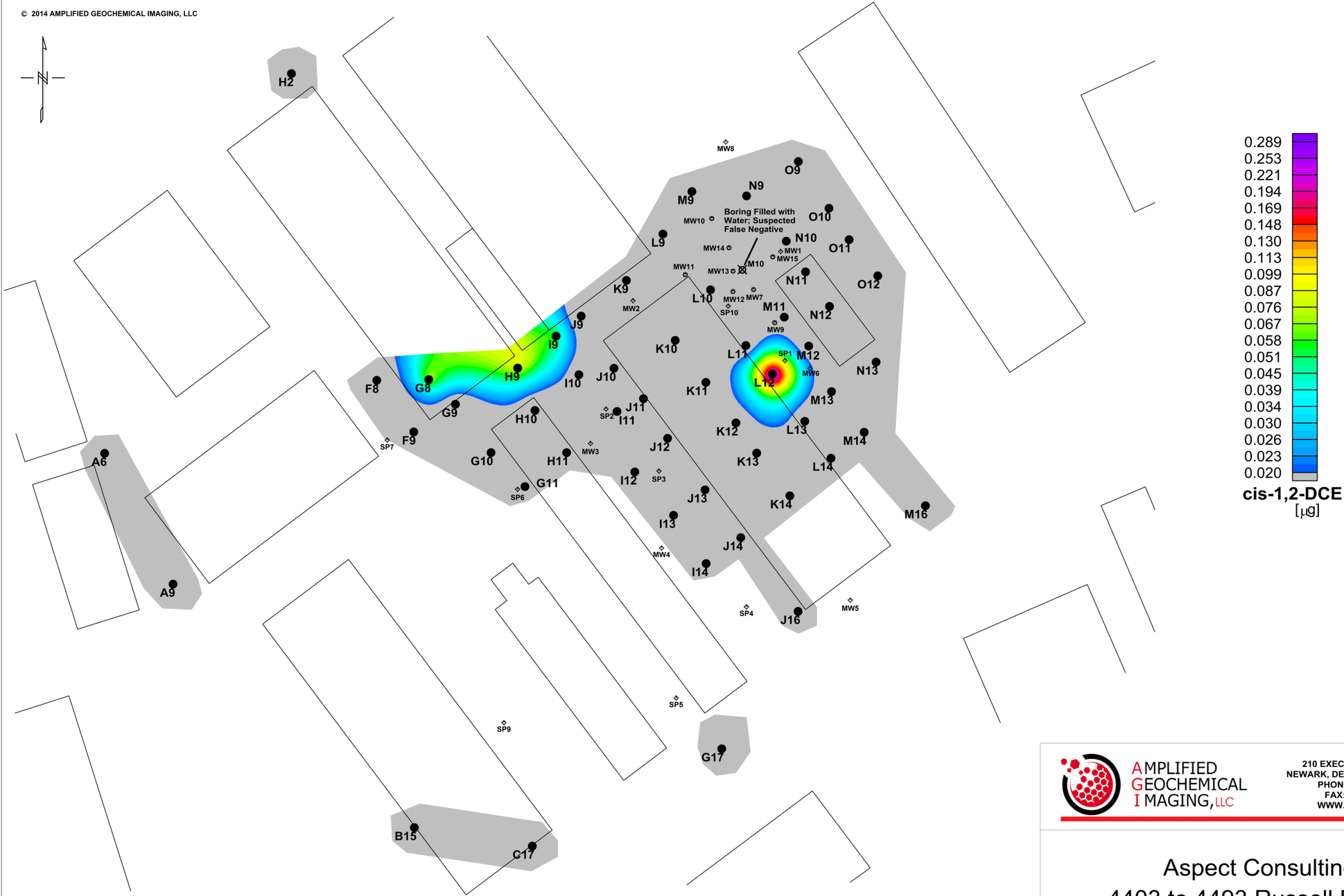
AMPLIFIED GEOCHEMICAL IMAGING, LLC

210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

# Aspect Consulting, Seattle, WA
# 4403 to 4493 Russell Road, Mukilteo, WA
# Trichloroethene

| | | | |
|---|---|---|---|
| DATE DRAWN: 04 Dec 2014 | DRAWN BY: JW | ORIG. CAD: | SITE CODE: |
| REV. DATE: | REV. #: | PROJECT NUMBER: 01244 | |

© 2014 AMPLIFIED GEOCHEMICAL IMAGING, LLC




0.289
0.253
0.221
0.194
0.169
0.148
0.130
0.113
0.099
0.087
0.076
0.067
0.058
0.051
0.045
0.039
0.034
0.030
0.026
0.023
0.020

**cis-1,2-DCE**
[µg]

Scale 1:1200

50 0 50 100 150 200 250

US survey foot

*NAD83 / *NAD 1983 StatePlane Washington North FIPS 4601 Feet*

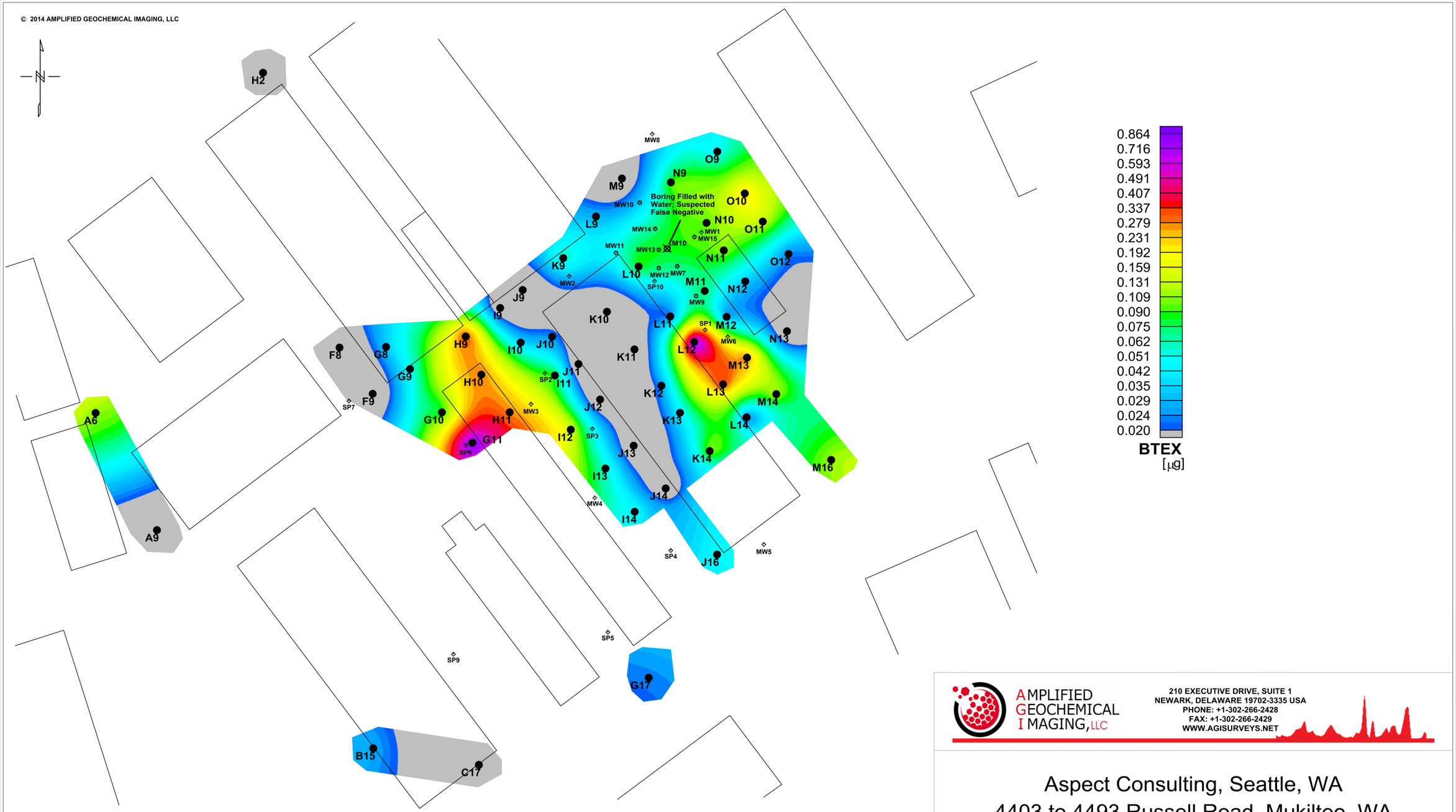
THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

# Aspect Consulting, Seattle, WA
# 4403 to 4493 Russell Road, Mukilteo, WA
# cis-1,2-Dichloroethene

| | | | |
|---|---|---|---|
| DATE DRAWN: 04 Dec 2014 | DRAWN BY: JW | ORIG. CAD: | SITE CODE: |
| REV. DATE: | REV. #: | PROJECT NUMBER: 01244 | |

© 2014 AMPLIFIED GEOCHEMICAL IMAGING, LLC




Scale 1:1200

50 0 50 100 150 200 250

US survey foot

*NAD83 / *NAD 1983 StatePlane Washington North FIPS 4601 Feet*

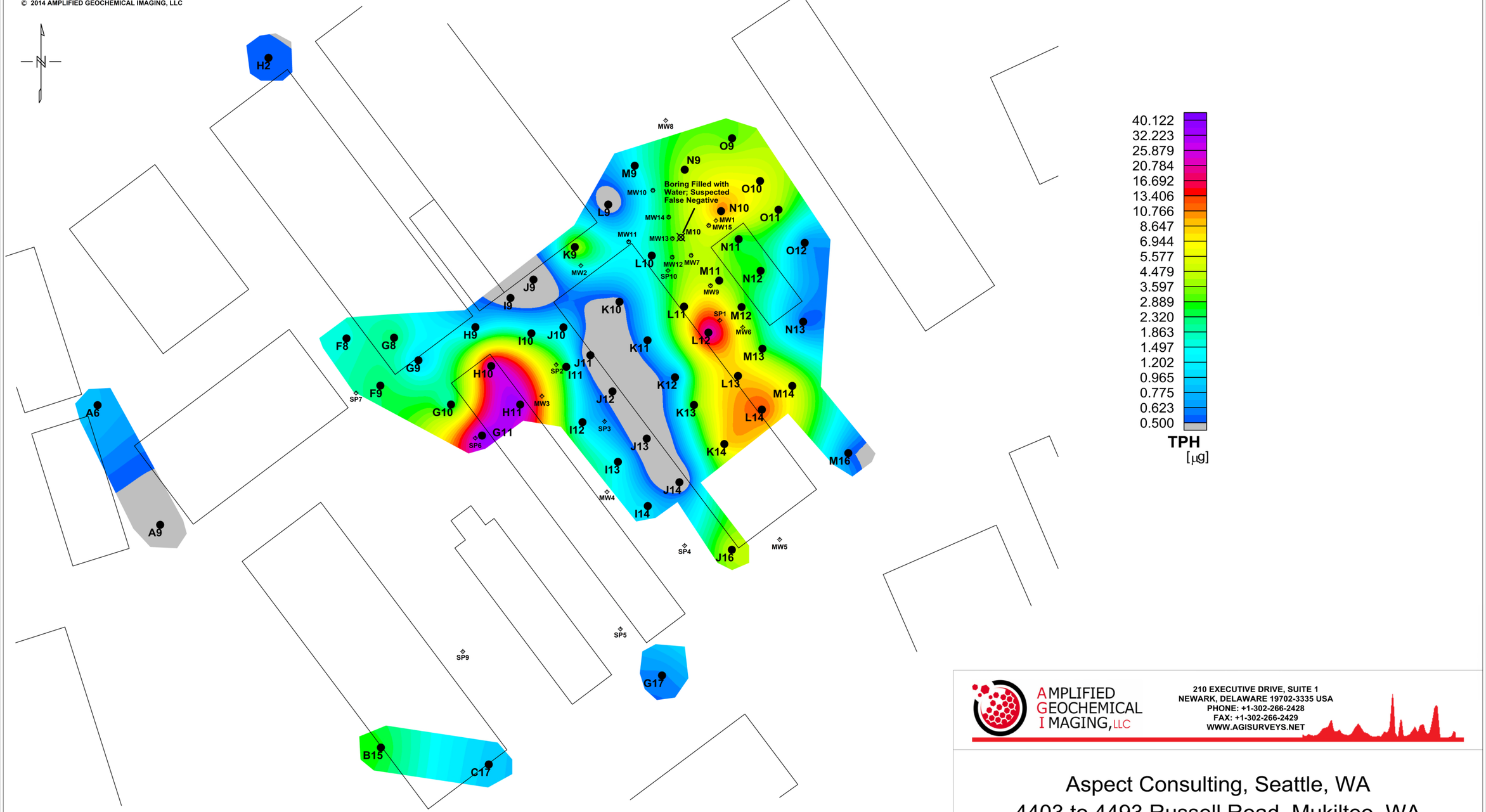
THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

# Aspect Consulting, Seattle, WA
# 4403 to 4493 Russell Road, Mukilteo, WA
# BTEX

| | | | |
|---|---|---|---|
| DATE DRAWN: 04 Dec 2014 | DRAWN BY: JW | ORIG. CAD: | SITE CODE: |
| REV. DATE: | REV. #: | PROJECT NUMBER: 01244 | |

© 2014 AMPLIFIED GEOCHEMICAL IMAGING, LLC




Scale 1:1200

50 0 50 100 150 200 250

US survey foot

*NAD83 / *NAD 1983 StatePlane Washington North FIPS 4601 Feet*

THIS DRAWING AND ANY OF ITS ATTACHMENTS HAVE BEEN PRODUCED FOR THE SOLE USE OF THE RECIPIENT IDENTIFIED HEREIN AND MUST NOT BE USED, REPRODUCED OR MODIFIED IN ANY WAY WITHOUT THE PRIOR WRITTEN CONSENT OF AMPLIFIED GEOCHEMICAL IMAGING, LLC. UNAUTHORIZED USE IS STRICTLY PROHIBITED PURSUANT TO COPYRIGHT, TRADEMARK AND OTHER APPLICABLE LAWS.

AMPLIFIED GEOCHEMICAL IMAGING, LLC
210 EXECUTIVE DRIVE, SUITE 1
NEWARK, DELAWARE 19702-3335 USA
PHONE: +1-302-266-2428
FAX: +1-302-266-2429
WWW.AGISURVEYS.NET

# Aspect Consulting, Seattle, WA
# 4403 to 4493 Russell Road, Mukilteo, WA
# Total Petroleum Hydrocarbons

| DATE DRAWN: 04 Dec 2014 | DRAWN BY: JW | ORIG. CAD: | SITE CODE: |
|---|---|---|---|
| REV. DATE: | REV. #: | PROJECT NUMBER: 01244 | |




***Delaware Office and AGI Laboratory:***
210 Executive Drive, Suite 1
Newark, Delaware 19702-3335 USA
Phone: +1-302-266-2428
Fax: +1-302-266-2429

***German Sales Office:***
Amplified Geochemical Imaging GmbH
Alte Landstraße 25,
D-85521 Ottobrunn GERMANY
Phone: +49 89 6387927-12
Fax: +49 89 6387927-10

***Corporate Office:***
8369 SouthPark Lane, Suite B
Littleton, CO 80120 USA
Phone: +1-303-988-1968
Fax: +1-303-986-2898

www.agisurveys.net

# Appendix F - Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 28, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on January 21, 2015 from the HERS Industrial Park 140252, F&BI 501283 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0128R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252, F&BI 501283 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 501283 -01 | MW-16-15.5 |
| 501283 -02 | MW-17-10 |
| 501283 -03 | MW-18-10.5 |
| 501283 -04 | MW-19-15 |

All quality control requirements were acceptable.

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283
Date Extracted: 01/22/15
Date Analyzed: 01/22/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 50-150) |
|---|---|---|
| MW-16-15.5<br>501283-01 | <2 | 98 |
| MW-17-10<br>501283-02 | <2 | 96 |
| MW-18-10.5<br>501283-03 | <2 | 95 |
| MW-19-15<br>501283-04 | <2 | 91 |
| Method Blank<br>05-125 MB2 | <2 | 96 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283
Date Extracted: 01/23/15
Date Analyzed: 01/23/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 56-165) |
|---|---|---|---|
| MW-16-15.5<br>501283-01 | <50 | <250 | 99 |
| MW-17-10<br>501283-02 | <50 | <250 | 108 |
| MW-18-10.5<br>501283-03 | <50 | <250 | 108 |
| MW-19-15<br>501283-04 | <50 | <250 | 95 |
| Method Blank<br>05-158 MB | <50 | <250 | 111 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16-15.5 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/23/15 | Lab ID: | 501283-01 |
| Date Analyzed: | 01/26/15 | Data File: | 501283-01.030 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 104 | 60 | 125 |
| Indium | 97 | 60 | 125 |
| Holmium | 103 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.06 |
| Barium | 24.9 |
| Cadmium | <1 |
| Chromium | 9.75 |
| Lead | 1.63 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-17-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/23/15 | Lab ID: | 501283-02 |
| Date Analyzed: | 01/26/15 | Data File: | 501283-02.031 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 104 | 60 | 125 |
| Indium | 93 | 60 | 125 |
| Holmium | 99 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.28 |
| Barium | 34.4 |
| Cadmium | <1 |
| Chromium | 19.7 |
| Lead | 2.31 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-18-10.5 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/23/15 | Lab ID: | 501283-03 |
| Date Analyzed: | 01/26/15 | Data File: | 501283-03.032 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 106 | 60 | 125 |
| Indium | 95 | 60 | 125 |
| Holmium | 100 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.85 |
| Barium | 37.2 |
| Cadmium | <1 |
| Chromium | 23.7 |
| Lead | 2.15 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-19-15 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/23/15 | Lab ID: | 501283-04 |
| Date Analyzed: | 01/26/15 | Data File: | 501283-04.033 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 104 | 60 | 125 |
| Indium | 93 | 60 | 125 |
| Holmium | 99 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.61 |
| Barium | 34.4 |
| Cadmium | <1 |
| Chromium | 16.5 |
| Lead | 2.07 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/23/15 | Lab ID: | I5-039 mb |
| Date Analyzed: | 01/26/15 | Data File: | I5-039 mb.009 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 95 | 60 | 125 |
| Indium | 96 | 60 | 125 |
| Holmium | 101 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16-15.5 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/22/15 | Lab ID: | 501283-01 |
| Date Analyzed: | 01/27/15 | Data File: | 012712.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 90 | 111 |
| Toluene-d8 | 96 | 64 | 137 |
| 4-Bromofluorobenzene | 99 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | 0.066 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | 0.066 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | 4.9 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-17-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/22/15 | Lab ID: | 501283-02 |
| Date Analyzed: | 01/27/15 | Data File: | 012713.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 106 | 90 | 111 |
| Toluene-d8 | 95 | 64 | 137 |
| 4-Bromofluorobenzene | 98 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-18-10.5 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/22/15 | Lab ID: | 501283-03 |
| Date Analyzed: | 01/27/15 | Data File: | 012714.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 90 | 111 |
| Toluene-d8 | 95 | 64 | 137 |
| 4-Bromofluorobenzene | 98 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-19-15 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/21/15 | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/22/15 | Lab ID: | 501283-04 |
| Date Analyzed: | 01/27/15 | Data File: | 012715.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 90 | 111 |
| Toluene-d8 | 96 | 64 | 137 |
| 4-Bromofluorobenzene | 99 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park 140252, F&BI 501283 |
| Date Extracted: | 01/27/15 | Lab ID: | 05-0108 mb2 |
| Date Analyzed: | 01/27/15 | Data File: | 012711.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 90 | 111 |
| Toluene-d8 | 95 | 64 | 137 |
| 4-Bromofluorobenzene | 98 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 501277-04 (Duplicate)

| Analyte | Reporting Units | Sample Result (Wet Wt) | Duplicate Result (Wet Wt) | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | <2 | <2 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | 20 | 100 | 61-153 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283

## QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 501283-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet Wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | <50 | 103 | 93 | 63-146 | 10 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 97 | 79-144 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 501282-03 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 3.13 | 104 | 100 | 70-118 | 4 |
| Barium | mg/kg (ppm) | 50 | 58.2 | 129 | 111 | 60-141 | 15 |
| Cadmium | mg/kg (ppm) | 10 | <1 | 112 | 111 | 83-116 | 1 |
| Chromium | mg/kg (ppm) | 50 | 18.4 | 95 | 92 | 57-128 | 3 |
| Lead | mg/kg (ppm) | 50 | 26.6 | 99 | 108 | 59-148 | 9 |
| Mercury | mg/kg (ppm | 10 | <1 | 104 | 104 | 50-150 | 0 |
| Selenium | mg/kg (ppm) | 5 | <1 | 94 | 97 | 64-117 | 3 |
| Silver | mg/kg (ppm) | 10 | <1 | 102 | 103 | 73-122 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 104 | 83-113 |
| Barium | mg/kg (ppm) | 50 | 115 | 85-116 |
| Cadmium | mg/kg (ppm) | 10 | 112 | 54-114 |
| Chromium | mg/kg (ppm) | 50 | 108 | 78-121 |
| Lead | mg/kg (ppm) | 50 | 109 | 80-120 |
| Mercury | mg/kg (ppm) | 10 | 105 | 70-130 |
| Selenium | mg/kg (ppm) | 5 | 104 | 84-115 |
| Silver | mg/kg (ppm) | 10 | 106 | 81-116 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 501124-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 16 | 14 | 10-56 | 13 |
| Chloromethane | mg/kg (ppm) | 2.5 | <0.5 | 44 | 41 | 10-90 | 7 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | <0.05 | 45 | 42 | 10-91 | 7 |
| Bromomethane | mg/kg (ppm) | 2.5 | <0.5 | 66 | 62 | 10-110 | 6 |
| Chloroethane | mg/kg (ppm) | 2.5 | <0.5 | 59 | 57 | 10-101 | 3 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 54 | 49 | 10-95 | 10 |
| Acetone | mg/kg (ppm) | 12.5 | <0.5 | 87 | 80 | 11-141 | 8 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 63 | 60 | 11-103 | 5 |
| Methylene chloride | mg/kg (ppm) | 2.5 | <0.5 | 81 | 76 | 14-128 | 6 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | <0.05 | 84 | 81 | 17-134 | 4 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 73 | 69 | 13-112 | 6 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 79 | 75 | 23-115 | 5 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 80 | 79 | 18-117 | 1 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 83 | 78 | 25-120 | 6 |
| Chloroform | mg/kg (ppm) | 2.5 | <0.05 | 87 | 81 | 29-117 | 7 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | <0.5 | 82 | 74 | 20-133 | 10 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | <0.05 | 87 | 82 | 22-124 | 6 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 84 | 79 | 27-112 | 6 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 77 | 73 | 26-107 | 5 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | <0.05 | 84 | 79 | 22-115 | 6 |
| Benzene | mg/kg (ppm) | 2.5 | <0.03 | 78 | 73 | 26-114 | 7 |
| Trichloroethene | mg/kg (ppm) | 2.5 | <0.02 | 81 | 76 | 30-112 | 6 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 86 | 83 | 31-119 | 4 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | <0.05 | 92 | 87 | 31-131 | 6 |
| Dibromomethane | mg/kg (ppm) | 2.5 | <0.05 | 89 | 84 | 27-124 | 6 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | <0.5 | 100 | 94 | 16-147 | 6 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 94 | 89 | 28-137 | 5 |
| Toluene | mg/kg (ppm) | 2.5 | <0.05 | 81 | 74 | 34-112 | 9 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 93 | 86 | 30-136 | 8 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 86 | 32-126 | 8 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | <0.5 | 96 | 88 | 17-147 | 9 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 89 | 83 | 29-125 | 7 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | <0.025 | 82 | 74 | 27-110 | 10 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 87 | 32-143 | 7 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | <0.05 | 90 | 84 | 32-126 | 7 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 80 | 37-113 | 5 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | 0.12 | 82 | 77 | 38-111 | 6 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 98 | 91 | 35-126 | 7 |
| m,p-Xylene | mg/kg (ppm) | 5 | 0.27 | 85 | 79 | 38-112 | 7 |
| o-Xylene | mg/kg (ppm) | 2.5 | 0.077 | 89 | 83 | 38-113 | 7 |
| Styrene | mg/kg (ppm) | 2.5 | <0.05 | 92 | 86 | 38-118 | 7 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | 0.25 | 86 | 79 | 37-114 | 8 |
| Bromoform | mg/kg (ppm) | 2.5 | <0.05 | 90 | 84 | 18-155 | 7 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | 0.46 | 74 | 70 | 36-114 | 6 |
| Bromobenzene | mg/kg (ppm) | 2.5 | <0.05 | 83 | 79 | 40-115 | 5 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | 0.90 | 74 b | 69 b | 35-116 | 7 b |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 98 | 95 | 33-128 | 3 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 81 | 33-123 | 7 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 82 | 39-110 | 2 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 79 | 39-111 | 6 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 81 | 36-116 | 7 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | 2.0 | 61 b | 60 b | 35-116 | 2 b |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | 0.62 | 76 b | 71 b | 33-118 | 7 b |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | 0.55 | 80 b | 75 b | 32-119 | 6 b |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 78 | 38-111 | 7 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 79 | 39-109 | 7 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 82 | 77 | 40-111 | 6 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | <0.5 | 96 | 89 | 34-134 | 8 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 82 | 78 | 31-117 | 5 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | <0.25 | 94 | 85 | 25-122 | 10 |
| Naphthalene | mg/kg (ppm) | 2.5 | 1.4 | 76 b | 74 b | 39-120 | 3 b |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 83 | 78 | 35-117 | 6 |

Date of Report: 01/28/15
Date Received: 01/21/15
Project: HERS Industrial Park 140252, F&BI 501283

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | 54 | 10-76 |
| Chloromethane | mg/kg (ppm) | 2.5 | 78 | 34-98 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | 88 | 42-107 |
| Bromomethane | mg/kg (ppm) | 2.5 | 94 | 46-113 |
| Chloroethane | mg/kg (ppm) | 2.5 | 97 | 47-115 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | 98 | 53-112 |
| Acetone | mg/kg (ppm) | 12.5 | 113 | 39-147 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | 100 | 65-110 |
| Methylene chloride | mg/kg (ppm) | 2.5 | 111 | 62-119 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | 108 | 72-122 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 103 | 71-113 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | 104 | 76-109 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | 118 | 64-151 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 107 | 77-110 |
| Chloroform | mg/kg (ppm) | 2.5 | 105 | 78-108 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | 93 | 60-121 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | 104 | 80-109 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | 111 | 72-116 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | 101 | 77-108 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | 113 | 67-123 |
| Benzene | mg/kg (ppm) | 2.5 | 98 | 75-107 |
| Trichloroethene | mg/kg (ppm) | 2.5 | 99 | 72-107 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | 106 | 78-111 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | 108 | 75-126 |
| Dibromomethane | mg/kg (ppm) | 2.5 | 102 | 80-111 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | 110 | 80-128 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 110 | 71-138 |
| Toluene | mg/kg (ppm) | 2.5 | 102 | 79-112 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 106 | 77-135 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | 105 | 84-115 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | 103 | 71-129 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | 101 | 82-113 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | 105 | 77-110 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | 111 | 64-152 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | 101 | 83-116 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | 102 | 82-113 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | 104 | 81-114 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 116 | 76-125 |
| m,p-Xylene | mg/kg (ppm) | 5 | 107 | 82-115 |
| o-Xylene | mg/kg (ppm) | 2.5 | 110 | 81-116 |
| Styrene | mg/kg (ppm) | 2.5 | 108 | 81-118 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | 109 | 81-117 |
| Bromoform | mg/kg (ppm) | 2.5 | 105 | 50-174 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | 100 | 82-116 |
| Bromobenzene | mg/kg (ppm) | 2.5 | 101 | 82-118 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | 107 | 83-120 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 107 | 83-125 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | 101 | 79-116 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | 103 | 80-114 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | 102 | 82-114 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | 107 | 82-116 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | 108 | 82-116 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | 104 | 81-123 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | 108 | 82-124 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | 100 | 80-118 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | 102 | 79-117 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | 99 | 80-118 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | 107 | 71-131 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | 101 | 75-122 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | 100 | 74-130 |
| Naphthalene | mg/kg (ppm) | 2.5 | 109 | 83-128 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | 101 | 80-126 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

501283

# SAMPLE CHAIN OF CUSTODY

ME 01-21-15

151 / EDD BL

Page # 1 of 1

Send Report To Alan Noell

Company Aspect Consulting, LLC

Address 401 2nd Ave S, #201

City, State, ZIP Seattle, WA 98104

Phone # (206) 838-6592 Fax #

SAMPLERS (signature) Matthew M Lewis

PROJECT NAME/NO. HERS Industrial Park 140252

PO#

REMARKS

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Metals | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-16-15.5 | 01 A-G | 1/21/15 | 1230 | Soil | 5 | X | X | X | X | | | X | | | | | | |
| MW-17-10 | 02 | " | 1326 | " | " | X | X | X | X | | | X | | | | | | |
| MW-18-10.5 | 03 | " | 0955 | " | " | X | X | X | X | | | X | | | | | | |
| MW-19-15 | 04 | " | 1530 | " | " | X | X | X | X | | | X | | | | | | |
| | | | | | | | MW | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M Lewis | Matthew M Lewis | Aspect | 1/21/15 | 1 |
| Received by: | Jon Shannon | FBI | 1/21/15 | 17:46 |
| Relinquished by: | | | | |
| Received by: | | | | |

Samples received at 2 °C

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 25, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included is the amended report from the testing of material submitted on January 23, 2015 from the HERS Industrial Park 140252, F&BI 501330 project. Per your request, the sample ID MW-14-012315 has been amended to MW-19-Duplicate.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0202R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 2, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on January 23, 2015 from the HERS Industrial Park 140252, F&BI 501330 project. There are 49 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0202R.DOC

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## CASE NARRATIVE

This case narrative encompasses samples received on January 23, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252, F&BI 501330 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 501330 -01 | MW-1-012215 |
| 501330 -02 | MW-2-012315 |
| 501330 -03 | MW-3-012215 |
| 501330 -04 | MW-4-012215 |
| 501330 -05 | MW-5-012215 |
| 501330 -06 | MW-6-012315 |
| 501330 -07 | MW-8-012215 |
| 501330 -08 | MW-9-012315 |
| 501330 -09 | MW-10-012215 |
| 501330 -10 | MW-12-012315 |
| 501330 -11 | MW-15-012215 |
| 501330 -12 | MW-16-012315 |
| 501330 -13 | MW-17-012315 |
| 501330 -14 | MW-18-012315 |
| 501330 -15 | MW-19-012315 |
| 501330 -16 | MW-19-Duplicate |

Several compounds in the 8260C laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/27/15
Date Analyzed: 01/27/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate (% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-1-012215<br>501330-01 | <100 | 93 |
| MW-2-012315<br>501330-02 | <100 | 94 |
| MW-3-012215<br>501330-03 | <100 | 95 |
| MW-4-012215<br>501330-04 | <100 | 98 |
| MW-5-012215<br>501330-05 | <100 | 96 |
| MW-6-012315<br>501330-06 | <100 | 92 |
| MW-8-012215<br>501330-07 | <100 | 97 |
| MW-9-012315<br>501330-08 | <100 | 91 |
| MW-10-012215<br>501330-09 | <100 | 89 |
| MW-12-012315<br>501330-10 | <100 | 102 |
| MW-15-012215<br>501330-11 | <100 | 98 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/27/15
Date Analyzed: 01/27/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate (% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-16-012315<br>501330-12 | 280 | 96 |
| MW-17-012315<br>501330-13 | <100 | 101 |
| MW-18-012315<br>501330-14 | <100 | 95 |
| MW-19-012315<br>501330-15 | <100 | 96 |
| MW-19-Duplicate<br>501330-16 | <100 | 101 |
| Method Blank<br>05-162 MB | <100 | 96 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/27/15
Date Analyzed: 01/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 41-152) |
|---|---|---|---|
| MW-1-012215<br>501330-01 | 390 x | 270 x | 85 |
| MW-2-012315<br>501330-02 1/1.2 | <60 | <300 | 85 |
| MW-3-012215<br>501330-03 | 600 x | 350 x | 93 |
| MW-4-012215<br>501330-04 | 150 x | <250 | 87 |
| MW-5-012215<br>501330-05 | 59 x | <250 | 95 |
| MW-6-012315<br>501330-06 | 84 x | <250 | 96 |
| MW-8-012215<br>501330-07 | <50 | <250 | 83 |
| MW-9-012315<br>501330-08 | 110 x | <250 | 96 |
| MW-10-012215<br>501330-09 | <50 | <250 | 83 |
| MW-12-012315<br>501330-10 | 56 x | <250 | 88 |
| MW-15-012215<br>501330-11 | 370 x | 370 x | 92 |
| MW-16-012315<br>501330-12 | 330 x | <250 | 95 |
| MW-17-012315<br>501330-13 | 300 x | <250 | 98 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/27/15
Date Analyzed: 01/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 41-152) |
|---|---|---|---|
| MW-18-012315<br>501330-14 | 96 x | <250 | 99 |
| MW-19-012315<br>501330-15 | 590 x | 420 x | 92 |
| MW-19-Duplicate<br>501330-16 | 660 x | 500 x | 104 |
| Method Blank<br>05-190 MB | <50 | <250 | 76 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-1-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-01 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-01.036 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 106 | 60 | 125 |
| Indium | 94 | 60 | 125 |
| Holmium | 94 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 23.1 |
| Barium | 25.6 |
| Cadmium | <1 |
| Chromium | 1.57 |
| Lead | <1 |
| Selenium | 1.68 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-2-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-02 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-02.040 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 94 | 60 | 125 |
| Indium | 91 | 60 | 125 |
| Holmium | 93 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 1.86 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-3-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-03 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-03.041 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 92 | 60 | 125 |
| Indium | 84 | 60 | 125 |
| Holmium | 86 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 10.6 |
| Barium | 46.2 |
| Cadmium | <1 |
| Chromium | 2.58 |
| Lead | <1 |
| Selenium | 1.81 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-4-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-04 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-04.042 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 98 | 60 | 125 |
| Indium | 92 | 60 | 125 |
| Holmium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 34.7 |
| Barium | 10.3 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-5-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-05 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-05.043 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 92 | 60 | 125 |
| Indium | 89 | 60 | 125 |
| Holmium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 5.56 |
| Barium | 11.1 |
| Cadmium | <1 |
| Chromium | 1.62 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-6-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-06 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-06.044 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 93 | 60 | 125 |
| Indium | 92 | 60 | 125 |
| Holmium | 98 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 6.43 |
| Cadmium | <1 |
| Chromium | 1.51 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-8-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-07 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-07.045 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 88 | 60 | 125 |
| Indium | 86 | 60 | 125 |
| Holmium | 94 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 13.4 |
| Cadmium | <1 |
| Chromium | 1.36 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-9-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-08 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-08.046 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 98 | 60 | 125 |
| Indium | 95 | 60 | 125 |
| Holmium | 100 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.73 |
| Barium | 35.4 |
| Cadmium | <1 |
| Chromium | 1.79 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-10-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-09 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-09.047 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 86 | 60 | 125 |
| Indium | 88 | 60 | 125 |
| Holmium | 97 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.11 |
| Barium | 26.7 |
| Cadmium | <1 |
| Chromium | 1.08 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-12-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-10 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-10.048 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 84 | 60 | 125 |
| Indium | 85 | 60 | 125 |
| Holmium | 93 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 36.4 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-15-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-11 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-11.049 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 94 | 60 | 125 |
| Indium | 87 | 60 | 125 |
| Holmium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 22.3 |
| Barium | 13.5 |
| Cadmium | <1 |
| Chromium | 1.83 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-12 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-12.051 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 84 | 60 | 125 |
| Indium | 84 | 60 | 125 |
| Holmium | 90 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.02 |
| Barium | 162 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | 1.76 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-17-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-13 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-13.052 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 90 | 60 | 125 |
| Indium | 88 | 60 | 125 |
| Holmium | 94 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 9.82 |
| Barium | 187 |
| Cadmium | <1 |
| Chromium | 1.72 |
| Lead | <1 |
| Selenium | 2.07 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-18-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-14 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-14.053 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 88 | 60 | 125 |
| Indium | 88 | 60 | 125 |
| Holmium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 47.7 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-19-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-15 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-15.054 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 85 | 60 | 125 |
| Indium | 84 | 60 | 125 |
| Holmium | 88 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.75 |
| Barium | 337 |
| Cadmium | <1 |
| Chromium | 2.43 |
| Lead | <1 |
| Selenium | 3.61 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-19-Duplicate | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | 501330-16 |
| Date Analyzed: | 01/26/15 | Data File: | 501330-16.055 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 82 | 60 | 125 |
| Indium | 82 | 60 | 125 |
| Holmium | 87 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.93 |
| Barium | 330 |
| Cadmium | <1 |
| Chromium | 2.59 |
| Lead | <1 |
| Selenium | 3.79 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/26/15 | Lab ID: | I5-040 mb |
| Date Analyzed: | 01/26/15 | Data File: | I5-040 mb.034 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 100 | 60 | 125 |
| Indium | 100 | 60 | 125 |
| Holmium | 102 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/26/15
Date Analyzed: 01/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Dissolved Mercury |
|---|---|
| MW-1-012215<br>501330-01 | <0.1 |
| MW-2-012315<br>501330-02 | <0.1 |
| MW-3-012215<br>501330-03 | <0.1 |
| MW-4-012215<br>501330-04 | <0.1 |
| MW-5-012215<br>501330-05 | <0.1 |
| MW-6-012315<br>501330-06 | <0.1 |
| MW-8-012215<br>501330-07 | <0.1 |
| MW-9-012315<br>501330-08 | <0.1 |
| MW-10-012215<br>501330-09 | 0.11 |
| MW-12-012315<br>501330-10 | <0.1 |
| MW-15-012215<br>501330-11 | <0.1 |
| MW-16-012315<br>501330-12 | <0.1 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330
Date Extracted: 01/26/15
Date Analyzed: 01/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Dissolved Mercury |
|---|---|
| MW-17-012315<br>501330-13 | <0.1 |
| MW-18-012315<br>501330-14 | <0.1 |
| MW-19-012315<br>501330-15 | <0.1 |
| MW-19-Duplicate<br>501330-16 | <0.1 |
| Method Blank<br>I5-042 | <0.1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-1-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-01 |
| Date Analyzed: | 01/27/15 | Data File: | 012710.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 1080 |
| Toluene-d8 | 101 | 91 | 107 |
| 4-Bromofluorobenzene | 102 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 2.3 |
| Vinyl chloride | 4.1 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | 1.2 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 5.2 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 96 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-2-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-02 |
| Date Analyzed: | 01/28/15 | Data File: | 012806.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 108 |
| Toluene-d8 | 103 | 91 | 107 |
| 4-Bromofluorobenzene | 103 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | 18 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-3-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-03 |
| Date Analyzed: | 01/27/15 | Data File: | 012712.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 94 | 108 |
| Toluene-d8 | 103 | 91 | 107 |
| 4-Bromofluorobenzene | 103 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 1.5 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-4-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-04 |
| Date Analyzed: | 01/27/15 | Data File: | 012713.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 94 | 108 |
| Toluene-d8 | 102 | 91 | 107 |
| 4-Bromofluorobenzene | 102 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-5-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-05 |
| Date Analyzed: | 01/27/15 | Data File: | 012714.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 108 |
| Toluene-d8 | 100 | 91 | 107 |
| 4-Bromofluorobenzene | 101 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-6-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-06 |
| Date Analyzed: | 01/27/15 | Data File: | 012715.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 108 |
| Toluene-d8 | 101 | 91 | 107 |
| 4-Bromofluorobenzene | 101 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-8-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-07 |
| Date Analyzed: | 01/27/15 | Data File: | 012716.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 94 | 108 |
| Toluene-d8 | 101 | 91 | 107 |
| 4-Bromofluorobenzene | 102 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-9-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-08 |
| Date Analyzed: | 01/27/15 | Data File: | 012717.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 94 | 108 |
| Toluene-d8 | 101 | 91 | 107 |
| 4-Bromofluorobenzene | 103 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | 8.7 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-10-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-09 |
| Date Analyzed: | 01/27/15 | Data File: | 012718.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 94 | 108 |
| Toluene-d8 | 100 | 91 | 107 |
| 4-Bromofluorobenzene | 101 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 7.5 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-12-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-10 |
| Date Analyzed: | 01/27/15 | Data File: | 012719.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 100 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 14 |
| Vinyl chloride | 0.30 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 11 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 20 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-15-012215 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-11 |
| Date Analyzed: | 01/27/15 | Data File: | 012720.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 101 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | 0.69 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 1.6 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-12 |
| Date Analyzed: | 01/27/15 | Data File: | 012721.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 100 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 110 |
| Vinyl chloride | 5.8 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | 1.5 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | 2.8 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 290 ve | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | 1.5 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 470 ve | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-12 1/10 |
| Date Analyzed: | 01/27/15 | Data File: | 012728.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 100 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <10 | 1,3-Dichloropropane | <10 |
| Chloromethane | <100 | Tetrachloroethene | 100 |
| Vinyl chloride | 6.0 | Dibromochloromethane | <10 |
| Bromomethane | <10 | 1,2-Dibromoethane (EDB) | <10 |
| Chloroethane | <10 | Chlorobenzene | <10 |
| Trichlorofluoromethane | <10 | Ethylbenzene | <10 |
| Acetone | <100 | 1,1,1,2-Tetrachloroethane | <10 |
| 1,1-Dichloroethene | <10 | m,p-Xylene | <20 |
| Methylene chloride | <50 | o-Xylene | <10 |
| Methyl t-butyl ether (MTBE) | <10 | Styrene | <10 |
| trans-1,2-Dichloroethene | <10 | Isopropylbenzene | <10 |
| 1,1-Dichloroethane | <10 | Bromoform | <10 |
| 2,2-Dichloropropane | <10 | n-Propylbenzene | <10 |
| cis-1,2-Dichloroethene | 270 | Bromobenzene | <10 |
| Chloroform | <10 | 1,3,5-Trimethylbenzene | <10 |
| 2-Butanone (MEK) | <100 | 1,1,2,2-Tetrachloroethane | <10 |
| 1,2-Dichloroethane (EDC) | <10 | 1,2,3-Trichloropropane | <10 |
| 1,1,1-Trichloroethane | <10 | 2-Chlorotoluene | <10 |
| 1,1-Dichloropropene | <10 | 4-Chlorotoluene | <10 |
| Carbon tetrachloride | <10 | tert-Butylbenzene | <10 |
| Benzene | <3.5 | 1,2,4-Trimethylbenzene | <10 |
| Trichloroethene | 410 | sec-Butylbenzene | <10 |
| 1,2-Dichloropropane | <10 | p-Isopropyltoluene | <10 |
| Bromodichloromethane | <10 | 1,3-Dichlorobenzene | <10 |
| Dibromomethane | <10 | 1,4-Dichlorobenzene | <10 |
| 4-Methyl-2-pentanone | <100 | 1,2-Dichlorobenzene | <10 |
| cis-1,3-Dichloropropene | <10 | 1,2-Dibromo-3-chloropropane | <100 |
| Toluene | <10 | 1,2,4-Trichlorobenzene | <10 |
| trans-1,3-Dichloropropene | <10 | Hexachlorobutadiene | <10 |
| 1,1,2-Trichloroethane | <10 | Naphthalene | <10 |
| 2-Hexanone | <100 | 1,2,3-Trichlorobenzene | <10 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-17-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-13 |
| Date Analyzed: | 01/27/15 | Data File: | 012722.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 98 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-18-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-14 |
| Date Analyzed: | 01/27/15 | Data File: | 012723.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 94 | 108 |
| Toluene-d8 | 99 | 91 | 107 |
| 4-Bromofluorobenzene | 99 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 1.2 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-19-012315 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-15 |
| Date Analyzed: | 01/28/15 | Data File: | 012807.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 94 | 108 |
| Toluene-d8 | 100 | 91 | 107 |
| 4-Bromofluorobenzene | 97 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | 11 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-19-Duplicate | Client: | Aspect Consulting, LLC |
| Date Received: | 01/23/15 | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 501330-16 |
| Date Analyzed: | 01/28/15 | Data File: | 012808.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 94 | 108 |
| Toluene-d8 | 100 | 91 | 107 |
| 4-Bromofluorobenzene | 100 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | 11 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park 140252, F&BI 501330 |
| Date Extracted: | 01/27/15 | Lab ID: | 05-0178 mb |
| Date Analyzed: | 01/27/15 | Data File: | 012708.D |
| Matrix: | Water | Instrument: | GCMS7 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 94 | 108 |
| Toluene-d8 | 100 | 91 | 107 |
| 4-Bromofluorobenzene | 99 | 91 | 110 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 501325-06 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 100 | 69-134 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 88 | 82 | 58-134 | 7 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 501330-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 23.1 | 120 | 108 | 60-150 | 11 |
| Barium | ug/L (ppb) | 50 | 25.6 | 107 | 103 | 79-126 | 4 |
| Cadmium | ug/L (ppb) | 5 | <1 | 105 | 100 | 83-116 | 5 |
| Chromium | ug/L (ppb) | 20 | 1.57 | 91 | 87 | 64-132 | 4 |
| Lead | ug/L (ppb) | 10 | <1 | 101 | 98 | 79-121 | 3 |
| Selenium | ug/L (ppb) | 5 | 1.68 | 116 | 112 | 43-178 | 4 |
| Silver | ug/L (ppb) | 5 | <1 | 97 | 93 | 71-115 | 4 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 99 | 80-111 |
| Barium | ug/L (ppb) | 50 | 101 | 83-117 |
| Cadmium | ug/L (ppb) | 5 | 103 | 83-113 |
| Chromium | ug/L (ppb) | 20 | 102 | 80-119 |
| Lead | ug/L (ppb) | 10 | 102 | 83-115 |
| Selenium | ug/L (ppb) | 5 | 106 | 81-119 |
| Silver | ug/L (ppb) | 5 | 101 | 80-116 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Laboratory Code: 501330-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Mercury | ug/L (ppb) | 0.5 | <0.1 | 88 | 97 | 71-125 | 10 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Mercury | ug/L (ppb) | 0.5 | 91 | 88-113 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 501330-05 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | <1 | 119 | 51-147 |
| Chloromethane | ug/L (ppb) | 50 | <10 | 93 | 56-133 |
| Vinyl chloride | ug/L (ppb) | 50 | <0.2 | 94 | 58-136 |
| Bromomethane | ug/L (ppb) | 50 | <1 | 152 | 32-180 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 113 | 61-138 |
| Trichlorofluoromethane | ug/L (ppb) | 50 | <1 | 102 | 64-135 |
| Acetone | ug/L (ppb) | 250 | <10 | 93 | 58-120 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | <1 | 93 | 75-118 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 106 | 73-118 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | <1 | 99 | 80-114 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 97 | 82-111 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 96 | 85-110 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 108 | 59-134 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 98 | 84-112 |
| Chloroform | ug/L (ppb) | 50 | <1 | 99 | 84-111 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | <10 | 115 | 74-122 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 98 | 81-114 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | <1 | 105 | 83-115 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | <1 | 99 | 84-112 |
| Carbon tetrachloride | ug/L (ppb) | 50 | <1 | 117 | 82-118 |
| Benzene | ug/L (ppb) | 50 | <0.35 | 98 | 85-109 |
| Trichloroethene | ug/L (ppb) | 50 | <1 | 99 | 84-105 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 102 | 85-111 |
| Bromodichloromethane | ug/L (ppb) | 50 | <1 | 116 | 80-118 |
| Dibromomethane | ug/L (ppb) | 50 | <1 | 101 | 84-114 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | <10 | 123 | 90-126 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 113 | 80-122 |
| Toluene | ug/L (ppb) | 50 | <1 | 99 | 86-111 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 115 | 79-126 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | <1 | 104 | 73-129 |
| 2-Hexanone | ug/L (ppb) | 250 | <10 | 116 | 73-136 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | <1 | 105 | 85-113 |
| Tetrachloroethene | ug/L (ppb) | 50 | <1 | 99 | 72-121 |
| Dibromochloromethane | ug/L (ppb) | 50 | <1 | 118 | 77-131 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | <1 | 120 | 81-120 |
| Chlorobenzene | ug/L (ppb) | 50 | <1 | 97 | 84-110 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 102 | 86-115 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 116 | 83-118 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 107 | 78-125 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 107 | 84-119 |
| Styrene | ug/L (ppb) | 50 | <1 | 114 | 86-121 |
| Isopropylbenzene | ug/L (ppb) | 50 | <1 | 110 | 86-120 |
| Bromoform | ug/L (ppb) | 50 | <1 | 122 | 75-129 |
| n-Propylbenzene | ug/L (ppb) | 50 | <1 | 106 | 83-119 |
| Bromobenzene | ug/L (ppb) | 50 | <1 | 101 | 80-115 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 113 | 82-124 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 109 | 78-120 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | <1 | 95 | 81-114 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | <1 | 102 | 10-250 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | <1 | 104 | 46-160 |
| tert-Butylbenzene | ug/L (ppb) | 50 | <1 | 111 | 83-122 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 111 | 83-122 |
| sec-Butylbenzene | ug/L (ppb) | 50 | <1 | 111 | 82-121 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | <1 | 110 | 81-122 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 100 | 82-113 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 95 | 79-111 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 100 | 81-113 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | <10 | 118 | 71-126 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 100 | 74-120 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | <1 | 94 | 63-120 |
| Naphthalene | ug/L (ppb) | 50 | <1 | 113 | 79-132 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 101 | 75-121 |

