

**Whitten Oil  
Groundwater Monitoring  
September 2021  
Sampling Report**

**Whitty's Chevron  
370 West 5<sup>th</sup> Avenue  
Colville, Washington 99114**

Project Number: 213162.00

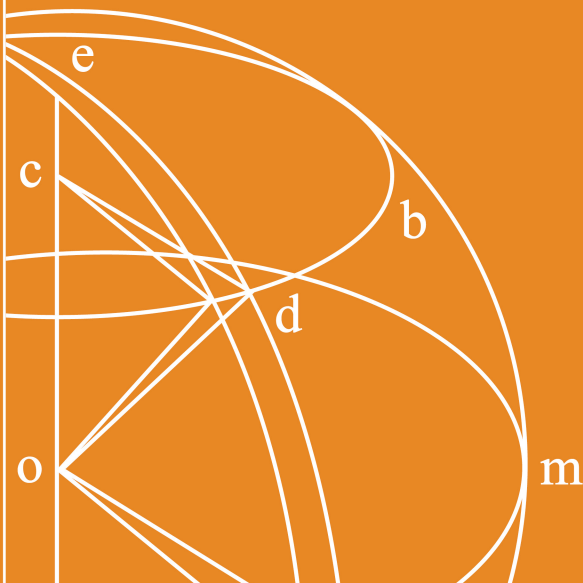
Date: November 8, 2021

**Prepared for:**

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**Report Title:** Whitten Oil Groundwater Monitoring Event September 2021 Sampling Report

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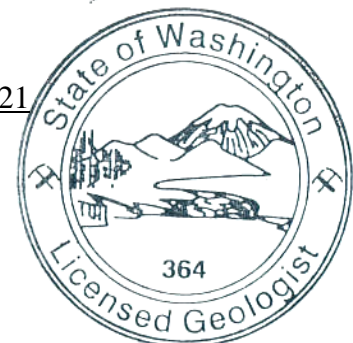
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### ***Report Integrity***

*Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied, as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.*



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## 1.0 INTRODUCTION

On September 22, 2021, Fulcrum Environmental Consulting, Inc. (Fulcrum) conducted semi-annual groundwater monitoring for seven (7) monitoring wells located at Whitty's Chevron in Colville, Washington. The purpose of the monitoring was to evaluate petroleum hydrocarbon impacts to site groundwater associated with a historical gasoline release identified in September 1989.



*Whitty's Chevron  
370 West 5<sup>th</sup> Avenue, Colville, Washington*

Site services were completed by Scott Groat, a Washington State recognized Geologist-In-Training, and Ethan Ducken, an Environmental Technician, both with Fulcrum. Work was completed under the direction of Travis Trent, a Washington State Licensed Geologist/Hydrogeologist and Principal with Fulcrum. Relevant professional certifications are presented in Appendix A.

### 1.1 Scope of Services

Fulcrum has been retained by Whitten Oil (Whitten) to complete semi-annual groundwater sampling services utilizing existing onsite groundwater monitoring wells at Whitty's Chevron located at 370 West 5<sup>th</sup> Avenue in Colville, Washington. Each semi-annual sampling event consists of measurement of water depths in seven (7) onsite groundwater monitoring wells followed by collection of water samples from each well. Samples are collected in accordance with industry standard of care and submitted under chain of custody to a Washington State accredited laboratory to be analyzed for benzene, toluene, ethyl benzene, xylene (BTEX), gasoline-range organics, diesel-range organics, and heavy oil-range organics. Results of the investigation and testing from September 2021 are presented in this summary report.

### 1.2 Site Description

The site is located on the northeast corner of West Fifth Avenue (U.S. Highway 395) and North Lincoln Street in Colville, Washington. The subject facility functions as an active gasoline service station and car wash. One (1) refueling area containing one (1) dispenser island were observed to



be located south of the convenience store, while another gasoline/diesel refueling area with two (2) dispenser islands was observed to be located north of the convenience store. A more recently constructed dispensing island is located southeast of the convenience store. Four (4) operational underground storage tanks (UST) were reported to be located west of the convenience store within the southern portion of the property: two 10,000-gallon diesel tanks, one 6,000-gallon premium gasoline tank, and one 10,000-gallon unleaded gasoline tank. A six-bay carwash station is located northwest of the convenience store.

The entire surface of the property was observed to be covered by building footprint, concrete, or asphalt. Historical reports and observations from Fulcrum's September 2021 ground water monitoring well installation event indicates that beneath the paved surface are 3 to 8 feet (ft) of sandy fill material underlain by fine-grained alluvium down to 14.5 feet below ground surface (ft bgs).

### **1.3 Site Hydrogeology**

The site sits approximately 1,586 feet (ft) above mean sea level (MSL). The inferred groundwater flow direction is to the northwest, generally following surface topography of the area, with a hydraulic gradient of 0.022. During Fulcrum's investigation, recorded site groundwater levels ranged from 4.64 to 6.10 ft bgs.

### **1.4 Background**

The following information is summarized in part from prior project reporting provided by the owner. Fulcrum has made no independent investigation to verify accuracy of provided historical site information. A copy of select representative historical documentation is provided in Appendix B.

The subject facility has been in operation as a service station or bulk plant since the 1950s. Whitten Oil began operation around 1973, and the carwash was constructed around 1988. In September 1989, Petroleum Equipment Sales, Inc. (PES) was reportedly retained to decommission and replace onsite USTs during the construction of a new tank basin. Sunrise Environmental Services (SES) was reportedly retained by PES to observe the removal of the USTs and provide recommendations for corrective action. PES reportedly removed a total of six (6) USTs from the site with one (1) UST abandoned in place due to its location beneath the onsite office building. Three (3) of the USTs were reported to have been suspect for leakage. Approximately 1,200 cubic yards of petroleum-contaminated soil was removed along with the USTs.



Following removal of the USTs and associated contaminated soils, additional site investigation was conducted to evaluate the potential for residual soil and/or groundwater impact. In January 1990, Delta Environmental Consultants (Delta) supervised drilling activities performed by Budinger & Associates. Six (6) soil borings were drilled in suspected areas of petroleum hydrocarbon contamination to investigate for potential petroleum hydrocarbon impact to site soils/groundwater. The depth of soil borings ranged from 10 to 14.5 ft bgs. Soil samples were collected at 5-foot intervals during the advancement of soil borings. Soil samples that exhibited a petroleum hydrocarbon odor were submitted to Technology Laboratory, Inc. of Fort Collins, Colorado for benzene, toluene, ethylbenzene, xylenes (BTEX) and total hydrocarbon analyses. Laboratory analysis identified petroleum hydrocarbons in only one (1) of the collected samples (SB-5). Concentrations were reportedly below Washington State Department of Ecology's specified guidelines at the time.

All soil borings, with the exception of SB-5, were completed as groundwater monitoring wells, and groundwater samples were collected and submitted to Technology Laboratory, Inc. of Fort Collins, Colorado, for BTEX and total hydrocarbon analyses. Laboratory analyses for BTEX and total hydrocarbons indicated that the groundwater had been impacted at the subject site. The highest hydrocarbon concentrations were detected in groundwater samples from monitoring wells MW-2 and MW-4, which were located in close proximity to the former UST basin. Detectable hydrocarbon concentrations were also found in downgradient monitoring well MW-6. It was Delta's professional opinion that site conditions posed little threat to humans or the environment due to tight soil conditions, thus preventing contamination from migrating off site. Therefore, no significant remedial action was recommended. Locations of the historical soil borings, monitoring wells, and approximate areas of excavation are presented as Figure 2. Historical soil boring and groundwater monitoring data is presented as Appendix B.

In December 2005, additional soil sampling was conducted by Northwest Environmental Solutions, Inc. to facilitate the change in ownership for the subject site. The investigation consisted of five (5) soil borings drilled in areas proximal to regions of historical soil work or current UST presence. The depth of the soil borings ranged from 5 to 15 ft bgs. One (1) soil sample was collected at the bottom of each soil boring. All five (5) soil samples were submitted to Spectra Laboratories of Tacoma, Washington, for lead, methyl tert-butyl ether (MTBE), BTEX, and for concentrations of diesel-range hydrocarbons by Northwest Total Petroleum Hydrocarbons as diesel (NWTPH-Dx), as oil (NWTPH-Oil), and as gasoline (NWTPH-Gx). Detectable analytes (gasoline range petroleum hydrocarbons, ethyl benzene, toluene, xylene, and lead) were reported in soil boring 2-A and (toluene and xylene) were detected in soil borings 2-C and 2-D; all below MTCA Method A cleanup levels for soil. The 2005 historical soil boring results and locations are presented as Appendix C.



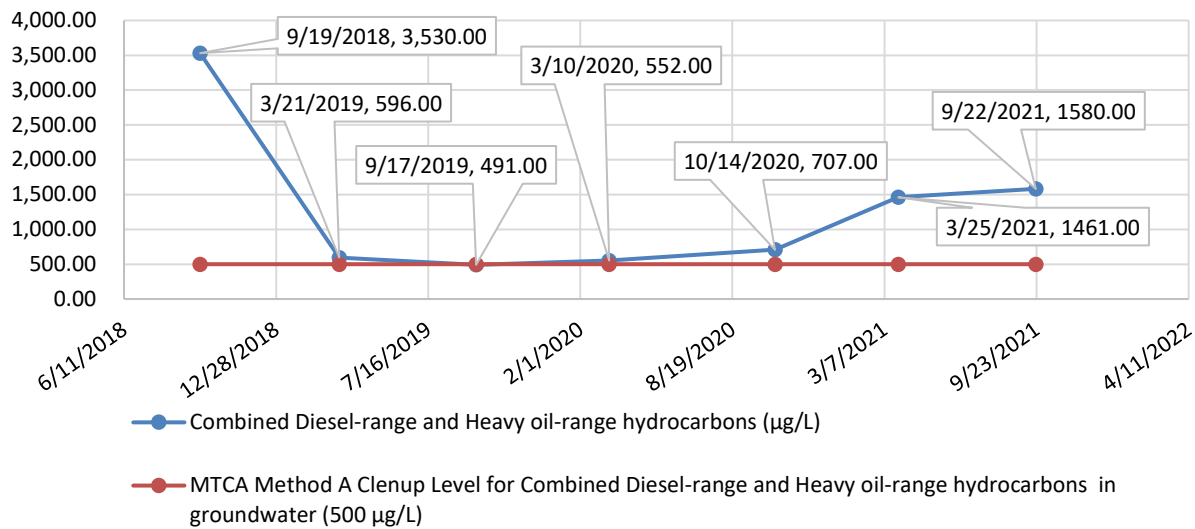
On September 30, 2020, Fulcrum coordinated the decommissioning of two (2) historical monitoring wells and installation of four (4) new wells at Whitty's Chevron located at 370 West 5<sup>th</sup> Avenue in Colville, Washington. Historic monitoring wells MW-04 and MW-06 were decommissioned due to failing surface seals and poor recharge rates. These two (2) wells were replaced with new monitoring wells and two (2) additional wells were added to the site. Monitoring well MW-02 was installed upgradient behind the gas station where the former Leaking Underground Storage Tanks (LUSTs) were removed and monitoring well MW-07 was installed downgradient at the northwest corner of the property to act as a downgradient sentinel well.



*Whitty's Chevron  
370 West 5<sup>th</sup> Avenue, Colville, Washington*

General trending for combined diesel and heavy oil-range hydrocarbons concentrations from September of 2018 to September of 2021 in monitoring well MW-04, is presented in the following graph.

