

**Whitten Oil
Groundwater Monitoring
March 2023
Sampling Report**

**Whitty's Chevron
370 West 5th Avenue
Colville, Washington 99114**

Project Number: 233710.00

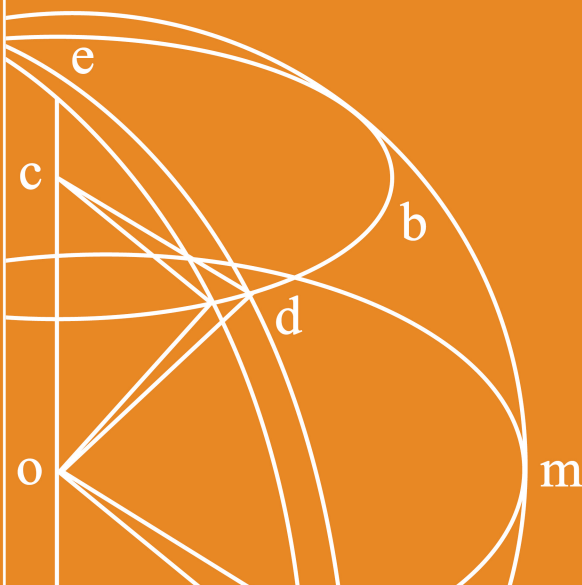
Date: May 2, 2023

Prepared for:

Whitten Oil
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Fulcrum Environmental Consulting, Inc.
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Spokane, Washington 99201





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Report Integrity

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1.0 INTRODUCTION

On March 28, 2023, Fulcrum Environmental Consulting, Inc. (Fulcrum) conducted a 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 5th Avenue, Colville, Washington

Site services were completed by Scott Groat, A Washington State Licensed Geologist and Ethan Ducken, a Washington State recognized Geologist-In-Training (GIT), 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 for onsite groundwater monitoring wells at Whitty's Chevron located at 370 West 5th 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, ethylbenzene, xylene (BTEX), gasoline-range organics, diesel-range organics, and heavy oil-range organics. Results of the investigation and testing from March 2023 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 was 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 (USTs) were reported to be located west of the convenience store within the southern portion of the property: two (2) 10,000-gallon diesel tanks, one (1) 6,000-gallon premium gasoline tank, and one (1) 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 2020 groundwater monitoring well installation event identified that beneath the paved surface are three (3) to eight (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 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 0.024. During Fulcrum's investigation, recorded site groundwater levels ranged from 4.53 to 5.65 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 the site's 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 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 the 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 the 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 the contamination from migrating offsite. 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 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). Laboratory analytical identified detectable concentrations of gasoline range petroleum hydrocarbons, ethyl benzene, toluene, xylene, and lead in soil boring 2-A and toluene and xylene were detected in soil borings 2-C and 2-D; all analytes were identified below MTCA Method A cleanup levels for soil. The 2005 historical soil boring results and locations are presented as Appendix C.



In 2017 Fulcrum was retained to conduct semi-annual groundwater sampling at the site. Monitoring wells MW-04 and MW-06 were identified to be in poor condition (poor surface seals and slow recharge). They were decommissioned and replaced by new wells under Fulcrum's oversight on September 30, 2020. Concurrent with the well replacement, Fulcrum directed the installation of two (2) new monitoring wells to support ongoing site monitoring.



Monitoring well MW-02 was installed upgradient north of the gas station building where the former Leaking Underground Storage Tanks (LUSTs) were removed and monitoring well MW-07 was installed at the northwest corner of the property to act as a downgradient sentinel well. Fulcrum continues to conduct groundwater monitoring on a semi-annual basis.

In May of 2022, Ecology requested recommendations for additional investigation to be included in the September 2022 groundwater monitoring report. This report presents results of the March 2023 sampling event and updates characterization as presented in the September 2022 report.

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

3.1 Groundwater Sampling

On March 28, 2023, Fulcrum completed groundwater sampling of the following seven (7) monitoring wells: CW-01, CW-02, MW-02, MW-03, MW-04, MW-06, and -MW07. Seven (7) groundwater samples (WOS-032822-CW01, -CW02, -MW02, -MW03, -MW04, -MW06, -MW07) and one (1) field duplicate sample (WOS-032822-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 ± 0.01 foot. Elevation corrections were made using wellhead elevation data from the subject site.

The groundwater flow direction, as determined by this sampling and monitoring event, is northwest with a hydraulic gradient of 0.024 (4.4-ft change in groundwater elevation over 180-feet), which is consistent with site geomorphology. A groundwater elevation map is presented as Figure 4.

Sampling activities were completed using a peristaltic pump, submersible pump, and field water quality instruments. In each location the monitoring well was purged 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

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 (µg/L). Copies of current groundwater sampling laboratory analytical results are presented in Appendix D.

Table 1: Whitty's Chevron Groundwater Analytical Results for March 28, 2023

Location	Sample Number	Ground-water Elevation	Results (µg/L)						
			NWTPH-Dx		Gasoline	Benzene	Toluene	Ethyl-benzene	Xylene
			Diesel	Oil					
CW-01	WOS-032823-CW01	94.65	173.0	ND	ND	6.05	ND	ND	ND
	WOS-032823-MW08		195.0	ND	ND	6.02	ND	ND	ND
CW-02	WOS-032823-CW02	94.48	355.0	ND	429.0	104.0	20.5	0.46	10.32
MW-02	WOS-032823-MW02	94.33	1250.0	ND	489.0	4.97	ND	1.58	ND
MW-03	WOS-032823-MW03	93.24	518.0	ND	389.0	88.3	20.3	0.54	3.0
MW-04	WOS-032823-MW04	93.54	1250.0	ND	1180.0	70.2	ND	15.5	3.94
MW-06	WOS-032823-MW06	91.62	374.0	ND	80.0	2.09	ND	ND	ND
MW-07	WOS-032823-MW07	89.93	225	ND	ND	ND	ND	ND	ND
MTCA Cleanup Levels ¹			500 ⁺		800 [*]	5	1,000	700	1,000

