Site Assessment

WSDOT—Union Gap Facility Release Investigation
Former Service Station CSID #4942
Union Gap, Washington

for
Washington State Department of Transportation

September 27, 2023

GeoEngineers
Earth Science + Technology

Site Assessment

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GeoEngineers

523 East Second Avenue
Spokane, Washington 99202
509.363.3125

Site Assessment

WSDOT – Union Gap Facility Release Investigation
Former Service Station CSID #4942
Union Gap, Washington

File No. 0180-429-00

September 27, 2023

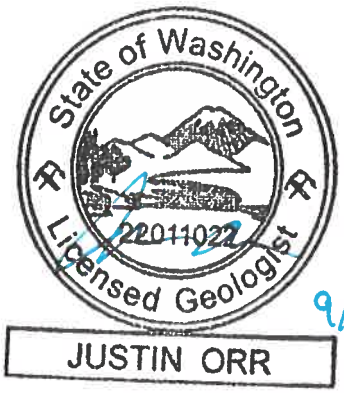
Prepared for:

Washington State Department of Transportation
310 Maple Park Avenue
Olympia, Washington 98504

Attention: Matt Cox, Dangerous/Hazardous Waste Compliance Manager

Prepared by:

GeoEngineers, Inc.
523 East Second Avenue
Spokane, Washington 99202
509.363.3125



9/27/2023

Justin D. Orr, LG
Staff Geologist

Phil D. Welker, PE
Principal Environmental Engineer

JDO:PDW:leh

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

This report describes soil assessment activities conducted at the Washington State Department of Transportation (WSDOT) – Union Gap Facility, Former Service Station (herein referred to as "site") located at 2809 Rudkin Road in Union Gap, Washington, as shown in the attached Vicinity Map, Figure 1. The Washington State Department of Ecology (Ecology) reference numbers for this site include Facility Site ID (FSID) #541 and Cleanup Site ID (CSID) #4942.

This assessment report has been prepared by GeoEngineers, Inc. (GeoEngineers) for WSDOT under WSDOT Agreement Number Y-12778. The purpose of this assessment was to determine if contamination related to the historical release related to a decommissioned underground storage tank (UST) at the site is present in soil, and to assess the magnitude of contamination if present. Data generated from this assessment will support a no further action (NFA) determination or planning potential remedial actions within the defined project area to address ecological and human health risks associated with the contamination.

2.0 SITE DESCRIPTION AND BACKGROUND

The WSDOT – Union Gap facility is located at 2809 Rudkin Road in Union Gap, Washington. Limited historical information identifies the site as a WSDOT facility at least to the 1980s. The site is currently occupied by WSDOT maintenance and administration facilities and is developed with multiple structures in use by WSDOT, as well as asphalt parking lots and roads and an unpaved equipment yard. The site is bounded to the north by a vacant lot and commercial properties, to the south by East Ahtanum Road and residential properties, to the east by Highway 82 and the Yakima River, and to the west by Rudkin Road and commercial and residential properties. Site features are shown in Site Plan, Figure 2.

2.1. Previous Investigations

Ecology issued the memorandum: *Comments on the three historical areas of concern (AOC) at the facility* on June 28, 2022, detailing the historical releases at the site, including three USTs decommissioned near the former service station in 1989, two USTs and an aboveground storage tank (AST) removed from the boiler building in 1992, and remediation of a xylene release in the former sign shop building in 2003 and 2004 (Ecology 2022). The Former Service Station historical release is detailed below. Other releases were investigated and reported to WSDOT under separate cover.

2.1.1. Former Service Station UST Decommissioning

Three USTs were removed in 1989. The tanks contained gasoline and diesel and were associated with the former service station at the site. A waste oil AST located at the south side of the former service station is mentioned in association with this decommissioning; however, the waste oil AST was not decommissioned.

Analytical results obtained during the decommissioning were reported as total petroleum hydrocarbons (TPH) and not as gasoline or diesel fuel (TPH-Gx or TPH-Dx). One soil sample (soil sample #3) was greater than the Washington Model Toxics Control Act (MTCA) generic TPH cleanup level of 1,500 milligrams per kilogram (mg/kg). Volatile organic compounds (VOCs) were also analyzed and were less than their respective MTCA Method A cleanup levels. Monitoring wells near the USTs were sampled for four quarters following the UST decommissioning; TPH-Gx, TPH-Dx and VOC concentrations were either not detected or were detected below their respective cleanup levels.

Ecology determined that an empirical demonstration shows that groundwater is not impacted by the petroleum release. Ecology requested collection of new soil samples in the vicinity of soil sample #3 near the southwest corner of the maintenance building to confirm if petroleum contamination is still present at the site (Ecology 2022). The release associated with the Former Service Station is designated CSID #4942.

3.0 FIELD INVESTIGATION ACTIVITIES

GeoEngineers advanced soil borings, collected soil samples from the borings and submitted the samples for chemical analysis to assess soil conditions for potential contamination associated with the historic release of diesel fuel from the ASTs.

The following sections describe field activities including advancing sonic soil borings, collection of soil samples, and a discussion of observed subsurface conditions. Based on site conditions, some modifications to the Work Plan (GeoEngineers 2023) were implemented as explained in the sections below.

3.1. Soil Assessment

Initial site reconnaissance occurred on June 19, 2023. During these site visits, site access was assessed, and potential boring locations were marked. Site utilities located near the boring locations were identified and marked by Utilities Plus on July 5, 2023. Boring locations are shown in Figure 2. The boring locations were adjusted from the proposed locations in the Work Plan to avoid conflicts with underground utilities.

Anderson Environmental Contracting, LLC (AEC) advanced three borings (FSD-B1 through FSD-B3) on July 7, 2023, with a sonic drill rig. Boring logs are included in Appendix A, Boring Logs. The soil borings were advanced to 15 feet below ground surface (bgs) instead of 20 feet bgs as described in the Work Plan because groundwater was encountered at approximately 11 feet bgs.

Soil samples recovered from the borings were field screened for petroleum contamination. Field screening results are included in the boring logs (Appendix A). Volatile organic vapors, measured using a photoionization detector (PID), ranged between 0 parts per million (ppm) and 2.4 ppm, and no sheens, odors or staining were observed.

AEC backfilled the borings with bentonite chips and completed the borings with cold-patch asphalt to match the existing ground surface.

3.2. Subsurface Conditions

Soil samples recovered from FSD-B1 through FSD-B3 indicate the subsurface soil profile described below.

- FSD-B1: Approximately 4 feet of concrete debris (fill material), with native silty gravel and sand with trace silt to 15 feet bgs.
- FSD-B2: Approximately 3 feet of road base (gravel with silt) and concrete debris from 3 feet bgs to 11 feet bgs. Native silty gravel was observed from 11 feet bgs to 15 feet bgs.
- FSD-B3: Approximately 3 feet of road base (gravel with silt) underlain by silty gravel fill material to 10 feet bgs. Concrete debris was observed from 10 to 12 feet bgs. Native gravel with silt was observed from 12 to 15 feet bgs.
- Groundwater was encountered at approximately 11 feet bgs in the borings.

3.3. Investigation-Derived Waste (IDW)

Soil cuttings from the borings were placed in a 55-gallon drum, labeled and stored near WSDOT's drum storage and disposal area in the northeast portion of the facility per WSDOT's request, pending analysis and disposal. Able Cleanup Technologies (ACT) collected the IDW on August 22, 2023, and disposed of the IDW at Waste Management's Graham Road Landfill in Spokane, Washington on August 25, 2023. ACT's disposal manifest is included in Appendix B, IDW Disposal Documentation.

4.0 CHEMICAL ANALYTICAL RESULTS

Three soil samples and one duplicate sample were submitted to OnSite Environmental, Inc. (OnSite) for chemical analysis. The laboratory analytical report and a data validation report are included in Appendix C, Chemical Analytical Laboratory Reports and Data Validation. The samples were analyzed for the following contaminants of concern (COCs):

- Gasoline-range petroleum hydrocarbons (GRPH) using Northwest Method NWTPH-Gx;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) using Environmental Protection Agency (EPA) Method 8260D; and
- Diesel- and oil-range petroleum hydrocarbons (DRPH and ORPH, respectively) using Northwest Method NWTPH-Dx.

Soil chemical analytical results are presented and compared to the MTCA Method A cleanup levels for unrestricted land use in Table 1, Chemical Analytical Results – Soil. COCs were either not detected or were detected at concentrations less than their respective MTCA Method A cleanup levels[1].

5.0 CONCLUSIONS AND RECOMMENDATIONS

Three sonic soil borings were advanced on July 7, 2023, at the WSDOT – Union Gap Facility, Former Service Station site located at 2809 Rudkin Road in Union Gap, Washington. Soil samples were collected from the borings. COCs were either not detected or were detected at concentrations less than their respective MTCA Method A cleanup levels.