Date of Report: 02/02/15
Date Received: 01/23/15
Project: HERS Industrial Park 140252, F&BI 501330

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | 87 | 92 | 69-134 | 6 |
| Chloromethane | ug/L (ppb) | 50 | 78 | 84 | 68-126 | 7 |
| Vinyl chloride | ug/L (ppb) | 50 | 80 | 85 | 72-124 | 6 |
| Bromomethane | ug/L (ppb) | 50 | 133 | 138 | 48-175 | 4 |
| Chloroethane | ug/L (ppb) | 50 | 101 | 104 | 69-133 | 3 |
| Trichlorofluoromethane | ug/L (ppb) | 50 | 89 | 94 | 77-127 | 5 |
| Acetone | ug/L (ppb) | 250 | 82 | 85 | 52-138 | 4 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 83 | 88 | 78-119 | 6 |
| Methylene chloride | ug/L (ppb) | 50 | 93 | 99 | 71-119 | 6 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | 93 | 100 | 81-118 | 7 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 85 | 91 | 82-116 | 7 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 87 | 92 | 81-116 | 6 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | 123 | 131 | 74-138 | 6 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 88 | 94 | 82-116 | 7 |
| Chloroform | ug/L (ppb) | 50 | 89 | 94 | 75-121 | 5 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | 105 | 105 | 64-136 | 0 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 89 | 92 | 81-113 | 3 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 101 | 107 | 84-117 | 6 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | 90 | 95 | 82-117 | 5 |
| Carbon tetrachloride | ug/L (ppb) | 50 | 121 vo | 127 vo | 85-119 | 5 |
| Benzene | ug/L (ppb) | 50 | 88 | 93 | 81-113 | 6 |
| Trichloroethene | ug/L (ppb) | 50 | 90 | 95 | 82-110 | 5 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | 93 | 96 | 85-114 | 3 |
| Bromodichloromethane | ug/L (ppb) | 50 | 111 | 114 | 81-118 | 3 |
| Dibromomethane | ug/L (ppb) | 50 | 92 | 95 | 84-115 | 3 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | 113 | 115 | 39-185 | 2 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | 115 | 117 | 85-127 | 2 |
| Toluene | ug/L (ppb) | 50 | 90 | 93 | 85-112 | 3 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | 122 | 122 | 87-123 | 0 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | 94 | 96 | 84-114 | 2 |
| 2-Hexanone | ug/L (ppb) | 250 | 105 | 104 | 77-127 | 1 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | 95 | 97 | 84-114 | 2 |
| Tetrachloroethene | ug/L (ppb) | 50 | 91 | 94 | 78-117 | 3 |
| Dibromochloromethane | ug/L (ppb) | 50 | 117 | 119 | 88-121 | 2 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | 111 | 115 | 85-115 | 4 |
| Chlorobenzene | ug/L (ppb) | 50 | 88 | 92 | 83-112 | 4 |
| Ethylbenzene | ug/L (ppb) | 50 | 92 | 96 | 85-116 | 4 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | 114 | 120 vo | 86-116 | 5 |
| m,p-Xylene | ug/L (ppb) | 100 | 96 | 101 | 84-119 | 5 |
| o-Xylene | ug/L (ppb) | 50 | 96 | 102 | 85-118 | 6 |
| Styrene | ug/L (ppb) | 50 | 103 | 107 | 85-120 | 4 |
| Isopropylbenzene | ug/L (ppb) | 50 | 99 | 105 | 86-120 | 6 |
| Bromoform | ug/L (ppb) | 50 | 124 | 127 | 83-128 | 2 |
| n-Propylbenzene | ug/L (ppb) | 50 | 99 | 102 | 82-120 | 3 |
| Bromobenzene | ug/L (ppb) | 50 | 94 | 96 | 79-116 | 2 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | 106 | 109 | 83-122 | 3 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | 101 | 103 | 79-120 | 2 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | 88 | 90 | 69-124 | 2 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | 96 | 98 | 82-115 | 2 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | 97 | 98 | 83-117 | 1 |
| tert-Butylbenzene | ug/L (ppb) | 50 | 105 | 108 | 82-123 | 3 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | 102 | 107 | 82-122 | 5 |
| sec-Butylbenzene | ug/L (ppb) | 50 | 103 | 107 | 81-122 | 4 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | 102 | 106 | 81-123 | 4 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | 93 | 95 | 82-114 | 2 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | 88 | 91 | 80-111 | 3 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | 92 | 96 | 81-112 | 4 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | 122 vo | 128 vo | 78-120 | 5 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | 92 | 98 | 74-120 | 6 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | 91 | 95 | 71-118 | 4 |
| Naphthalene | ug/L (ppb) | 50 | 103 | 110 | 74-132 | 7 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | 92 | 99 | 70-124 | 7 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

501330

# SAMPLE CHAIN OF CUSTODY

ME 01/23/15 VA/ADEQ/COC

Page # 1 of 2

Send Report To Alan Noel
Company Aspect Consulting
Address 201 2nd Ave S
City, State, ZIP Seattle 98104
Phone # (206) 838-6592 Fax #

SAMPLERS (signature) Matthew M. Lewis
PROJECT NAME/NO. HERS Industrial Park 190252
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled (NP) | Time Sampled | Sample Type (NP) | # of containers | ANALYSES REQUESTED: TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Dissolved Metals | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1-012215 | 01 A-F | 01/22/15 | 1230 | water | 6 | X | X | X | X | | | X | | | | | | |
| MW-2-012315 | 02 | 01/23/15 | 0925 | | | X | X | X | X | | | X | | | | | | |
| MW-3-012215 | 03 | 01/23/15 per FBI BHM | 1210 | | | X | X | X | X | | | X | | | | | | |
| MW-4-012215 | 04 | 01/22/15 | 1405 | | | X | X | X | X | | | X | | | | | | |
| MW-5-012215 | 05 | ↓ | 1435 | | | X | X | X | X | | | X | | | | | | |
| MW-6-012315 | 06 | 01/23/15 | 1405 | | | X | X | X | X | | | X | | | | | | |
| MW-8-012215 | 07 | 01/22/15 | 1055 | | | X | X | X | X | | | X | | | | | | |
| MW-9-012315 | 08 | 01/23/15 | 1515 | | | X | X | X | X | | | X | | | | | | |
| MW-10-12215 | 09 | 01/22/15 | 1145 | | | X | X | X | X | | | X | | | | | | |
| MW-12-012315 | 10 | 01/23/15 | 1010 | ↓ | ↓ | X | X | X | X | | | X | | | | | | |


*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*


FORMS\COC\COC.DOC

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | Matthew M. Lewis | Matthew M. Lewis | Aspect | 1/23/15 | 1720 |
| Received by: | | Jon Shamura | FBI | 1 | 1 |
| Relinquished by: | | | | | |
| Received by: | | | Samples received at 2 °C | | |

501330

# SAMPLE CHAIN OF CUSTODY

ME 01/23/15 (ND) V4/AIG/CO.

Send Report To Alan Noell
Company Aspect Consulting
Address 201 2nd Ave S
City, State, ZIP Seattle 98104
Phone # (206) 838-6592 Fax #

SAMPLERS (signature) Matthew M. Lewis
PROJECT NAME/NO. HERS Industrial 140252
PO#
REMARKS

Page # 2 of 2

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled (ND) | Time Sampled | Sample Type (ND) | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Dissolved Metals | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ANALYSES REQUESTED | | | | | | | | | | | | | |
| MW-15-012215 | 11 A-F | 01/22/15 | 1335 | water | 6 | X | X | X | X | | | X | | | | | | | |
| MW-16-012315 | 12 | 01/23/15 | 1045 | | | X | X | X | X | | | X | | | | | | | |
| MW-17-012315 | 13 | | 1135 | | | X | X | X | X | | | X | | | | | | | |
| MW-18-012315 | 14 | | 1255 | | | X | X | X | X | | | X | | | | | | | |
| MW-19-012315 | 15 | | 0835 | | | X | X | X | X | | | X | | | | | | | |
| ~~MW-14~~ 012315 | 16 | | 0840 | | | X | X | X | X | | | X | | | | | | | |
| MW-19-Duplicate | | | | | | | | | | | | | | | | | | | |
| per ML 2/23/15 MG | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |


*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*


FORMS\COC\COC.DOC

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 1/23/15 | 1720 |
| Received by: | Joe Shimazu | FBT | 1 | 1 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 2 °C | | |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 9, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on January 28, 2015 from the HERS 140252, F&BI 501395 project. There are 17 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0209R.DOC

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## CASE NARRATIVE

This case narrative encompasses samples received on January 28, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS 140252, F&BI 501395 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 501395 -01 | MW-7-012815 |
| 501395 -02 | MW-11-012815 |

All quality control requirements were acceptable.

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395
Date Extracted: 01/29/15
Date Analyzed: 01/29/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate (% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-7-012815<br>501395-01 | <100 | 94 |
| MW-11-012815<br>501395-02 | <100 | 94 |
| Method Blank<br>05-168 MB | <100 | 89 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395
Date Extracted: 02/02/15
Date Analyzed: 02/02/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 51-134) |
|---|---|---|---|
| MW-7-012815<br>501395-01 | 130 x | 340 x | 94 |
| MW-11-012815<br>501395-02 | <50 | <250 | 89 |
| Method Blank<br>05-234 MB | <50 | <250 | 85 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-7-012815 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/28/15 | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 02/05/15 | Lab ID: | 501395-01 |
| Date Analyzed: | 02/05/15 | Data File: | 501395-01.023 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 97 | 60 | 125 |
| Indium | 96 | 60 | 125 |
| Holmium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 19.1 |
| Cadmium | <1 |
| Chromium | 1.49 |
| Lead | 2.35 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-11-012815 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/28/15 | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 02/05/15 | Lab ID: | 501395-02 |
| Date Analyzed: | 02/05/15 | Data File: | 501395-02.024 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 91 | 60 | 125 |
| Indium | 91 | 60 | 125 |
| Holmium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | 23.9 |
| Cadmium | <1 |
| Chromium | 4.99 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 02/05/15 | Lab ID: | I5-068 mb |
| Date Analyzed: | 02/05/15 | Data File: | I5-068 mb.029 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | AP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 96 | 60 | 125 |
| Indium | 99 | 60 | 125 |
| Holmium | 99 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Selenium | <1 |
| Silver | <1 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395
Date Extracted: 02/02/15
Date Analyzed: 02/03/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Dissolved Mercury |
|---|---|
| MW-7-012815<br>501395-01 | <0.1 |
| MW-11-012815<br>501395-02 | <0.1 |
| Method Blank<br>i5-059 | <0.1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-7-012815 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/28/15 | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 01/28/15 | Lab ID: | 501395-01 |
| Date Analyzed: | 01/28/15 | Data File: | 012827.D |
| Matrix: | Water | Instrument: | GCMS9 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 85 | 117 |
| Toluene-d8 | 99 | 93 | 107 |
| 4-Bromofluorobenzene | 98 | 76 | 126 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-11-012815 | Client: | Aspect Consulting, LLC |
| Date Received: | 01/28/15 | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 01/28/15 | Lab ID: | 501395-02 |
| Date Analyzed: | 01/28/15 | Data File: | 012828.D |
| Matrix: | Water | Instrument: | GCMS9 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 85 | 117 |
| Toluene-d8 | 97 | 93 | 107 |
| 4-Bromofluorobenzene | 96 | 76 | 126 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 12 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 7.4 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 54 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS 140252, F&BI 501395 |
| Date Extracted: | 01/28/15 | Lab ID: | 05-0180 mb |
| Date Analyzed: | 01/28/15 | Data File: | 012807.D |
| Matrix: | Water | Instrument: | GCMS9 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 104 | 85 | 117 |
| Toluene-d8 | 96 | 93 | 107 |
| 4-Bromofluorobenzene | 98 | 76 | 126 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 501395-01 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 100 | 69-134 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 86 | 94 | 58-134 | 9 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 501419-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 1.30 | 110 | 113 | 60-150 | 3 |
| Barium | ug/L (ppb) | 50 | 1.23 | 107 | 108 | 79-126 | 1 |
| Cadmium | ug/L (ppb) | 5 | <1 | 109 | 110 | 83-116 | 1 |
| Chromium | ug/L (ppb) | 20 | 2.91 | 104 | 101 | 64-132 | 3 |
| Lead | ug/L (ppb) | 10 | <1 | 108 | 106 | 79-121 | 2 |
| Selenium | ug/L (ppb) | 5 | 2.19 | 110 | 116 | 43-178 | 5 |
| Silver | ug/L (ppb) | 5 | <1 | 95 | 97 | 71-115 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 105 | 80-111 |
| Barium | ug/L (ppb) | 50 | 105 | 83-117 |
| Cadmium | ug/L (ppb) | 5 | 108 | 83-113 |
| Chromium | ug/L (ppb) | 20 | 103 | 80-119 |
| Lead | ug/L (ppb) | 10 | 105 | 83-115 |
| Selenium | ug/L (ppb) | 5 | 110 | 81-119 |
| Silver | ug/L (ppb) | 5 | 103 | 80-116 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Laboratory Code: 501395-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Mercury | ug/L (ppb) | 0.5 | <0.1 | 93 | 92 | 71-125 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Mercury | ug/L (ppb) | 0.5 | 94 | 88-113 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 501371-09 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | <1 | 82 | 55-144 |
| Chloromethane | ug/L (ppb) | 50 | <10 | 83 | 67-131 |
| Vinyl chloride | ug/L (ppb) | 50 | <0.2 | 87 | 61-139 |
| Bromomethane | ug/L (ppb) | 50 | <1 | 98 | 66-129 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 97 | 68-126 |
| Trichlorofluoromethane | ug/L (ppb) | 50 | <1 | 90 | 71-128 |
| Acetone | ug/L (ppb) | 250 | <10 | 102 | 48-149 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | <1 | 91 | 71-123 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 99 | 61-126 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | <1 | 94 | 68-125 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 92 | 72-122 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 93 | 79-113 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 91 | 58-132 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 14 | 89 b | 73-119 |
| Chloroform | ug/L (ppb) | 50 | <1 | 92 | 80-112 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | <10 | 98 | 69-123 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 94 | 78-113 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | <1 | 92 | 79-116 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | <1 | 90 | 67-121 |
| Carbon tetrachloride | ug/L (ppb) | 50 | <1 | 104 | 72-123 |
| Benzene | ug/L (ppb) | 50 | 1.3 | 89 | 79-109 |
| Trichloroethene | ug/L (ppb) | 50 | 9.3 | 87 | 75-109 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 94 | 80-111 |
| Bromodichloromethane | ug/L (ppb) | 50 | <1 | 98 | 78-117 |
| Dibromomethane | ug/L (ppb) | 50 | <1 | 95 | 80-112 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | <10 | 103 | 79-123 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 96 | 76-120 |
| Toluene | ug/L (ppb) | 50 | <1 | 87 | 73-117 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 97 | 75-122 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | <1 | 96 | 81-111 |
| 2-Hexanone | ug/L (ppb) | 250 | <10 | 101 | 75-126 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | <1 | 94 | 81-111 |
| Tetrachloroethene | ug/L (ppb) | 50 | 4.5 | 88 | 72-113 |
| Dibromochloromethane | ug/L (ppb) | 50 | <1 | 103 | 69-129 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | <1 | 99 | 83-114 |
| Chlorobenzene | ug/L (ppb) | 50 | <1 | 90 | 75-115 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 90 | 71-120 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 98 | 78-122 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 91 | 63-128 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 92 | 64-129 |
| Styrene | ug/L (ppb) | 50 | <1 | 97 | 70-122 |
| Isopropylbenzene | ug/L (ppb) | 50 | <1 | 94 | 76-118 |
| Bromoform | ug/L (ppb) | 50 | <1 | 98 | 49-138 |
| n-Propylbenzene | ug/L (ppb) | 50 | <1 | 94 | 74-117 |
| Bromobenzene | ug/L (ppb) | 50 | <1 | 90 | 70-121 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 96 | 81-112 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 99 | 79-120 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | <1 | 94 | 72-119 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | <1 | 91 | 77-114 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | <1 | 90 | 81-109 |
| tert-Butylbenzene | ug/L (ppb) | 50 | <1 | 97 | 81-116 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 97 | 74-118 |
| sec-Butylbenzene | ug/L (ppb) | 50 | <1 | 97 | 77-118 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | <1 | 94 | 64-132 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 92 | 81-111 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 89 | 78-110 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 91 | 81-111 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | <10 | 103 | 69-129 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 87 | 74-115 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | <1 | 85 | 67-120 |
| Naphthalene | ug/L (ppb) | 50 | <1 | 96 | 63-136 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 89 | 79-115 |