Bold – MTCA Method A exceedance ND – Nondetect µg/L – Micrograms per liter (µg/L), equivalent to parts per billion (ppb)

¹Model Toxic Cleanup Act Method A Cleanup Levels for groundwater in µg/L, as established by the Washington State Department of Ecology
+ Diesel-range and heavy oil-range hydrocarbon concentrations are combined together per MTCA Method A cleanup standards for groundwater

*Established cleanup level when benzene is present in groundwater



Analytical results document concentrations of select analytes in excess of regulatory thresholds in all monitoring wells except MW-06 and MW-07. Benzene was identified at concentrations above regulatory thresholds in four (4) of the seven (7) monitoring wells.

Samples were shown as received by the laboratory at an acceptable temperature. Based on laboratory reports, it is Fulcrum's opinion that field and laboratory data quality results confirm acceptable accuracy of analytical data for all samples.

5.0 DISCUSSION

Fulcrum's March 2023 semi-annual groundwater monitoring event for seven (7) onsite groundwater monitoring wells documented presence of petroleum hydrocarbon concentrations in excess of regulatory thresholds in five (5) of the seven (7) monitoring wells. In addition, benzene was identified in concentrations above regulatory thresholds in four (4) of the seven (7) monitoring wells.

6.0 TRENDING EVALUATION

Review of monitoring data shows a trend of increased contaminant concentrations and areal extent that is inconsistent with ongoing degradation of a 1989 spill. Review of data generated during Fulcrum's monitoring from December of 2017 to current shows an increasing trend in both concentration and areal extent. Evaluation identified normal fluctuations in hydrogeologic conditions and replacement/addition of monitoring wells as potential sources of the change, but the ongoing trend suggests a new release of petroleum product.

6.1 Concentration Trending

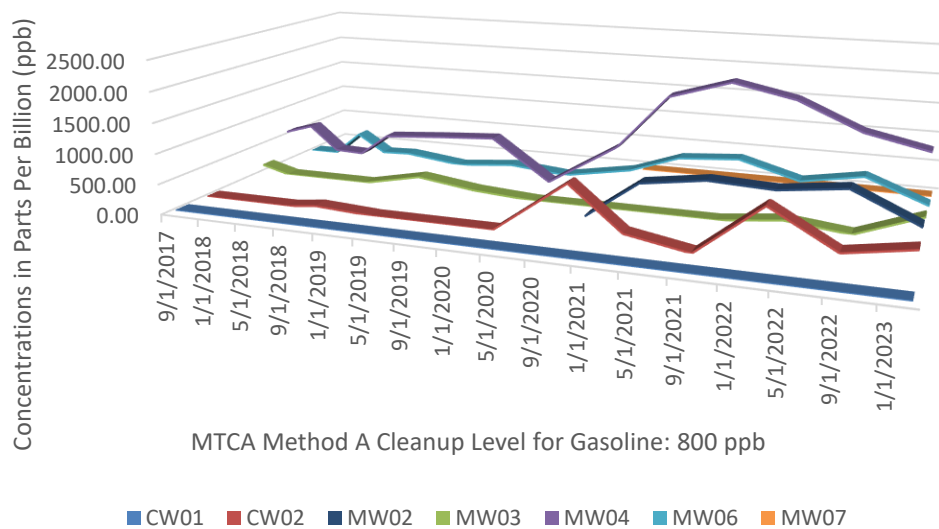
In review of concentration trending Fulcrum reviewed gasoline-range hydrocarbons, benzene, and diesel-range hydrocarbons. Fulcrum notes a variety of site conditions with potential to result in short term influence on contaminant concentrations including periodically dry wells, replacement of select monitoring wells, and placement of new monitoring wells. It is Fulcrum's opinion that review of contaminant concentrations over a longer period provides a strong understanding of site conditions.

Graph 1 as follows presents gasoline-range hydrocarbons concentrations in seven (7) site monitoring wells over 17 consecutive events of monitoring.



Results show a relatively stable range of concentrations in MW-04 until the October 2020 sampling event where concentrations increased significantly. During the same sampling event elevated concentrations were also identified in CW-02, a location that had been previously clean. A second notable increase in concentrations is noted in MW-02 and MW-04 in September 2021, and a third notable increase in concentrations is noted in CW-02 in March of 2022. In March 2023 gasoline concentrations in CW-02 and MW-03 are shown to increase, while all other wells are shown to decrease or remain non-detect.