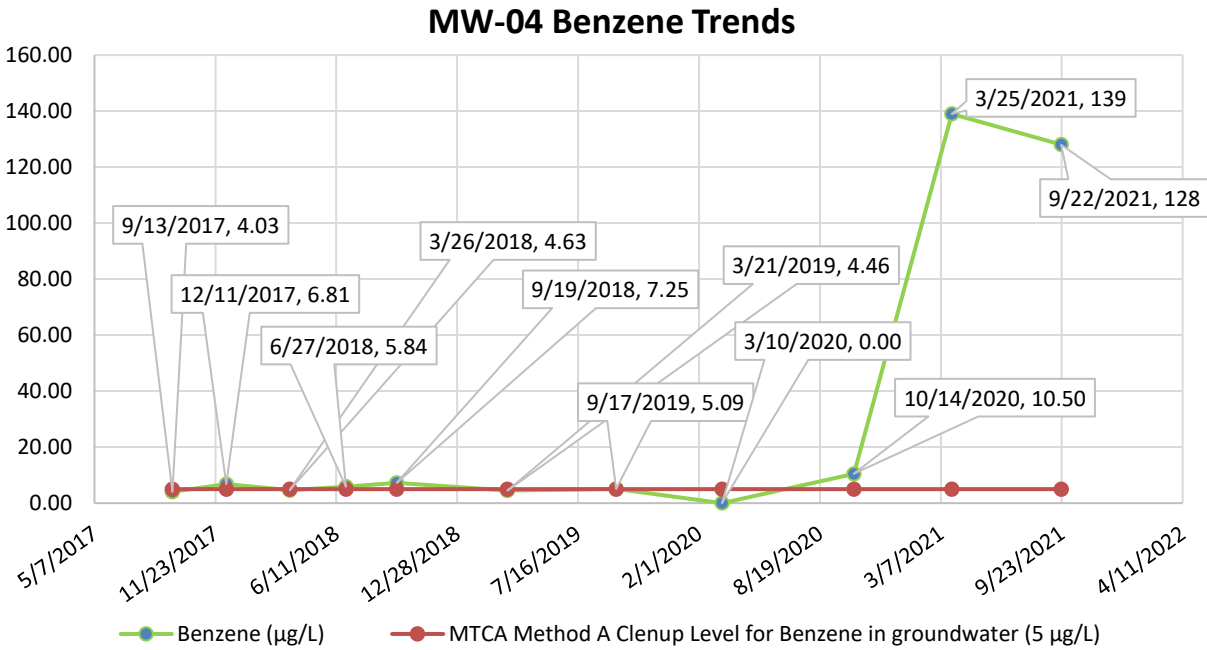
### MW-04 Combined Diesel-range and Heavy Oil-range Hydrocarbon Trends





Results for MW-04 show a steep decrease in concentrations of combined diesel-range and heavy oil-range hydrocarbons in September of 2019 where concentrations stabilize around Method A Cleanup levels over the following four (4) semi-annual sampling events before a significant increase in March of 2021. Results of September 2021 testing show a continued upward trend in diesel-range and heavy oil-range hydrocarbons concentrations in MW-04.

General trending of benzene concentrations observed in monitoring well MW-04 from September 2017 to September 2021 is presented in the graph below.

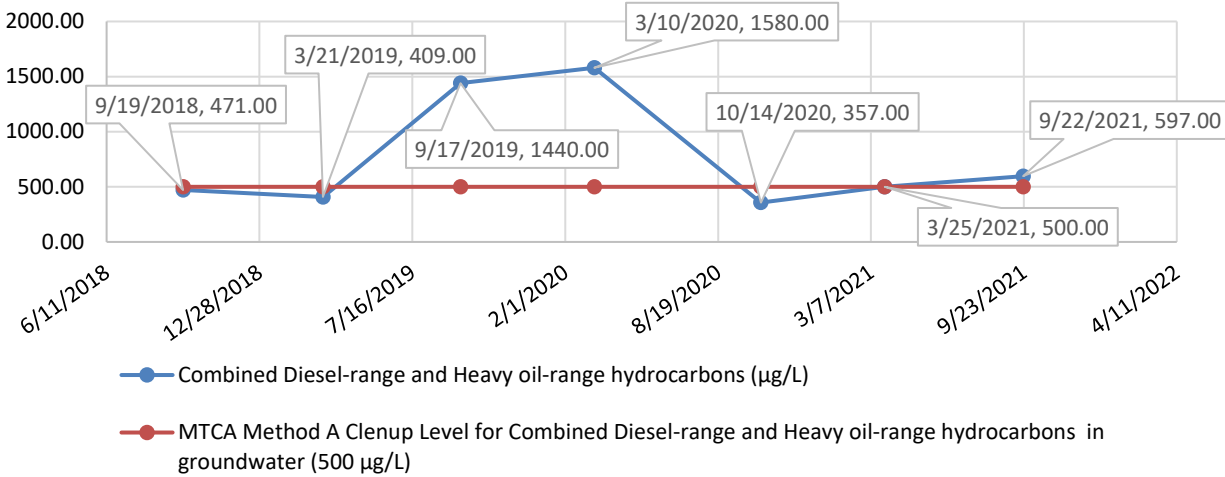


Benzene concentrations in MW-04 have remained relatively stable while fluctuating above and below Method A Cleanup levels since monitoring began in September 2017 through October 2020 with concentrations ranging between non-detect and 10.50 µg/L. In March of 2021 benzene concentrations significantly increased to 139.00 µg/L. Sampling results for September 2021 for benzene concentrations in MW-04 remained elevated, but decreased slightly to a most recent concentration of 128.00 µg/L.

General trending for combined diesel-range and heavy oil-range hydrocarbon concentrations from September of 2018 to September of 2021, in monitoring well MW-06, is presented in the following graph.



## MW-06 Combined Diesel-range and Heavy Oil-range Hydrocarbon Trends



Analytical results show that diesel-range and heavy oil-range hydrocarbons concentrations were trending upwards since March of 2019 to March of 2020. Sampling conducted in October 2020, showed concentrations to have decrease significantly to 357.00 µg/L. Combined diesel-range and heavy oil-range concentrations have been fluctuating around the Method A Cleanup Level since October 2020, with the most recent sampling event conducted in September 2021 identifying combined diesel-range and heavy oil-range hydrocarbon concentrations at 597.00 µg/L.

## 2.0 DISCUSSION OF PERTINENT REGULATIONS AND GUIDANCE

### 2.1 MTCA Regulations

In Washington State, MTCA Cleanup Regulations became effective in March of 1989, with amended MTCA Cleanup Regulations effective in February of 2001. The MTCA Cleanup Regulations set standards to ensure quality of cleanup and protection of human health and the environment.

A major portion of the MTCA regulations are the development of numerical cleanup standards and requirements for cleanup actions. MTCA establishes three (3) options for site-specific cleanup levels: Method A, B, and C. Method A defines cleanup levels for 25-30 of the most common hazardous substances found in soil and groundwater. Method B cleanup levels are established using applicable state and federal laws, risk assessment equations, and other requirements





specified for each medium. Method C is similar to Method B, but cleanup levels are based on less stringent exposure assumptions, and the lifetime cancer risk is set at 1 in 100,000 rather than 1 in 1,000,000.

## **2.2 MTCA Cleanup Standards**

Contaminants of concern at the subject site are gasoline-range hydrocarbons, diesel-range hydrocarbons, and BTEX, for which regulatory cleanup limits are provided under MTCA Method A. Based on the contaminants released at the subject site, the Method A Cleanup Levels are the most appropriate and conservative for determining site cleanup.

## **3.0 FIELD ACTIVITIES**

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### **3.1 Groundwater Sampling**

On September 22, 2021, Fulcrum completed groundwater sampling of the following seven (7) monitoring wells: CW-01, CW-02, MW-02, MW-03, MW-04, MW-06, and MW-07. Seven (7) groundwater samples (WOS-092221-CW01, -CW02, -MW02, -MW03, -MW04, -MW06, -MW07) and one (1) field duplicate sample (WOS-092221-MW08) were collected for a total of eight (8) groundwater samples.

Prior to sample collection, Fulcrum measured the depth to groundwater (DTW) and depth to bottom (DTB) utilizing an electronic water level indicator accurate to  $\pm 0.01$  foot. Elevation corrections were made using wellhead elevation data from the subject site. Sampling activities were completed using a peristaltic pump or submersible pump and field water quality instruments. In each location the monitoring well was either pumped dry or for a minimum of three (3) well volumes following the stabilization of field parameters. Field parameters were measured prior to, during, and following completion of the monitoring well pumping to ensure that they stabilized, indicating a representative sample of groundwater.

Samples were placed in a pre-cooled ice chest and shipped under standard chain-of-custody for analysis to Fremont Analytical Inc. (Fremont); a Washington State certified laboratory located in Seattle, Washington. A site diagram map is presented as Figure 3.





## **4.0 RESULTS**

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### **4.1 Laboratory Analytical Results**

All groundwater samples were analyzed for concentrations of gasoline-range hydrocarbons by Northwest Total Petroleum Hydrocarbons as Gasoline (NWTPH-Gx), diesel-range and heavy oil-range hydrocarbons by Northwest Total Petroleum Hydrocarbons as diesel (NWTPH-Dx), and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260c.

Table 1 summarizes sample identification, locations, and analyte concentrations, which are reported in micrograms per liter ( $\mu\text{g/L}$ ). Copies of current groundwater sampling laboratory analytical results are presented in Appendix D.

**Table 1: Whitty's Chevron Groundwater Analytical Results for September 22, 2021**

Location	Sample Number	Groundwater Elevation	Results (µg/L)						
			NWTPH-Dx		NWTPH-Gx	Benzene	Toluene	Ethyl-benzene	Xylene
			Diesel-range hydrocarbons	Heavy oil-range hydrocarbons					
CW-01	WOS-092221-CW01	93.47	441.00	ND	ND	ND	ND	ND	ND
CW-02	WOS-092221-CW02	93.29	354.00	ND	112.00	0.72	ND	ND	ND
	WOS-092221-MW08		379.00	ND	115.00	0.69	ND	ND	ND
MW-02	WOS-092221-MW02	93.12	<b>1,010.00</b>	ND	<b>872.00</b>	3.57	ND	4.73	ND
MW-03	WOS-092221-MW03	92.98	159.00	ND	ND	ND	ND	ND	ND
MW-04	WOS-092221-MW04	93.63	<b>1,580.00</b>	ND	<b>2,050.00</b>	<b>128.00</b>	3.10	36.5	6.07
MW-06	WOS-092221-MW06	91.17	<b>597.00</b>	ND	575.00	2.32	ND	0.75	ND
MW-07	WOS-092221-MW07	89.80	ND	112.00	ND	ND	ND	ND	ND
MTCA Cleanup Levels <sup>2</sup>			500 <sup>+</sup>		800 <sup>*</sup>	5	1,000	700	1,000

**Bold** – MTCA Method A exceedance

ND – Nondetect

<sup>\*</sup>Established cleanup level when benzene is present in groundwater

µg/L – Micrograms per liter (µg/L), equivalent to parts per billion (ppb)

<sup>1</sup>Model Toxic Cleanup Act Method A Cleanup Levels for groundwater in µg/L, as established by the Washington State Department of Ecology.

<sup>+</sup> Diesel-range and heavy oil-range hydrocarbon concentrations are combined together per MTCA Method A cleanup standards for groundwater.



## 4.2 Diesel-Range and Heavy Oil-Range Extended Organics

Laboratory analytical results identified detectable concentrations for diesel-range hydrocarbons below MTCA Method A Cleanup Levels in monitoring wells CW-01, CW-02, and MW-03. Laboratory analytical results report detectable concentrations for heavy oil-range hydrocarbons below MTCA Method A Cleanup Levels in well MW-07.

Laboratory analytical results identified diesel-range hydrocarbons at 1,010.00 µg/L and heavy oil-range hydrocarbons to be non-detect in monitoring well MW-02, the combined concentration is above the MTCA Method A Cleanup Level of 500 µg/L.

Laboratory analytical results identified diesel-range hydrocarbons at 1,580.00 µg/L and heavy oil-range hydrocarbons to be non-detect in monitoring well MW-04, the combined concentration is above the MTCA Method A Cleanup Level of 500 µg/L.

Laboratory analytical results identified diesel-range hydrocarbons at 597.00 µg/L and heavy oil-range hydrocarbons to be non-detect in monitoring well MW-06, the combined concentration is above the MTCA Method A Cleanup Level of 500 µg/L.

Laboratory analytical results report non-detect concentrations of diesel-range hydrocarbons in monitoring well MW-07. Laboratory analytical results report non-detect concentrations of heavy oil-range hydrocarbons in monitoring wells CW-01, CW-02, MW-02, MW-03, MW-04, and MW-06.

## 4.3 Gasoline-Range Extended Organics

Laboratory analytical results identified detectable concentrations of gasoline-range hydrocarbons for monitoring wells CW-02 and MW-06 below the MTCA Method A cleanup level of 800 µg/L.

Laboratory analytical results identified gasoline-range hydrocarbons for monitoring well MW-02 at 872.00 µg/L, which is above the MTCA Method A Cleanup Level of 800 µg/L.

Laboratory analytical results identified gasoline-range hydrocarbons for monitoring well MW-04 at 2,050.00 µg/L, which is above the MTCA Method A Cleanup Level of 800 µg/L.

Laboratory analytical results identified non-detect concentrations of gasoline-range hydrocarbons for monitoring wells CW-01, MW-03, and MW-07.



#### **4.4 Benzene, Toluene, Ethylbenzene, and Xylenes**

Laboratory analytical results identified detectable benzene concentrations in monitoring wells CW-02, MW-02, and MW-06, below the MTCA Method A Cleanup Level of 5.00 µg/L.

Laboratory analytical results identified benzene concentrations in monitoring well MW-04 at 128.00 µg/L, which is above the MTCA Method A Cleanup Levels of 5.00 µg/L.

Laboratory analytical results identified detectable concentrations of toluene in monitoring well MW-04, below the MTCA Method A Cleanup Level of 1,000 µg/L.

Laboratory analytical results identified detectable concentrations of ethylbenzene in monitoring wells MW-02, MW-04, and MW-06, all below the MTCA Method A Cleanup Level of 700 µg/L.