5.1. Terrestrial Ecological Evaluation

A terrestrial ecological evaluation (TEE) is required by MTCA unless an exclusion under Washington Administrative Code (WAC) 173-340-7491(1)(a) through (d) applies to the site. A TEE determines whether a release of hazardous substances to soil may pose a threat to the terrestrial environment, characterizes threats to terrestrial plants and animals, and establishes cleanup standards for the protection of terrestrial plants and animals.

[1] The laboratory PQL for GRPH in FSD-B2 was greater than the MTCA Method A cleanup level for GRPH when benzene is present. However, based on the BTEX results for FSD-B2 (benzene was detected but at an order of magnitude less than the MTCA Method A cleanup level) and the GRPH and BTEX results for FSD-B1 and FSD-B3, the GRPH soil concentration in FSD-B2 is expected to be well below 30 milligrams per kilogram (mg/kg) and likely less than 5.2 mg/kg, which is the highest PQL from samples FSD-B1 and FSD-B3.

The site is in a commercial area near a major highway. The entire site is covered with paved drive and parking areas and will continue to be covered in the future. The site qualifies for an exclusion because, per WAC 173-340-7491(1)(c)(i), there is less than 1.5 acres of contiguous undeveloped land on the site or within 500 feet of the site. Based on this exclusion, no further evaluation is required.

5.2. Recommendations

Based on the results of this soil assessment, contamination related to the historic release from the decommissioned UST is not present at the site. We recommend that the site receive a NFA determination from Ecology.

6.0 LIMITATIONS

We have prepared this report for the exclusive use of WSDOT and their authorized agents.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgement and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix D, Report Limitations and Guidelines for Use, for additional information pertaining to this report.

7.0 REFERENCES

GeoEngineers, Inc. 2023. "Final Work Plan, WSDOT Union Gap Facility Release Investigation, Union Gap, Washington." July 3, 2023. File No. 0180-429-00.

Washington Department of Ecology. 2013. "Model Toxics Control Act Regulation and Statute, Chapter 173-340 WAC and 70.105D RCW." Revised 2013, Publication 94-06.

Washington Department of Ecology. 2022. "Comments on the three historical areas of concern (AOC) at the facility." June 28, 2022.

TABLES

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Table 1

Chemical Analytical Results - Soil[1]

WSDOT - Union Gap Facility (Former Service Station CSID #4942)

Union Gap, Washington

			Location ID	FSD-B1		FSD-B2		FSD-B3	
			Sample Depth (feet bgs)	4 to 5		11 to 12		5 to 6	
			Sample Date	7/7/2023		7/7/2023		7/7/2023	
Method	**Analyte**	**MTCA CUL[5]**	**Units**						
NWTPH-Gx[2]	GRPH	30/100[6]	mg/kg	5.1	U	41	U	5.2	U
NWTPH-Dx[3]	DRPH	2,000	mg/kg	28	U	29	U	130	U
	ORPH		mg/kg	55	U	57	U	**1,000**	
VOCs[4]	Benzene	0.03	mg/kg	**0.0021**		**0.0027**		0.0010	U
	Toluene	7	mg/kg	0.0051	U	**0.0052**		0.0050	U
	Ethylbenzene	6	mg/kg	0.0010	U	**0.00096**		0.0010	U
	m, p-Xylene	NE	mg/kg	0.0021	U	**0.0026**		0.0020	U
	o-Xylene	NE	mg/kg	0.0010	U	**0.0011**		0.0010	U
	Xylenes (total)	9	mg/kg	0.0031	U	**0.0037**		0.0030	U

Notes

[1]Samples analyzed by OnSite Environmental, Inc. located in Redmond, Washington.

[2]Gasoline-range petroleum hydrocarbons (GRPH) analyzed using Northwest Method NWTPH-Gx.

[3]Diesel- and oil-range petroleum hydrocarbons (DRPH and ORPH, respectively) analyzed using Northwest Method NWTPH-Dx.

[4]Benzene, toluene, ethylbenzene and xylens (BTEX) analyzed using EPA Method 8260D.

[5]MTCA Method A cleanup levels (CUL) for unrestricted land use (CUL).

[6]Gasoline-range hydrocarbons when benzene is present / no detectable benzene.

mg/kg = milligrams per kilogram.

bgs = below ground surface.

NE = not established.

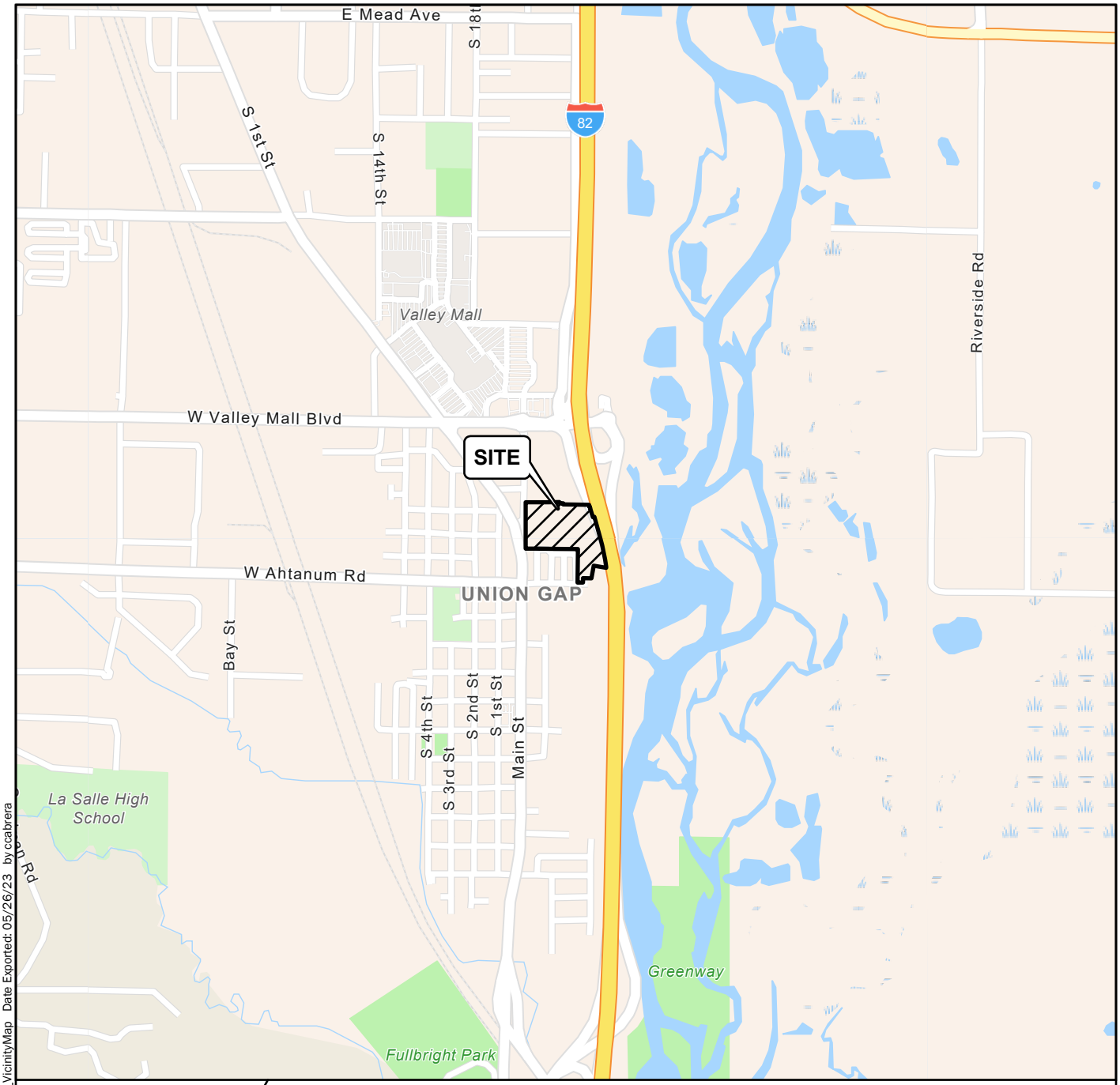
U = analyte was not detected above the laboratory method detection limit (MDL).

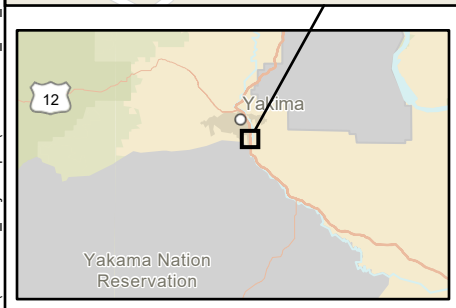
Bold indicates analyte was detected.