Date of Report: 02/09/15
Date Received: 01/28/15
Project: HERS 140252, F&BI 501395

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | 98 | 98 | 54-149 | 0 |
| Chloromethane | ug/L (ppb) | 50 | 92 | 91 | 67-133 | 1 |
| Vinyl chloride | ug/L (ppb) | 50 | 94 | 92 | 73-132 | 2 |
| Bromomethane | ug/L (ppb) | 50 | 114 | 115 | 69-123 | 1 |
| Chloroethane | ug/L (ppb) | 50 | 106 | 104 | 68-126 | 2 |
| Trichlorofluoromethane | ug/L (ppb) | 50 | 99 | 98 | 70-132 | 1 |
| Acetone | ug/L (ppb) | 250 | 111 | 104 | 44-145 | 7 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 97 | 94 | 75-119 | 3 |
| Methylene chloride | ug/L (ppb) | 50 | 105 | 102 | 63-132 | 3 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | 100 | 98 | 70-122 | 2 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 98 | 95 | 76-118 | 3 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 98 | 96 | 80-116 | 2 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | 98 | 100 | 62-141 | 2 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 96 | 93 | 81-111 | 3 |
| Chloroform | ug/L (ppb) | 50 | 97 | 96 | 81-109 | 1 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | 105 | 99 | 53-140 | 6 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 101 | 98 | 79-109 | 3 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 98 | 97 | 80-116 | 1 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | 96 | 93 | 78-112 | 3 |
| Carbon tetrachloride | ug/L (ppb) | 50 | 110 | 107 | 72-128 | 3 |
| Benzene | ug/L (ppb) | 50 | 95 | 93 | 81-108 | 2 |
| Trichloroethene | ug/L (ppb) | 50 | 94 | 92 | 77-108 | 2 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | 100 | 98 | 82-109 | 2 |
| Bromodichloromethane | ug/L (ppb) | 50 | 104 | 102 | 76-120 | 2 |
| Dibromomethane | ug/L (ppb) | 50 | 100 | 98 | 80-110 | 2 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | 107 | 107 | 59-142 | 0 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | 105 | 103 | 76-128 | 2 |
| Toluene | ug/L (ppb) | 50 | 95 | 91 | 83-108 | 4 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | 104 | 101 | 76-128 | 3 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | 102 | 101 | 82-110 | 1 |
| 2-Hexanone | ug/L (ppb) | 250 | 104 | 99 | 53-145 | 5 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | 100 | 97 | 83-110 | 3 |
| Tetrachloroethene | ug/L (ppb) | 50 | 96 | 93 | 78-109 | 3 |
| Dibromochloromethane | ug/L (ppb) | 50 | 113 | 109 | 63-140 | 4 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | 103 | 100 | 85-113 | 3 |
| Chlorobenzene | ug/L (ppb) | 50 | 96 | 94 | 84-108 | 2 |
| Ethylbenzene | ug/L (ppb) | 50 | 98 | 95 | 84-110 | 3 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | 109 | 106 | 76-125 | 3 |
| m,p-Xylene | ug/L (ppb) | 100 | 99 | 96 | 84-112 | 3 |
| o-Xylene | ug/L (ppb) | 50 | 101 | 97 | 82-113 | 4 |
| Styrene | ug/L (ppb) | 50 | 103 | 100 | 84-116 | 3 |
| Isopropylbenzene | ug/L (ppb) | 50 | 103 | 100 | 81-122 | 3 |
| Bromoform | ug/L (ppb) | 50 | 110 | 104 | 40-161 | 6 |
| n-Propylbenzene | ug/L (ppb) | 50 | 100 | 97 | 81-115 | 3 |
| Bromobenzene | ug/L (ppb) | 50 | 95 | 94 | 80-113 | 1 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | 104 | 103 | 83-117 | 1 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | 103 | 101 | 79-118 | 2 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | 99 | 96 | 74-116 | 3 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | 97 | 97 | 79-112 | 0 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | 97 | 95 | 81-113 | 2 |
| tert-Butylbenzene | ug/L (ppb) | 50 | 106 | 106 | 81-119 | 0 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | 104 | 102 | 83-116 | 2 |
| sec-Butylbenzene | ug/L (ppb) | 50 | 105 | 105 | 83-116 | 0 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | 103 | 102 | 82-119 | 1 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | 98 | 96 | 83-111 | 2 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | 95 | 93 | 82-109 | 2 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | 99 | 97 | 83-111 | 2 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | 112 | 111 | 62-133 | 1 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | 96 | 96 | 77-117 | 0 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | 97 | 97 | 74-118 | 0 |
| Naphthalene | ug/L (ppb) | 50 | 104 | 106 | 75-131 | 2 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | 97 | 98 | 82-115 | 1 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

501395 [redacted]

# SAMPLE CHAIN OF CUSTODY ME 01-28-15 AIR/COY/VI

Send Report To Alan Noell

Company Aspect Consulting

Address 1101 2nd Ave S

City, State, ZIP Seattle, Wa

Phone #_____ Fax #_____

SAMPLERS (signature) Matthew M Lewis

PROJECT NAME/NO. HERS 140252

PO#

REMARKS

Page # 1 of 1

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Metals Dissolved | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-7-012815 | 01A-F | 1/28/15 | 1250 | Water | 6 | X | X | X | X | | | X | | | | | | |
| MW-11-012815 | 02T | " | 1395 | " | 6 | X | X | X | X | | | X | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M Lewis | Matthew M Lewis | Aspect | 1/28/15 | 1515 |
| Received by: | DdUS | FRB | " | 15:45 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 3 °C | | |

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 17, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on April 10, 2015 from the Hers Industrial Park, F&BI 504207 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0417R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 10, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Hers Industrial Park, F&BI 504207 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 504207 -01 | MW-20-10 |
| 504207 -02 | MW-16D-15 |
| 504207 -03 | MW-16D-25 |
| 504207 -04 | MW-16D-45 |
| 504207 -05 | MW-16D-65 |
| 504207 -06 | MW-16D-90 |

All quality control requirements were acceptable.

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-20-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/14/15 | Lab ID: | 504207-01 |
| Date Analyzed: | 04/15/15 | Data File: | 504207-01.026 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 87 | 60 | 125 |
| Indium | 81 | 60 | 125 |
| Holmium | 93 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.13 |
| Barium | 18.7 |
| Cadmium | <1 |
| Chromium | 8.16 |
| Lead | 1.96 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/14/15 | Lab ID: | I5-222 mb |
| Date Analyzed: | 04/15/15 | Data File: | I5-222 mb.010 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 94 | 60 | 125 |
| Indium | 94 | 60 | 125 |
| Holmium | 102 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-20-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-01 |
| Date Analyzed: | 04/13/15 | Data File: | 041311.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 89 | 113 |
| Toluene-d8 | 101 | 64 | 137 |
| 4-Bromofluorobenzene | 103 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-15 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-02 |
| Date Analyzed: | 04/13/15 | Data File: | 041312.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 89 | 113 |
| Toluene-d8 | 100 | 64 | 137 |
| 4-Bromofluorobenzene | 99 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | 0.13 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | 1.9 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-25 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-03 |
| Date Analyzed: | 04/13/15 | Data File: | 041313.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 89 | 113 |
| Toluene-d8 | 99 | 64 | 137 |
| 4-Bromofluorobenzene | 99 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | 0.042 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-45 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-04 |
| Date Analyzed: | 04/13/15 | Data File: | 041314.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 89 | 113 |
| Toluene-d8 | 100 | 64 | 137 |
| 4-Bromofluorobenzene | 102 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | 0.037 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | 1.3 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-65 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-05 |
| Date Analyzed: | 04/13/15 | Data File: | 041315.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 89 | 113 |
| Toluene-d8 | 99 | 64 | 137 |
| 4-Bromofluorobenzene | 101 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | 0.067 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-90 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/10/15 | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 504207-06 |
| Date Analyzed: | 04/13/15 | Data File: | 041316.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 89 | 113 |
| Toluene-d8 | 101 | 64 | 137 |
| 4-Bromofluorobenzene | 102 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | Hers Industrial Park, F&BI 504207 |
| Date Extracted: | 04/13/15 | Lab ID: | 05-0718 mb |
| Date Analyzed: | 04/13/15 | Data File: | 041308.D |
| Matrix: | Soil | Instrument: | GCMS9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 89 | 113 |
| Toluene-d8 | 100 | 64 | 137 |
| 4-Bromofluorobenzene | 100 | 81 | 119 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Methylene chloride | <0.5 | o-Xylene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Styrene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Isopropylbenzene | <0.05 |
| 1,1-Dichloroethane | <0.05 | Bromoform | <0.05 |
| 2,2-Dichloropropane | <0.05 | n-Propylbenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | Bromobenzene | <0.05 |
| Chloroform | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 1,2,3-Trichloropropane | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | 4-Chlorotoluene | <0.05 |
| Carbon tetrachloride | <0.05 | tert-Butylbenzene | <0.05 |
| Benzene | <0.03 | 1,2,4-Trimethylbenzene | <0.05 |
| Trichloroethene | <0.02 | sec-Butylbenzene | <0.05 |
| 1,2-Dichloropropane | <0.05 | p-Isopropyltoluene | <0.05 |
| Bromodichloromethane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dichlorobenzene | <0.05 |
| cis-1,3-Dichloropropene | <0.05 | 1,2-Dibromo-3-chloropropane | <0.5 |
| Toluene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Hexachlorobutadiene | <0.25 |
| 1,1,2-Trichloroethane | <0.05 | Naphthalene | <0.05 |
| 2-Hexanone | <0.5 | 1,2,3-Trichlorobenzene | <0.25 |

Date of Report: 04/17/15
Date Received: 04/10/15
Project: Hers Industrial Park, F&BI 504207

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 504171-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 1.92 | 75 | 80 | 67-121 | 6 |
| Barium | mg/kg (ppm) | 50 | 20.4 | 79 | 86 | 74-135 | 8 |
| Cadmium | mg/kg (ppm) | 10 | <1 | 89 | 94 | 88-121 | 5 |
| Chromium | mg/kg (ppm) | 50 | 7.50 | 76 | 80 | 57-128 | 5 |
| Lead | mg/kg (ppm) | 50 | 7.41 | 81 | 87 | 59-148 | 7 |
| Mercury | mg/kg (ppm | 10 | <1 | 93 | 101 | 50-150 | 8 |
| Selenium | mg/kg (ppm) | 5 | <1 | 81 | 84 | 55-130 | 4 |
| Silver | mg/kg (ppm) | 10 | <1 | 79 | 85 | 73-122 | 7 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 97 | 83-113 |
| Barium | mg/kg (ppm) | 50 | 104 | 85-116 |
| Cadmium | mg/kg (ppm) | 10 | 105 | 85-114 |
| Chromium | mg/kg (ppm) | 50 | 95 | 78-121 |
| Lead | mg/kg (ppm) | 50 | 102 | 80-120 |
| Mercury | mg/kg (ppm) | 10 | 100 | 70-130 |
| Selenium | mg/kg (ppm) | 5 | 99 | 87-117 |
| Silver | mg/kg (ppm) | 10 | 99 | 78-117 |

Date of Report: 04/17/15
Date Received: 04/10/15
Project: Hers Industrial Park, F&BI 504207

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 504208-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 38 | 37 | 10-56 | 3 |
| Chloromethane | mg/kg (ppm) | 2.5 | <0.5 | 60 | 60 | 10-90 | 0 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | <0.05 | 64 | 63 | 10-91 | 2 |
| Bromomethane | mg/kg (ppm) | 2.5 | <0.5 | 65 | 65 | 10-110 | 0 |
| Chloroethane | mg/kg (ppm) | 2.5 | <0.5 | 74 | 72 | 10-101 | 3 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 71 | 72 | 10-95 | 1 |
| Acetone | mg/kg (ppm) | 12.5 | <0.5 | 92 | 91 | 11-141 | 1 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 78 | 79 | 11-103 | 1 |
| Methylene chloride | mg/kg (ppm) | 2.5 | <0.5 | 92 | 92 | 14-128 | 0 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | <0.05 | 92 | 92 | 17-134 | 0 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 85 | 13-112 | 0 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 87 | 23-115 | 0 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 88 | 86 | 18-117 | 2 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 91 | 91 | 25-120 | 0 |
| Chloroform | mg/kg (ppm) | 2.5 | <0.05 | 88 | 89 | 29-117 | 1 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | <0.5 | 99 | 101 | 20-133 | 2 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | <0.05 | 84 | 86 | 22-124 | 2 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 90 | 90 | 27-112 | 0 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 90 | 26-107 | 1 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | <0.05 | 89 | 88 | 22-115 | 1 |
| Benzene | mg/kg (ppm) | 2.5 | <0.03 | 86 | 85 | 26-114 | 1 |
| Trichloroethene | mg/kg (ppm) | 2.5 | <0.02 | 90 | 88 | 30-112 | 2 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 92 | 31-119 | 1 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 92 | 31-131 | 1 |
| Dibromomethane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 91 | 27-124 | 0 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | <0.5 | 102 | 101 | 16-147 | 1 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 98 | 97 | 28-137 | 1 |
| Toluene | mg/kg (ppm) | 2.5 | <0.05 | 88 | 90 | 34-112 | 2 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 92 | 93 | 30-136 | 1 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 88 | 89 | 32-126 | 1 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | <0.5 | 89 | 90 | 17-147 | 1 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 94 | 29-125 | 1 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | <0.025 | 88 | 89 | 25-114 | 1 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | <0.05 | 88 | 89 | 32-143 | 1 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | <0.05 | 91 | 92 | 32-126 | 1 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 90 | 37-113 | 1 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 91 | 92 | 34-115 | 1 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 93 | 35-126 | 2 |
| m,p-Xylene | mg/kg (ppm) | 5 | <0.1 | 93 | 93 | 25-125 | 0 |
| o-Xylene | mg/kg (ppm) | 2.5 | <0.05 | 94 | 96 | 27-126 | 2 |
| Styrene | mg/kg (ppm) | 2.5 | <0.05 | 95 | 96 | 39-121 | 1 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 97 | 98 | 34-123 | 1 |
| Bromoform | mg/kg (ppm) | 2.5 | <0.05 | 85 | 87 | 18-155 | 2 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 94 | 96 | 31-120 | 2 |
| Bromobenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 89 | 40-115 | 0 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 96 | 24-130 | 0 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 95 | 94 | 27-148 | 1 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 89 | 33-123 | 2 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 93 | 93 | 39-110 | 0 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 93 | 92 | 39-111 | 1 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 102 | 103 | 36-116 | 1 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 97 | 35-116 | 1 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 98 | 33-118 | 2 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 97 | 32-119 | 1 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 90 | 38-111 | 3 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 87 | 39-109 | 1 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 89 | 40-111 | 0 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | <0.5 | 92 | 96 | 37-122 | 4 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 93 | 95 | 31-121 | 2 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | <0.25 | 90 | 91 | 24-128 | 1 |
| Naphthalene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 98 | 24-139 | 2 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 91 | 93 | 35-117 | 2 |

Date of Report: 04/17/15
Date Received: 04/10/15
Project: Hers Industrial Park, F&BI 504207

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | 52 | 10-76 |
| Chloromethane | mg/kg (ppm) | 2.5 | 67 | 34-98 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | 72 | 42-107 |
| Bromomethane | mg/kg (ppm) | 2.5 | 70 | 46-113 |
| Chloroethane | mg/kg (ppm) | 2.5 | 78 | 47-115 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | 80 | 53-112 |
| Acetone | mg/kg (ppm) | 12.5 | 94 | 39-147 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | 84 | 65-110 |
| Methylene chloride | mg/kg (ppm) | 2.5 | 92 | 50-127 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | 92 | 72-122 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 88 | 71-113 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | 89 | 74-109 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | 88 | 64-151 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 91 | 73-110 |
| Chloroform | mg/kg (ppm) | 2.5 | 90 | 76-110 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | 110 | 60-121 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | 91 | 73-111 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | 93 | 72-116 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | 93 | 72-112 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | 92 | 67-123 |
| Benzene | mg/kg (ppm) | 2.5 | 90 | 72-106 |
| Trichloroethene | mg/kg (ppm) | 2.5 | 93 | 72-107 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | 97 | 74-115 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | 96 | 75-126 |
| Dibromomethane | mg/kg (ppm) | 2.5 | 95 | 76-116 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | 112 | 80-128 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 107 | 71-138 |
| Toluene | mg/kg (ppm) | 2.5 | 93 | 74-111 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 101 | 77-135 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | 93 | 77-116 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | 107 | 70-129 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | 101 | 75-115 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | 89 | 73-111 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | 94 | 64-152 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | 99 | 77-117 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | 93 | 76-109 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | 95 | 75-112 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 88 | 76-125 |
| m,p-Xylene | mg/kg (ppm) | 5 | 97 | 77-115 |
| o-Xylene | mg/kg (ppm) | 2.5 | 94 | 76-115 |
| Styrene | mg/kg (ppm) | 2.5 | 101 | 76-119 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | 97 | 76-120 |
| Bromoform | mg/kg (ppm) | 2.5 | 92 | 50-174 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | 99 | 77-115 |
| Bromobenzene | mg/kg (ppm) | 2.5 | 96 | 76-112 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | 97 | 77-121 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 99 | 74-121 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | 97 | 74-116 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | 95 | 75-113 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | 96 | 77-115 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | 103 | 77-123 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | 99 | 77-119 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | 97 | 78-120 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | 98 | 77-120 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | 91 | 76-112 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | 89 | 74-109 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | 89 | 75-114 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | 92 | 68-122 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | 89 | 75-122 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | 84 | 74-130 |
| Naphthalene | mg/kg (ppm) | 2.5 | 92 | 73-122 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | 86 | 75-117 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504207

# SAMPLE CHAIN OF CUSTODY ME 04-10-15

BEH / VBI

Page # 1 of 1

Send Report To Alan Noell
Company Aspect
Address 401 2nd Ave S, #201
City, State, ZIP Seattle, WA 98104
Phone #206-838-6592 Fax #

SAMPLERS (signature) Matthew M. Lewis
PROJECT NAME/NO. HERS Industrial Park 140252
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☑ Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | ANALYSES REQUESTED: TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Metals | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-20-10 | 01A-E | 4/9/15 | 0920 | Soil | 5 | | | | X | | | X | | | | | | |
| MW-16D-15 | 02A-D | | 1110 | | 4 | | | | X | | | | | | | | | |
| MW-16D-25 | 03 | | 1125 | | | | | | X | | | | | | | | | |
| MW-16D-45 | 04 | | 1215 | | | | | | X | | | | | | | | | |
| MW-16D-65 | 05 | | 1415 | | | | | | X | | | | | | | | | |
| MW-16D-90 | 06 | | 1530 | | | | | | X | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

Samples received at 2 °C

Samples received

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 4/10/15 | 1730 |
| Received by: | VINH | FBI | 4/10/15 | 1730 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 5, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on April 27, 2015 from the HERS Industrial Park 140252, F&BI 504489 project. There are 15 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0505R.DOC

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## CASE NARRATIVE

This case narrative encompasses samples received on April 27, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252, F&BI 504489 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 504489 -01 | MW-16D-042715 |
| 504489 -02 | MW-20-042715 |

All quality control requirements were acceptable.