Laboratory analytical results identified detectable concentrations of xylene in monitoring well MW-04 below the MTCA Method A Cleanup Level of 1,000 µg/L.

Laboratory analytical results identified non-detect concentrations for BTEX in monitoring wells CW-01, MW-03, and MW-07.

#### **4.5 Hydraulic Results**

The groundwater flow direction, as determined by this sampling and monitoring event, is northwest with a hydraulic gradient of 0.022 (2.3-ft change in groundwater elevation over 105-feet), which is consistent with site geomorphology. A groundwater elevation map is presented as Figure 4.

#### **4.6 Data Quality**

Samples were shown as received by the laboratory at an acceptable temperature. Qualifiers were not present in the laboratory quality control (QC) sample results report, with the exception of a D qualifier associated with sample WOS-092221-MW04. This qualifier signifies dilution was required to analyze the sample leading the sample concentrations being biased low. Based on reported analytical results, identified cleanup standards, and the quantity of lab data qualifiers, it is Fulcrum's opinion that field and laboratory data quality results confirm acceptable accuracy of analytical data for all samples.



## 5.0 DISCUSSION

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Fulcrum conducted a semi-annual groundwater monitoring event for seven (7) onsite groundwater monitoring wells. A brief discussion of the groundwater monitoring results is provided below:

- **CW-01:** Analytical results for groundwater samples collected from CW-01 report detectable concentrations of diesel-range hydrocarbons below MTCA Method A Cleanup Levels and non-detectable concentrations for heavy oil-range hydrocarbons, gasoline-range hydrocarbons, benzene, toluene, ethylbenzene, and xylene at the laboratory method detection limit.
- **CW-02:** Analytical results for groundwater samples collected from CW-02 reported detectable concentrations of diesel-range hydrocarbons, gasoline-range hydrocarbons, and benzene below MTCA Method A Cleanup Levels. Analytical results for groundwater samples report non-detectable concentrations for heavy oil-range hydrocarbons, toluene, ethylbenzene, and xylene at the laboratory method detection limit.
- **MW-02: Analytical results for groundwater samples collected from MW-02 reported detectable concentrations of diesel-range hydrocarbons and gasoline-range hydrocarbons above their respective MTCA Method A Cleanup Levels.** Analytical results for groundwater samples report detectable concentrations of benzene and ethylbenzene below their respective MTCA Method A Cleanup Levels. Analytical results for groundwater samples report non-detectable concentrations for heavy oil-range hydrocarbons, toluene, and xylene at the laboratory method detection limit.
- **MW-03:** Analytical results for groundwater samples collected from MW-03 reported detectable concentrations of diesel-range hydrocarbons below MTCA Method A Cleanup Levels. Analytical results for groundwater samples collected report non-detectable concentrations for heavy oil-range hydrocarbons, gasoline-range hydrocarbons, benzene, toluene, ethylbenzene, and xylene at the laboratory method detection limit.
- **MW-04: Analytical results for groundwater samples collected from MW-04 reported detectable concentrations of diesel-range hydrocarbons, gasoline-range hydrocarbons, and benzene above their respective MTCA Method A Cleanup Levels.** Laboratory analytical results for groundwater samples report detectable concentrations for toluene, ethylbenzene, and xylene below their respective MTCA Method A Cleanup Levels. Analytical results for groundwater collected report non-detectable concentrations for heavy oil-range hydrocarbons at the laboratory method detection limit.
- **MW-06: Analytical results for groundwater samples collected from MW-06 reported detectable concentrations of diesel-range hydrocarbons above the MTCA Method A**



**Cleanup Level.** Analytical results for groundwater samples reported detectable concentrations of gasoline-range hydrocarbons, benzene, and ethylbenzene, all below MTCA Method A Cleanup Levels. Analytical results for groundwater samples report non-detectable concentrations for heavy oil-range hydrocarbons, toluene, and xylene at the laboratory method detection limit.

- **MW-07:** Analytical results for groundwater samples collected from MW-07 reported detectable concentrations of heavy oil-range hydrocarbons below MTCA Method A Cleanup Levels. Analytical results for groundwater samples collected reported non-detect concentrations of diesel-range and gasoline-range hydrocarbons, benzene, toluene, ethylbenzene, and xylene at the laboratory method detection limit.

The September 2021 groundwater analytical data indicates contaminant concentrations in wells CW-01, CW-02, MW-03, and MW-07 to be below MTCA Method A Cleanup Levels. Groundwater analytical data indicates combined diesel-range and heavy oil-range hydrocarbon concentrations in wells MW-02, MW-04, and MW-06, to be above MTCA Method A Cleanup Levels. Analytical data indicates gasoline-range hydrocarbon concentrations in wells MW-02 and MW-04 to be above MTCA Method A Cleanup Levels. Analytical data indicates benzene concentrations in monitoring well MW-04 to be above MTCA Method A Cleanup Levels.

## **6.0 RECOMMENDATIONS**

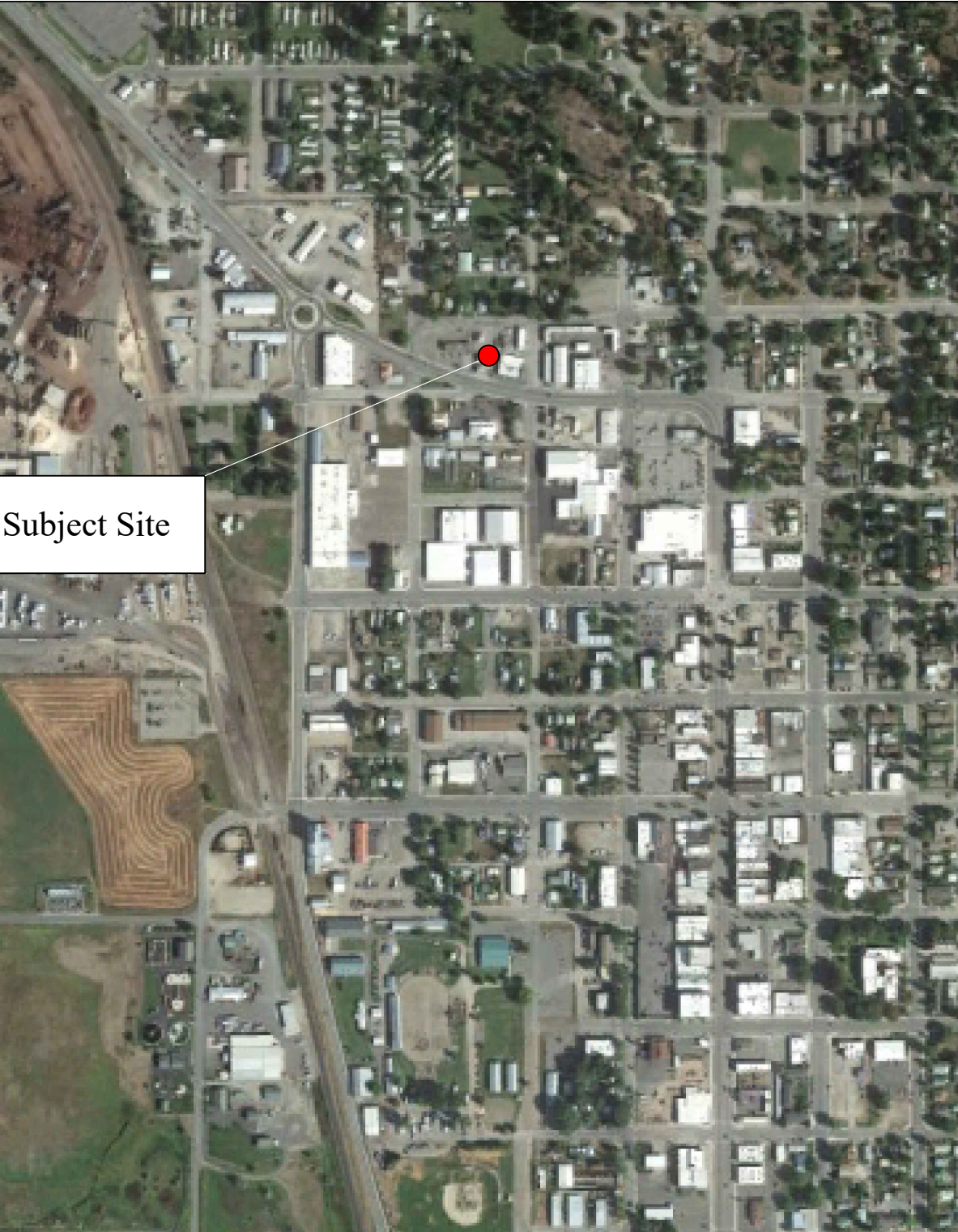
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Based on the results of this investigation, Fulcrum recommends continuing semi-annual monitoring of the onsite monitoring wells.



## Figures





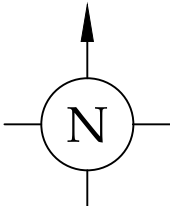
Subject Site

Figure 1: General Site Location Map

Second Semi-annual Groundwater Sampling Event September 2021  
 Whitty's Chevron  
 370 West 5th Avenue  
 Colville, Washington

LEGEND

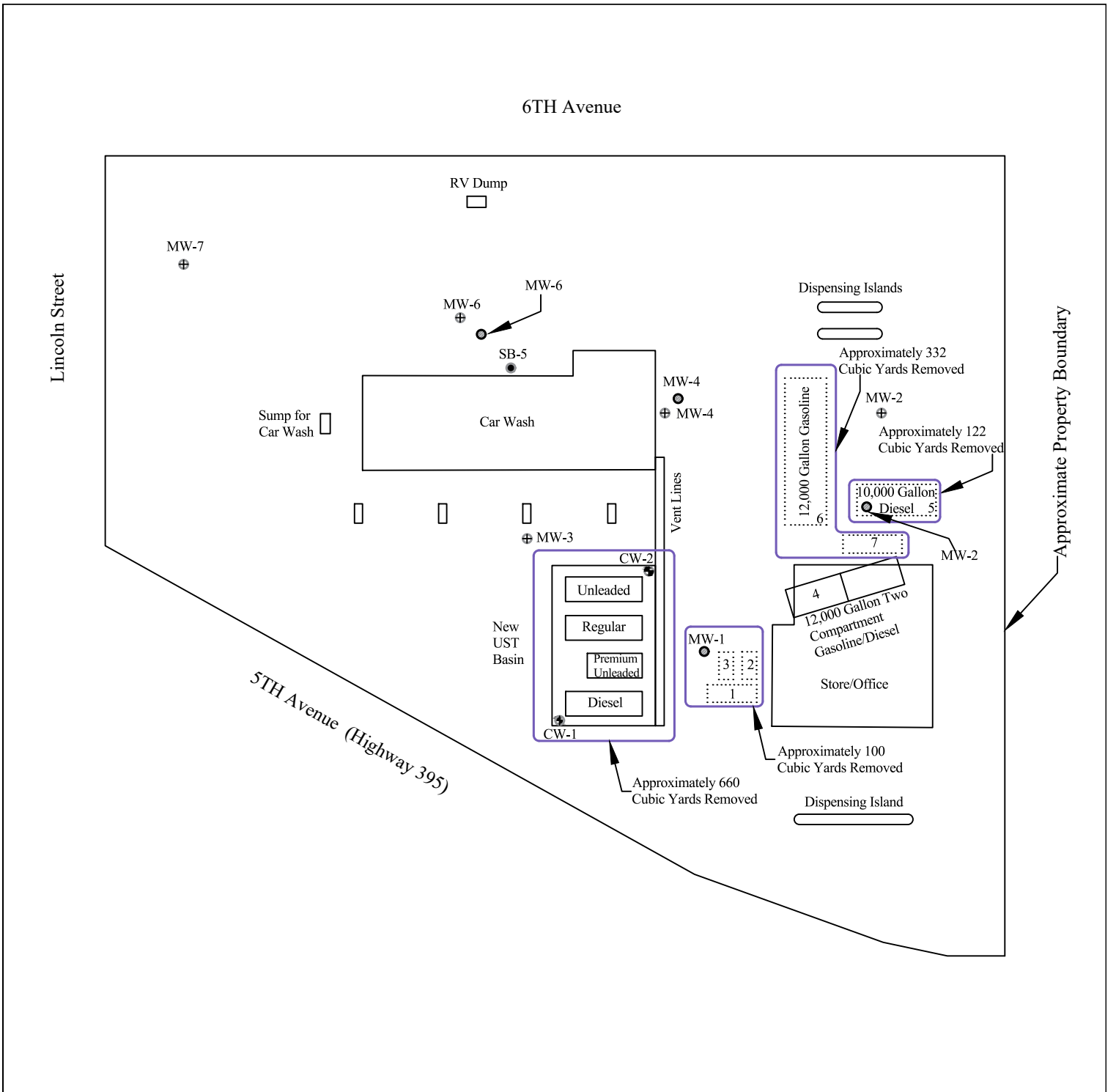
Map Location










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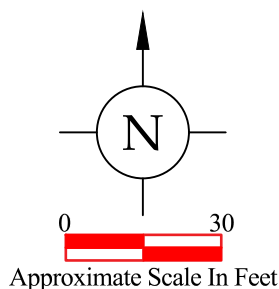
MAP BY: Ethan Ducken	PROJECT NUMBER: 213162.00
DATE: November 04, 2021	REVIEWED BY: T. Trent