Bold with blue shading indicates the analyte was not detected, but the MDL was greater than the MTCA Method A cleanup level.

FIGURES

GeoEngineers





N

0 2,000

Feet

Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Vicinity Map

WSDOT - Union Gap
Union Gap, Washington

GeoEngineers

Figure 1

P:\0\0180429\GIS\0180429_Project\0180429_Project.aprx\018042900_F01_VicinityMap Date Exported: 05/26/23 by ccabrera

Source(s):
- Bing Imagery

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

- GeoEngineers Boring Number and Approximate Location
- Soil Sample 3 (1989)
- Underground Fiber Optic Conduit
- Water
- Sensor Plate
- 1989 UST Removal Excavation

N

0 10

Feet

Site Plan – Former Service Station (CSID #4942)

WSDOT - Union Gap
Union Gap, Washington

GeoEngineers

Figure 2

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APPENDICES

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APPENDIX A
Boring Logs

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel / Dames & Moore (D&M)

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point load test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

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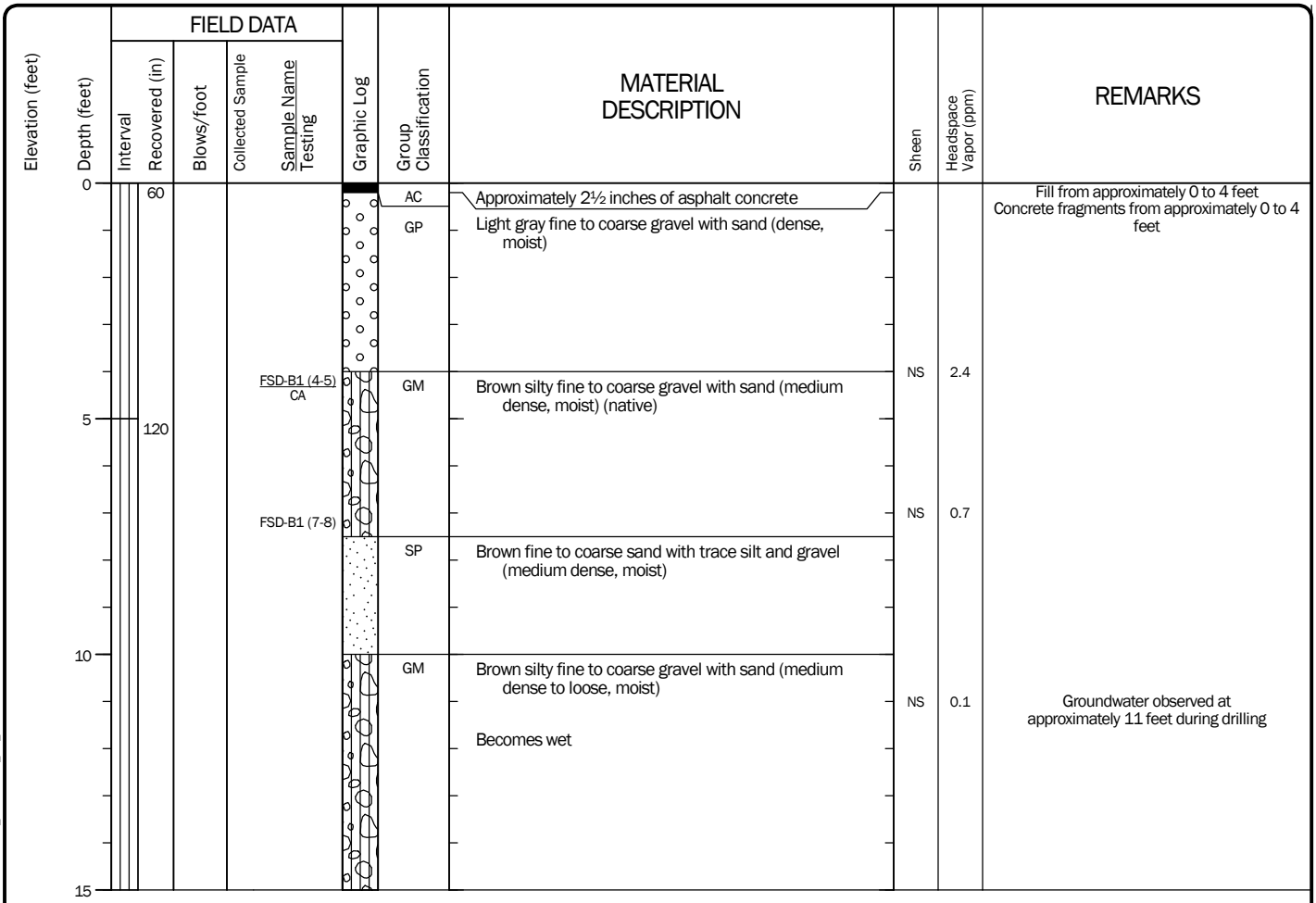
Figure A-1

Drilled Start 7/7/2023 End 7/7/2023	Total Depth (ft) 15	Logged By JDO Checked By PDW	Driller Anderson Environmental Contracting, LLC	Drilling Method Sonic	
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Terrasonic drill rig	
Latitude 46.558828 Longitude -120.474275		System Datum		See "Remarks" section for groundwater observed	
Notes:					



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring FSD-B1

GeoEngineers

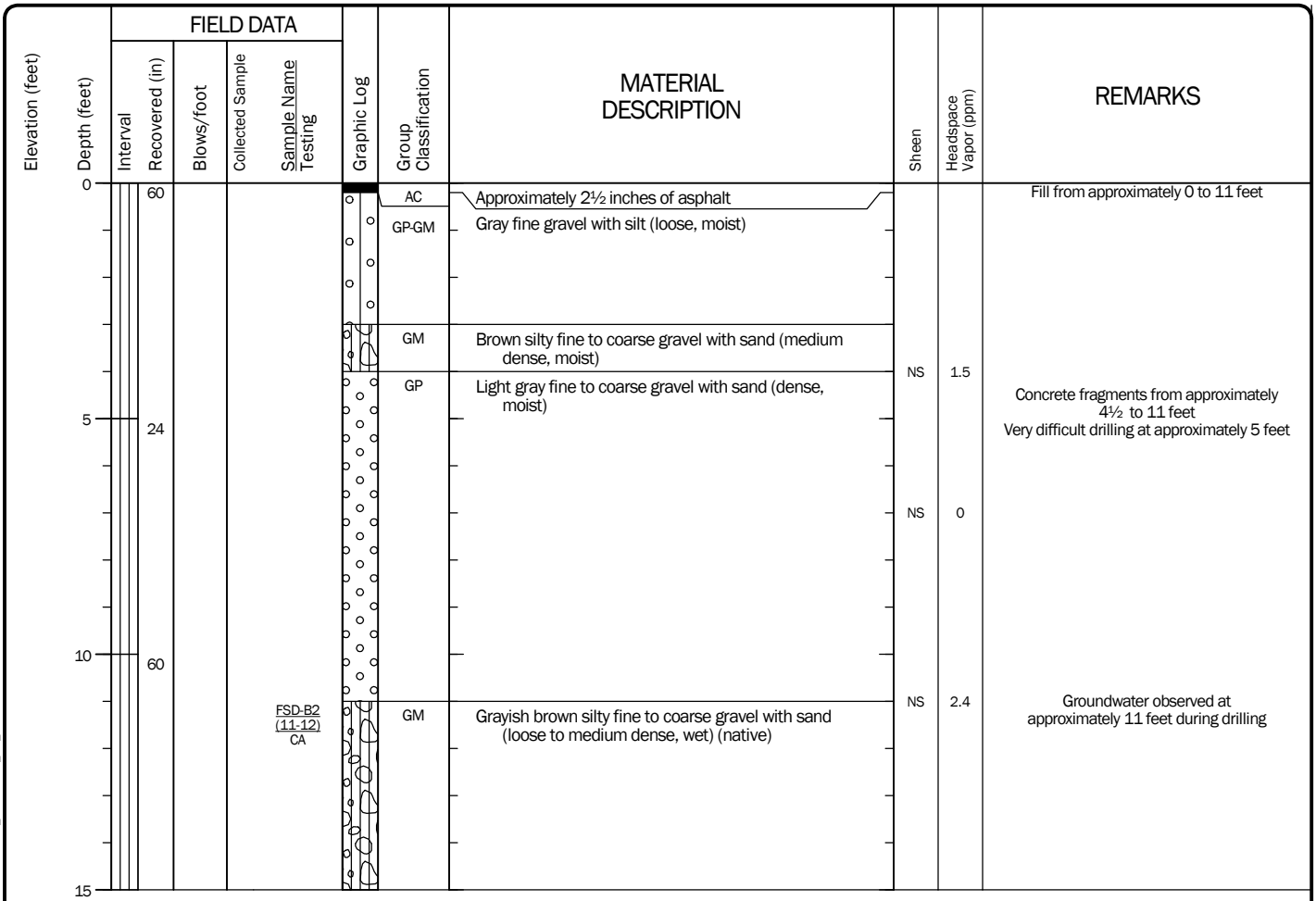
Project: WSDOT Union Gap - Service Station
Project Location: Union Gap, Washington
Project Number: 0180-429-00