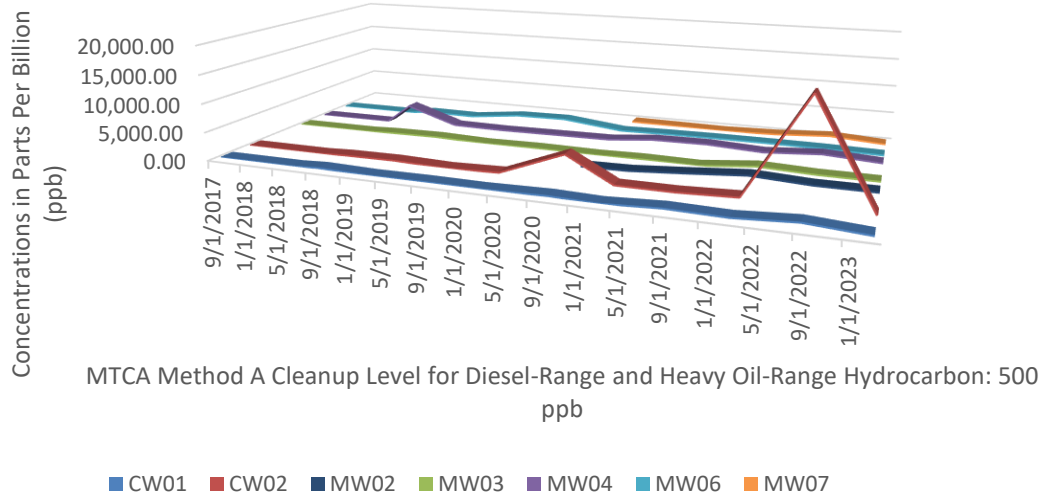
Graph 1: March 2023 Gasoline (NWTPH-Gx) Concentrations



Graph 2 below presents combined diesel-range and heavy oil-range hydrocarbon concentrations in the seven (7) monitored wells. All wells were reported as non-detect for combined diesel-range and heavy oil-range hydrocarbon concentrations until September 2018 where a notable increase is noted in MW-04. A second notable increase in concentrations is noted in CW-02 in March 2020 and again in September 2022, concurrently with the downgradient well MW-07. Results from March 2023 show a decrease in combined diesel-range and heavy oil-range hydrocarbon concentrations in all wells.

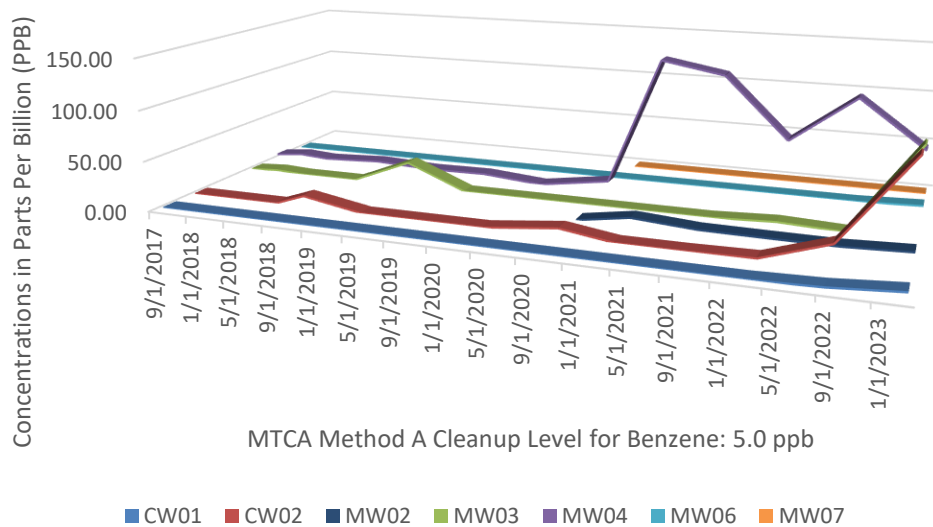


Graph 2: March 2023 Combined Diesel-Range and Heavy Oil-Range Hydrocarbon Concentrations



Graph 3 below presents identified benzene concentrations in the seven (7) monitored wells. All wells were reported as non-detect or below cleanup for benzene concentrations with the exception of MW-04 through September 2018. Notable concentration increases occur in CW-02 in September 2018, October 2020, and again in September 2022. A notable increase in concentrations is noted in MW-03 in March 2019. Notable increases in concentrations in MW-04 are noted in March 2021 and September 2022. March 2023 results show benzene concentrations to increase in all wells with the exception of MW-04, which remains above Cleanup, and MW-07 which remains non-detect.

Graph 3: March 2023 Benzene Concentrations





6.2 Area Extent Trending

Review of historical monitoring data shows an initial zone of contaminant concentration in the 1990 sampling data noting that the results are likely a generalization and that well placement was likely insufficient to fully characterize the exact extent of contaminant presence. Fulcrum re-characterized the general extent of contaminant presence using existing onsite monitoring wells starting in December of 2017. In September of 2020 Fulcrum replaced two (2) historical monitoring wells and added two (2) additional monitoring wells to assist in better characterizing the groundwater contaminant plume at the site.

Monitoring results from 2017 to 2023 show a trend of expanding contaminant presence for gasoline-range hydrocarbons, diesel-range hydrocarbons, and benzene. Monitoring results from 2023 show a general decrease in gasoline-range hydrocarbons and diesel-range hydrocarbon concentrations while benzene concentrations are shown to have increased and expanded. See Figures 5, 6, and 7 for a presentation of contaminant plume changes over time.

6.3 Laboratory Evaluation

Following the September 2022 sampling event, to further assist in evaluation of the trending data, Fulcrum contacted Fremont Analytical of Seattle, Washington to request review of the data. Fremont Analytical is a Washington State accredited laboratory (79636). Fremont has been providing analytical services for the project since the initial monitoring event in December 2017. Fremont provided a general review of chromatographic data noting that results would only be generalized in nature and not a substitute for site specific forensic chemistry. Review of chromatographic data was limited to historical data collected from monitoring well CW-02.

Following review of the historical chromatographic data, Fremont's laboratory director reported that from 2018-2019 CW-02 reported low to non-detect concentrations of gasoline. From 2020-2021 an apparent increase in gasoline-range materials with a chemical footprint indicative of old, weathered gasoline was reported. In September of 2022, an apparent new material with a unique chemical footprint likely related to diesel was identified. Fremont reported that the weathered nature of the new material indicates that a new release likely occurred after the March 2022 sampling event.