## LEGEND

-  Approximate extent of soil excavation
-  Existing onsite UST
-  Historical UST removed from site
-  Historic Soil Boring
-  Historical Monitoring Well
-  Existing onsite Monitoring Well
-  Existing onsite Compliance Well



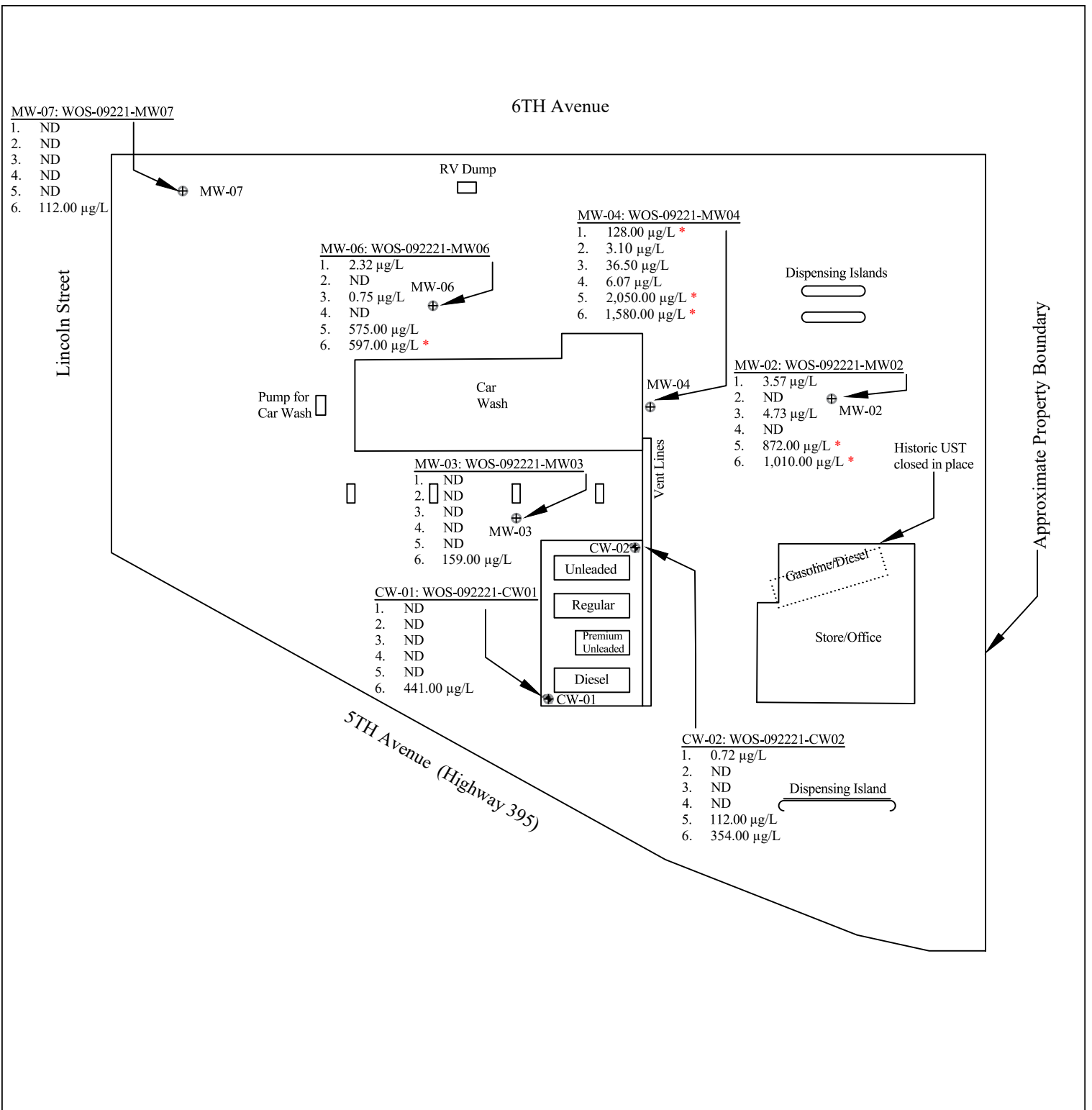
## Figure 2: Historical USTs, Soil Borings, and Monitoring Wells Site Diagram Map

Second Semi-annual Groundwater Sampling Event September 2021  
Whitty's Chevron  
370 West 5th Avenue  
Colville, Washington



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MAP BY: Ethan Ducken	PROJECT NUMBER: 213162.00
DATE: November 04, 2021	REVIEWED BY: T. Trent



**LEGEND**

Parameters (µg/L)

1. Benzene
2. Toluene
3. Ethyl-benzene
4. Xylenes
5. NWT PH-GX
6. Combined Diesel-range and Heavy Oil-range Hydrocarbons

⊕ Monitoring Well

⊗ Compliance Well

\* Analyte Concentration Exceeds MTCA Method A Cleanup Level

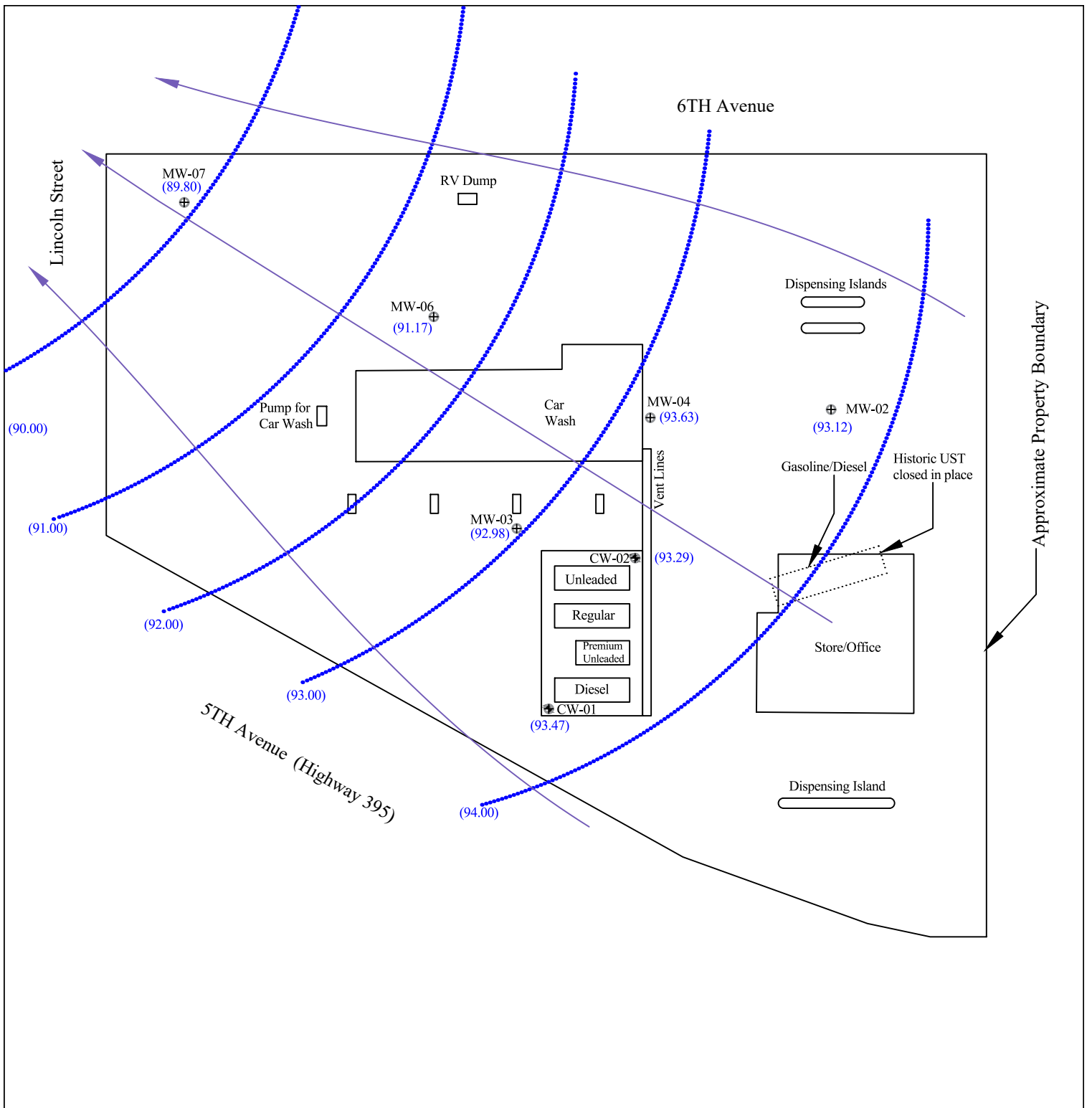
Approximate Scale In Feet

**Figure 3: Site Diagram Map**






Second Semi-annual Groundwater Sampling Event September 2021  
 Whitty's Chevron  
 370 West 5th Avenue  
 Colville, Washington

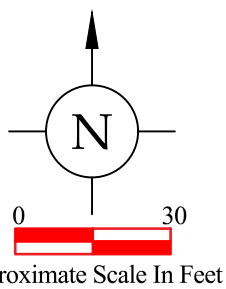
FULCRUM ENVIRONMENTAL CONSULTING, INC.  
 207 W. BOONE AVENUE  
 SPOKANE, WASHINGTON 99201  
 (509) 459-9220 www.efulcrum.net

MAP BY: Ethan Ducken	PROJECT NUMBER: 213162.00
DATE: November 04, 2021	REVIEWED BY: T. Trent



## LEGEND

-  Approximate Groundwater Flow Direction & Gradient
-  Groundwater Elevation Contour (In Feet)
-  (93.00) Monitoring Well Groundwater Elevation (In Feet)
-  Monitoring Well
-  Compliance Well



## Figure 4: Groundwater Elevation Map

Second Semi-annual Groundwater Sampling Event September 2021  
 Whitty's Chevron  
 370 West 5th Avenue  
 Colville, Washington



FULCRUM ENVIRONMENTAL CONSULTING, INC.  
 207 W. BOONE AVENUE  
 SPOKANE, WASHINGTON 99201  
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MAP BY: Ethan Ducken

PROJECT NUMBER: 213162.00

DATE: November 04, 2021

REVIEWED BY: T. Trent



## **APPENDIX A**

### Professional Certifications



# STATE OF WASHINGTON

DEPARTMENT OF LICENSING – BUSINESS AND PROFESSIONS DIVISION  
THIS CERTIFIES THAT THE PERSON OR BUSINESS NAMED BELOW IS AUTHORIZED AS A



**GEOLOGIST**  
**Hydrogeologist**

**TRAVIS L TRENT**  
**1127 W 8th Ave**  
**Spokane WA 99204-3107**

**364**

**License Number**

**01/08/2002**

**Issue Date**

**06/06/2022**

**Expiration Date**

*Teresa Berntsen*

Teresa Berntsen, Director



## **APPENDIX B**

### Summary of Historical Data

**HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA**  
Whitty's Chervon

370 West Fifth Avenue  
Colville, Washington

<b>Boring ID</b>	<b>Sampling Date</b>	<b>ERP (feet)</b>	<b>DS (feet)</b>	<b>TD (feet)</b>	<b>TPH (µg/L)</b>	<b>Diesel-range hydrocarbons (µg/L)</b>	<b>Heavy oil-range hydrocarbons (µg/L)</b>	<b>Combined Diesel-range and Heavy oil-range (µg/L)</b>	<b>NWTPH-Gx (µg/L)</b>	<b>B (µg/L)</b>	<b>T (µg/L)</b>	<b>E (µg/L)</b>	<b>X (µg/L)</b>
SB-1	1/8/1990	100.20	---	15.00	---	---	---	---	---	---	---	---	---
SB-2	1/8/1990	99.39	10.00	15.00	ND	---	---	---	ND	ND	ND	ND	ND
SB-3	1/9/1990	99.30	---	15.00	---	---	---	---	---	---	---	---	---
SB-4	1/9/1990	98.96	5.00	15.00	ND	---	---	---	ND	ND	ND	ND	ND
SB-5	1/9/1990	99.29	5.00	15.00	1,220	---	---	---	---	0.476	1.38	5.62	50.2
SB-6	1/9/1990	97.87	---	15.00	---	---	---	---	---	---	---	---	---