Figure A-2
Sheet 1 of 1

Drilled	Start 7/7/2023	End 7/7/2023	Total Depth (ft)	15	Logged By	JDO	Driller	Anderson Environmental Contracting, LLC	Drilling Method	Sonic
					Checked By	PDW				

Surface Elevation (ft) Vertical Datum	Undetermined	Hammer Data	N/A	Drilling Equipment	Terrasonic drill rig
Latitude Longitude	46.558824 -120.474339	System Datum		See "Remarks" section for groundwater observed	

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

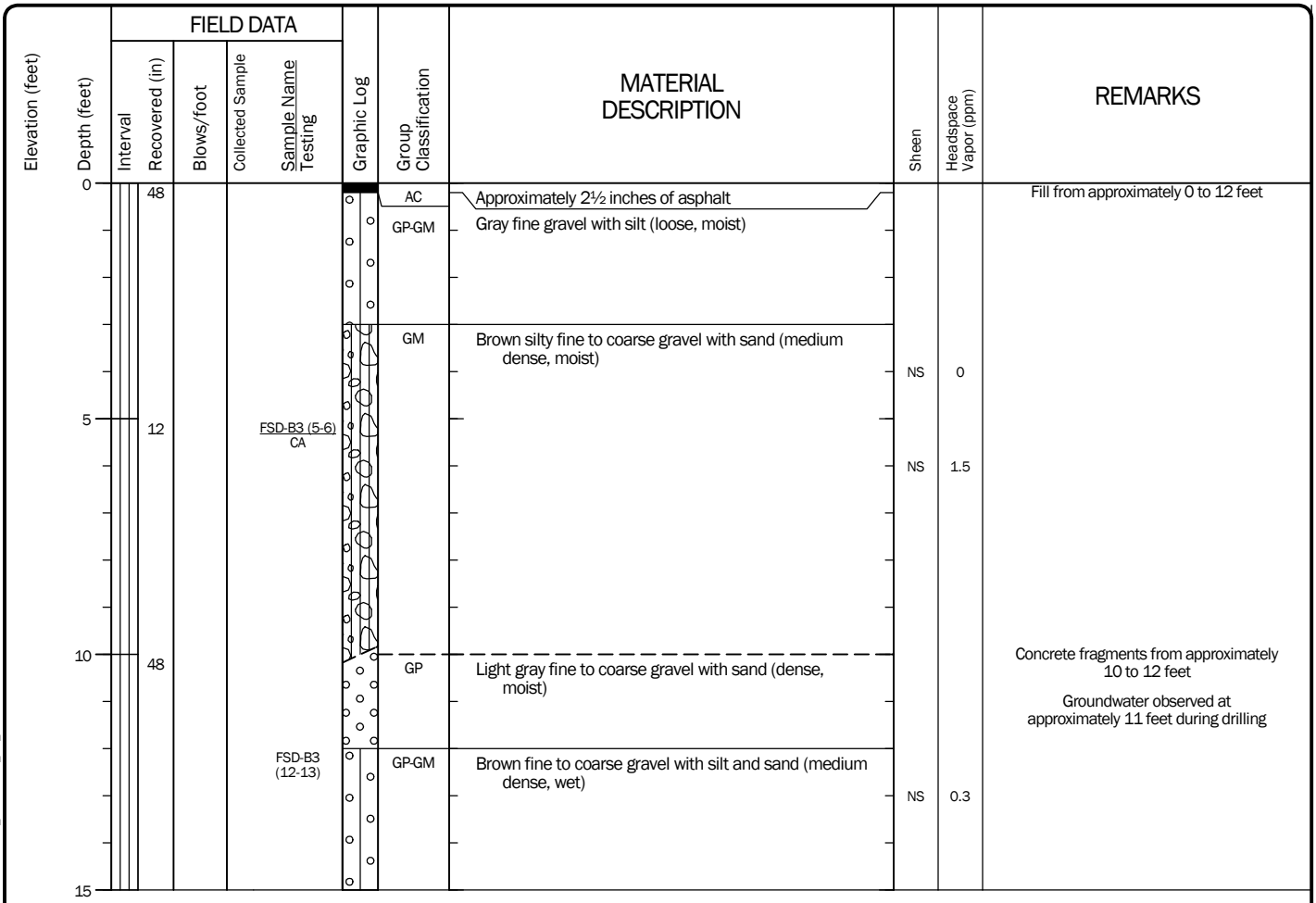
Log of Boring FSD-B2

GeoEngineers

Project: WSDOT Union Gap - Service Station
Project Location: Union Gap, Washington
Project Number: 0180-429-00

Figure A-3
Sheet 1 of 1

Drilled: Start 7/7/2023 End 7/7/2023	Total Depth (ft): 15	Logged By: JDO Checked By: PDW	Driller: Anderson Environmental Contracting, LLC	Drilling Method: Sonic	
Surface Elevation (ft) Vertical Datum: Undetermined		Hammer Data: N/A		Drilling Equipment: Terrasonic drill rig	
Latitude: 46.558823 Longitude: -120.474372		System Datum:		See "Remarks" section for groundwater observed	
Notes:					



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring FSD-B3

GeoEngineers

Project: WSDOT Union Gap - Service Station
Project Location: Union Gap, Washington
Project Number: 0180-429-00

Figure A-4
Sheet 1 of 1

APPENDIX B
IDW Disposal Documentation

Graham Road Facility
1820 S. Graham Road
Medical Lake, WA 99022 Ph: (509)244-0151

Original
Ticket# 702957

Customer Name	ABLECLEAN ABLE CLEAN-UP	Carrier	ABLECLEANUP ABLE CLEANUP TECHNOLOGIE
Ticket Date	08/25/2023	Vehicle#	darren
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	
Route		Check#	
Hauling Ticket#		Billing#	0000726
Destination		Grid	

Manifest 109512wa
Profile 109512WA (LF01 - Drill Cuttings Geo Tech (WM012A))
Generator WA-ABLE CLEANUP TECHNOLOGIES ABLE CLEANUP TECHNOLOGIES
PO# 23224

	Time	Scale	Operator	Inbound	Gross	13180 lb
In	08/25/2023 13:45:07	Scale1	ZRICHARD		Tare	11900 lb
Out	08/25/2023 13:55:37	Scale1	ZRICHARD		Net	1280 lb
					Tons	0.64

Comments

	Product	LD%	Qty	UOM	Rate	Tax/Fee	Amount	Origin
1	Spwaste Solid Oth-Tons-	100	0.64	Tons	39.58	1.42	$39.58	SPOKANE
2	EVF-P10-Environmental F	100		%	10.00		$3.98	SPOKANE
3	SRHD1-Spokane Regional	100	0.64	Tons	0.32	0.01	$0.20	SPOKANE

Total Tax/Fees	$1.43
Total Ticket	$45.19

Driver`s Signature

The total amount includes fees and taxes that may not all be listed on this ticket due to technic limitation.

Graham Road Facility
1820 S. Graham Road
Medical Lake, WA 99022 Ph: (509)244-0151

Original
Ticket# 702961

Customer Name	ABLECLEAN ABLE CLEAN-UP	Carrier	ABLECLEANUP ABLE CLEANUP TECHNOLOGIE
Ticket Date	08/25/2023	Vehicle#	darren
Payment Type	Credit Account	Container	
Manual Ticket#		Driver	
Route		Check#	
Hauling Ticket#		Billing#	0000726
Destination		Grid	

Manifest 116999wa
Profile 116999WA (IDW)
Generator WA-ABLE CLEANUP TECH 18838 ABLE CLEANUP TECHNOLOGIES INC_5308 N MYRTLE ST,
PO# 23224

	Time	Scale	Operator	Inbound		
In	08/25/2023 13:56:26	Scale1	ZRICHARD		Gross	11900 lb
Out	08/25/2023 14:04:27	Scale1	ZRICHARD		Tare	11360 lb
					Net	540 lb
					Tons	0.27

Comments

	Product	LD%	Qty	UOM	Rate	Tax/Fee	Amount	Origin
1	Cont Soil Pet-RGC-Tons-	100	0.27	Tons				SPOKANE
2	EVF-P-Standard Environm	100		%				SPOKANE
3	FUEL-Fuel Surcharge - L	100		%				SPOKANE
4	SRHD1-Spokane Regional	100	0.27	Tons				SPOKANE

Total Tax/Fees
Total Ticket

Driver`s Signature

The total amount includes fees and taxes that may not all be listed on this ticket due to technic
limitation.