6.4 Trending Findings

Trending data shows increases in both concentrations and areal extent of contaminant presence at the site up to the March 2023 sampling event.



Concentrations and areal extent decrease in the March 2023 event with the exception of benzene. A preliminary review of laboratory data indicates a change in chromatographic data in September 2022 concurrent with significant increases in contaminant concentration and areal extent. Results indicate that a new source(s) of contaminant has likely been introduced at the site some time prior to the September 2022 sampling event. Potential sources include but are not limited to spill/overflow events associated with the current USTs, leaks from the USTs or associated piping or dispensers, spills associated with normal fuel station operations, and/or run off from carwash activities.

7.0 FINDINGS AND RECOMMENDATIONS

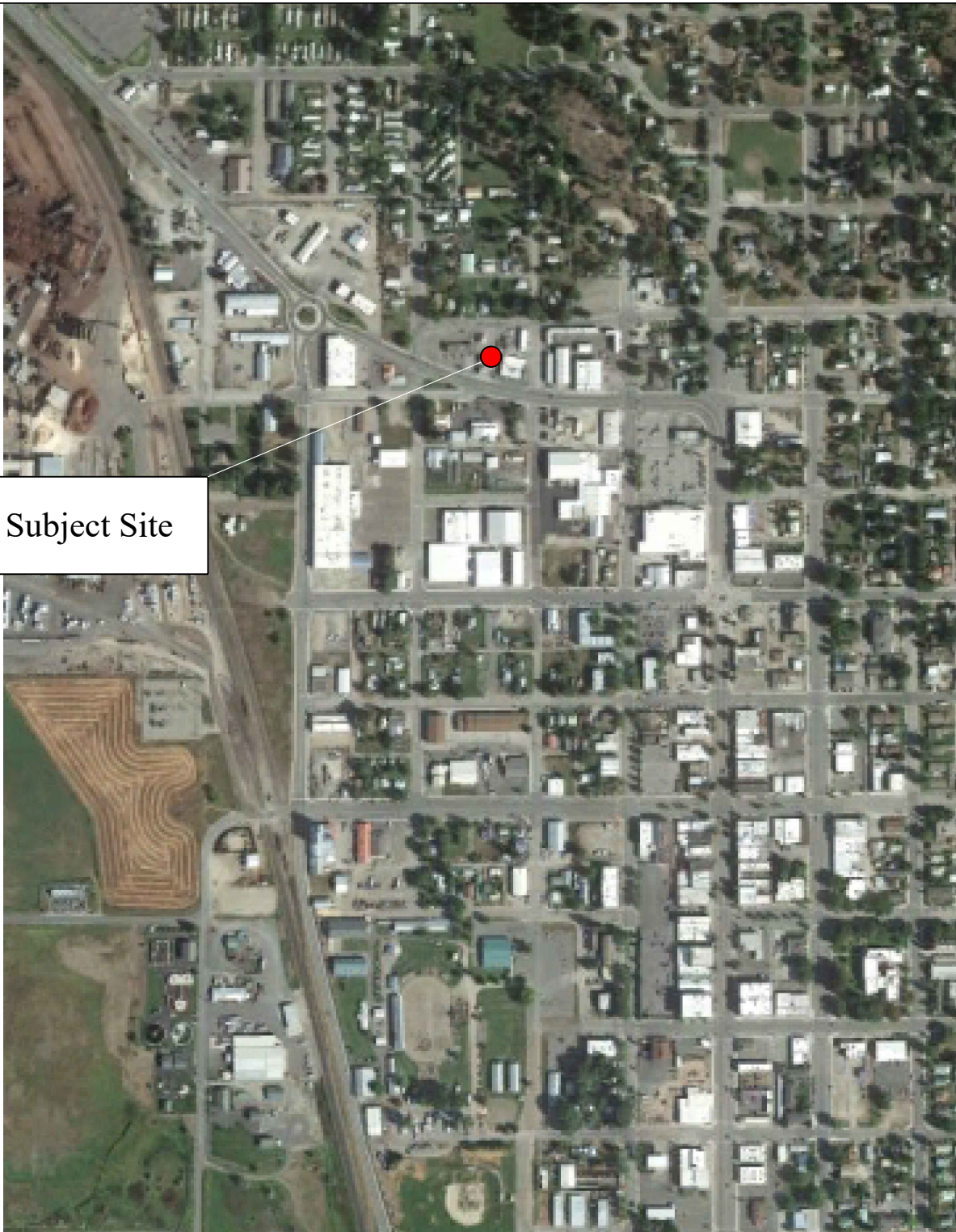
Current monitoring data shows that concentrations and areal extent have decreased in March 2023 prior to the highest concentrations and broadest areal extent of contaminant presence in September 2022. Review of trending data indicates the likely introduction of a new source(s) of contaminant presence in CW-02. Fulcrum recommends investigation of the following conditions to help ensure that contaminants are not currently being discharged to the site.

- Consult with the current property owner and/or fuel delivery company regarding any potential leaks or overflow events.
- Investigate current UST detection systems.
- Check with the fueling company and/or site owner/operator for possible overflow or spill events.
- Investigate the car wash system to ensure that car wash discharge is not released to site soils.

Following review of conditions as outlined above, Fulcrum recommends further evaluation of the site monitoring plan to ensure that it is positioned and designed to effectively characterize environmental conditions of site groundwater.