<b>Well ID</b>	<b>Sampling Date</b>	<b>ERP (feet)</b>	<b>DTW (feet)</b>	<b>GWE (feet)</b>	<b>TPH (µg/L)</b>	<b>Diesel-range hydrocarbons (µg/L)</b>	<b>Heavy oil-range hydrocarbons (µg/L)</b>	<b>Combined Diesel-range and Heavy oil-range (µg/L)</b>	<b>NWTPH-Gx (µg/L)</b>	<b>B (µg/L)</b>	<b>T (µg/L)</b>	<b>E (µg/L)</b>	<b>X (µg/L)</b>
CW-01	1/10/1990	99.50	5.82	93.68	---	---	---	---	---	---	---	---	---
	9/13/2017	99.50	5.91	93.59	---	---	---	---	ND	ND	ND	ND	ND
	12/11/2017	99.50	4.96	94.54	---	---	---	---	ND	ND	ND	ND	ND
	3/26/2018	99.50	4.71	94.79	---	---	---	---	ND	ND	ND	ND	ND
	3/26/2018	99.50	4.71	94.79	---	---	---	---	ND	ND	ND	ND	ND
	6/27/2018	99.50	5.53	93.97	---	---	---	---	ND	ND	ND	ND	ND
	9/19/2018	99.50	5.86	93.64	---	214.00	ND	214.00	ND	ND	ND	ND	ND
	3/21/2019	99.50	4.84	94.66	---	ND	ND	ND	ND	ND	ND	ND	ND
	9/17/2019	99.50	5.85	93.65	---	63.30	ND	63.30	ND	ND	ND	ND	ND
	3/10/2020	99.50	4.89	94.61	---	ND	ND	ND	ND	ND	ND	ND	ND
	10/14/2020	99.50	5.81	93.69	---	212.00	ND	212.00	ND	ND	ND	ND	ND
	3/25/2021	99.50	5.57	93.93	---	ND	ND	ND	ND	ND	ND	ND	ND
	3/25/2021	99.50	5.57	93.93	---	ND	ND	ND	ND	ND	ND	ND	ND
	9/22/2021	99.50	6.03	93.47	---	441.00	ND	441.00	ND	ND	ND	ND	ND
CW-02	1/10/1990	99.01	5.33	93.68	---	---	---	---	---	---	---	---	---
	9/13/2017	99.01	5.64	93.36	---	---	---	---	ND	ND	ND	ND	ND
	12/11/2017	99.01	4.65	94.36	---	---	---	---	ND	ND	ND	ND	ND
	3/26/2018	99.01	4.39	94.62	---	---	---	---	ND	ND	ND	ND	ND
	6/27/2018	99.01	5.24	93.77	---	---	---	---	ND	ND	ND	ND	ND
	9/19/2018	99.01	5.56	93.45	---	ND	ND	ND	50.60	10.60	16.60	ND	ND

<b>2001 MTCA Method A Cleanup Levels for Groundwater</b>	NE	500	800	5	1000	700	1000
--	----	-----	-----	---	------	-----	------

Well ID	Sampling Date	ERP (feet)	DTW (feet)	GWE (feet)	TPH (µg/L)	Diesel-range hydrocarbons (µg/L)	Heavy oil-range hydrocarbons (µg/L)	Combined Diesel-range and Heavy oil-range (µg/L)	NWTPH-Gx (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	
CW-02	9/19/2018	99.01	5.56	93.45	---	ND	188.00	188.00	56.80	9.94	15.90	ND	ND	
	3/21/2019	99.01	4.53	94.48	---	ND	261.00	261.00	ND	ND	ND	ND	ND	
	9/17/2019	99.01	5.54	93.46	---	ND	ND	ND	ND	ND	ND	ND	ND	
	3/10/2020	99.01	5.20	93.81	---	ND	255.00	255.00	ND	ND	ND	ND	ND	
	10/14/2020	99.01	5.54	93.47	---	ND	777.00	777.00	864.00	7.58	1.89	8.41	43.10	
	10/14/2020	99.01	5.54	93.47	---	4,570.00	ND	4,570.00	818.00	7.45	1.89	8.26	42.20	
	3/25/2021	99.01	5.4	93.61	---	364.00	ND	364.00	180.00	ND	ND	0.49	0.94	
	9/22/2021	99.01	5.72	93.29	---	354.00	ND	354.00	0.72	ND	ND	ND	ND	
MW-1 <i>Decommissioned</i>	1/10/1990	100.00	5.59	94.41	ND	---	---	---	---	ND	ND	ND	ND	
MW-2 <i>Decommissioned</i>	1/10/1990	98.92	4.51	94.41	2,460	---	---	---	1,643.0	409.00	ND	2955.00		
New Well Installed	10/14/2020	98.92	5.83	93.09	---	249.00	ND	249.00	106.00	ND	ND	ND	ND	
	3/25/2021	98.92	5.83	93.09	---	3,300.00	534.00	3,834.00	725.00	8.04	ND	27.70	1.74	
	9/22/2021	98.92	5.47	93.45	---	1,010.00	ND	1,010.00	872.00	3.57	ND	4.73	ND	
MW-03	1/10/1990	98.56	5.77	92.79	ND	---	---	---	---	ND	ND	ND	ND	
	9/13/2017	98.56	5.55	93.02	---	---	---	---	131.00	ND	ND	ND	ND	
	12/11/2017	98.56	5.05	93.51	---	---	---	---	ND	1.65	ND	ND	ND	
	12/11/2017	98.56	5.05	93.51	---	---	---	---	ND	1.60	ND	ND	ND	
	3/26/2018	98.56	4.44	94.12	---	---	---	---	ND	ND	ND	ND	ND	
	6/27/2018	98.56	5.26	93.30	---	---	---	---	ND	ND	ND	ND	ND	
	9/19/2018	98.56	5.56	93.01	---	ND	172.00	172.00	ND	ND	ND	ND	ND	
	3/21/2019	98.56	4.80	93.76	---	273	ND	273	202.00	24.40	32.00	1.10	16.54	
	9/17/2019	98.56	5.55	93.01	---	ND	ND	ND	67.30	ND	ND	ND	ND	
	3/10/2020	98.56	5.57	92.99	---	ND	122.00	122.00	ND	ND	ND	ND	ND	
	10/14/2020	98.56	5.86	92.70	---	ND	ND	ND	ND	ND	ND	ND	ND	
	3/25/2021	98.56	6.11	92.45	---	ND	135.00	135.00	ND	ND	ND	ND	ND	
9/22/2021	98.56	5.58	92.28	---	159.00	ND	159.00	ND	ND	ND	ND	ND		
MW-04	1/10/1990	98.27	4.06	94.21	3,050	---	---	---	---	118	23.00	ND	284.00	
	9/13/2017	98.27	5.32	92.96	---	---	---	---	558.00	4.03	ND	1.51	1.46	
	9/13/2017	98.27	5.32	92.96	---	---	---	---	547.00	ND	ND	ND	ND	
	12/11/2017	98.27	4.13	94.17	---	---	---	---	702.00	6.81	1.07	9.07	ND	
	3/26/2018	98.27	3.75	94.52	---	---	---	---	302.00	4.63	1.34	15.70	ND	
	6/27/2018	98.27	4.80	93.47	---	---	---	---	284.00	5.84	1.32	16.60	ND	
	9/19/2018	98.27	4.83	93.44	---	1,450.00	2,080.00	3,530.00	644.00	7.25	2.61	25.80	2.72	
	3/21/2019	98.27	3.60	94.67	---	220.00	376.00	596.00	718.00	4.46	1.78	18.10	2.70	
	9/17/2019	98.27	4.92	93.35	---	181.00	310.00	491.00	780.00	5.09	ND	3.08	1.16	
	3/10/2020	98.27	4.12	94.15	---	ND	552.00	552.00	96.00	ND	ND	2.60	ND	
	Lab Filtered New Well Installed	3/10/2020	98.27	4.12	94.15	---	ND	602.00	602.00	80.10	ND	ND	2.61	ND
	10/14/2020	98.27	4.80	93.47	---	707.00	ND	707.00	818.00	10.50	1.19	9.92	1.91	
	3/25/2021	98.27	5.42	92.85	---	497.00	964.00	1,461.00	1,740.00	139.00	3.84	56.20	12.02	
	9/22/2021	98.27	4.64	93.63	---	1,580.00	ND	1,580.00	2,050.00	128.00	3.10	36.50	6.07	
MW-06	1/10/1990	97.27	9.01	88.26	ND	---	---	---	---	9.00	5.00	15.00	80.00	
	9/13/2017	97.27	---	---	---	---	---	---	ND	ND	ND	ND	ND	
2001 MTCA Method A Cleanup Levels for Groundwater					NE	500			800	5	1,000	700	1,000	



Well ID	Sampling Date	ERP (feet)	DTW (feet)	GWE (feet)	TPH (µg/L)	Diesel-range hydrocarbons (µg/L)	Heavy oil-range hydrocarbons (µg/L)	Combined Diesel-range and Heavy oil-range (µg/L)	NWTPHGx (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	
<b>MW-06</b>	12/11/2017	97.27	---	---	---	---	---	---	---	---	---	---	---	
	3/26/2018	97.27	5.24	92.03	---	---	---	---	404.00	ND	ND	ND	ND	
	6/27/2018	97.27	5.31	91.96	---	---	---	---	101.00	ND	ND	ND	ND	
	9/19/2018	97.27	6.36	90.92	---	102.00	369.00	471.00	119.00	ND	ND	ND	ND	
	3/21/2019	97.27	5.08	92.19	---	ND	409.00	409.00	ND	ND	ND	ND	ND	
	9/17/2019	97.27	4.95	92.32	---	ND	<b>1440.00</b>	<b>1440.00</b>	90.20	ND	ND	ND	ND	
	3/10/2020	97.27	4.51	92.76	---	ND	<b>1580.00</b>	<b>1580.00</b>	ND	ND	ND	ND	ND	
	<i>Lab Filtered</i>	3/10/2020	97.27	4.51	92.76	---	ND	<b>1350.00</b>	<b>1350.00</b>	ND	ND	ND	ND	ND
	<i>New well installed</i>	10/14/2020	97.27	9.65	87.62	---	357.00	ND	357.00	202	ND	ND	ND	ND
		3/25/2021	97.27	5.90	91.37	---	128.00	372.00	<b>500.00</b>	499	4.01	ND	1.70	1.33
	9/22/2021	97.27	6.10	91.17	---	<b>597.00</b>	ND	<b>597.00</b>	575.00	2.32	ND	0.75	ND	
<b>MW-07</b>	<i>New well installed</i>	10/14/2020	95.27	8.72	86.55	---	179.00	ND	179.00	ND	ND	ND	ND	
		3/25/2021	95.27	5.96	89.31	---	ND	105.00	105.00	ND	ND	ND	ND	
		9/22/2021	95.27	5.47	89.80	---	ND	112.00	112.00	ND	ND	ND	ND	
<b>2001 MTCA Method A Cleanup Levels for Groundwater</b>					<b>NE</b>	<b>500</b>			<b>800</b>	<b>5</b>	<b>1000</b>	<b>700</b>	<b>1000</b>	

**Notes :**

MTCA Method A exceedences shown in bold

*Historic Data not collected by Fulcrum shown in italics*

**NE** Not Established. Individual analyte thresholds for Total Petroleum Hydrocarbons (TPH) have not been established and are referenced as the appropriate regulatory values above

TPH Total Petroleum Hydrocarbons

TD Total Boring Depth

**Notes :**

DS Depth Sampled

ERP Elevation of riser pipe based on an arbitrary datum of 100.00 feet

DTW Depth to water

GWE Groundwater elevation based on an arbitrary datum of 100.00 feet

NWTPHGx Northwest total petroleum hydrocarbons as gasoline;