APPENDIX C
Chemical Analytical Laboratory Reports and Data Validation

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 20, 2023

Justin Orr
GeoEngineers, Inc.
523 E 2nd Street
Spokane, WA 99202

Re: Analytical Data for Project 0180-429-00
Laboratory Reference No. 2307-047

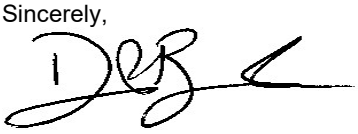
Dear Justin:

Enclosed are the analytical results and associated quality control data for samples submitted on July 11, 2023.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,



David Baumeister
Project Manager

Enclosures

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

Case Narrative

Samples were collected on July 6 and 7, 2023 and received by the laboratory on July 11, 2023. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

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ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
FSS-B2:070623	07-047-01	Water	7-6-23	7-11-23	
FSS-B3:070623	07-047-02	Water	7-6-23	7-11-23	
FSD-B1 (4-5)	07-047-03	Soil	7-7-23	7-11-23	
FSD-B2 (11-12)	07-047-04	Soil	7-7-23	7-11-23	
FSD-B3 (5-6)	07-047-05	Soil	7-7-23	7-11-23	
FSD-DUP	07-047-06	Soil	7-7-23	7-11-23	
waste characterization	07-047-07	Soil	7-7-23	7-11-23	

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GASOLINE RANGE ORGANICS
NWTPH-Gx

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSS-B2:070623**					
Laboratory ID:	07-047-01					
Gasoline	**ND**	100	NWTPH-Gx	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*65-122*				
Client ID:	**FSS-B3:070623**					
Laboratory ID:	07-047-02					
Gasoline	**ND**	100	NWTPH-Gx	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*87*	*65-122*				

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GASOLINE RANGE ORGANICS
NWTPH-Gx

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSD-B1 (4-5)**					
Laboratory ID:	07-047-03					
Gasoline	**ND**	5.1	NWTPH-Gx	7-12-23	7-12-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*110*	*65-126*				
Client ID:	**FSD-B2 (11-12)**					
Laboratory ID:	07-047-04					
Gasoline	**ND**	41	NWTPH-Gx	7-12-23	7-12-23	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*110*	*65-126*				
Client ID:	**FSD-B3 (5-6)**					
Laboratory ID:	07-047-05					
Gasoline	**ND**	5.2	NWTPH-Gx	7-12-23	7-12-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*116*	*65-126*				
Client ID:	**FSD-DUP**					
Laboratory ID:	07-047-06					
Gasoline	**ND**	5.2	NWTPH-Gx	7-12-23	7-12-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*117*	*65-126*				

Date of Report: July 20, 2023
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Laboratory Reference: 2307-047
Project: 0180-429-00

VOLATILE ORGANICS EPA 8260D

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSS-B2:070623**					
Laboratory ID:	07-047-01					
Benzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	1.0	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.40	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*109*	*75-127*				
Toluene-d8	*99*	*80-127*				
4-Bromofluorobenzene	*104*	*78-125*				
Client ID:	**FSS-B3:070623**					
Laboratory ID:	07-047-02					
Benzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	1.0	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.40	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*110*	*75-127*				
Toluene-d8	*100*	*80-127*				
4-Bromofluorobenzene	*104*	*78-125*				

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

VOLATILE ORGANICS EPA 8260D

Matrix: Soil
Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSD-B1 (4-5)**					
Laboratory ID:	07-047-03					
Benzene	0.0021	0.0010	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	0.0051	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.0021	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*91*	*66-133*				
Toluene-d8	*92*	*78-128*				
4-Bromofluorobenzene	*110*	*71-130*				
Client ID:	**FSD-B2 (11-12)**					
Laboratory ID:	07-047-04					
Benzene	0.0027	0.00088	EPA 8260D	7-11-23	7-11-23	
Toluene	0.0052	0.0044	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	0.00096	0.00088	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	0.0026	0.0018	EPA 8260D	7-11-23	7-11-23	
o-Xylene	0.0011	0.00088	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*89*	*66-133*				
Toluene-d8	*90*	*78-128*				
4-Bromofluorobenzene	*114*	*71-130*				
Client ID:	**FSD-B3 (5-6)**					
Laboratory ID:	07-047-05					
Benzene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	0.0050	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.0020	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*88*	*66-133*				
Toluene-d8	*91*	*78-128*				
4-Bromofluorobenzene	*113*	*71-130*				

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

VOLATILE ORGANICS EPA 8260D

Matrix: Soil
Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSD-DUP**					
Laboratory ID:	07-047-06					
Benzene	ND	0.0011	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	0.0054	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.0011	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.0022	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.0011	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*90*	*66-133*				
Toluene-d8	*90*	*78-128*				
4-Bromofluorobenzene	*109*	*71-130*				

Date of Report: July 20, 2023
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Laboratory Reference: 2307-047
Project: 0180-429-00

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSS-B2:070623**					
Laboratory ID:	07-047-01					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil Range Organics	**ND**	0.21	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*104*	*50-150*				
Client ID:	**FSS-B3:070623**					
Laboratory ID:	07-047-02					
Diesel Range Organics	**ND**	0.21	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil	**0.24**	0.21	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*69*	*50-150*				

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**FSD-B1 (4-5)**					
Laboratory ID:	07-047-03					
Diesel Range Organics	**ND**	28	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil Range Organics	**ND**	55	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*62*	*50-150*				
Client ID:	**FSD-B2 (11-12)**					
Laboratory ID:	07-047-04					
Diesel Range Organics	**ND**	29	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil Range Organics	**ND**	57	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*67*	*50-150*				
Client ID:	**FSD-B3 (5-6)**					
Laboratory ID:	07-047-05					
Diesel Range Organics	**ND**	130	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil	**1000**	260	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*88*	*50-150*				
Client ID:	**FSD-DUP**					
Laboratory ID:	07-047-06					
Diesel Range Organics	**ND**	140	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil	**1000**	270	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*77*	*50-150*				

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**waste characterization**					
Laboratory ID:	07-047-07					
Arsenic	**ND**	11	EPA 6010D	7-12-23	7-12-23	
Barium	**46**	2.7	EPA 6010D	7-12-23	7-12-23	
Cadmium	**ND**	0.53	EPA 6010D	7-12-23	7-12-23	
Chromium	**9.1**	0.53	EPA 6010D	7-12-23	7-12-23	
Lead	**ND**	5.3	EPA 6010D	7-12-23	7-12-23	
Mercury	**ND**	0.27	EPA 7471B	7-12-23	7-12-23	
Selenium	**ND**	11	EPA 6010D	7-12-23	7-12-23	
Silver	**ND**	1.1	EPA 6010D	7-12-23	7-12-23	

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Project: 0180-429-00

GASOLINE RANGE ORGANICS
NWTPH-Gx
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0711W1					
Gasoline	**ND**	100	NWTPH-Gx	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*88*	*65-122*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-047-01										
	ORIG	DUP									
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*93*	*83*	*65-122*			

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

GASOLINE RANGE ORGANICS
NWTPH-Gx
QUALITY CONTROL

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0712S1					
Gasoline	**ND**	5.0	NWTPH-Gx	7-12-23	7-12-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*109*	*65-126*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-069-01										
	ORIG	DUP									
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*110*	*107*	*65-126*			

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Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

VOLATILE ORGANICS EPA 8260D
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0711W1					
Benzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	1.0	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.40	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.20	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*109*	*75-127*				
Toluene-d8	*99*	*80-127*				
4-Bromofluorobenzene	*104*	*78-125*				

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0711W1									
	SB	SBD	SB	SBD	SB	SBD				
Benzene	**10.1**	**9.52**	10.0	10.0	101	95	81-124	6	16	
Toluene	**9.05**	**8.73**	10.0	10.0	91	87	83-118	4	18	
Ethylbenzene	**9.75**	**9.55**	10.0	10.0	98	96	80-124	2	15	
m,p-Xylene	**19.6**	**19.1**	20.0	20.0	98	96	80-124	3	15	
o-Xylene	**9.86**	**9.60**	10.0	10.0	99	96	80-124	3	15	
Surrogate:										
Dibromofluoromethane					*110*	*108*	*75-127*			
Toluene-d8					*101*	*99*	*80-127*			
4-Bromofluorobenzene					*107*	*106*	*78-125*			