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489
Date Extracted: 04/28/15
Date Analyzed: 04/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-16D-042715<br>504489-01 | <100 | 110 |
| MW-20-042715<br>504489-02 | <100 | 108 |
| Method Blank<br>05-822 MB | <100 | 107 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489
Date Extracted: 04/28/15
Date Analyzed: 04/28/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 41-152) |
|---|---|---|---|
| MW-16D-042715<br>504489-01 | 750 x | 540 x | 105 |
| MW-20-042715<br>504489-02 | <50 | <250 | 108 |
| Method Blank<br>05-855 MB | <50 | <250 | 91 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16D-042715 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/27/15 | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/28/15 | Lab ID: | 504489-01 |
| Date Analyzed: | 04/30/15 | Data File: | 504489-01.041 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 89 | 60 | 125 |
| Indium | 88 | 60 | 125 |
| Holmium | 91 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.22 |
| Barium | 55.5 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Mercury | <1 |
| Selenium | 1.27 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-20-042715 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/27/15 | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/28/15 | Lab ID: | 504489-02 |
| Date Analyzed: | 04/30/15 | Data File: | 504489-02.042 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 92 | 60 | 125 |
| Indium | 92 | 60 | 125 |
| Holmium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 4.99 |
| Barium | 27.5 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Mercury | <1 |
| Selenium | 1.54 |
| Silver | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/28/15 | Lab ID: | I5-259 mb |
| Date Analyzed: | 04/30/15 | Data File: | I5-259 mb.039 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Germanium | 94 | 60 | 125 |
| Indium | 96 | 60 | 125 |
| Holmium | 99 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Lead | <1 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-042715 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/27/15 | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/27/15 | Lab ID: | 504489-01 |
| Date Analyzed: | 04/27/15 | Data File: | 042726.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 95 | 63 | 127 |
| 4-Bromofluorobenzene | 98 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | 1.0 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | 24 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-20-042715 | Client: | Aspect Consulting, LLC |
| Date Received: | 04/27/15 | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/27/15 | Lab ID: | 504489-02 |
| Date Analyzed: | 04/27/15 | Data File: | 042727.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 104 | 57 | 121 |
| Toluene-d8 | 96 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | 17 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park 140252, F&BI 504489 |
| Date Extracted: | 04/27/15 | Lab ID: | 05-0791 mb |
| Date Analyzed: | 04/27/15 | Data File: | 042714.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 57 | 121 |
| Toluene-d8 | 96 | 63 | 127 |
| 4-Bromofluorobenzene | 98 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) | Compounds: | Concentration ug/L (ppb) |
|---|---|---|---|
| Dichlorodifluoromethane | <1 | 1,3-Dichloropropane | <1 |
| Chloromethane | <10 | Tetrachloroethene | <1 |
| Vinyl chloride | <0.2 | Dibromochloromethane | <1 |
| Bromomethane | <1 | 1,2-Dibromoethane (EDB) | <1 |
| Chloroethane | <1 | Chlorobenzene | <1 |
| Trichlorofluoromethane | <1 | Ethylbenzene | <1 |
| Acetone | <10 | 1,1,1,2-Tetrachloroethane | <1 |
| 1,1-Dichloroethene | <1 | m,p-Xylene | <2 |
| Methylene chloride | <5 | o-Xylene | <1 |
| Methyl t-butyl ether (MTBE) | <1 | Styrene | <1 |
| trans-1,2-Dichloroethene | <1 | Isopropylbenzene | <1 |
| 1,1-Dichloroethane | <1 | Bromoform | <1 |
| 2,2-Dichloropropane | <1 | n-Propylbenzene | <1 |
| cis-1,2-Dichloroethene | <1 | Bromobenzene | <1 |
| Chloroform | <1 | 1,3,5-Trimethylbenzene | <1 |
| 2-Butanone (MEK) | <10 | 1,1,2,2-Tetrachloroethane | <1 |
| 1,2-Dichloroethane (EDC) | <1 | 1,2,3-Trichloropropane | <1 |
| 1,1,1-Trichloroethane | <1 | 2-Chlorotoluene | <1 |
| 1,1-Dichloropropene | <1 | 4-Chlorotoluene | <1 |
| Carbon tetrachloride | <1 | tert-Butylbenzene | <1 |
| Benzene | <0.35 | 1,2,4-Trimethylbenzene | <1 |
| Trichloroethene | <1 | sec-Butylbenzene | <1 |
| 1,2-Dichloropropane | <1 | p-Isopropyltoluene | <1 |
| Bromodichloromethane | <1 | 1,3-Dichlorobenzene | <1 |
| Dibromomethane | <1 | 1,4-Dichlorobenzene | <1 |
| 4-Methyl-2-pentanone | <10 | 1,2-Dichlorobenzene | <1 |
| cis-1,3-Dichloropropene | <1 | 1,2-Dibromo-3-chloropropane | <10 |
| Toluene | <1 | 1,2,4-Trichlorobenzene | <1 |
| trans-1,3-Dichloropropene | <1 | Hexachlorobutadiene | <1 |
| 1,1,2-Trichloroethane | <1 | Naphthalene | <1 |
| 2-Hexanone | <10 | 1,2,3-Trichlorobenzene | <1 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 504487-01 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 98 | 69-134 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 102 | 104 | 63-142 | 2 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 504467-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 8.13 | 91 | 89 | 60-150 | 2 |
| Barium | ug/L (ppb) | 50 | 15.5 | 102 | 101 | 79-126 | 1 |
| Cadmium | ug/L (ppb) | 5 | <1 | 102 | 102 | 80-124 | 0 |
| Chromium | ug/L (ppb) | 20 | 1.24 | 79 | 79 | 64-132 | 0 |
| Lead | ug/L (ppb) | 10 | 167 | 0 b | 0 b | 79-121 | 0 b |
| Mercury | ug/L (ppb) | 10 | <1 | 94 | 95 | 50-150 | 1 |
| Selenium | ug/L (ppb) | 5 | 1.27 | 93 | 94 | 68-142 | 1 |
| Silver | ug/L (ppb) | 5 | <1 | 86 | 87 | 60-121 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 88 | 80-111 |
| Barium | ug/L (ppb) | 50 | 99 | 83-117 |
| Cadmium | ug/L (ppb) | 5 | 101 | 83-113 |
| Chromium | ug/L (ppb) | 20 | 95 | 80-119 |
| Lead | ug/L (ppb) | 10 | 99 | 83-115 |
| Mercury | ug/L (ppb) | 10 | 94 | 70-130 |
| Selenium | ug/L (ppb) | 5 | 83 | 81-119 |
| Silver | ug/L (ppb) | 5 | 88 | 75-120 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 504467-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | <1 | 67 | 10-172 |
| Chloromethane | ug/L (ppb) | 50 | <10 | 73 | 25-166 |
| Vinyl chloride | ug/L (ppb) | 50 | <0.2 | 87 | 36-166 |
| Bromomethane | ug/L (ppb) | 50 | <1 | 87 | 47-169 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 89 | 46-160 |
| Trichlorofluoromethane | ug/L (ppb) | 50 | <1 | 89 | 44-165 |
| Acetone | ug/L (ppb) | 250 | <10 | 92 | 10-182 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | <1 | 87 | 60-136 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 104 | 67-132 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | <1 | 89 | 74-127 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 96 | 72-129 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 93 | 70-128 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 81 | 36-154 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 93 | 71-127 |
| Chloroform | ug/L (ppb) | 50 | <1 | 90 | 65-132 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | <10 | 107 | 10-129 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 89 | 69-133 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | <1 | 93 | 60-146 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | <1 | 91 | 69-133 |
| Carbon tetrachloride | ug/L (ppb) | 50 | <1 | 108 | 56-152 |
| Benzene | ug/L (ppb) | 50 | <0.35 | 91 | 76-125 |
| Trichloroethene | ug/L (ppb) | 50 | <1 | 96 | 66-135 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | <1 | 93 | 78-125 |
| Bromodichloromethane | ug/L (ppb) | 50 | <1 | 103 | 61-150 |
| Dibromomethane | ug/L (ppb) | 50 | <1 | 94 | 66-141 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | <10 | 104 | 10-185 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 105 | 72-132 |
| Toluene | ug/L (ppb) | 50 | <1 | 93 | 76-122 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | <1 | 112 | 76-130 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | <1 | 101 | 68-131 |
| 2-Hexanone | ug/L (ppb) | 250 | <10 | 108 | 10-185 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | <1 | 98 | 71-128 |
| Tetrachloroethene | ug/L (ppb) | 50 | <1 | 94 | 10-226 |
| Dibromochloromethane | ug/L (ppb) | 50 | <1 | 119 | 70-139 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | <1 | 105 | 69-134 |
| Chlorobenzene | ug/L (ppb) | 50 | <1 | 93 | 77-122 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 93 | 69-135 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 105 | 73-137 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 95 | 69-135 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 95 | 60-140 |
| Styrene | ug/L (ppb) | 50 | <1 | 96 | 71-133 |
| Isopropylbenzene | ug/L (ppb) | 50 | <1 | 96 | 65-142 |
| Bromoform | ug/L (ppb) | 50 | <1 | 120 | 65-142 |
| n-Propylbenzene | ug/L (ppb) | 50 | <1 | 98 | 58-144 |
| Bromobenzene | ug/L (ppb) | 50 | <1 | 99 | 75-124 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 99 | 66-137 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | <1 | 102 | 51-154 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | <1 | 104 | 53-150 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | <1 | 98 | 66-127 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | <1 | 96 | 65-130 |
| tert-Butylbenzene | ug/L (ppb) | 50 | <1 | 100 | 65-137 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | <1 | 98 | 59-146 |
| sec-Butylbenzene | ug/L (ppb) | 50 | <1 | 98 | 64-140 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | <1 | 97 | 65-141 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 99 | 72-123 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 93 | 69-126 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | <1 | 96 | 69-128 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | <10 | 117 | 32-164 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 96 | 66-136 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | <1 | 96 | 60-143 |
| Naphthalene | ug/L (ppb) | 50 | <1 | 105 | 44-164 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | <1 | 100 | 69-148 |

Date of Report: 05/05/15
Date Received: 04/27/15
Project: HERS Industrial Park 140252, F&BI 504489

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | ug/L (ppb) | 50 | 97 | 87 | 25-158 | 11 |
| Chloromethane | ug/L (ppb) | 50 | 89 | 87 | 45-156 | 2 |
| Vinyl chloride | ug/L (ppb) | 50 | 99 | 98 | 50-154 | 1 |
| Bromomethane | ug/L (ppb) | 50 | 96 | 95 | 55-143 | 1 |
| Chloroethane | ug/L (ppb) | 50 | 96 | 93 | 58-146 | 3 |
| Trichlorofluoromethane | ug/L (ppb) | 250 | 96 | 91 | 50-150 | 5 |
| Acetone | ug/L (ppb) | 250 | 92 | 97 | 53-131 | 5 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 89 | 88 | 67-136 | 1 |
| Methylene chloride | ug/L (ppb) | 50 | 99 | 97 | 39-148 | 2 |
| Methyl t-butyl ether (MTBE) | ug/L (ppb) | 50 | 95 | 94 | 64-147 | 1 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 96 | 95 | 68-128 | 1 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 95 | 95 | 79-121 | 0 |
| 2,2-Dichloropropane | ug/L (ppb) | 50 | 89 | 88 | 55-143 | 1 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 96 | 93 | 80-123 | 3 |
| Chloroform | ug/L (ppb) | 50 | 92 | 91 | 80-121 | 1 |
| 2-Butanone (MEK) | ug/L (ppb) | 250 | 111 | 108 | 57-149 | 3 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 93 | 93 | 73-132 | 0 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 98 | 95 | 83-130 | 3 |
| 1,1-Dichloropropene | ug/L (ppb) | 50 | 94 | 92 | 77-129 | 2 |
| Carbon tetrachloride | ug/L (ppb) | 50 | 113 | 109 | 75-158 | 4 |
| Benzene | ug/L (ppb) | 50 | 92 | 91 | 69-134 | 1 |
| Trichloroethene | ug/L (ppb) | 50 | 100 | 97 | 80-120 | 3 |
| 1,2-Dichloropropane | ug/L (ppb) | 50 | 96 | 95 | 77-123 | 1 |
| Bromodichloromethane | ug/L (ppb) | 50 | 107 | 104 | 81-133 | 3 |
| Dibromomethane | ug/L (ppb) | 50 | 97 | 95 | 82-125 | 2 |
| 4-Methyl-2-pentanone | ug/L (ppb) | 250 | 106 | 106 | 65-138 | 0 |
| cis-1,3-Dichloropropene | ug/L (ppb) | 50 | 112 | 110 | 82-132 | 2 |
| Toluene | ug/L (ppb) | 50 | 95 | 94 | 72-122 | 1 |
| trans-1,3-Dichloropropene | ug/L (ppb) | 50 | 119 | 117 | 80-136 | 2 |
| 1,1,2-Trichloroethane | ug/L (ppb) | 50 | 103 | 102 | 75-124 | 1 |
| 2-Hexanone | ug/L (ppb) | 250 | 107 | 108 | 60-136 | 1 |
| 1,3-Dichloropropane | ug/L (ppb) | 50 | 101 | 100 | 76-126 | 1 |
| Tetrachloroethene | ug/L (ppb) | 50 | 99 | 95 | 76-121 | 4 |
| Dibromochloromethane | ug/L (ppb) | 50 | 125 | 123 | 84-133 | 2 |
| 1,2-Dibromoethane (EDB) | ug/L (ppb) | 50 | 108 | 107 | 82-125 | 1 |
| Chlorobenzene | ug/L (ppb) | 50 | 96 | 94 | 83-114 | 2 |
| Ethylbenzene | ug/L (ppb) | 50 | 97 | 94 | 77-124 | 3 |
| 1,1,1,2-Tetrachloroethane | ug/L (ppb) | 50 | 108 | 109 | 84-127 | 1 |
| m,p-Xylene | ug/L (ppb) | 100 | 97 | 95 | 83-125 | 2 |
| o-Xylene | ug/L (ppb) | 50 | 100 | 97 | 81-121 | 3 |
| Styrene | ug/L (ppb) | 50 | 99 | 98 | 84-119 | 1 |
| Isopropylbenzene | ug/L (ppb) | 50 | 99 | 96 | 85-117 | 3 |
| Bromoform | ug/L (ppb) | 50 | 122 | 123 | 74-136 | 1 |
| n-Propylbenzene | ug/L (ppb) | 50 | 103 | 99 | 74-126 | 4 |
| Bromobenzene | ug/L (ppb) | 50 | 102 | 99 | 80-121 | 3 |
| 1,3,5-Trimethylbenzene | ug/L (ppb) | 50 | 104 | 100 | 78-123 | 4 |
| 1,1,2,2-Tetrachloroethane | ug/L (ppb) | 50 | 105 | 104 | 66-126 | 1 |
| 1,2,3-Trichloropropane | ug/L (ppb) | 50 | 106 | 107 | 67-124 | 1 |
| 2-Chlorotoluene | ug/L (ppb) | 50 | 101 | 97 | 77-127 | 4 |
| 4-Chlorotoluene | ug/L (ppb) | 50 | 100 | 98 | 78-128 | 2 |
| tert-Butylbenzene | ug/L (ppb) | 50 | 104 | 100 | 80-123 | 4 |
| 1,2,4-Trimethylbenzene | ug/L (ppb) | 50 | 102 | 98 | 79-122 | 4 |
| sec-Butylbenzene | ug/L (ppb) | 50 | 103 | 100 | 80-125 | 3 |
| p-Isopropyltoluene | ug/L (ppb) | 50 | 101 | 98 | 81-123 | 3 |
| 1,3-Dichlorobenzene | ug/L (ppb) | 50 | 99 | 97 | 85-116 | 2 |
| 1,4-Dichlorobenzene | ug/L (ppb) | 50 | 96 | 93 | 84-121 | 3 |
| 1,2-Dichlorobenzene | ug/L (ppb) | 50 | 99 | 97 | 85-116 | 2 |
| 1,2-Dibromo-3-chloropropane | ug/L (ppb) | 50 | 122 | 120 | 57-141 | 2 |
| 1,2,4-Trichlorobenzene | ug/L (ppb) | 50 | 100 | 99 | 72-130 | 1 |
| Hexachlorobutadiene | ug/L (ppb) | 50 | 104 | 100 | 53-141 | 4 |
| Naphthalene | ug/L (ppb) | 50 | 108 | 107 | 64-133 | 1 |
| 1,2,3-Trichlorobenzene | ug/L (ppb) | 50 | 103 | 101 | 65-136 | 2 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504489

# SAMPLE CHAIN OF CUSTODY

ME 04-2715

AI6/D04/41

Page # 1 of 1

Send Report To Alan Noell
Company Aspect Consulting
Address 401 2nd Ave S, 201
City, State, ZIP Seattle WA 98104
Phone # _____ Fax # _____

SAMPLERS (signature) Matthew M. Sun
PROJECT NAME/NO. HERS Industrial Park 140252
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | ANALYSES REQUESTED: TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | RCRA Dissolved Metals | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-16D-042715 | 01A-G | 4/27/15 | 1240 | Water | 7 | X | X | X | X | | | X | | | | | | |
| MW-20-042715 | 02A-G | " | 1105 | " | 7 | X | X | X | X | | | X | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FORMS\COC\COC.DOC

| SIGNATURE | PRINT | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Sun | [illegible] | [illegible] | [illegible] | |
| Received by: [signature] | Nicole Pha[illegible] | [illegible] | | |
| Relinquished by: | | | | |
| Received by: | | | | |

Samples received at 8 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 31, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on July 24, 2015 from the HERS 140252, F&BI 507383 project. There are 15 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0731R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 24, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS 140252, F&BI 507383 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 507383 -01 | MW-21-9-10 |
| 507383 -02 | MW-22-10-11 |

All quality control requirements were acceptable.