FIGURES



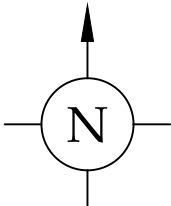
Subject Site

Figure 1: General Site Location Map

Second Semi-annual Groundwater Sampling Event March 2023
 Whitty's Chevron
 370 West 5th Avenue
 Colville, Washington

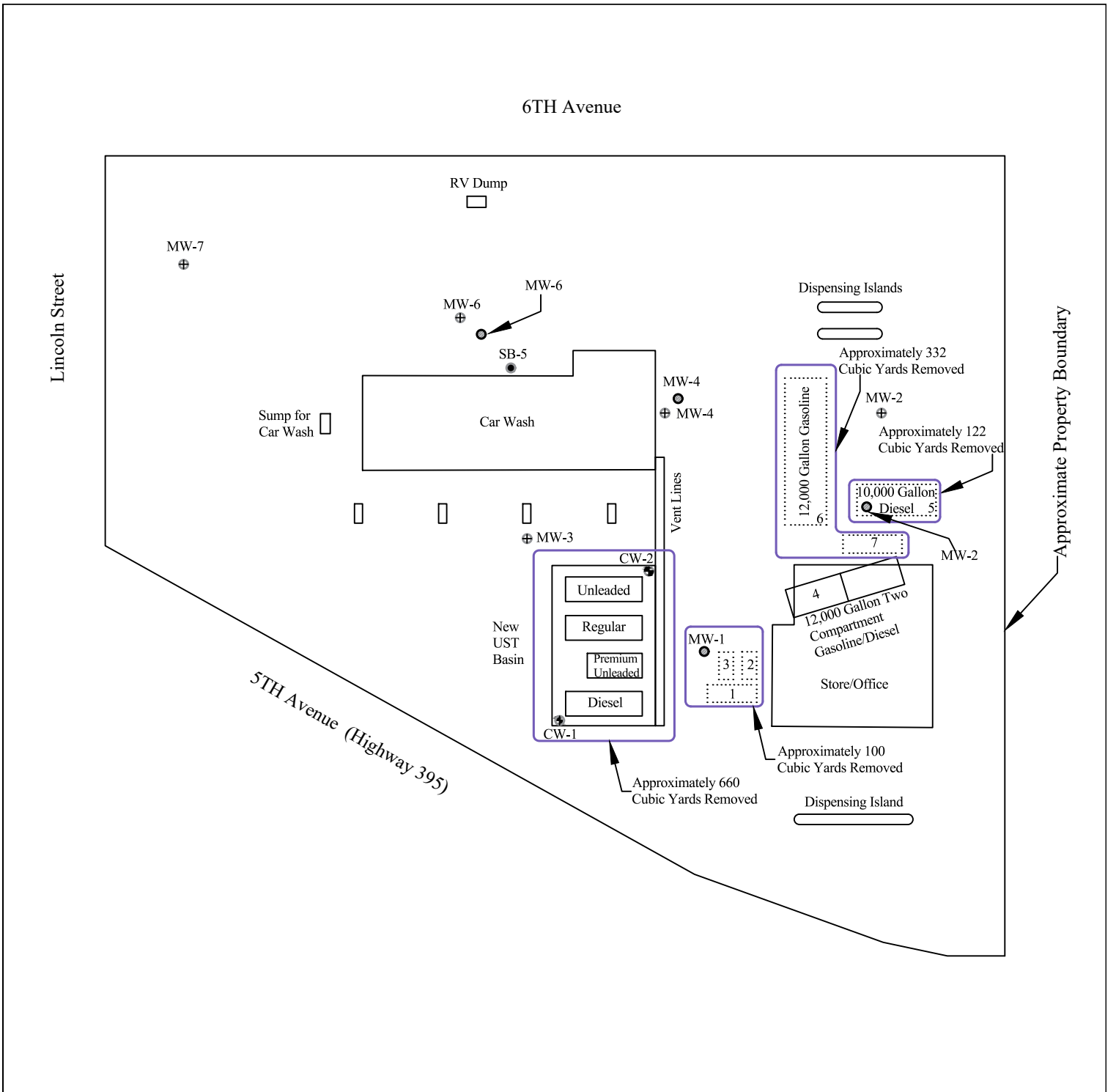
LEGEND

Map Location



FULCRUM ENVIRONMENTAL CONSULTING, INC.
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MAP BY: Ethan Ducken	PROJECT NUMBER: 233710.00
DATE: April 27, 2023	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