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Project: 0180-429-00

VOLATILE ORGANICS EPA 8260D
QUALITY CONTROL

Matrix: Soil
Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0711S1					
Benzene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
Toluene	ND	0.0050	EPA 8260D	7-11-23	7-11-23	
Ethylbenzene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
m,p-Xylene	ND	0.0020	EPA 8260D	7-11-23	7-11-23	
o-Xylene	ND	0.0010	EPA 8260D	7-11-23	7-11-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
Dibromofluoromethane	*90*	*66-133*				
Toluene-d8	*90*	*78-128*				
4-Bromofluorobenzene	*110*	*71-130*				

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB0711S1									
	SB	SBD	SB	SBD	SB	SBD				
Benzene	**0.0526**	**0.0528**	0.0500	0.0500	105	106	81-122	0	15	
Toluene	**0.0526**	**0.0520**	0.0500	0.0500	105	104	83-120	1	15	
Ethylbenzene	**0.0477**	**0.0488**	0.0500	0.0500	95	98	80-120	2	15	
m,p-Xylene	**0.0974**	**0.0996**	0.100	0.100	97	100	80-119	2	15	
o-Xylene	**0.0491**	**0.0493**	0.0500	0.0500	98	99	80-120	0	15	
Surrogate:										
Dibromofluoromethane					*88*	*89*	*66-133*			
Toluene-d8					*94*	*93*	*78-128*			
4-Bromofluorobenzene					*111*	*113*	*71-130*			

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0713W1					
Diesel Range Organics	**ND**	160	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil Range Organics	**ND**	160	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*76*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	07-039-01									
	ORIG	DUP								
Diesel Range	**ND**	**ND**	NA	NA		NA	NA	NA	40	
Lube Oil Range	**ND**	**ND**	NA	NA		NA	NA	NA	40	
Surrogate:										
o-Terphenyl						*66* *83*	*50-150*			

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Laboratory Reference: 2307-047
Project: 0180-429-00

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0713S1					
Diesel Range Organics	**ND**	25	NWTPH-Dx	7-13-23	7-13-23	
Lube Oil Range Organics	**ND**	50	NWTPH-Dx	7-13-23	7-13-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*80*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	07-047-03									
	ORIG	DUP								
Diesel Range	**ND**	**ND**	NA	NA		NA	NA	NA	40	
Lube Oil Range	**ND**	**ND**	NA	NA		NA	NA	NA	40	
Surrogate:										
o-Terphenyl						*62* *69*	*50-150*			

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Laboratory Reference: 2307-047
Project: 0180-429-00

TOTAL METALS
EPA 6010D/7471B
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0712SM1					
Arsenic	**ND**	10	EPA 6010D	7-12-23	7-12-23	
Barium	**ND**	2.5	EPA 6010D	7-12-23	7-12-23	
Cadmium	**ND**	0.50	EPA 6010D	7-12-23	7-12-23	
Chromium	**ND**	0.50	EPA 6010D	7-12-23	7-12-23	
Lead	**ND**	5.0	EPA 6010D	7-12-23	7-12-23	
Selenium	**ND**	10	EPA 6010D	7-12-23	7-12-23	
Silver	**ND**	1.0	EPA 6010D	7-12-23	7-12-23	
Laboratory ID:	MB0712S1					
Mercury	**ND**	0.25	EPA 7471B	7-12-23	7-12-23	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-034-03										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Barium	**22.1**	**22.6**	NA	NA		NA		NA	2	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**9.25**	**9.10**	NA	NA		NA		NA	2	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	07-019-01										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	07-034-03										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**102**	**100**	100	100	ND	**102**	**100**	75-125	1	20	
Barium	**121**	**120**	100	100	22.1	**99**	**98**	75-125	1	20	
Cadmium	**46.0**	**45.0**	50.0	50.0	ND	**92**	**90**	75-125	2	20	
Chromium	**109**	**106**	100	100	9.25	**100**	**97**	75-125	3	20	
Lead	**255**	**249**	250	250	ND	**102**	**100**	75-125	2	20	
Selenium	**100**	**95.8**	100	100	ND	**100**	**96**	75-125	4	20	
Silver	**22.6**	**22.3**	25.0	25.0	ND	**90**	**89**	75-125	1	20	
Laboratory ID:	07-019-01										
Mercury	**0.496**	**0.503**	0.500	0.500	0.0176	**96**	**97**	80-120	1	20	

Date of Report: July 20, 2023
Samples Submitted: July 11, 2023
Laboratory Reference: 2307-047
Project: 0180-429-00

% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
FSD-B1 (4-5)	07-047-03	**9**	7-11-23
FSD-B2 (11-12)	07-047-04	**12**	7-11-23
FSD-B3 (5-6)	07-047-05	**5**	7-11-23
FSD-DUP	07-047-06	**8**	7-11-23
waste characterization	07-047-07	**6**	7-19-23

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 07-047

Company: GeoEngineers
Project Number: 0180-429-00 → Direct Bill to (Matt Cox) WSDOT
Project Name: WSDOT-Union Gap Facility Release Investigation
Project Manager: Justin Orr
Sampled by: Justin Orr

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX (8021 ☐ 8260 ☒)	NWTPH-Gx	NWTPH-Dx (SG Cleanup ☐)	Volatiles 8260	Halogenated Volatiles 8260	EDB EPA 8011 (Waters Only)	Semivolatiles 8270/SIM (with low-level PAHs)	PAHs 8270/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081	Organophosphorus Pesticides 8270/SIM	Chlorinated Acid Herbicides 8151	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664					% Moisture
1	FSS-B2:070623	7/6/23	1423	W	8		X		X																		
2	FSS-B3: 070623	7/6/23	1553	W	↓		X		X																		
3	FSD-B1 (4-5)	7/7/23	0835	S	5		X		X																		X
4	FSD-B2 (11-12)		1040	S	1		X		X																		
5	FSD-B3 (5-6)		1115	S			X		X																		
6	FSD-DUP		0800	S	↓		X		X																		
7	Waste characterization		1130	S	1														X								↓
	~~Trip Blank~~	~~7/6/23~~	~~0800~~	~~W~~			X																				

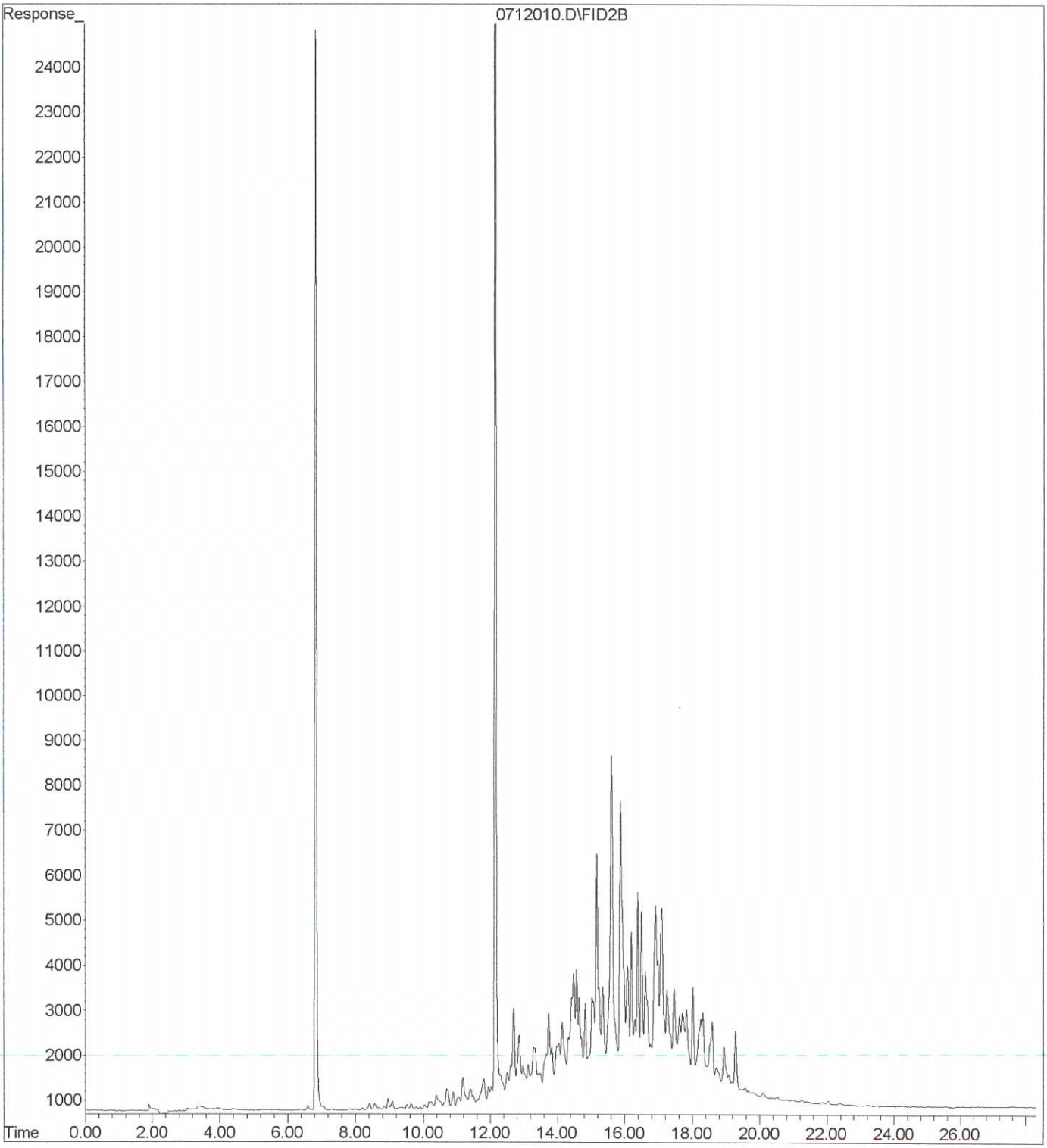
	Signature	Company	Date	Time
Relinquished		GEI	7/7/23	1900
Received		GEI	7/10/23	0700
Relinquished		GEI	7/10/23	1000
Received		ORE	7/11/23	1010
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