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383
Date Extracted: 07/27/15
Date Analyzed: 07/27/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 50-150) |
|---|---|---|
| MW-21-9-10<br>507383-01 | <2 | 101 |
| MW-22-10-11<br>507383-02 | <2 | 101 |
| Method Blank<br>05-1356 MB | <2 | 101 |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383
Date Extracted: 07/27/15
Date Analyzed: 07/27/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 56-165) |
|---|---|---|---|
| MW-21-9-10<br>507383-01 | <50 | <250 | 95 |
| MW-22-10-11<br>507383-02 | <50 | <250 | 91 |
| Method Blank<br>05-1519 MB | <50 | <250 | 104 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-21-9-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/24/15 | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | 507383-01 |
| Date Analyzed: | 07/28/15 | Data File: | 507383-01.043 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 90 | 60 | 125 |
| Holmium | 99 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.25 |
| Lead | 2.05 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-22-10-11 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/24/15 | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | 507383-02 |
| Date Analyzed: | 07/28/15 | Data File: | 507383-02.044 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 86 | 60 | 125 |
| Holmium | 95 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.04 |
| Lead | 2.05 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | I5-417 mb |
| Date Analyzed: | 07/28/15 | Data File: | I5-417 mb.007 |
| Matrix: | Soil | Instrument: | ICPMS1 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 97 | 60 | 125 |
| Holmium | 102 | 60 | 125 |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Lead | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-21-9-10 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/24/15 | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | 507383-01 |
| Date Analyzed: | 07/27/15 | Data File: | 072722.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 62 | 142 |
| Toluene-d8 | 101 | 55 | 145 |
| 4-Bromofluorobenzene | 100 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | 0.048 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | 0.056 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-22-10-11 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/24/15 | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | 507383-02 |
| Date Analyzed: | 07/27/15 | Data File: | 072723.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 62 | 142 |
| Toluene-d8 | 102 | 55 | 145 |
| 4-Bromofluorobenzene | 101 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS 140252, F&BI 507383 |
| Date Extracted: | 07/27/15 | Lab ID: | 05-1504 mb |
| Date Analyzed: | 07/27/15 | Data File: | 072707.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 62 | 142 |
| Toluene-d8 | 101 | 55 | 145 |
| 4-Bromofluorobenzene | 100 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 507383-02 (Duplicate)

| Analyte | Reporting Units | Sample Result (Wet Wt) | Duplicate Result (Wet Wt) | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | <2 | <2 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | 20 | 100 | 71-131 |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383

## QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 507387-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet Wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | <50 | 102 | 106 | 63-146 | 4 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 106 | 79-144 |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 507395-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 3.71 | 100 | 96 | 67-121 | 4 |
| Lead | mg/kg (ppm) | 50 | 3.64 | 104 | 103 | 59-148 | 1 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 97 | 83-113 |
| Lead | mg/kg (ppm) | 50 | 105 | 80-120 |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 507383-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 21 | 18 | 10-142 | 15 |
| Chloromethane | mg/kg (ppm) | 2.5 | <0.5 | 49 | 48 | 10-126 | 2 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | <0.05 | 51 | 50 | 10-138 | 2 |
| Bromomethane | mg/kg (ppm) | 2.5 | <0.5 | 65 | 65 | 10-163 | 0 |
| Chloroethane | mg/kg (ppm) | 2.5 | <0.5 | 67 | 67 | 10-176 | 0 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 64 | 63 | 10-176 | 2 |
| Acetone | mg/kg (ppm) | 12.5 | <0.5 | 81 | 79 | 10-163 | 2 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 74 | 72 | 10-160 | 3 |
| Hexane | mg/kg (ppm) | 2.5 | <0.25 | 57 | 55 | 10-137 | 4 |
| Methylene chloride | mg/kg (ppm) | 2.5 | <0.5 | 84 | 83 | 10-156 | 1 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | <0.05 | 87 | 86 | 21-145 | 1 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 85 | 14-137 | 0 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 88 | 87 | 19-140 | 1 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 83 | 83 | 10-158 | 0 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 85 | 25-135 | 2 |
| Chloroform | mg/kg (ppm) | 2.5 | <0.05 | 92 | 90 | 21-145 | 2 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | <0.5 | 85 | 89 | 19-147 | 5 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | <0.05 | 88 | 86 | 12-160 | 2 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 89 | 10-156 | 2 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 84 | 17-140 | 2 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | <0.05 | 95 | 94 | 9-164 | 1 |
| Benzene | mg/kg (ppm) | 2.5 | <0.03 | 83 | 83 | 29-129 | 0 |
| Trichloroethene | mg/kg (ppm) | 2.5 | 0.091 | 89 | 88 | 21-139 | 1 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 91 | 30-135 | 0 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | <0.05 | 98 | 96 | 23-155 | 2 |
| Dibromomethane | mg/kg (ppm) | 2.5 | <0.05 | 90 | 89 | 23-145 | 1 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | <0.5 | 95 | 93 | 24-155 | 2 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 96 | 96 | 28-144 | 0 |
| Toluene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 86 | 35-130 | 1 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 93 | 95 | 26-149 | 2 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 93 | 10-205 | 0 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | <0.5 | 92 | 91 | 15-166 | 1 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 91 | 91 | 31-137 | 0 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | 0.077 | 83 | 84 | 20-133 | 1 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | <0.05 | 97 | 97 | 28-150 | 0 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | <0.05 | 96 | 95 | 28-142 | 1 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 85 | 32-129 | 0 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 86 | 32-137 | 1 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 92 | 93 | 31-143 | 1 |
| m,p-Xylene | mg/kg (ppm) | 5 | <0.1 | 88 | 88 | 34-136 | 0 |
| o-Xylene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 87 | 33-134 | 0 |
| Styrene | mg/kg (ppm) | 2.5 | <0.05 | 92 | 92 | 35-137 | 0 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 89 | 31-142 | 0 |
| Bromoform | mg/kg (ppm) | 2.5 | <0.05 | 101 | 100 | 21-156 | 1 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 89 | 23-146 | 0 |
| Bromobenzene | mg/kg (ppm) | 2.5 | <0.05 | 90 | 90 | 34-130 | 0 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 90 | 91 | 18-149 | 1 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 93 | 95 | 28-140 | 2 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 88 | 25-144 | 1 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 87 | 31-134 | 0 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 88 | 89 | 31-136 | 1 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 90 | 91 | 30-137 | 1 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 89 | 10-182 | 0 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 90 | 90 | 23-145 | 0 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | <0.05 | 90 | 90 | 21-149 | 0 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 88 | 30-131 | 1 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 86 | 29-129 | 0 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 86 | 31-132 | 0 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | <0.5 | 92 | 92 | 11-161 | 0 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 88 | 88 | 22-142 | 0 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | <0.25 | 92 | 94 | 10-142 | 2 |
| Naphthalene | mg/kg (ppm) | 2.5 | <0.05 | 89 | 88 | 14-157 | 1 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 89 | 88 | 20-144 | 1 |

Date of Report: 07/31/15
Date Received: 07/24/15
Project: HERS 140252, F&BI 507383

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | 52 | 10-146 |
| Chloromethane | mg/kg (ppm) | 2.5 | 79 | 27-133 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | 82 | 22-139 |
| Bromomethane | mg/kg (ppm) | 2.5 | 93 | 38-114 |
| Chloroethane | mg/kg (ppm) | 2.5 | 94 | 10-163 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | 98 | 10-196 |
| Acetone | mg/kg (ppm) | 12.5 | 96 | 52-141 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | 99 | 47-128 |
| Hexane | mg/kg (ppm) | 2.5 | 88 | 43-142 |
| Methylene chloride | mg/kg (ppm) | 2.5 | 102 | 42-132 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | 105 | 60-123 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 107 | 67-127 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | 107 | 68-115 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | 108 | 52-170 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 105 | 72-113 |
| Chloroform | mg/kg (ppm) | 2.5 | 109 | 66-120 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | 101 | 57-123 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | 102 | 56-135 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | 111 | 62-131 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | 104 | 69-128 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | 117 | 60-139 |
| Benzene | mg/kg (ppm) | 2.5 | 100 | 68-114 |
| Trichloroethene | mg/kg (ppm) | 2.5 | 107 | 64-117 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | 106 | 72-127 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | 114 | 72-130 |
| Dibromomethane | mg/kg (ppm) | 2.5 | 104 | 70-120 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | 107 | 45-145 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 111 | 75-136 |
| Toluene | mg/kg (ppm) | 2.5 | 102 | 66-126 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 109 | 72-132 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | 105 | 75-113 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | 102 | 33-152 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | 105 | 72-130 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | 103 | 72-114 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | 113 | 74-125 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | 113 | 74-132 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | 100 | 76-111 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | 102 | 64-123 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 110 | 69-135 |
| m,p-Xylene | mg/kg (ppm) | 5 | 104 | 78-122 |
| o-Xylene | mg/kg (ppm) | 2.5 | 103 | 77-124 |
| Styrene | mg/kg (ppm) | 2.5 | 107 | 74-126 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | 105 | 76-127 |
| Bromoform | mg/kg (ppm) | 2.5 | 117 | 56-132 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | 101 | 74-124 |
| Bromobenzene | mg/kg (ppm) | 2.5 | 103 | 72-122 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | 105 | 76-126 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 106 | 56-143 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | 99 | 61-137 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | 100 | 74-121 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | 101 | 75-122 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | 105 | 73-130 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | 104 | 76-125 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | 104 | 71-130 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | 104 | 70-132 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | 101 | 75-121 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | 99 | 74-117 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | 100 | 76-121 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | 109 | 58-138 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | 103 | 64-135 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | 107 | 50-153 |
| Naphthalene | mg/kg (ppm) | 2.5 | 105 | 63-140 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | 105 | 63-138 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

507383

# SAMPLE CHAIN OF CUSTODY

ME 07-24-15

EDF / VSI

Page # 1 of 1 BI

Send Report To Alan Noel

Company Aspect

Address 402 2nd Ave S. Ste 201

City, State, ZIP Seattle, WA 98104

Phone #_____ Fax #_____

SAMPLERS (signature) Matthew M Lewis

PROJECT NAME/NO. HERS / ~~0447~~ 140252

PO#

REMARKS

TURNAROUND TIME
- [X] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [X] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | NWTPH-Diesel | NWTPH-Gasoline | BTEX by 8021B | VOCs by 8260 | SVOCs by 8270 | HFS | Metals Arsenic & Lead | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-21-9-10 | 01A-E | 7/24/15 | 1205 | Soil | 5 | X | X | | X | | | X | | | | | |
| MW-22-10-11 | 02T | " | 1005 | " | 5 | X | X | | X | | | X | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | Samples received at 4 °C |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 7/24/15 | 1510 |
| Received by: | Nham Phan | FCBI | 7/24/15 | 1540 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 7, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on July 31, 2015 from the HERS Industrial Park 140252, F&BI 507484 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0807R.DOC

## CASE NARRATIVE

This case narrative encompasses samples received on July 31, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252, F&BI 507484 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 507484 -01 | MW-2D-55 |
| 507484 -02 | MW-2D-190 |
| 507484 -03 | AB-1-2.5 |
| 507484 -04 | AB-3-11 |

All quality control requirements were acceptable.

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-2D-55 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/31/15 | Project: | HERS Industrial Park 140252, F&BI 507484 |
| Date Extracted: | 08/03/15 | Lab ID: | 507484-01 |
| Date Analyzed: | 08/03/15 | Data File: | 080323.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 62 | 142 |
| Toluene-d8 | 99 | 55 | 145 |
| 4-Bromofluorobenzene | 99 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-2D-190 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/31/15 | Project: | HERS Industrial Park 140252, F&BI 507484 |
| Date Extracted: | 08/03/15 | Lab ID: | 507484-02 |
| Date Analyzed: | 08/03/15 | Data File: | 080324.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 62 | 142 |
| Toluene-d8 | 101 | 55 | 145 |
| 4-Bromofluorobenzene | 99 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | AB-1-2.5 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/31/15 | Project: | HERS Industrial Park 140252, F&BI 507484 |
| Date Extracted: | 08/03/15 | Lab ID: | 507484-03 |
| Date Analyzed: | 08/03/15 | Data File: | 080325.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 62 | 142 |
| Toluene-d8 | 101 | 55 | 145 |
| 4-Bromofluorobenzene | 99 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | AB-3-11 | Client: | Aspect Consulting, LLC |
| Date Received: | 07/31/15 | Project: | HERS Industrial Park 140252, F&BI 507484 |
| Date Extracted: | 08/03/15 | Lab ID: | 507484-04 |
| Date Analyzed: | 08/03/15 | Data File: | 080326.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 62 | 142 |
| Toluene-d8 | 100 | 55 | 145 |
| 4-Bromofluorobenzene | 99 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park 140252, F&BI 507484 |
| Date Extracted: | 08/03/15 | Lab ID: | 05-1514 mb |
| Date Analyzed: | 08/03/15 | Data File: | 080322.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 62 | 142 |
| Toluene-d8 | 99 | 55 | 145 |
| 4-Bromofluorobenzene | 99 | 65 | 139 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Dichlorodifluoromethane | <0.5 | 1,3-Dichloropropane | <0.05 |
| Chloromethane | <0.5 | Tetrachloroethene | <0.025 |
| Vinyl chloride | <0.05 | Dibromochloromethane | <0.05 |
| Bromomethane | <0.5 | 1,2-Dibromoethane (EDB) | <0.05 |
| Chloroethane | <0.5 | Chlorobenzene | <0.05 |
| Trichlorofluoromethane | <0.5 | Ethylbenzene | <0.05 |
| Acetone | <0.5 | 1,1,1,2-Tetrachloroethane | <0.05 |
| 1,1-Dichloroethene | <0.05 | m,p-Xylene | <0.1 |
| Hexane | <0.25 | o-Xylene | <0.05 |
| Methylene chloride | <0.5 | Styrene | <0.05 |
| Methyl t-butyl ether (MTBE) | <0.05 | Isopropylbenzene | <0.05 |
| trans-1,2-Dichloroethene | <0.05 | Bromoform | <0.05 |
| 1,1-Dichloroethane | <0.05 | n-Propylbenzene | <0.05 |
| 2,2-Dichloropropane | <0.05 | Bromobenzene | <0.05 |
| cis-1,2-Dichloroethene | <0.05 | 1,3,5-Trimethylbenzene | <0.05 |
| Chloroform | <0.05 | 1,1,2,2-Tetrachloroethane | <0.05 |
| 2-Butanone (MEK) | <0.5 | 1,2,3-Trichloropropane | <0.05 |
| 1,2-Dichloroethane (EDC) | <0.05 | 2-Chlorotoluene | <0.05 |
| 1,1,1-Trichloroethane | <0.05 | 4-Chlorotoluene | <0.05 |
| 1,1-Dichloropropene | <0.05 | tert-Butylbenzene | <0.05 |
| Carbon tetrachloride | <0.05 | 1,2,4-Trimethylbenzene | <0.05 |
| Benzene | <0.03 | sec-Butylbenzene | <0.05 |
| Trichloroethene | <0.02 | p-Isopropyltoluene | <0.05 |
| 1,2-Dichloropropane | <0.05 | 1,3-Dichlorobenzene | <0.05 |
| Bromodichloromethane | <0.05 | 1,4-Dichlorobenzene | <0.05 |
| Dibromomethane | <0.05 | 1,2-Dichlorobenzene | <0.05 |
| 4-Methyl-2-pentanone | <0.5 | 1,2-Dibromo-3-chloropropane | <0.5 |
| cis-1,3-Dichloropropene | <0.05 | 1,2,4-Trichlorobenzene | <0.25 |
| Toluene | <0.05 | Hexachlorobutadiene | <0.25 |
| trans-1,3-Dichloropropene | <0.05 | Naphthalene | <0.05 |
| 1,1,2-Trichloroethane | <0.05 | 1,2,3-Trichlorobenzene | <0.25 |
| 2-Hexanone | <0.5 | | |

Date of Report: 08/07/15
Date Received: 07/31/15
Project: HERS Industrial Park 140252, F&BI 507484

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 507484-03 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 21 | 19 | 10-142 | 10 |
| Chloromethane | mg/kg (ppm) | 2.5 | <0.5 | 49 | 47 | 10-126 | 4 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | <0.05 | 50 | 47 | 10-138 | 6 |
| Bromomethane | mg/kg (ppm) | 2.5 | <0.5 | 63 | 65 | 10-163 | 3 |
| Chloroethane | mg/kg (ppm) | 2.5 | <0.5 | 71 | 66 | 10-176 | 7 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | <0.5 | 61 | 55 | 10-176 | 10 |
| Acetone | mg/kg (ppm) | 12.5 | <0.5 | 87 | 84 | 10-163 | 4 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 67 | 65 | 10-160 | 3 |
| Hexane | mg/kg (ppm) | 2.5 | <0.25 | 52 | 47 | 10-137 | 10 |
| Methylene chloride | mg/kg (ppm) | 2.5 | <0.5 | 84 | 82 | 10-156 | 2 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | <0.05 | 88 | 84 | 21-145 | 5 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 77 | 73 | 14-137 | 5 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 81 | 78 | 19-140 | 4 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 85 | 78 | 10-158 | 9 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 81 | 25-135 | 4 |
| Chloroform | mg/kg (ppm) | 2.5 | <0.05 | 87 | 83 | 21-145 | 5 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | <0.5 | 90 | 91 | 19-147 | 1 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | <0.05 | 86 | 83 | 12-160 | 4 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 80 | 10-156 | 8 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 83 | 79 | 17-140 | 5 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | <0.05 | 87 | 84 | 9-164 | 4 |
| Benzene | mg/kg (ppm) | 2.5 | <0.03 | 80 | 77 | 29-129 | 4 |
| Trichloroethene | mg/kg (ppm) | 2.5 | <0.02 | 82 | 79 | 21-139 | 4 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 85 | 81 | 30-135 | 5 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | <0.05 | 94 | 91 | 23-155 | 3 |
| Dibromomethane | mg/kg (ppm) | 2.5 | <0.05 | 88 | 85 | 23-145 | 3 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | <0.5 | 95 | 92 | 24-155 | 3 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 95 | 92 | 28-144 | 3 |
| Toluene | mg/kg (ppm) | 2.5 | <0.05 | 80 | 77 | 35-130 | 4 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | <0.05 | 95 | 93 | 26-149 | 2 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | <0.05 | 86 | 84 | 10-205 | 2 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | <0.5 | 92 | 92 | 15-166 | 0 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 87 | 84 | 31-137 | 4 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | <0.025 | 81 | 78 | 20-133 | 4 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | <0.05 | 89 | 85 | 28-150 | 5 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | <0.05 | 91 | 87 | 28-142 | 4 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 82 | 80 | 32-129 | 2 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 81 | 32-137 | 4 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 89 | 88 | 31-143 | 1 |
| m,p-Xylene | mg/kg (ppm) | 5 | <0.1 | 85 | 82 | 34-136 | 4 |
| o-Xylene | mg/kg (ppm) | 2.5 | <0.05 | 83 | 81 | 33-134 | 2 |
| Styrene | mg/kg (ppm) | 2.5 | <0.05 | 88 | 86 | 35-137 | 2 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 83 | 31-142 | 2 |
| Bromoform | mg/kg (ppm) | 2.5 | <0.05 | 93 | 89 | 21-156 | 4 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 83 | 23-146 | 2 |
| Bromobenzene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 82 | 34-130 | 2 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 84 | 82 | 18-149 | 2 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | <0.05 | 90 | 90 | 28-140 | 0 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | <0.05 | 86 | 85 | 25-144 | 1 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 82 | 81 | 31-134 | 1 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 83 | 31-136 | 4 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 83 | 30-137 | 4 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 86 | 83 | 10-182 | 4 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 83 | 23-145 | 2 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | <0.05 | 87 | 85 | 21-149 | 2 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 84 | 30-131 | 1 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 83 | 81 | 29-129 | 2 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | <0.05 | 85 | 82 | 31-132 | 4 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | <0.5 | 96 | 92 | 11-161 | 4 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 87 | 86 | 22-142 | 1 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | <0.25 | 90 | 88 | 10-142 | 2 |
| Naphthalene | mg/kg (ppm) | 2.5 | <0.05 | 88 | 87 | 14-157 | 1 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | <0.25 | 89 | 86 | 20-144 | 3 |

Date of Report: 08/07/15
Date Received: 07/31/15
Project: HERS Industrial Park 140252, F&BI 507484

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 2.5 | 43 | 10-146 |
| Chloromethane | mg/kg (ppm) | 2.5 | 66 | 27-133 |
| Vinyl chloride | mg/kg (ppm) | 2.5 | 73 | 22-139 |
| Bromomethane | mg/kg (ppm) | 2.5 | 78 | 38-114 |
| Chloroethane | mg/kg (ppm) | 2.5 | 90 | 10-163 |
| Trichlorofluoromethane | mg/kg (ppm) | 2.5 | 86 | 10-196 |
| Acetone | mg/kg (ppm) | 12.5 | 95 | 52-141 |
| 1,1-Dichloroethene | mg/kg (ppm) | 2.5 | 88 | 47-128 |
| Hexane | mg/kg (ppm) | 2.5 | 82 | 43-142 |
| Methylene chloride | mg/kg (ppm) | 2.5 | 94 | 42-132 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 2.5 | 95 | 60-123 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 92 | 67-127 |
| 1,1-Dichloroethane | mg/kg (ppm) | 2.5 | 94 | 68-115 |
| 2,2-Dichloropropane | mg/kg (ppm) | 2.5 | 95 | 52-170 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 2.5 | 95 | 72-113 |
| Chloroform | mg/kg (ppm) | 2.5 | 97 | 66-120 |
| 2-Butanone (MEK) | mg/kg (ppm) | 12.5 | 106 | 57-123 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 2.5 | 98 | 56-135 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 2.5 | 99 | 62-131 |
| 1,1-Dichloropropene | mg/kg (ppm) | 2.5 | 97 | 69-128 |
| Carbon tetrachloride | mg/kg (ppm) | 2.5 | 103 | 60-139 |
| Benzene | mg/kg (ppm) | 2.5 | 91 | 68-114 |
| Trichloroethene | mg/kg (ppm) | 2.5 | 93 | 64-117 |
| 1,2-Dichloropropane | mg/kg (ppm) | 2.5 | 95 | 72-127 |
| Bromodichloromethane | mg/kg (ppm) | 2.5 | 104 | 72-130 |
| Dibromomethane | mg/kg (ppm) | 2.5 | 100 | 70-120 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 12.5 | 103 | 45-145 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 107 | 75-136 |
| Toluene | mg/kg (ppm) | 2.5 | 89 | 66-126 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 2.5 | 105 | 72-132 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 2.5 | 96 | 75-113 |
| 2-Hexanone | mg/kg (ppm) | 12.5 | 103 | 33-152 |
| 1,3-Dichloropropane | mg/kg (ppm) | 2.5 | 96 | 72-130 |
| Tetrachloroethene | mg/kg (ppm) | 2.5 | 92 | 72-114 |
| Dibromochloromethane | mg/kg (ppm) | 2.5 | 99 | 74-125 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 2.5 | 101 | 74-132 |
| Chlorobenzene | mg/kg (ppm) | 2.5 | 92 | 76-111 |
| Ethylbenzene | mg/kg (ppm) | 2.5 | 93 | 64-123 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 99 | 69-135 |
| m,p-Xylene | mg/kg (ppm) | 5 | 95 | 78-122 |
| o-Xylene | mg/kg (ppm) | 2.5 | 92 | 77-124 |
| Styrene | mg/kg (ppm) | 2.5 | 97 | 74-126 |
| Isopropylbenzene | mg/kg (ppm) | 2.5 | 96 | 76-127 |
| Bromoform | mg/kg (ppm) | 2.5 | 102 | 56-132 |
| n-Propylbenzene | mg/kg (ppm) | 2.5 | 94 | 74-124 |
| Bromobenzene | mg/kg (ppm) | 2.5 | 92 | 72-122 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 2.5 | 94 | 76-126 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 2.5 | 99 | 56-143 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 2.5 | 95 | 61-137 |
| 2-Chlorotoluene | mg/kg (ppm) | 2.5 | 92 | 74-121 |
| 4-Chlorotoluene | mg/kg (ppm) | 2.5 | 95 | 75-122 |
| tert-Butylbenzene | mg/kg (ppm) | 2.5 | 94 | 73-130 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 2.5 | 95 | 76-125 |
| sec-Butylbenzene | mg/kg (ppm) | 2.5 | 93 | 71-130 |
| p-Isopropyltoluene | mg/kg (ppm) | 2.5 | 95 | 70-132 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 2.5 | 95 | 75-121 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 2.5 | 92 | 74-117 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 2.5 | 94 | 76-121 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 2.5 | 102 | 58-138 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 2.5 | 98 | 64-135 |
| Hexachlorobutadiene | mg/kg (ppm) | 2.5 | 98 | 50-153 |
| Naphthalene | mg/kg (ppm) | 2.5 | 98 | 63-140 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 2.5 | 97 | 63-138 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