BTEX Benzene, toluene, ethylbenzene and total xylenes

µg/L micrograms per liter or parts per billion

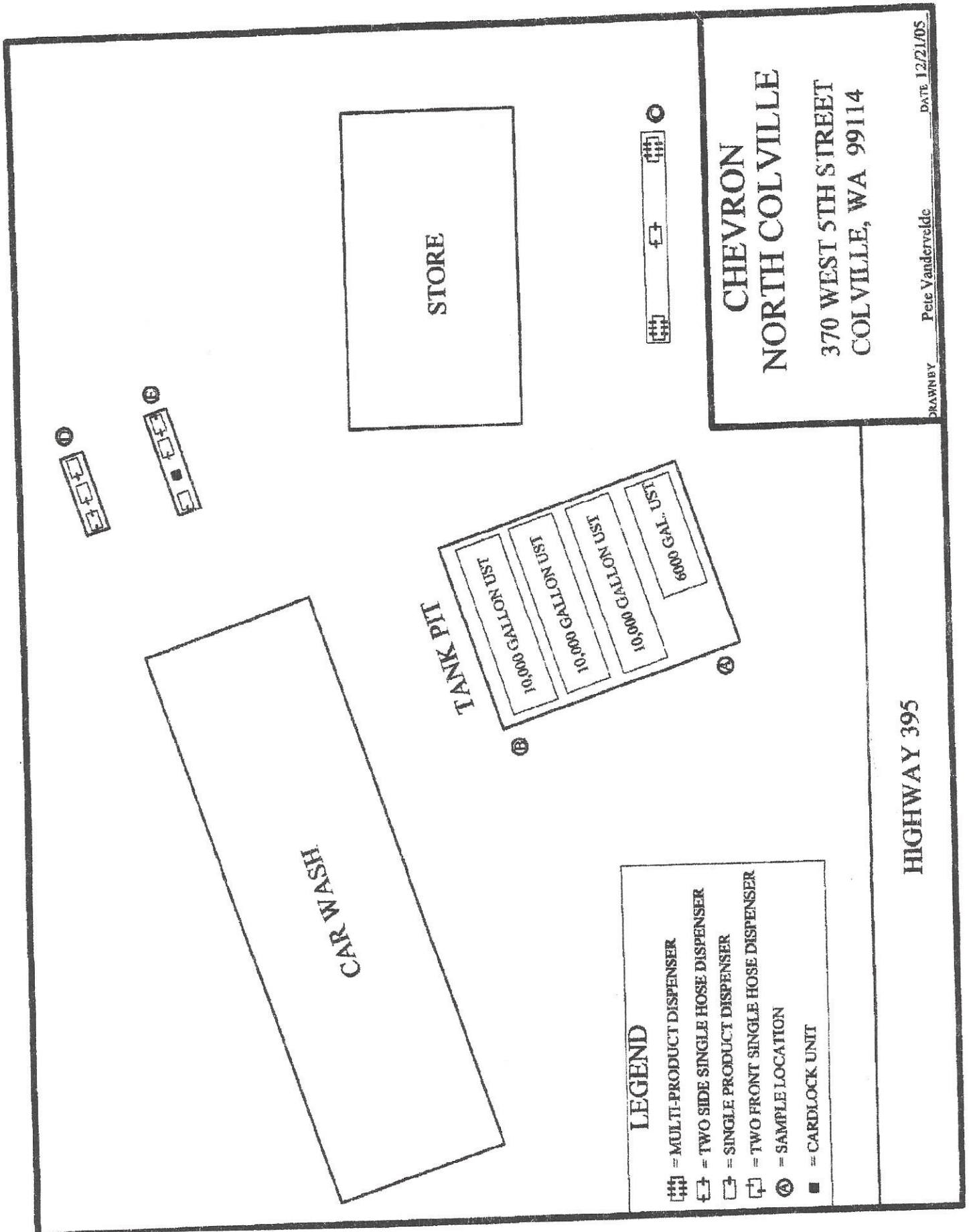
ND Not detected in concentrations exceeding laboratory method detection limit

--- Not available, not tested, not measured



## **APPENDIX C**

### 2005 Soil Sampling Results



**TABLE 1**  
**SOIL SAMPLE RESULTS**  
**CHEVRON**  
**NORTH COLVILLE**

DEPTH OF SAMPLE	15'	14'	5'	5'	5'	5'
<b>ANALYSES</b>	2-A	2-B	2-C	2-D	2-E	2-E
NWTPH-OIL	<100	<100	<100	<100	<100	<100
NWTPH-DIESEL	<10	<10	<10	<10	<10	<10
NWTPH-GAS	R	<5.0	<5.0	<5.0	<5.0	<5.0
<b>BENZENE</b>	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
<b>ETHYLBENZENE</b>	0.12	<0.025	<0.025	<0.025	<0.025	<0.025
<b>MTBE</b>	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
<b>TOLUENE</b>	0.229	<0.05	0.111	0.066	<0.05	<0.05
<b>XYLENE</b>	0.69	<0.05	0.099	0.081	<0.05	<0.05
<b>TOTAL LEAD</b>	13	N/A	N/A	N/A	N/A	N/A

**CLEANUP STANDARD**  
 2000 mg/Kg  
 2000 mg/Kg  
 100 mg/Kg OR 30mg/Kg  
 0.03 mg/Kg  
 6.0 mg/Kg  
 0.1 mg/Kg  
 7.0 mg/Kg  
 9.0 mg/Kg  
 250 mg/Kg

N/A = NOT ANALYZED (verifies analytic is below cleanup standards for highest NWTPH-G concentration reported)

**BOLDED RESULTS = ABOVE CLEANUP STANDARDS**

*ITALICIZED RESULTS = ESTIMATED CONCENTRATION. RESULT IS ABOVE NORMAL CALIBRATION RANGE. FINAL RESULT IS MOST LIKELY HIGHER*

<1.25 ? = SAMPLE METHOD DETECTION LIMIT WAS DILUTED ABOVE CLEANUP STANDARD DUE TO HIGH CONCENTRATION OF OTHER ANALYTE DETECTED



# SPECTRA Laboratories

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12/16/2005

Northwest Environmental Solutions, Inc  
 PO Box 1583  
 Sumner, WA 98390  
 Attn: Pete Vanderveide

P.O.#: Pd Ck #7160319036  
 Project: Whitton Oil  
 Client ID: 2-A  
 Sample Matrix: Soil  
 Date Sampled: 12/08/2005  
 Date Received: 12/12/2005  
 Spectra Project: 2005120166  
 Spectra Number: 1  
 Rush

Analyte	Result	Units	Method
Diesel	<10	mg/Kg	NWIPH-D
Oil	<100	mg/Kg	NWIPH-U
Gasoline	8	mg/Kg	NWIPH-G
Benzene	<0.025	mg/Kg	SW846 8200B
Ethylbenzene	0.12	mg/Kg	SW846 8200B
Methyl-tert-Butyl Ether	<0.025	mg/Kg	SW846 8200B
Toluene	0.229	mg/Kg	SW846 8200B
Total Xylenes	0.69	mg/Kg	SW846 8200B

Substrate	Recovery	Method
Technical Oil	113	NWIPH-D
2-Methyl-2-butanol	118	NWIPH-U
n-Propylal	10	NWIPH-G

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 (253) 272-4850



# SPECTRA Laboratories

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12/16/2005


Northwest Environmental Solutions, Inc  
 PO Box 1583  
 Sumner, WA 98390  
 Attn: Pete Vandervelde

P.O.#: Pd Ck #7160319036  
 Project: Whirton Oil  
 Client ID: 2-B  
 Sample Matrix: Soil  
 Date Sampled: 12/08/2005  
 Date Received: 12/12/2005  
 Spectra Project: 2005120166  
 Spectra Number: 2  
 Rush

Analyte	Result	Units	Method
Diesel	<10	mg/Kg	NWTPH-D
Oil	<100	mg/Kg	NWTPH-D
Gasoline	<5	mg/Kg	NWTPH-G
Benzene	<0.025	mg/Kg	SW846 8260B
Ethylbenzene	<0.025	mg/Kg	SW846 8260B
Methyl-tert-Butyl Ether	<0.025	mg/Kg	SW846 8260B
Toluene	<0.05	mg/Kg	SW846 8260B
Total Xylenes	<0.05	mg/Kg	SW846 8260B

Substrate	Recovery	Method
Toluene-d8	118	NWTPH-G
4-Fluorofluorobenzene	111	NWTPH-G
p-Terphenyl	60	NWTPH-D

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Steve Hibbs, Laboratory Manager

sh/hh



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12/16/2005

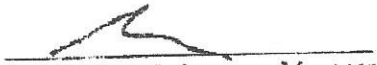
Northwest Environmental Solutions, Inc  
 PO Box 1583  
 Sumner, WA 98390  
 Attn: Pete Vandervelde

P.O.#: Pd Ck #7160319036  
 Project: Whitton Oil  
 Client ID: 2-C  
 Sample Matrix: Soil  
 Date Sampled: 12/08/2005  
 Date Received: 12/12/2005  
 Spectra Project: 2005120166  
 Spectra Number: 3  
 Rush

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Method</u>
Diesel	<10	mg/Kg	NWTPH-D
Oil	<100	mg/Kg	NWTPH-D
Gasoline	<5	mg/Kg	NWTPH-G
Benzene	<0.025	mg/Kg	SW846 8260B
Ethylbenzene	<0.025	mg/Kg	SW846 8260B
Methyl-tert-Butyl Ether	<0.025	mg/Kg	SW846 8260B
Toluene	0.111	mg/Kg	SW846 8260B
Total Xylenes	0.099	mg/Kg	SW846 8260B

<u>Surrogate</u>	<u>Recovery</u>	<u>Method</u>
Toluene-d8	111	NWTPH-G
4-Bromofluorobenzene	119	NWTPH-G
p-Terphenyl	62	NWTPH-D

## SPECTRA LABORATORIES



Steve Hibbs, Laboratory Manager





# SPECTRA Laboratories

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12/16/2005

Northwest Environmental Solutions, Inc  
 PO Box 1583  
 Sumner, WA 98390  
 Attn: Pete Vandervelde

P.O.#: Pd Ck #7160319036  
 Project: Whitton Oil  
 Client ID: 2-D  
 Sample Matrix: Soil  
 Date Sampled: 12/08/2005  
 Date Received: 12/12/2005  
 Spectra Project: 2005120166  
 Spectra Number: 4  
 Rush

Analyte	Result	Units	Method
Diesel	<10	mg/Kg	NWTPH-D
Oil	<100	mg/Kg	NWTPH-D
Gasoline	<5	mg/Kg	NWTPH-G
Benzene	<0.025	mg/Kg	SW846 8260B
Ethylbenzene	<0.025	mg/Kg	SW846 8260B
Methyl-tert-Butyl Ether	<0.025	mg/Kg	SW846 8260B
Toluene	0.066	mg/Kg	SW846 8260B
Total Xylenes	0.081	mg/Kg	SW846 8260B

Substrate	Recovery	Method
Toluene IS	115	NWTPH-G
4-Methylchlorobenzene	112	NWTPH-G
p-Terphenyl	76	NWTPH-D

SPECTRA LABORATORIES



Steve Hibbs, Laboratory Manager



# SPECTRA Laboratories

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12/16/2005

Northwest Environmental Solutions, Inc  
PO Box 1583  
Sumner, WA 98390  
Attn: Pete Vandervelde

P.O.#: Pd Ck #7160319036  
Project: Whitton Oil  
Client ID: 2-E  
Sample Matrix: Soil  
Date Sampled: 12/08/2005  
Date Received: 12/12/2005  
Spectra Project: 2005120166  
Spectra Number: 5  
Rush

Analyte	Result	Units	Method
Diesel	<10	mg/Kg	NWTPH-D
Oil	<100	mg/Kg	NWTPH-D
Gasoline	<5	mg/Kg	NWTPH-G
Benzene	<0.025	mg/Kg	SW846 8260B
Ethylbenzene	<0.025	mg/Kg	SW846 8260B
Methyl-tert-Butyl Ether	<0.025	mg/Kg	SW846 8260B
Toluene	<0.05	mg/Kg	SW846 8260B
Total Xylenes	<0.05	mg/Kg	SW846 8260B

Surrogate	Recovery	Method
Toluene-d8	112	NWTPH-G
4-Bromofluorobenzene	113	NWTPH-G
p-Terphenyl	62	NWTPH-D

SPECTRA LABORATORIES

  
Steve Hibbs, Laboratory Manager



## **APPENDIX D**

### Laboratory Analytical Results



**Fulcrum Environmental**

Ethan Bucken  
207 W Boone Ave.  
Spokane, WA 99201

**RE: Whitten Groundwater**  
**Work Order Number: 2109399**

October 01, 2021

**Attention Ethan Bucken:**

Fremont Analytical, Inc. received 8 sample(s) on 9/24/2021 for the analyses presented in the following report.

***Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.***  
***Gasoline by NWTPH-Gx***  
***Volatile Organic Compounds by EPA Method 8260D***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager



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**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater  
**Work Order:** 2109399

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**Work Order Sample Summary**

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Date/Time Collected</b>	<b>Date/Time Received</b>
2109399-001	W05-092221-CW01	09/22/2021 1:30 PM	09/24/2021 10:22 AM
2109399-002	W05-092221-CW02	09/22/2021 11:10 AM	09/24/2021 10:22 AM
2109399-003	W05-092221-MW02	09/22/2021 4:50 PM	09/24/2021 10:22 AM
2109399-004	W05-092221-MW03	09/22/2021 2:35 PM	09/24/2021 10:22 AM
2109399-005	W05-092221-MW04	09/22/2021 11:55 AM	09/24/2021 10:22 AM
2109399-006	W05-092221-MW06	09/22/2021 4:40 PM	09/24/2021 10:22 AM
2109399-007	W05-092221-MW07	09/22/2021 6:25 PM	09/24/2021 10:22 AM
2109399-008	W05-092221-MW08	09/22/2021 11:18 AM	09/24/2021 10:22 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

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**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

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**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

### Qualifiers:

- \* - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

### Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 1:30:00 PM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-001

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-CW01

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851 Analyst: MM

Diesel (Fuel Oil)	441	99.4		µg/L	1	9/28/2021 3:34:40 PM
Heavy Oil	ND	99.4		µg/L	1	9/28/2021 3:34:40 PM
Total Petroleum Hydrocarbons	441	199		µg/L	1	9/28/2021 3:34:40 PM
Surr: 2-Fluorobiphenyl	98.9	50 - 150		%Rec	1	9/28/2021 3:34:40 PM
Surr: o-Terphenyl	99.9	50 - 150		%Rec	1	9/28/2021 3:34:40 PM

**Gasoline by NWTPH-Gx**

Batch ID: 33841 Analyst: KT

Gasoline	ND	50.0		µg/L	1	9/27/2021 2:22:45 PM
Surr: Toluene-d8	99.4	65 - 135		%Rec	1	9/27/2021 2:22:45 PM
Surr: 4-Bromofluorobenzene	99.7	65 - 135		%Rec	1	9/27/2021 2:22:45 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841 Analyst: KT

Benzene	ND	0.440		µg/L	1	9/27/2021 2:22:45 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 2:22:45 PM
Ethylbenzene	ND	0.400		µg/L	1	9/27/2021 2:22:45 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 2:22:45 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 2:22:45 PM
Surr: Dibromofluoromethane	97.9	80 - 120		%Rec	1	9/27/2021 2:22:45 PM
Surr: Toluene-d8	93.9	80 - 120		%Rec	1	9/27/2021 2:22:45 PM
Surr: 1-Bromo-4-fluorobenzene	97.7	80 - 120		%Rec	1	9/27/2021 2:22:45 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 11:10:00 AM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-002

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-CW02

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851 Analyst: MM

Diesel (Fuel Oil)	354	98.3		µg/L	1	9/28/2021 5:18:05 PM
Heavy Oil	ND	98.3		µg/L	1	9/28/2021 5:18:05 PM
Total Petroleum Hydrocarbons	354	197		µg/L	1	9/28/2021 5:18:05 PM
Surr: 2-Fluorobiphenyl	98.9	50 - 150		%Rec	1	9/28/2021 5:18:05 PM
Surr: o-Terphenyl	100	50 - 150		%Rec	1	9/28/2021 5:18:05 PM

**Gasoline by NWTPH-Gx**

Batch ID: 33841 Analyst: KT

Gasoline	112	50.0		µg/L	1	9/27/2021 3:52:53 PM
Surr: Toluene-d8	99.0	65 - 135		%Rec	1	9/27/2021 3:52:53 PM
Surr: 4-Bromofluorobenzene	103	65 - 135		%Rec	1	9/27/2021 3:52:53 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841 Analyst: KT

Benzene	0.717	0.440		µg/L	1	9/27/2021 3:52:53 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 3:52:53 PM
Ethylbenzene	ND	0.400		µg/L	1	9/27/2021 3:52:53 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 3:52:53 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 3:52:53 PM
Surr: Dibromofluoromethane	97.6	80 - 120		%Rec	1	9/27/2021 3:52:53 PM
Surr: Toluene-d8	95.1	80 - 120		%Rec	1	9/27/2021 3:52:53 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	9/27/2021 3:52:53 PM





**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 4:50:00 PM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-003

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW02

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851 Analyst: MM

Diesel (Fuel Oil)	1,010	98.8		µg/L	1	9/29/2021 10:58:53 AM
Heavy Oil	ND	98.8		µg/L	1	9/29/2021 10:58:53 AM
Total Petroleum Hydrocarbons	1,010	198		µg/L	1	9/29/2021 10:58:53 AM
Surr: 2-Fluorobiphenyl	92.2	50 - 150		%Rec	1	9/29/2021 10:58:53 AM
Surr: o-Terphenyl	97.0	50 - 150		%Rec	1	9/29/2021 10:58:53 AM

**Gasoline by NWTPH-Gx**

Batch ID: 33841 Analyst: KT

Gasoline	872	50.0		µg/L	1	9/27/2021 4:22:59 PM
Surr: Toluene-d8	99.7	65 - 135		%Rec	1	9/27/2021 4:22:59 PM
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	9/27/2021 4:22:59 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841 Analyst: KT

Benzene	3.57	0.440		µg/L	1	9/27/2021 4:22:59 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 4:22:59 PM
Ethylbenzene	4.73	0.400		µg/L	1	9/27/2021 4:22:59 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 4:22:59 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 4:22:59 PM
Surr: Dibromofluoromethane	96.1	80 - 120		%Rec	1	9/27/2021 4:22:59 PM
Surr: Toluene-d8	96.4	80 - 120		%Rec	1	9/27/2021 4:22:59 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	9/27/2021 4:22:59 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 2:35:00 PM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-004

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW03

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851

Analyst: MM

Diesel (Fuel Oil)	159	98.7		µg/L	1	9/29/2021 11:24:36 AM
Heavy Oil	ND	98.7		µg/L	1	9/29/2021 11:24:36 AM
Total Petroleum Hydrocarbons	ND	197		µg/L	1	9/29/2021 11:24:36 AM
Surr: 2-Fluorobiphenyl	95.6	50 - 150		%Rec	1	9/29/2021 11:24:36 AM
Surr: o-Terphenyl	102	50 - 150		%Rec	1	9/29/2021 11:24:36 AM

**Gasoline by NWTPH-Gx**

Batch ID: 33841

Analyst: KT

Gasoline	ND	50.0		µg/L	1	9/27/2021 4:53:06 PM
Surr: Toluene-d8	99.8	65 - 135		%Rec	1	9/27/2021 4:53:06 PM
Surr: 4-Bromofluorobenzene	102	65 - 135		%Rec	1	9/27/2021 4:53:06 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841

Analyst: KT

Benzene	ND	0.440		µg/L	1	9/27/2021 4:53:06 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 4:53:06 PM
Ethylbenzene	ND	0.400		µg/L	1	9/27/2021 4:53:06 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 4:53:06 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 4:53:06 PM
Surr: Dibromofluoromethane	96.6	80 - 120		%Rec	1	9/27/2021 4:53:06 PM
Surr: Toluene-d8	92.8	80 - 120		%Rec	1	9/27/2021 4:53:06 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	9/27/2021 4:53:06 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 11:55:00 AM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-005

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW04

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851

Analyst: MM

Diesel (Fuel Oil)	1,580	98.2		µg/L	1	9/29/2021 11:50:28 AM
Heavy Oil	ND	98.2		µg/L	1	9/29/2021 11:50:28 AM
Total Petroleum Hydrocarbons	1,580	196		µg/L	1	9/29/2021 11:50:28 AM
Surr: 2-Fluorobiphenyl	93.8	50 - 150		%Rec	1	9/29/2021 11:50:28 AM
Surr: o-Terphenyl	105	50 - 150		%Rec	1	9/29/2021 11:50:28 AM

**Gasoline by NWTPH-Gx**

Batch ID: 33841

Analyst: KT

Gasoline	2,050	500	D	µg/L	10	9/28/2021 7:56:46 AM
Surr: Toluene-d8	98.7	65 - 135	D	%Rec	10	9/28/2021 7:56:46 AM
Surr: 4-Bromofluorobenzene	97.9	65 - 135	D	%Rec	10	9/28/2021 7:56:46 AM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841

Analyst: KT

Benzene	128	4.40	D	µg/L	10	9/28/2021 7:56:46 AM
Toluene	3.10	0.750		µg/L	1	9/27/2021 5:23:12 PM
Ethylbenzene	36.5	4.00	D	µg/L	10	9/28/2021 7:56:46 AM
m,p-Xylene	6.07	1.00		µg/L	1	9/27/2021 5:23:12 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 5:23:12 PM
Surr: Dibromofluoromethane	95.4	80 - 120		%Rec	1	9/27/2021 5:23:12 PM
Surr: Toluene-d8	96.4	80 - 120		%Rec	1	9/27/2021 5:23:12 PM
Surr: 1-Bromo-4-fluorobenzene	99.9	80 - 120		%Rec	1	9/27/2021 5:23:12 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 4:40:00 PM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-006

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW06

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851

Analyst: MM

Diesel (Fuel Oil)	597	99.9		µg/L	1	9/28/2021 7:01:39 PM
Heavy Oil	ND	99.9		µg/L	1	9/28/2021 7:01:39 PM
Total Petroleum Hydrocarbons	597	200		µg/L	1	9/28/2021 7:01:39 PM
Surr: 2-Fluorobiphenyl	100	50 - 150		%Rec	1	9/28/2021 7:01:39 PM
Surr: o-Terphenyl	107	50 - 150		%Rec	1	9/28/2021 7:01:39 PM

**Gasoline by NWTPH-Gx**

Batch ID: 33841

Analyst: KT

Gasoline	575	50.0		µg/L	1	9/28/2021 7:26:48 AM
Surr: Toluene-d8	99.0	65 - 135		%Rec	1	9/28/2021 7:26:48 AM
Surr: 4-Bromofluorobenzene	100	65 - 135		%Rec	1	9/28/2021 7:26:48 AM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841

Analyst: KT

Benzene	2.32	0.440		µg/L	1	9/28/2021 7:26:48 AM
Toluene	ND	0.750		µg/L	1	9/27/2021 5:53:19 PM
Ethylbenzene	0.752	0.400		µg/L	1	9/28/2021 7:26:48 AM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 5:53:19 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 5:53:19 PM
Surr: Dibromofluoromethane	95.7	80 - 120		%Rec	1	9/27/2021 5:53:19 PM
Surr: Toluene-d8	93.3	80 - 120		%Rec	1	9/27/2021 5:53:19 PM
Surr: 1-Bromo-4-fluorobenzene	102	80 - 120		%Rec	1	9/27/2021 5:53:19 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 6:25:00 PM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-007

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW07

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851

Analyst: MM

Diesel (Fuel Oil)	ND	99.0		µg/L	1	9/28/2021 7:27:36 PM
Heavy Oil	112	99.0		µg/L	1	9/28/2021 7:27:36 PM
Total Petroleum Hydrocarbons	ND	198		µg/L	1	9/28/2021 7:27:36 PM
Surr: 2-Fluorobiphenyl	92.1	50 - 150		%Rec	1	9/28/2021 7:27:36 PM
Surr: o-Terphenyl	96.3	50 - 150		%Rec	1	9/28/2021 7:27:36 PM

**Gasoline by NWTPH-Gx**

Batch ID: 33841

Analyst: KT

Gasoline	ND	50.0		µg/L	1	9/27/2021 6:23:26 PM
Surr: Toluene-d8	100	65 - 135		%Rec	1	9/27/2021 6:23:26 PM
Surr: 4-Bromofluorobenzene	101	65 - 135		%Rec	1	9/27/2021 6:23:26 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841

Analyst: KT

Benzene	ND	0.440		µg/L	1	9/27/2021 6:23:26 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 6:23:26 PM
Ethylbenzene	ND	0.400		µg/L	1	9/27/2021 6:23:26 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 6:23:26 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 6:23:26 PM
Surr: Dibromofluoromethane	95.7	80 - 120		%Rec	1	9/27/2021 6:23:26 PM
Surr: Toluene-d8	93.0	80 - 120		%Rec	1	9/27/2021 6:23:26 PM
Surr: 1-Bromo-4-fluorobenzene	100	80 - 120		%Rec	1	9/27/2021 6:23:26 PM



**Client:** Fulcrum Environmental

**Collection Date:** 9/22/2021 11:18:00 AM

**Project:** Whitten Groundwater

**Lab ID:** 2109399-008

**Matrix:** Groundwater

**Client Sample ID:** W05-092221-MW08

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Batch ID: 33851 Analyst: MM

Diesel (Fuel Oil)	379	98.4		µg/L	1	9/28/2021 7:53:28 PM
Heavy Oil	ND	98.4		µg/L	1	9/28/2021 7:53:28 PM
Total Petroleum Hydrocarbons	379	197		µg/L	1	9/28/2021 7:53:28 PM
Surr: 2-Fluorobiphenyl	96.6	50 - 150		%Rec	1	9/28/2021 7:53:28 PM
Surr: o-Terphenyl	94.8	50 - 150		%Rec	1	9/28/2021 7:53:28 PM

**Gasoline by NWTPH-Gx**

Batch ID: 33841 Analyst: KT

Gasoline	115	50.0		µg/L	1	9/27/2021 6:53:26 PM
Surr: Toluene-d8	99.2	65 - 135		%Rec	1	9/27/2021 6:53:26 PM
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	9/27/2021 6:53:26 PM