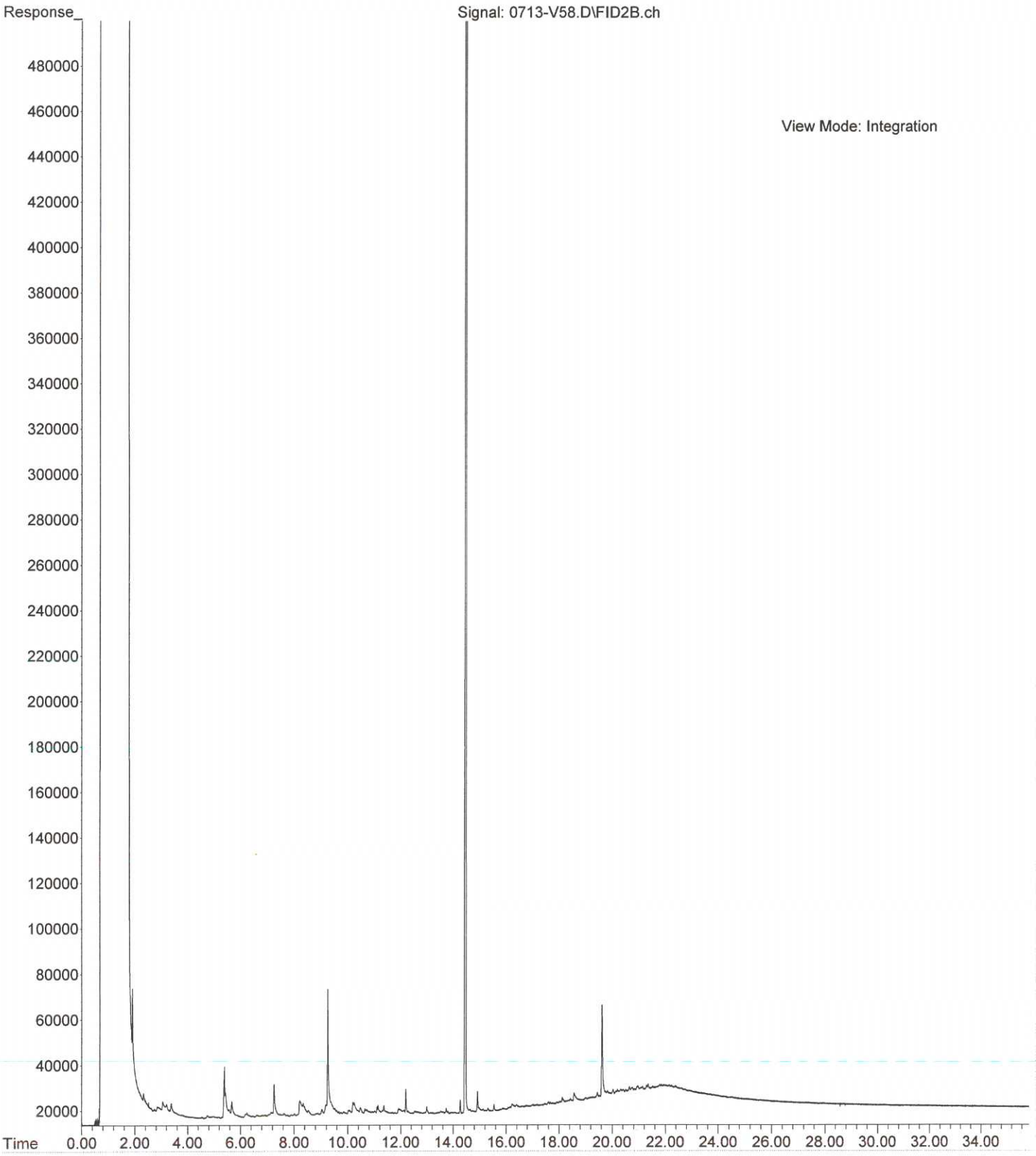
Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

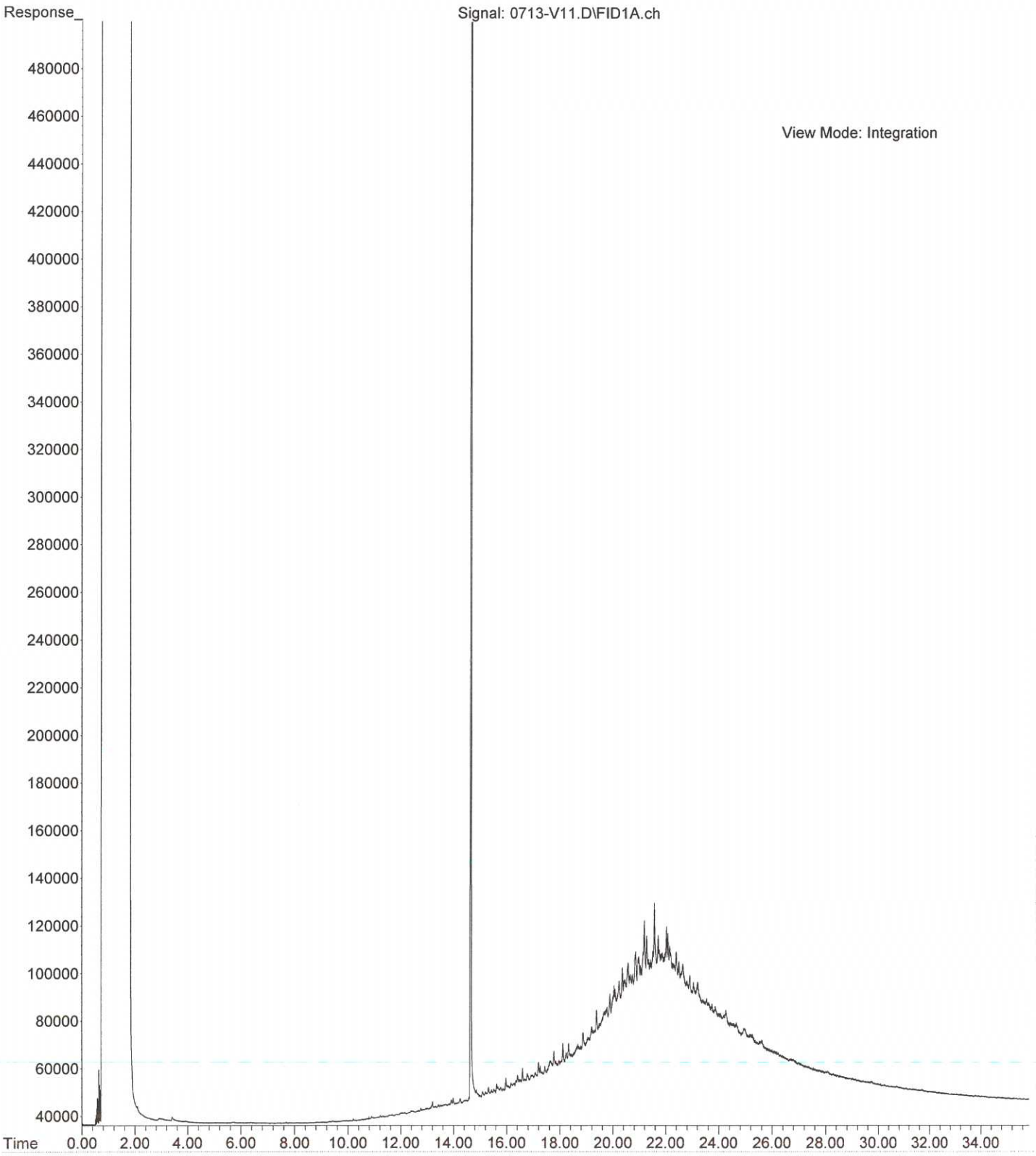
File : X:\BTEX\DARYL\DATA\D230712\0712010.D
Operator :
Acquired : 12 Jul 2023 20:02 using AcqMethod 230608B.M
Instrument : Daryl
Sample Name: 07-047-04s
Misc Info :
Vial Number: 10