507484

# SAMPLE CHAIN OF CUSTODY

ME 7/31/15

VSI/BI2

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave S, Ste 201

City, State, ZIP Seattle, WA 98104

Phone #_____ Fax #_____

SAMPLERS (signature) Matthew M. Lewis

PROJECT NAME/NO. 140252 HERS Industrial Park

PO#

REMARKS

Page #_____ of _____

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH_____
- Rush charges authorized by _____

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-2D-55 | 01 | 7/27/15 | 1340 | Soil | 5 | | | | X | | | | | | | | |
| MW-2D-190 | 02 | 7/30/15 | 1500 | " | " | | | | X | | | | | | | | |
| AB-1-2.5 | 03 | 7/30/15 | 1030 | " | " | | | | X | | | | | | | | |
| AB-3-11 | 04 | 7/30/15 | 1210 | " | " | | | | X | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | Samples received at 5 °C |
| | | | | | | | | | | | | | | | | | |

ANALYSES REQUESTED

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 7/31/15 | 1555 |
| Received by: [illegible] | DO VO | F&BE | 11 | 15.51 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 27, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on August 12, 2015 from the HERS Industrial Park, PO 140252, F&BI 508192 project. There are 22 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0827R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 12, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 508192 -01 | MW-3-081115 |
| 508192 -02 | MW-4-081115 |
| 508192 -03 | MW-5-081115 |

All quality control requirements were acceptable.

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192
Date Extracted: 08/13/15
Date Analyzed: 08/13/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-3-081115<br>508192-01 | <100 | 80 |
| MW-4-081115<br>508192-02 | <100 | 80 |
| MW-5-081115<br>508192-03 | <100 | 81 |
| Method Blank<br>05-1616 MB | <100 | 82 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192
Date Extracted: 08/13/15
Date Analyzed: 08/13/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 51-134) |
|---|---|---|---|
| MW-3-081115<br>508192-01 | 700 x | 420 x | 107 |
| MW-4-081115<br>508192-02 | <50 | <250 | 99 |
| MW-5-081115<br>508192-03 | 58 x | <250 | 93 |
| Method Blank<br>05-1659 MB | <50 | <250 | 89 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-3-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/14/15 | Lab ID: | 508192-01 |
| Date Analyzed: | 08/17/15 | Data File: | 508192-01.018 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 93 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 13.6 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-4-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/14/15 | Lab ID: | 508192-02 |
| Date Analyzed: | 08/17/15 | Data File: | 508192-02.016 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 7.59 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-5-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/14/15 | Lab ID: | 508192-03 |
| Date Analyzed: | 08/17/15 | Data File: | 508192-03.023 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.70 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/14/15 | Lab ID: | I5-449 mb |
| Date Analyzed: | 08/17/15 | Data File: | I5-449 mb rr.021 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 99 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-3-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508192-01 |
| Date Analyzed: | 08/14/15 | Data File: | 508192-01.041 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 85 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 17.9 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-4-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508192-02 |
| Date Analyzed: | 08/14/15 | Data File: | 508192-02.044 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 90 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 13.3 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-5-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508192-03 |
| Date Analyzed: | 08/14/15 | Data File: | 508192-03.045 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 87 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | I5-448 mb |
| Date Analyzed: | 08/14/15 | Data File: | I5-448 mb.039 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-3-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508192-01 |
| Date Analyzed: | 08/13/15 | Data File: | 081239.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 1.5 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-4-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508192-02 |
| Date Analyzed: | 08/13/15 | Data File: | 081240.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-5-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/12/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508192-03 |
| Date Analyzed: | 08/13/15 | Data File: | 081241.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 05-1576 mb |
| Date Analyzed: | 08/12/15 | Data File: | 081220.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 508192-01 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 95 | 69-134 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 100 | 101 | 58-134 | 1 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 508192-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 13.6 | 94 | 92 | 60-150 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 97 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 508192-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 17.9 | 101 | 98 | 60-150 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 93 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 508174-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | <0.2 | 111 | 36-166 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 137 | 46-160 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | <1 | 111 | 60-136 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 105 | 67-132 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 108 | 72-129 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 106 | 70-128 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 105 | 71-127 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 109 | 69-133 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | <1 | 119 | 60-146 |
| Benzene | ug/L (ppb) | 50 | <0.35 | 101 | 76-125 |
| Trichloroethene | ug/L (ppb) | 50 | 4.7 | 103 | 66-135 |
| Toluene | ug/L (ppb) | 50 | <1 | 94 | 76-122 |
| Tetrachloroethene | ug/L (ppb) | 50 | <1 | 97 | 10-226 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 96 | 69-135 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 98 | 69-135 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 97 | 60-140 |

Date of Report: 08/27/15
Date Received: 08/12/15
Project: HERS Industrial Park, PO 140252, F&BI 508192

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | 104 | 107 | 50-154 | 3 |
| Chloroethane | ug/L (ppb) | 50 | 129 | 132 | 58-146 | 2 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 108 | 112 | 67-136 | 4 |
| Methylene chloride | ug/L (ppb) | 50 | 106 | 108 | 39-148 | 2 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 104 | 109 | 68-128 | 5 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 105 | 107 | 79-121 | 2 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 103 | 106 | 80-123 | 3 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 106 | 108 | 73-132 | 2 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 113 | 116 | 83-130 | 3 |
| Benzene | ug/L (ppb) | 50 | 99 | 102 | 69-134 | 3 |
| Trichloroethene | ug/L (ppb) | 50 | 103 | 105 | 80-120 | 2 |
| Toluene | ug/L (ppb) | 50 | 93 | 93 | 72-122 | 0 |
| Tetrachloroethene | ug/L (ppb) | 50 | 96 | 96 | 76-121 | 0 |
| Ethylbenzene | ug/L (ppb) | 50 | 94 | 96 | 77-124 | 2 |
| m,p-Xylene | ug/L (ppb) | 100 | 96 | 98 | 83-125 | 2 |
| o-Xylene | ug/L (ppb) | 50 | 94 | 96 | 81-121 | 2 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

508192

# SAMPLE CHAIN OF CUSTODY

ME 8112115

AI2/VI/AOS

Page # 1 of 1

Send Report To Alan Noel

Company Aspect Consulting, LLC

Address 401 2nd Ave S, Ste 201

City, State, ZIP Seattle, WA 98104

Phone # _____ Fax # _____

SAMPLERS (signature) Matthew M. Lewis

PROJECT NAME/NO. HELS Industrial Park 140252

PO#

REMARKS Chlorinated VOCs only
Arsenic Only for metals

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | Dissolved Metals-Arsenic Total Metals Arsenic Only | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-3-081115 | 01A-G | 081115 | 1405 | Water | 7 | X | X | | X | | | X | X | | | | chlorinated VOCs only |
| MW-4-081115 | 02 | | 1495 | | | X | X | | X | | | X | X | | | | |
| MW-5-081115 | 03 | | 1435 | | | X | X | | X | | | X | X | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 8/12/15 | 1330 |
| Received by: Nhan Phan | Nhan Phan | FEBT | 8/12/15 | 1330 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 3 °C | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 27, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on August 11, 2015 from the HERS Industrial Park, PO 140252, F&BI 508174 project. There are 44 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0827R.DOC

## CASE NARRATIVE

This case narrative encompasses samples received on August 11, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park 140252 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 508174 -01 | MW-2-081115 |
| 508174 -02 | MW-6-081115 |
| 508174 -03 | MW-7-081115 |
| 508174 -04 | MW-8-081115 |
| 508174 -05 | MW-9-081115 |
| 508174 -06 | MW-12-081115 |
| 508174 -07 | MW-19-081115 |
| 508174 -08 | MW-18-081115 |
| 508174 -09 | MW-16-081115 |
| 508174 -10 | MW-16D-081115 |

Samples MW-2-081115, MW-12-081115, MW-18-081115, MW-16-081115, and MW-16D-081115 were sent to Amtest for sulfate and nitrate. The report generated by Amtest is enclosed.

All quality control requirements were acceptable.

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174
Date Extracted: 08/12/15
Date Analyzed: 08/12/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate (% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-2-081115<br>508174-01 | <100 | 83 |
| MW-6-081115<br>508174-02 | <100 | 81 |
| MW-7-081115<br>508174-03 | <100 | 82 |
| MW-8-081115<br>508174-04 | <100 | 82 |
| MW-9-081115<br>508174-05 | 200 | 82 |
| MW-12-081115<br>508174-06 | <100 | 85 |
| MW-19-081115<br>508174-07 | <100 | 83 |
| MW-18-081115<br>508174-08 | <100 | 85 |
| MW-16-081115<br>508174-09 | 120 x | 85 |
| MW-16D-081115<br>508174-10 | <100 | 83 |
| Method Blank<br>05-1613 MB | <100 | 83 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174
Date Extracted: 08/12/15
Date Analyzed: 08/12/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 41-152) |
|---|---|---|---|
| MW-2-081115<br>508174-01 | <50 | <250 | 104 |
| MW-6-081115<br>508174-02 | 590 x | 330 x | 113 |
| MW-7-081115<br>508174-03 | 220 x | <250 | 110 |
| MW-8-081115<br>508174-04 | 73 x | <250 | 105 |
| MW-9-081115<br>508174-05 | 830 x | 950 x | 75 |
| MW-12-081115<br>508174-06 | 110 x | <250 | 111 |
| MW-19-081115<br>508174-07 | 450 x | 410 x | 122 |
| MW-18-081115<br>508174-08 | 110 x | <250 | 94 |
| MW-16-081115<br>508174-09 | 220 x | <250 | 117 |
| MW-16D-081115<br>508174-10 | 460 x | <250 | 103 |
| Method Blank<br>05-1654 MB | <50 | <250 | 77 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-2-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-01 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-01.025 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 11.4 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-6-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-02 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-02.026 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 93 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-7-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-03 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-03.027 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 97 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.52 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-8-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-04 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-04.029 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-9-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-05 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-05.030 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 94 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 5.17 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-12-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-06 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-06.031 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 91 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.78 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-19-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-07 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-07.032 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 86 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 15.5 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-18-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-08 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-08.033 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 91 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.68 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-09 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-09.034 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 88 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 8.82 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16D-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-10 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-10.035 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 88 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.36 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | I5-445 mb |
| Date Analyzed: | 08/14/15 | Data File: | I5-445 mb.012 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-2-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-01 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-01.069 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 78 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-6-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-02 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-02.070 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 79 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-7-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-03 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-03.072 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 81 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.58 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-8-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-04 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-04.073 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 79 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-9-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-05 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-05.074 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 80 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 5.25 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-12-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-06 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-06.075 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 81 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.75 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-19-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-07 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-07.076 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 75 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 15.0 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-18-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-08 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-08.077 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 83 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.05 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-09 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-09.078 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 70 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-16D-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508174-10 |
| Date Analyzed: | 08/14/15 | Data File: | 508174-10.079 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 78 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 2.71 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | I5-446 mb |
| Date Analyzed: | 08/14/15 | Data File: | I5-446 mb.055 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 90 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-2-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-01 |
| Date Analyzed: | 08/12/15 | Data File: | 081225.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 4.7 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-6-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-02 |
| Date Analyzed: | 08/12/15 | Data File: | 081226.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-7-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-03 |
| Date Analyzed: | 08/13/15 | Data File: | 081235.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 104 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-8-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-04 |
| Date Analyzed: | 08/12/15 | Data File: | 081227.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-9-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-05 |
| Date Analyzed: | 08/12/15 | Data File: | 081228.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | 69 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-12-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-06 |
| Date Analyzed: | 08/12/15 | Data File: | 081229.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 104 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 2.8 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 40 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 59 |
| Tetrachloroethene | 28 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-19-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-07 |
| Date Analyzed: | 08/13/15 | Data File: | 081236.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 1.2 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-18-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-08 |
| Date Analyzed: | 08/13/15 | Data File: | 081237.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-09 |
| Date Analyzed: | 08/12/15 | Data File: | 081232.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 6.5 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | 1.1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | 3.5 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 290 ve |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 120 |
| Tetrachloroethene | 110 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-09 1/10 |
| Date Analyzed: | 08/12/15 | Data File: | 081230.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <3.5 |
| Toluene | <10 |
| Ethylbenzene | <10 |
| m,p-Xylene | <20 |
| o-Xylene | <10 |
| Vinyl chloride | 6.6 |
| Chloroethane | <10 |
| 1,1-Dichloroethene | <10 |
| Methylene chloride | <50 |
| trans-1,2-Dichloroethene | <10 |
| 1,1-Dichloroethane | <10 |
| cis-1,2-Dichloroethene | 290 |
| 1,2-Dichloroethane (EDC) | <10 |
| 1,1,1-Trichloroethane | <10 |
| Trichloroethene | 120 |
| Tetrachloroethene | 110 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-16D-081115 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/11/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 508174-10 |
| Date Analyzed: | 08/13/15 | Data File: | 081309.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 101 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 1.1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 10 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/12/15 | Lab ID: | 05-1576 mb |
| Date Analyzed: | 08/12/15 | Data File: | 081220.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 508151-02 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 100 | 69-134 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 79 | 94 | 63-142 | 17 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 508174-10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 3.36 | 96 | 93 | 60-150 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 100 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 508151-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 20.4 | 98 | 111 | 60-150 | 12 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 95 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 508174-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | <0.2 | 111 | 36-166 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 137 | 46-160 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | <1 | 111 | 60-136 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 105 | 67-132 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 108 | 72-129 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 106 | 70-128 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 105 | 71-127 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 109 | 69-133 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | <1 | 119 | 60-146 |
| Benzene | ug/L (ppb) | 50 | <0.35 | 101 | 76-125 |
| Trichloroethene | ug/L (ppb) | 50 | 4.7 | 103 | 66-135 |
| Toluene | ug/L (ppb) | 50 | <1 | 94 | 76-122 |
| Tetrachloroethene | ug/L (ppb) | 50 | <1 | 97 | 10-226 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 96 | 69-135 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 98 | 69-135 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 97 | 60-140 |

Date of Report: 08/27/15
Date Received: 08/11/15
Project: HERS Industrial Park, PO 140252, F&BI 508174

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | 104 | 107 | 50-154 | 3 |
| Chloroethane | ug/L (ppb) | 50 | 129 | 132 | 58-146 | 2 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 108 | 112 | 67-136 | 4 |
| Methylene chloride | ug/L (ppb) | 50 | 106 | 108 | 39-148 | 2 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 104 | 109 | 68-128 | 5 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 105 | 107 | 79-121 | 2 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 103 | 106 | 80-123 | 3 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 106 | 108 | 73-132 | 2 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 113 | 116 | 83-130 | 3 |
| Benzene | ug/L (ppb) | 50 | 99 | 102 | 69-134 | 3 |
| Trichloroethene | ug/L (ppb) | 50 | 103 | 105 | 80-120 | 2 |
| Toluene | ug/L (ppb) | 50 | 93 | 93 | 72-122 | 0 |
| Tetrachloroethene | ug/L (ppb) | 50 | 96 | 96 | 76-121 | 0 |
| Ethylbenzene | ug/L (ppb) | 50 | 94 | 96 | 77-124 | 2 |
| m,p-Xylene | ug/L (ppb) | 100 | 96 | 98 | 83-125 | 2 |
| o-Xylene | ug/L (ppb) | 50 | 94 | 96 | 81-121 | 2 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

**Am Test Inc.**
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

AMTEST LABORATORIES

***Professional Analytical Services***

Aug 18 2015
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|---|---|---|---|
| MW-2-081115 | Water | 15-A012834 | NUT, MIN |
| MW-12-081115 | Water | 15-A012835 | NUT, MIN |
| MW-18-081115 | Water | 15-A012836 | NUT, MIN |
| MW-16-081115 | Water | 15-A012837 | NUT, MIN |
| MW-160-081115 | Water | 15-A012838 | NUT, MIN |

Your samples were received on Wednesday, August 12, 2015. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 508174
PO Number: D-599

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

**Am Test Inc.**
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

*Professional Analytical Services*

## ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 508174
PO Number: D-599
All results reported on an as received basis.