**Volatile Organic Compounds by EPA Method 8260D**

Batch ID: 33841 Analyst: KT

Benzene	0.691	0.440		µg/L	1	9/27/2021 6:53:26 PM
Toluene	ND	0.750		µg/L	1	9/27/2021 6:53:26 PM
Ethylbenzene	ND	0.400		µg/L	1	9/27/2021 6:53:26 PM
m,p-Xylene	ND	1.00		µg/L	1	9/27/2021 6:53:26 PM
o-Xylene	ND	0.500		µg/L	1	9/27/2021 6:53:26 PM
Surr: Dibromofluoromethane	96.6	80 - 120		%Rec	1	9/27/2021 6:53:26 PM
Surr: Toluene-d8	94.2	80 - 120		%Rec	1	9/27/2021 6:53:26 PM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	9/27/2021 6:53:26 PM

**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Sample ID: <b>MB-33851</b>	SampType: <b>MBLK</b>	Units: <b>µg/L</b>			Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>					
Client ID: <b>MBLKW</b>	Batch ID: <b>33851</b>				Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424271</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	99.8									
Heavy Oil	ND	99.8									
Total Petroleum Hydrocarbons	ND	200									
Surr: 2-Fluorobiphenyl	20.2		19.96		101	50	150				
Surr: o-Terphenyl	21.6		19.96		108	50	150				

Sample ID: <b>LCS-33851</b>	SampType: <b>LCS</b>	Units: <b>µg/L</b>			Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>33851</b>				Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424272</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Petroleum Hydrocarbons	882	197	986.8	0	89.3	55	117				
Surr: 2-Fluorobiphenyl	16.4		19.74		83.0	50	150				
Surr: o-Terphenyl	20.6		19.74		104	50	150				

Sample ID: <b>2109422-002BMS</b>	SampType: <b>MS</b>	Units: <b>µg/L</b>			Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>					
Client ID: <b>BATCH</b>	Batch ID: <b>33851</b>				Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424275</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Petroleum Hydrocarbons	1,010	196	981.4	0	103	37.1	131				
Surr: 2-Fluorobiphenyl	15.0		19.63		76.2	50	150				
Surr: o-Terphenyl	22.4		19.63		114	50	150				

Sample ID: <b>2109399-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>			Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>					
Client ID: <b>W05-092221-CW01</b>	Batch ID: <b>33851</b>				Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424282</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	378	98.4						441.4	15.6	30	
Heavy Oil	ND	98.4						0		30	
Total Petroleum Hydrocarbons	378	197						441.4	15.6	30	

**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.**

Sample ID: <b>2109399-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>							
Client ID: <b>W05-092221-CW01</b>	Batch ID: <b>33851</b>		Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424282</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: 2-Fluorobiphenyl	17.7		19.68		90.0	50	150		0		
Surr: o-Terphenyl	18.5		19.68		94.0	50	150		0		

Sample ID: <b>2109411-002BDUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70202</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>33851</b>		Analysis Date: <b>9/28/2021</b>	SeqNo: <b>1424809</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	1,770	99.6						1,676	5.23	30	
Heavy Oil	ND	99.6						0		30	
Total Petroleum Hydrocarbons	1,770	199						1,676	5.23	30	
Surr: 2-Fluorobiphenyl	24.0		19.93		121	50	150		0		
Surr: o-Terphenyl	22.5		19.93		113	50	150		0		



**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Gasoline by NWTPH-Gx**

Sample ID: <b>MB-33841</b>	SampType: <b>MBLK</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70189</b>							
Client ID: <b>MBLKW</b>	Batch ID: <b>33841</b>		Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423857</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	50.0									
Surr: Toluene-d8	24.8		25.00		99.2	65	135				
Surr: 4-Bromofluorobenzene	24.4		25.00		97.7	65	135				

Sample ID: <b>2109399-001ADUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70189</b>							
Client ID: <b>W05-092221-CW01</b>	Batch ID: <b>33841</b>		Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423838</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	50.0						0		30	
Surr: Toluene-d8	24.6		25.00		98.4	65	135		0		
Surr: 4-Bromofluorobenzene	24.0		25.00		95.9	65	135		0		

Sample ID: <b>2109408-003ADUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70189</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>33841</b>		Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1424632</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	145	50.0						157.0	7.61	30	
Surr: Toluene-d8	24.9		25.00		99.7	65	135		0		
Surr: 4-Bromofluorobenzene	26.2		25.00		105	65	135		0		

Sample ID: <b>2109399-008AMS</b>	SampType: <b>MS</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70189</b>							
Client ID: <b>W05-092221-MW08</b>	Batch ID: <b>33841</b>		Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423848</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	563	50.0	500.0	114.8	89.7	65	135				
Surr: Toluene-d8	24.5		25.00		97.8	65	135				
Surr: 4-Bromofluorobenzene	26.1		25.00		104	65	135				

**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Volatile Organic Compounds by EPA Method 8260D**

Sample ID: <b>LCS-33841</b>	SampType: <b>LCS</b>	Units: <b>µg/L</b>				Prep Date: <b>9/27/2021</b>	RunNo: <b>70188</b>				
Client ID: <b>LCSW</b>	Batch ID: <b>33841</b>					Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423825</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.2	0.440	20.00	0	101	80	120				
Toluene	21.3	0.750	20.00	0	106	80	120				
Ethylbenzene	19.0	0.400	20.00	0	94.8	80	120				
m,p-Xylene	38.5	1.00	40.00	0	96.3	80	120				
o-Xylene	19.5	0.500	20.00	0	97.3	80	120				
Surr: Dibromofluoromethane	26.5		25.00		106	80	120				
Surr: Toluene-d8	26.8		25.00		107	80	120				
Surr: 1-Bromo-4-fluorobenzene	25.7		25.00		103	80	120				

Sample ID: <b>MB-33841</b>	SampType: <b>MBLK</b>	Units: <b>µg/L</b>				Prep Date: <b>9/27/2021</b>	RunNo: <b>70188</b>				
Client ID: <b>MBLKW</b>	Batch ID: <b>33841</b>					Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423824</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.440									
Toluene	ND	0.750									
Ethylbenzene	ND	0.400									
m,p-Xylene	ND	1.00									
o-Xylene	ND	0.500									
Surr: Dibromofluoromethane	24.1		25.00		96.4	80	120				
Surr: Toluene-d8	23.7		25.00		94.6	80	120				
Surr: 1-Bromo-4-fluorobenzene	24.2		25.00		96.8	80	120				

Sample ID: <b>2109399-001ADUP</b>	SampType: <b>DUP</b>	Units: <b>µg/L</b>				Prep Date: <b>9/27/2021</b>	RunNo: <b>70188</b>				
Client ID: <b>W05-092221-CW01</b>	Batch ID: <b>33841</b>					Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423800</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.440						0		30	
Toluene	ND	0.750						0		30	
Ethylbenzene	ND	0.400						0		30	

**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Volatile Organic Compounds by EPA Method 8260D**

Sample ID: <b>2109399-001ADUP</b>		SampType: <b>DUP</b>		Units: <b>µg/L</b>		Prep Date: <b>9/27/2021</b>		RunNo: <b>70188</b>			
Client ID: <b>W05-092221-CW01</b>		Batch ID: <b>33841</b>				Analysis Date: <b>9/27/2021</b>		SeqNo: <b>1423800</b>			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	0.500						0		30	
Surr: Dibromofluoromethane	24.6		25.00		98.4	80	120		0		
Surr: Toluene-d8	23.5		25.00		94.2	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	23.5		25.00		93.8	80	120		0		

Sample ID: <b>2109408-003ADUP</b>		SampType: <b>DUP</b>		Units: <b>µg/L</b>		Prep Date: <b>9/27/2021</b>		RunNo: <b>70188</b>			
Client ID: <b>BATCH</b>		Batch ID: <b>33841</b>				Analysis Date: <b>9/27/2021</b>		SeqNo: <b>1423811</b>			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	30.9	0.440						31.70	2.45	30	
Toluene	3.76	0.750						3.817	1.54	30	
Ethylbenzene	ND	0.400						0		30	
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	0.500						0		30	
Surr: Dibromofluoromethane	24.2		25.00		96.6	80	120		0		
Surr: Toluene-d8	23.8		25.00		95.2	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	25.6		25.00		103	80	120		0		

Sample ID: <b>2109399-008AMS</b>		SampType: <b>MS</b>		Units: <b>µg/L</b>		Prep Date: <b>9/27/2021</b>		RunNo: <b>70188</b>			
Client ID: <b>W05-092221-MW08</b>		Batch ID: <b>33841</b>				Analysis Date: <b>9/27/2021</b>		SeqNo: <b>1423810</b>			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.9	0.440	20.00	0.6909	96.1	76.9	135				
Toluene	20.1	0.750	20.00	0	101	76.2	131				
Ethylbenzene	20.0	0.400	20.00	0	100	82.1	129				
m,p-Xylene	41.0	1.00	40.00	0	102	84.3	123				
o-Xylene	20.9	0.500	20.00	0	104	83.5	122				
Surr: Dibromofluoromethane	24.1		25.00		96.2	80	120				

**Work Order:** 2109399  
**CLIENT:** Fulcrum Environmental  
**Project:** Whitten Groundwater

**QC SUMMARY REPORT**  
**Volatile Organic Compounds by EPA Method 8260D**

Sample ID: <b>2109399-008AMS</b>	SampType: <b>MS</b>	Units: <b>µg/L</b>	Prep Date: <b>9/27/2021</b>	RunNo: <b>70188</b>							
Client ID: <b>W05-092221-MW08</b>	Batch ID: <b>33841</b>		Analysis Date: <b>9/27/2021</b>	SeqNo: <b>1423810</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Toluene-d8	23.9		25.00		95.7	80	120				
Surr: 1-Bromo-4-fluorobenzene	26.7		25.00		107	80	120				

Client Name: **FES**

 Work Order Number: **2109399**

 Logged by: **Gabrielle Coeulle**

 Date Received: **9/24/2021 10:22:00 AM**

### Chain of Custody

1. Is Chain of Custody complete? Yes  No  Not Present
2. How was the sample delivered? FedEx

### Log In

3. Coolers are present? Yes  No  NA
4. Shipping container/cooler in good condition? Yes  No
5. Custody Seals present on shipping container/cooler?  
(Refer to comments for Custody Seals not intact) Yes  No  Not Present
6. Was an attempt made to cool the samples? Yes  No  NA
7. Were all items received at a temperature of >2°C to 6°C \* Yes  No  NA
8. Sample(s) in proper container(s)? Yes  No
9. Sufficient sample volume for indicated test(s)? Yes  No
10. Are samples properly preserved? Yes  No
11. Was preservative added to bottles? Yes  No  NA
12. Is there headspace in the VOA vials? Yes  No  NA
13. Did all samples containers arrive in good condition(unbroken)? Yes  No
14. Does paperwork match bottle labels? Yes  No
15. Are matrices correctly identified on Chain of Custody? Yes  No
16. Is it clear what analyses were requested? Yes  No
17. Were all holding times able to be met? Yes  No

### Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes  No  NA

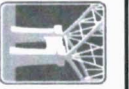
Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

### Item Information

Item #	Temp °C
Sample 1	3.7

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



**Fremont**  
Analytical

3600 Fremont Ave N.  
Seattle, WA 98103  
Tel: 206-352-3790  
Fax: 206-352-7178

**Chain of Custody Record & Laboratory Services Agreement**

Date: 9/23/2021 Page: 1 of 1

Project Name: Winkler Green Jacket

Project No: 213162.00

Collected by: E. Dackes

Location: Report To (PM): Ethan Dackes

PM Email: ethan.dackes@fulcrum.net

Sample Disposal:  Return to client  Disposal by lab (after 30 days)

Laboratory Project No (Internal): 2109399

Special Remarks:

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	# of Cont.	Analytes											Comments	
					VOCs (EPA 8260 / 624)	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (GX)	Diesel/Heavy Oil Range Organics (HCO)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - 625)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)   Dissolved (D)	Anions (C)***		EDB (8011)
1 W05-092221-CW01	9/22/21	1330	AW	4	X	X	X	X	X	X	X	X	X	X	X		
2 -CW02		1110		4	X	X	X	X	X	X	X	X	X	X	X		
3 -MW02		1650		4	X	X	X	X	X	X	X	X	X	X	X		
4 -MW03		1435		4	X	X	X	X	X	X	X	X	X	X	X		
5 -MW04		1155		4	X	X	X	X	X	X	X	X	X	X	X		
6 -MW06		1640		4	X	X	X	X	X	X	X	X	X	X	X		
7 -MW07		1825		4	X	X	X	X	X	X	X	X	X	X	X		
8 -MW08		1118		7	X	X	X	X	X	X	X	X	X	X	X		
9																	
10																	

\*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

\*\*Metals (Circle): MTCAs-5 RCRAs-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Tl Ti V Zn

\*\*\*Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished (Signature) \_\_\_\_\_ Date/Time \_\_\_\_\_ Received (Signature) \_\_\_\_\_ Date/Time \_\_\_\_\_