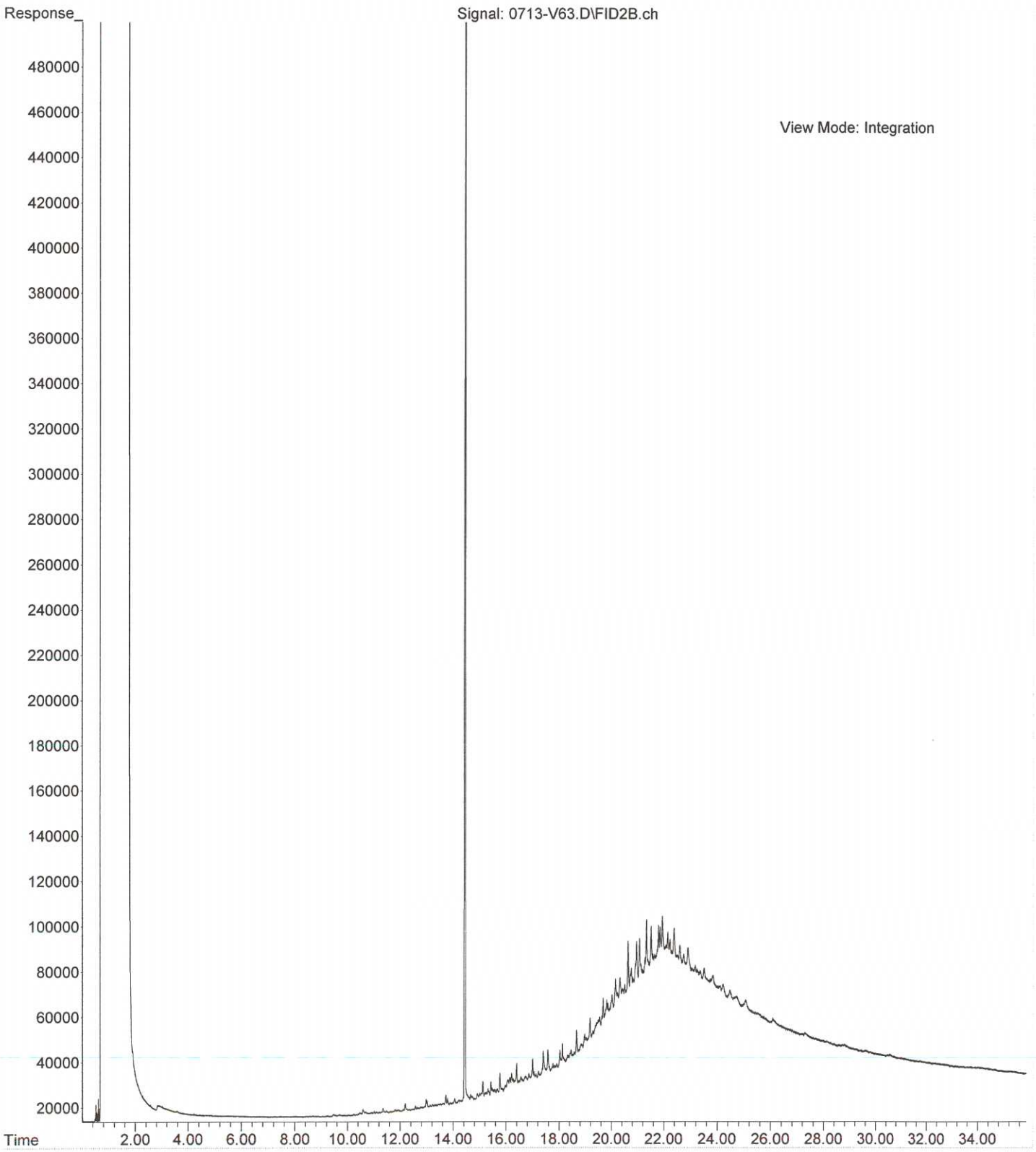
File :C:\msdchem\2\data\V230713.SEC\0713-V58.D
Operator : LW
Acquired : 13 Jul 2023 14:18 using AcqMethod V230113F.M
Instrument : Vigo
Sample Name: 07-047-02
Misc Info : RearSamp
Vial Number: 58



File :C:\msdchem\2\data\V230713\0713-V11.D
Operator : LW
Acquired : 13 Jul 2023 16:35 using AcqMethod V230113F.M
Instrument : Vigo
Sample Name: 07-047-06 5X
Misc Info : Sample
Vial Number: 11



File :C:\msdchem\2\data\V230713.SEC\0713-V63.D
Operator : LW
Acquired : 13 Jul 2023 17:56 using AcqMethod V230113F.M
Instrument : Vigo
Sample Name: 07-047-05 5X
Misc Info : RearSamp
Vial Number: 63



GeoEngineers

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Data Validation Report

Project: WSDOT – Union Gap Facility Release Investigation Assessment, Former Service Station
July 2023 Soil and Groundwater Samples

GEI File No: 00180-429-00

Date: September 5, 2023

This report documents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2A data validation (USEPA Document 540-R-08-005; USEPA, 2009) of analytical data from the analyses of soil and groundwater samples collected as part of the July 2023 sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the Union Gap Facility, Former Service Station facility located at 2809 Rudkin Road in Union Gap, Washington.

Objective and Quality Control Elements

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the USEPA Contract Laboratory Program National Functional for Organic Superfund Methods Data Review (USEPA, 2020a) and Inorganic Superfund Methods Data Review (USEPA, 2020b) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

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

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Work Plan (GeoEngineers, 2023), the data validation included review of the following QC elements:

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

Validated Sample Delivery Groups

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

TABLE 1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
2307-047	FSD-B1 (4-5), FSD-B2 (11-12), FSD-B3 (5-6), FSD-DUP, FSS-B2:070623, FSS-B3:070623, waste characterization

Chemical Analysis Performed

OnSite Environmental, Inc. (OnSite), located in Redmond, Washington, performed laboratory analyses on the samples using one or more of the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Petroleum Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx;
- Volatile Organic Compounds (VOCs) by Method EPA8260D; and
- Total Metals by Methods EPA6010D and EPA7471B

Data Validation Summary

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

Data Package Completeness

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

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the laboratory.

Holding Times and Sample Preservation

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

Surrogate Recoveries

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

Method Blanks

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

Matrix Spikes/Matrix Spike Duplicates

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

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

Laboratory Control Samples/Laboratory Control Sample Duplicates

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

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

Laboratory Duplicates

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

Field Duplicates

In order to assess precision, field duplicate samples were collected and analyzed along with the reviewed sample batches. The duplicate samples were analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or

more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for soil and water samples is 35 percent.

SDG 2307-047: One field duplicate sample pair, FSD-B3 (5-6) and FSD-DUP, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair.

Overall Assessment

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

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

References

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

U.S. Environmental Protection Agency (USEPA) 2020a. Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review, EPA-540-R-20-005. November 2020.

U.S. Environmental Protection Agency (USEPA) 2020b. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-542-R-20-006. November 2020.

GeoEngineers, Inc. (GeoEngineers). "Work Plan, WSDOT Union Gap Facility Release Investigation," prepared for Washington Department of Transportation. June 12, 2023.

APPENDIX D
Report Limitations and Guidelines for Use

APPENDIX D
REPORT LIMITATIONS AND GUIDELINES FOR USE[2]

This Appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of the Washington State Department of Transportation (WSDOT). This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Ecology should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the WSDOT – Union Gap Facility, Former Service Station site located at 2809 Rudkin Road in Union Gap, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of WSDOT. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm and WSDOT with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with WSDOT and generally accepted environmental practices in this area at the time this report was prepared.

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[2] Developed based on material provided by GBA, Professional Firms Practicing in the Geosciences; www.geoprofessional.org.

Environmental Regulations are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain Even After This Site Assessment is Completed

No environmental Site Assessment can wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled, or analyzed.

Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Most Environmental Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted, or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Do Not Redraw the Exploration Logs

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproductions are acceptable but recognize that separating logs from the report can elevate risk.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

Geotechnical, Geologic and Geoenvironmental Reports Should Not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If WSDOT desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

GeoEngineers