Date Received: 08/12/15
Date Reported: 8/18/15

---

**AMTEST Identification Number** **15-A012834**
**Client Identification** **MW-2-081115**
**Sampling Date** **08/11/15, 08:40**

### Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 15.6 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

### Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | 8.94 | mg/l | | 0.025 | EPA 300.0 | MR | 08/13/15 |

**AMTEST Identification Number** **15-A012835**
**Client Identification** **MW-12-081115**
**Sampling Date** **08/11/15, 10:45**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 5.76 | mg/l | | 0.1 | EPA 300.0 | MR | 08/14/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | < 0.025 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

**AMTEST Identification Number** **15-A012836**
**Client Identification** **MW-18-081115**
**Sampling Date** **08/11/15, 15:30**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 17.9 | mg/l | | 0.1 | EPA 300.0 | MR | 08/14/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | < 0.025 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

**AMTEST Identification Number** **15-A012837**
**Client Identification** **MW-16-081115**
**Sampling Date** **08/11/15, 13:15**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 11.6 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | < 0.025 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

**AMTEST Identification Number** **15-A012838**
**Client Identification** **MW-160-081115**
**Sampling Date** **08/11/15, 12:10**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 19.4 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | < 0.025 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

Aaron W. Young
Laboratory Manager

**Am Test Inc.**
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

*Professional Analytical Services*

**QC Summary for sample numbers: 15-A012834 to 15-A012838**

## DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|---|---|---|---|---|---|
| 15-A012838 | Nitrate | mg/l | < 0.025 | < 0.025 | |
| 15-A012634 | Sulfate | mg/l | 2.76 | 2.42 | 13. |
| 15-A012838 | Sulfate | mg/l | 19.4 | 18.5 | 4.7 |
| 15-A012849 | Sulfate | mg/l | 1.02 | 0.88 | 15. |

## MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|---|---|---|---|---|---|---|
| 15-A012634 | Sulfate | mg/l | 2.76 | 5.06 | 2.00 | 115.00 % |
| 15-A012838 | Sulfate | mg/l | 19.4 | 32.2 | 12.0 | 106.67 % |
| 15-A012849 | Sulfate | mg/l | 1.02 | 3.23 | 2.00 | 110.50 % |

## STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|---|---|---|---|---|
| Nitrate | mg/l | 2.00 | 1.97 | 98.5 % |
| Nitrate | mg/l | 2.00 | 1.96 | 98.0 % |
| Sulfate | mg/l | 2.00 | 2.07 | 104. % |
| Sulfate | mg/l | 2.00 | 2.03 | 102. % |

## BLANKS

| ANALYTE | UNITS | RESULT |
|---|---|---|
| Nitrate | mg/l | < 0.025 |
| Nitrate | mg/l | < 0.025 |
| Sulfate | mg/l | < 0.1 |
| Sulfate | mg/l | < 0.1 |
| Sulfate | mg/l | < 0.1 |

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER

| PROJECT NAME/NO. | PO # |
|---|---|
| 508174 | D-599 |

REMARKS

Please Email Results

Page # _____ of _____

TURNAROUND TIME
- ☑ Standard (2 Weeks)
- ☐ RUSH _____

Rush charges authorized by: _____

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Matrix | # of jars | Dioxins and Furans by 8290 | EPH | VPH | Nitrate | Sulfate | Alkalinity | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-2-081115 | | 8/11/15 | 0840 | | | | | | ✓ | ✓ | | | | | | |
| MW-12-081115 | | | 1045 | | | | | | ✓ | ✓ | ✓ | | | | | |
| MW-18-081115 | | | 1530 | | | | | | ✓ | ✓ | ✓ | | | | | |
| MW-16-081115 | | | 1315 | | | | | | ✓ | ✓ | ✓ | | | | | |
| MW-16D-081115 | | | 1210 | | | | | | ✓ | ✓ | ✓ | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | T=12.9 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |


*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*


| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | ~~Michael Erdahl~~ | Friedman & Bruya | 8/12 | 845 |
| Received by: | ~~Amt~~ Heidi | AmTest | 8/12/15 | 10:46 |
| Relinquished by: | | | | |
| Received by: | | | | |

P-6

courier

508174

# SAMPLE CHAIN OF CUSTODY

ME 08/11/15

A05/A15/V4

Page # 1 of

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave S, Ste 201

City, State, ZIP Seattle 98104

Phone # _____ Fax # _____

SAMPLERS (signature) Matthew M. Lewis

PROJECT NAME/NO. HERS Industrial Park 140252

PO#

REMARKS
Chlorinated VOCs only
Arsenic Only

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | Dissolved Metals Arsenic Only | Total Metals Arsenic Only | Sulfate | Nitrate | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-2-081115 | 01A-H | 081115 | 0840 | Water | 8 | X | X | | X | | | X | X | X | X | | | Chlorinated VOCs only |
| MW-6-081115 | 02A-G | | 0920 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-7-081115 | 03 | | 1005 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-8-081115 | 04 | | 0905 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-9-081115 | 05 | | 0955 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-12-081115 | 06A-H | | 1045 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-19-081115 | 07A-G | | 1135 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-18-081115 | 08 | | 1530 | | ~~8~~ 7 4WB | X | X | | X | | | X | X | X | X | | | |
| MW-16-081115 | 09A-H | | 1315 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-16D-081115 | 10 | | 1210 | | 8 | X | X | | X | | | X | X | X | X | | | |


*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*


| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M. Lewis | Matthew M. Lewis | Aspect | 8/11/15 | 1710 |
| Received by: | | | 8/11/15 | 1710 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 4 °C | | |

FORM\SCOC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 27, 2015

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on August 10, 2015 from the HERS Industrial Park, PO 140252, F&BI 508151 project. There are 43 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Parker Wittman
ASP0827R.DOC

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## CASE NARRATIVE

This case narrative encompasses samples received on August 10, 2015 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC HERS Industrial Park, PO 140252 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Aspect Consulting, LLC |
|---|---|
| 508151 -01 | MW-1-081015 |
| 508151 -02 | MW-10-081015 |
| 508151 -03 | MW-11-081015 |
| 508151 -04 | MW-15-081015 |
| 508151 -05 | MW-2D-081015 |
| 508151 -06 | MW-17-081015 |
| 508151 -07 | MW-20-081015 |
| 508151 -08 | MW-21-081015 |
| 508151 -09 | MW-22-081015 |

Samples MW-10-081015, MW-11-081015, MW-2D-081015, and MW-21-081015 were sent to Amtest for sulfate and nitrate analyses. The report generated by Amtest is enclosed.

All quality control requirements were acceptable.

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151
Date Extracted: 08/12/15
Date Analyzed: 08/12/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate (% Recovery)<br>(Limit 51-134) |
|---|---|---|
| MW-1-081015<br>508151-01 | 120 x | 80 |
| MW-10-081015<br>508151-02 | <100 | 81 |
| MW-11-081015<br>508151-03 | 150 x | 80 |
| MW-15-081015<br>508151-04 | <100 | 79 |
| MW-2D-081015<br>508151-05 | <100 | 82 |
| MW-17-081015<br>508151-06 | <100 | 83 |
| MW-20-081015<br>508151-07 | <100 | 80 |
| MW-21-081015<br>508151-08 | 180 x | 83 |
| MW-22-081015<br>508151-09 | <100 | 81 |
| Method Blank<br>05-1613 MB | <100 | 83 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151
Date Extracted: 08/12/15
Date Analyzed: 08/12/15

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 41-152) |
|---|---|---|---|
| MW-1-081015<br>508151-01 | 330 x | <250 | 107 |
| MW-10-081015<br>508151-02 | 140 x | <250 | 103 |
| MW-11-081015<br>508151-03 | 120 x | <250 | 105 |
| MW-15-081015<br>508151-04 | 300 x | <250 | 94 |
| MW-2D-081015<br>508151-05 | <50 | <250 | 109 |
| MW-17-081015<br>508151-06 | 200 x | <250 | 105 |
| MW-20-081015<br>508151-07 | 64 x | <250 | 105 |
| MW-21-081015<br>508151-08 | 130 x | <250 | 101 |
| MW-22-081015<br>508151-09 | 300 x | <250 | 111 |
| Method Blank<br>05-1654 MB | <50 | <250 | 77 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-1-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-01 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-01.015 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 88 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 22.4 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-10-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-02 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-02.016 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 93 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 4.28 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-11-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-03 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-03.018 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.44 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-15-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-04 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-04.019 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 96 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 29.4 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-2D-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-05 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-05.020 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 90 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 11.4 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-17-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-06 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-06.021 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 38.5 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-20-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-07 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-07.022 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.25 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-21-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-08 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-08.023 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 92 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-22-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-09 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-09.024 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 89 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Total Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | I5-445 mb |
| Date Analyzed: | 08/14/15 | Data File: | I5-445 mb.012 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 95 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-1-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-01 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-01.057 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 84 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 20.4 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-10-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-02 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-02.061 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 83 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.99 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-11-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-03 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-03.062 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 82 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.44 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-15-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-04 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-04.063 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 84 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 28.1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-2D-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-05 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-05.064 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 82 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 3.33 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-17-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-06 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-06.065 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 80 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 39.4 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-20-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-07 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-07.066 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 77 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | 1.24 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-21-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-08 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-08.067 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 78 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | MW-22-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | 508151-09 |
| Date Analyzed: | 08/14/15 | Data File: | 508151-09.068 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 77 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Dissolved Metals By EPA Method 200.8

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | NA | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/13/15 | Lab ID: | I5-446 mb |
| Date Analyzed: | 08/14/15 | Data File: | I5-446 mb.055 |
| Matrix: | Water | Instrument: | ICPMS1 |
| Units: | ug/L (ppb) | Operator: | SP |

| Internal Standard: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Indium | 90 | 60 | 125 |

| Analyte: | Concentration ug/L (ppb) |
|---|---|
| Arsenic | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-1-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-01 |
| Date Analyzed: | 08/11/15 | Data File: | 081116.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 4.0 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | 1.8 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 6.9 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | 1.7 |
| Trichloroethene | 220 ve |
| Tetrachloroethene | 5.3 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-1-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-01 1/10 |
| Date Analyzed: | 08/11/15 | Data File: | 081123.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <3.5 |
| Toluene | <10 |
| Ethylbenzene | <10 |
| m,p-Xylene | <20 |
| o-Xylene | <10 |
| Vinyl chloride | 3.5 |
| Chloroethane | <10 |
| 1,1-Dichloroethene | <10 |
| Methylene chloride | <50 |
| trans-1,2-Dichloroethene | <10 |
| 1,1-Dichloroethane | <10 |
| cis-1,2-Dichloroethene | <10 |
| 1,2-Dichloroethane (EDC) | <10 |
| 1,1,1-Trichloroethane | <10 |
| Trichloroethene | 200 |
| Tetrachloroethene | <10 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-10-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-02 |
| Date Analyzed: | 08/11/15 | Data File: | 081117.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | 3.2 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-11-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-03 |
| Date Analyzed: | 08/11/15 | Data File: | 081118.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 1.3 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | 2.2 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 66 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | 1.4 |
| Trichloroethene | 190 ve |
| Tetrachloroethene | 69 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-11-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-03 1/10 |
| Date Analyzed: | 08/11/15 | Data File: | 081124.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <3.5 |
| Toluene | <10 |
| Ethylbenzene | <10 |
| m,p-Xylene | <20 |
| o-Xylene | <10 |
| Vinyl chloride | <2 |
| Chloroethane | <10 |
| 1,1-Dichloroethene | <10 |
| Methylene chloride | <50 |
| trans-1,2-Dichloroethene | <10 |
| 1,1-Dichloroethane | <10 |
| cis-1,2-Dichloroethene | 64 |
| 1,2-Dichloroethane (EDC) | <10 |
| 1,1,1-Trichloroethane | <10 |
| Trichloroethene | 190 |
| Tetrachloroethene | 66 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-15-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-04 |
| Date Analyzed: | 08/11/15 | Data File: | 081122.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 0.96 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | 1.5 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | 5.8 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-2D-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-05 |
| Date Analyzed: | 08/11/15 | Data File: | 081120.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 104 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-17-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-06 |
| Date Analyzed: | 08/11/15 | Data File: | 081125.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 57 | 121 |
| Toluene-d8 | 104 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-20-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-07 |
| Date Analyzed: | 08/11/15 | Data File: | 081126.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 105 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | 25 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-21-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-08 |
| Date Analyzed: | 08/11/15 | Data File: | 081127.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 101 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | 1.3 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | 2.9 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | 1.5 |
| cis-1,2-Dichloroethene | 55 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | 2.2 |
| Trichloroethene | 290 ve |
| Tetrachloroethene | 85 |

# FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-21-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-08 1/10 |
| Date Analyzed: | 08/12/15 | Data File: | 081213.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 103 | 63 | 127 |
| 4-Bromofluorobenzene | 98 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <3.5 |
| Toluene | <10 |
| Ethylbenzene | <10 |
| m,p-Xylene | <20 |
| o-Xylene | <10 |
| Vinyl chloride | <2 |
| Chloroethane | <10 |
| 1,1-Dichloroethene | <10 |
| Methylene chloride | <50 |
| trans-1,2-Dichloroethene | <10 |
| 1,1-Dichloroethane | <10 |
| cis-1,2-Dichloroethene | 53 |
| 1,2-Dichloroethane (EDC) | <10 |
| 1,1,1-Trichloroethane | <10 |
| Trichloroethene | 280 |
| Tetrachloroethene | 81 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | MW-22-081015 | Client: | Aspect Consulting, LLC |
| Date Received: | 08/10/15 | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 508151-09 |
| Date Analyzed: | 08/11/15 | Data File: | 081128.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 101 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 99 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

## Analysis For Volatile Compounds By EPA Method 8260C

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Aspect Consulting, LLC |
| Date Received: | Not Applicable | Project: | HERS Industrial Park, PO 140252 |
| Date Extracted: | 08/11/15 | Lab ID: | 05-1574 mb |
| Date Analyzed: | 08/11/15 | Data File: | 081113.D |
| Matrix: | Water | Instrument: | GCMS4 |
| Units: | ug/L (ppb) | Operator: | JS |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | 57 | 121 |
| Toluene-d8 | 102 | 63 | 127 |
| 4-Bromofluorobenzene | 100 | 60 | 133 |

| Compounds: | Concentration ug/L (ppb) |
|---|---|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |
| Vinyl chloride | <0.2 |
| Chloroethane | <1 |
| 1,1-Dichloroethene | <1 |
| Methylene chloride | <5 |
| trans-1,2-Dichloroethene | <1 |
| 1,1-Dichloroethane | <1 |
| cis-1,2-Dichloroethene | <1 |
| 1,2-Dichloroethane (EDC) | <1 |
| 1,1,1-Trichloroethane | <1 |
| Trichloroethene | <1 |
| Tetrachloroethene | <1 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 508151-02 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | ug/L (ppb) | 1,000 | 100 | 69-134 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 79 | 94 | 63-142 | 17 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 508174-10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 3.36 | 96 | 93 | 60-150 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 100 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 508151-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 20.4 | 98 | 111 | 60-150 | 12 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | ug/L (ppb) | 10 | 95 | 80-111 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 508151-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Acceptance Criteria |
|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | 4.0 | 102 | 36-166 |
| Chloroethane | ug/L (ppb) | 50 | <1 | 128 | 46-160 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 1.8 | 107 | 60-136 |
| Methylene chloride | ug/L (ppb) | 50 | <5 | 102 | 67-132 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | <1 | 105 | 72-129 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | <1 | 103 | 70-128 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 6.9 | 104 | 71-127 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | <1 | 107 | 69-133 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 1.7 | 115 | 60-146 |
| Benzene | ug/L (ppb) | 50 | <0.35 | 99 | 76-125 |
| Trichloroethene | ug/L (ppb) | 50 | 220 | 105 b | 66-135 |
| Toluene | ug/L (ppb) | 50 | <1 | 94 | 76-122 |
| Tetrachloroethene | ug/L (ppb) | 50 | 5.3 | 97 | 10-226 |
| Ethylbenzene | ug/L (ppb) | 50 | <1 | 96 | 69-135 |
| m,p-Xylene | ug/L (ppb) | 100 | <2 | 98 | 69-135 |
| o-Xylene | ug/L (ppb) | 50 | <1 | 96 | 60-140 |

Date of Report: 08/27/15
Date Received: 08/10/15
Project: HERS Industrial Park, PO 140252, F&BI 508151

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Vinyl chloride | ug/L (ppb) | 50 | 97 | 102 | 50-154 | 5 |
| Chloroethane | ug/L (ppb) | 50 | 120 | 127 | 58-146 | 6 |
| 1,1-Dichloroethene | ug/L (ppb) | 50 | 101 | 105 | 67-136 | 4 |
| Methylene chloride | ug/L (ppb) | 50 | 99 | 104 | 39-148 | 5 |
| trans-1,2-Dichloroethene | ug/L (ppb) | 50 | 100 | 103 | 68-128 | 3 |
| 1,1-Dichloroethane | ug/L (ppb) | 50 | 99 | 103 | 79-121 | 4 |
| cis-1,2-Dichloroethene | ug/L (ppb) | 50 | 99 | 103 | 80-123 | 4 |
| 1,2-Dichloroethane (EDC) | ug/L (ppb) | 50 | 101 | 107 | 73-132 | 6 |
| 1,1,1-Trichloroethane | ug/L (ppb) | 50 | 108 | 113 | 83-130 | 5 |
| Benzene | ug/L (ppb) | 50 | 94 | 97 | 69-134 | 3 |
| Trichloroethene | ug/L (ppb) | 50 | 98 | 103 | 80-120 | 5 |
| Toluene | ug/L (ppb) | 50 | 89 | 92 | 72-122 | 3 |
| Tetrachloroethene | ug/L (ppb) | 50 | 92 | 95 | 76-121 | 3 |
| Ethylbenzene | ug/L (ppb) | 50 | 91 | 95 | 77-124 | 4 |
| m,p-Xylene | ug/L (ppb) | 100 | 93 | 96 | 83-125 | 3 |
| o-Xylene | ug/L (ppb) | 50 | 91 | 94 | 81-121 | 3 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

**Am Test Inc.**
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

***Professional Analytical Services***

Aug 18 2015
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|---|---|---|---|
| MW-10-081015 | Water | 15-A012830 | NUT, MIN |
| MW-11-081015 | Water | 15-A012831 | NUT, MIN |
| MW-2D-081015 | Water | 15-A012832 | NUT, MIN |
| MW-21-081015 | Water | 15-A012833 | NUT, MIN |

Your samples were received on Wednesday, August 12, 2015. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's). as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 508151
PO Number: D-599

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

**Am Test Inc.**
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

*Professional Analytical Services*

## ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 508151
PO Number: D-599
All results reported on an as received basis.

Date Received: 08/12/15
Date Reported: 8/18/15

---

**AMTEST Identification Number** **15-A012830**
**Client Identification** **MW-10-081015**
**Sampling Date** **08/10/15, 14:00**

### Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 20.4 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

### Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | < 0.025 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

**AMTEST Identification Number** **15-A012831**
**Client Identification** **MW-11-081015**
**Sampling Date** **08/10/15, 12:40**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 24.2 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | 7.27 | mg/l | | 0.025 | EPA 300.0 | MR | 08/13/15 |

**AMTEST Identification Number** **15-A012832**
**Client Identification** **MW-2D-081015**
**Sampling Date** **08/10/15, 10:55**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 22.1 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | 1.51 | mg/l | | 0.025 | EPA 300.0 | MR | 08/12/15 |

**AMTEST Identification Number** **15-A012833**
**Client Identification** **MW-21-081015**
**Sampling Date** **08/10/15, 11:30**

## Minerals

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Sulfate | 18.4 | mg/l | | 0.1 | EPA 300.0 | MR | 08/13/15 |

## Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|---|---|---|---|---|---|---|---|
| Nitrate | 7.54 | mg/l | | 0.025 | EPA 300.0 | MR | 08/13/15 |

Aaron W. Young
Laboratory Manager

**Am Test Inc.**
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

***Professional Analytical Services***

**QC Summary for sample numbers: 15-A012830 to 15-A012833**

## DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|---|---|---|---|---|---|
| 15-A012838 | Nitrate | mg/l | < 0.025 | < 0.025 | |
| 15-A012634 | Sulfate | mg/l | 2.76 | 2.42 | 13. |
| 15-A012838 | Sulfate | mg/l | 19.4 | 18.5 | 4.7 |
| 15-A012849 | Sulfate | mg/l | 1.02 | 0.88 | 15. |

## MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|---|---|---|---|---|---|---|
| 15-A012634 | Sulfate | mg/l | 2.76 | 5.06 | 2.00 | 115.00 % |
| 15-A012838 | Sulfate | mg/l | 19.4 | 32.2 | 12.0 | 106.67 % |
| 15-A012849 | Sulfate | mg/l | 1.02 | 3.23 | 2.00 | 110.50 % |

## STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|---|---|---|---|---|
| Nitrate | mg/l | 2.00 | 1.97 | 98.5 % |
| Nitrate | mg/l | 2.00 | 1.96 | 98.0 % |
| Sulfate | mg/l | 2.00 | 2.07 | 104. % |

## BLANKS

| ANALYTE | UNITS | RESULT |
|---|---|---|
| Nitrate | mg/l | < 0.025 |
| Nitrate | mg/l | < 0.025 |
| Sulfate | mg/l | < 0.1 |

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Amtest
PROJECT NAME/NO. 508151
PO # D-599
REMARKS
Please Email Results
c.c. cyoung@friedmanandbruya.com

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Matrix | # of jars | Dioxins and Furans by 8290 | EPH | VPH | Nitrate | Sulfate | Alkalinity | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-10-081015 | 12830 | 8/10/15 | 1400 | water | 1 | | | | X | X | | | | | | |
| MW-11-081015 | 831 | " | 1240 | " | 1 | | | | X | X | | | | | | |
| MW-2D-081015 | 832 | " | 1055 | " | 1 | | | | X | X | | | | | | |
| MW-21-081015 | 833 | " | 1130 | " | 1 | | | | X | X | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | T=11.2°C |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Michael Erdahl | Friedman & Bruya | 8/12/15 | 0800 |
| Received by: | Heidi | AmTest | 8/12/15 | 10:41a |
| Relinquished by: | | | | |
| Received by: | | | | |

Courier

508151

# SAMPLE CHAIN OF CUSTODY

ME 08/10/15 AIS/AUS/VS

Page # 1 of 1

Send Report To Alan Noell
Company Aspect Consulting, LLC
Address 401 2nd Ave S, Ste 201
City, State, ZIP Seattle 98104
Phone # _____ Fax # _____

SAMPLERS (signature) Matthew M Lewis
PROJECT NAME/NO. HERS Industrial Park 140252
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH _____
Rush charges authorized by _____

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | ANALYSES REQUESTED: TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by8260 | SVOCs by 8270 | HFS | Total Metals Arsenic only | Dissolved Metals Arsenic only | Sulfate | Nitrate | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1-081015 | 01A-G | 08/10/15 | 1505 | Water | 7 | X | X | | X | | | X | X | | | | | chlorinated VOCs only |
| MW-10-081015 | 02A-H | | 1400 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-11-081015 | 03A-H | | 1240 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-15-081015 | 04A-G | | 1500 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-2D-081015 | 05A-H | | 1055 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-17-081015 | 06A-G | | 1410 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-20-081015 | 07A-G | | 1225 | | 7 | X | X | | X | | | X | X | | | | | |
| MW-21-081015 | 08A-H | | 1130 | | 8 | X | X | | X | | | X | X | X | X | | | |
| MW-22-081015 | 09A-G | | 1320 | | 7 | X | X | | X | | | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Matthew M Lewis | Matthew M Lewis | Aspect | 8/10/15 | 1650 |
| Received by: David | David | FedEx | 11 | 16:50 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 4 °C | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*