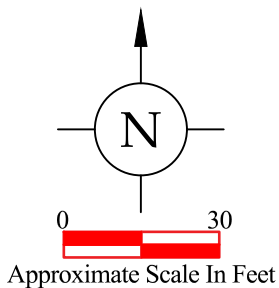


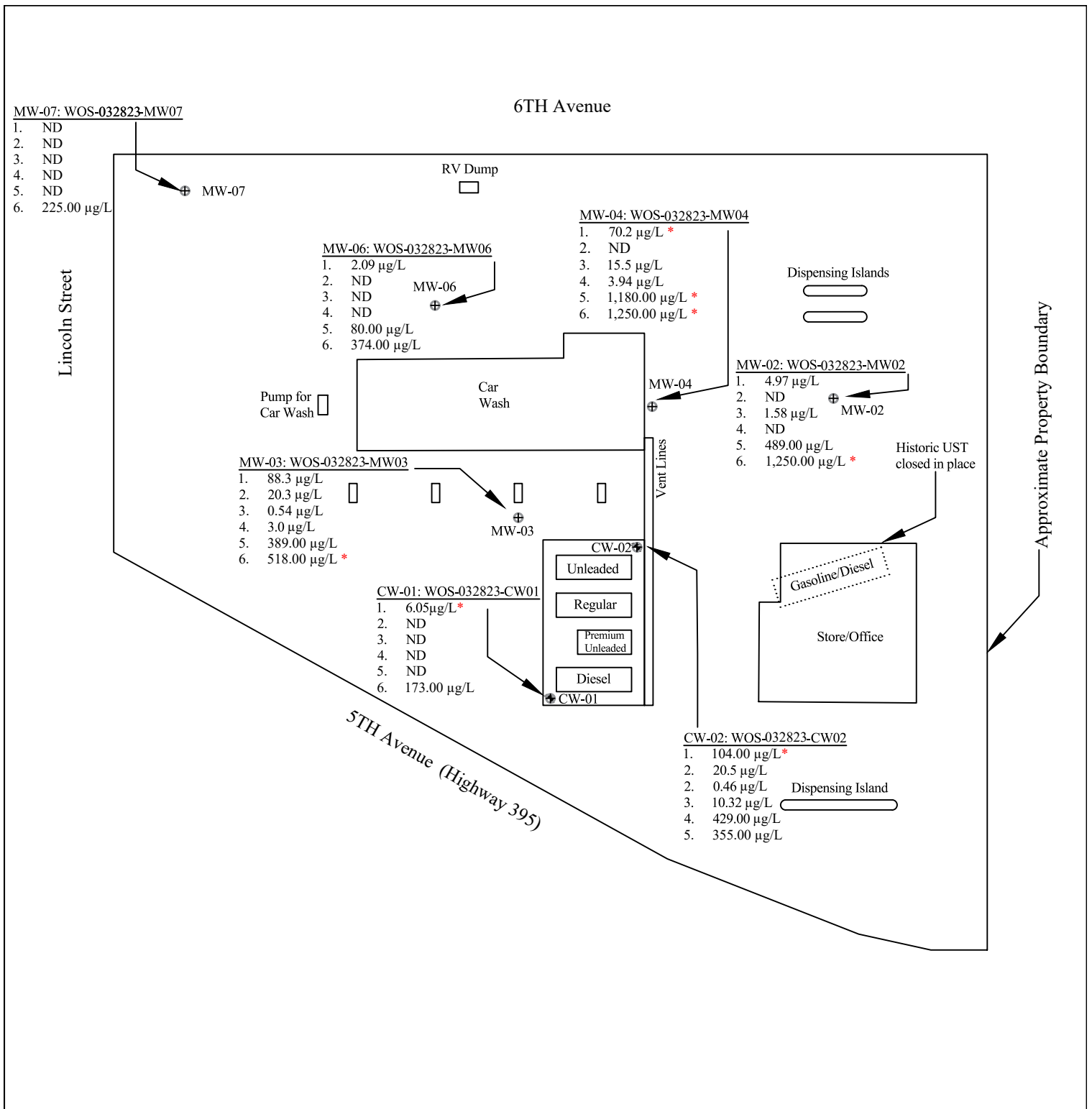
Figure 2: Historical USTs, Soil Borings, and Monitoring Wells Site Diagram Map

Second Semi-annual Groundwater Sampling Event March 2023
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LEGEND

Parameters (µg/L)

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

⊕ Monitoring Well

⊛ Compliance Well

* Analyte Concentration Exceeds MTCA Method A Cleanup Level

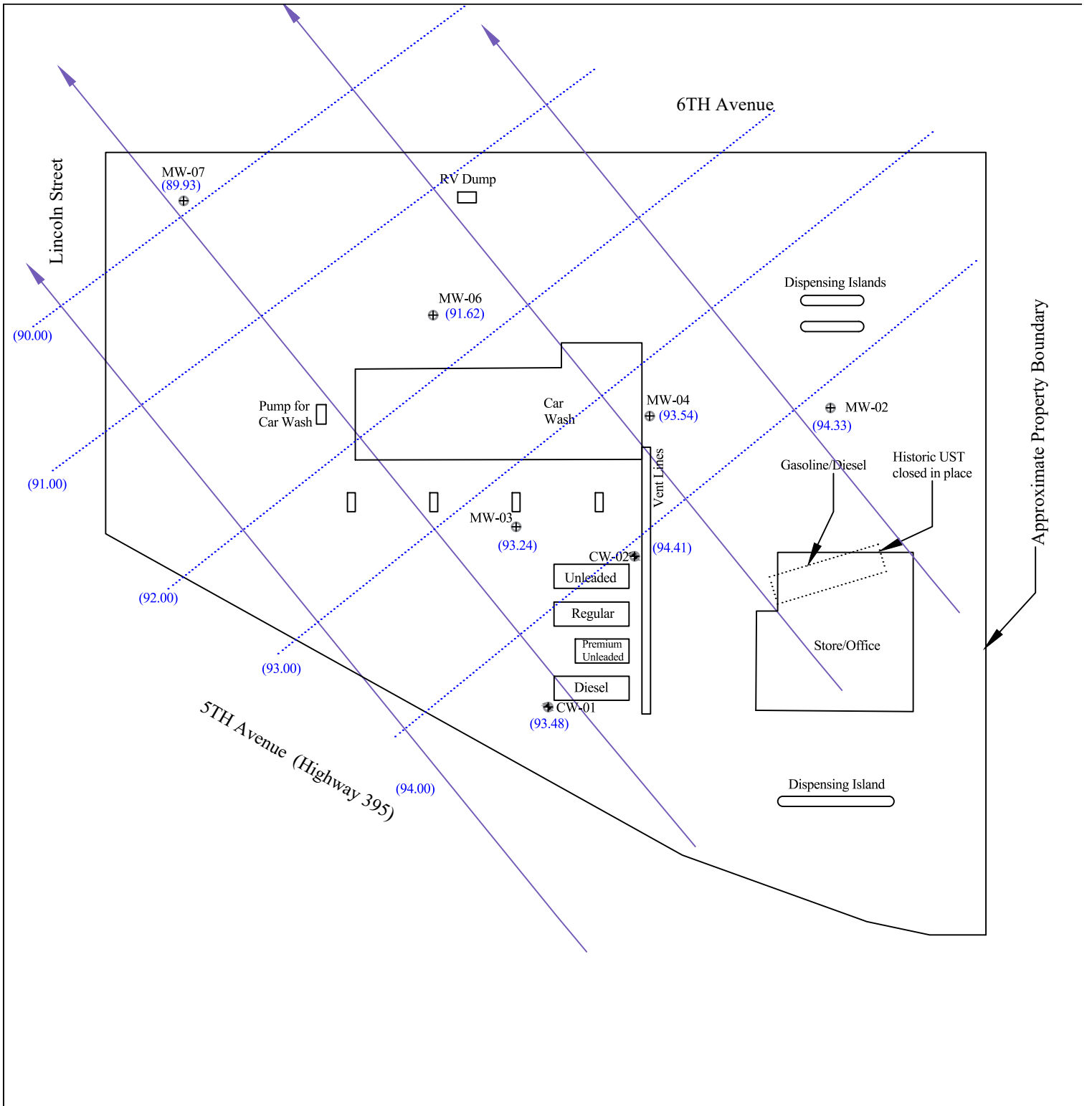
0 30
Approximate Scale In Feet

Figure 3: Site Diagram Map







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LEGEND

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

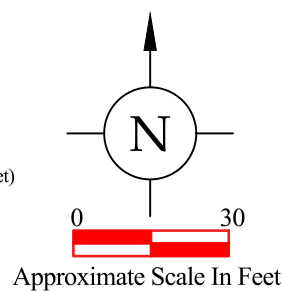


Figure 4: Groundwater Elevation Map

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REVIEWED BY: T. Trent



LEGEND

-  Concentrations above 1000.00 ppb
-  Concentrations 800.00 - 1000.00 ppb
-  Detectable concentrations below the regulatory threshold of 800 ppb

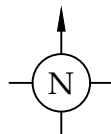


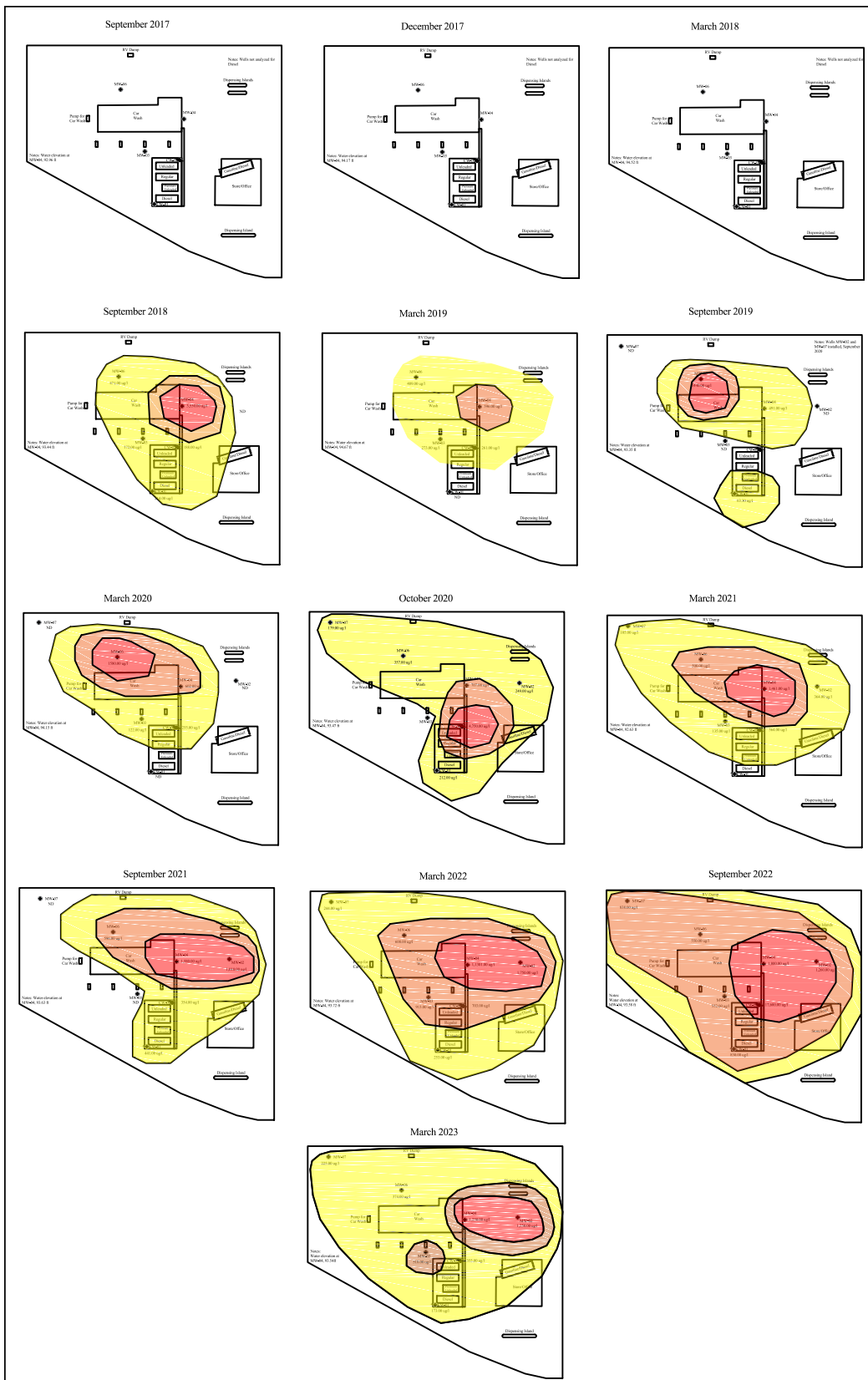
Figure 5: Gasoline Concentrations - Areal Extent Over Time




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-  Concentrations above 1000.00 ppb
-  Concentrations 500.00 - 1000.00 ppb
-  Detectable concentrations below the regulatory threshold of 500 ppb

LEGEND

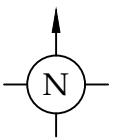

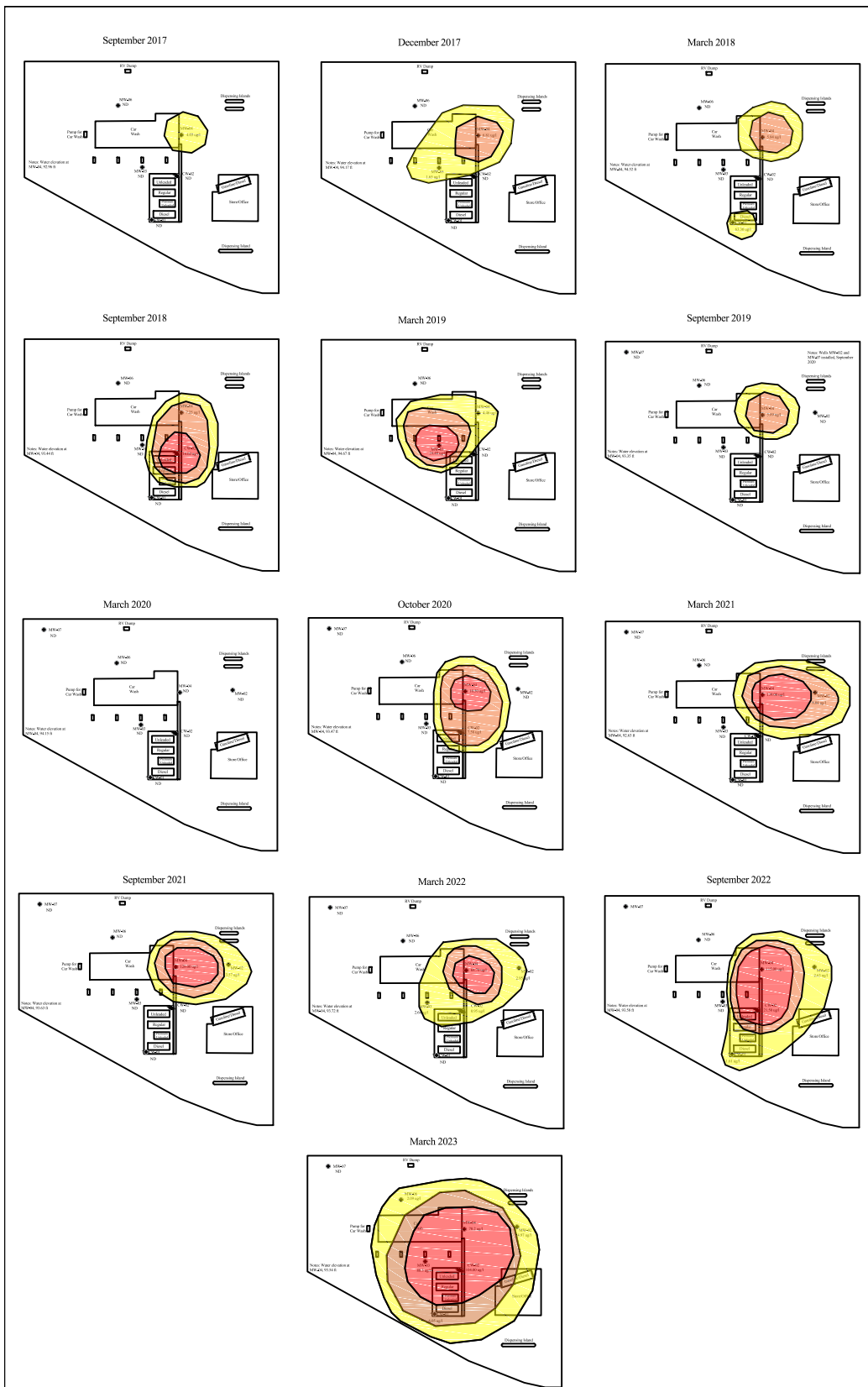


Figure 6: Combined Diesel-Range and Heavy Oil-Range Hydrocarbons - Areal Extent Over Time




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: 233710.00
DATE: April 27, 2023	REVIEWED BY: T. Trent



LEGEND

-  Concentrations above 10.00 ppb
-  Concentrations 5.00 - 10.00 ppb
-  Detectable concentrations below the regulatory threshold of 5.00 ppb

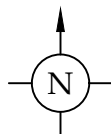


Figure 7: Benzene Concentrations - Areal Extent Over Time

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
DATE: April 27, 2023

PROJECT NUMBER: 233710.00
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

06/06/2023

Expiration Date

Teresa Berntsen

Teresa Berntsen, Director



STATE OF WASHINGTON

DEPARTMENT OF LICENSING – BUSINESS AND PROFESSIONS DIVISION

THIS CERTIFIES THAT THE PERSON OR BUSINESS NAMED BELOW IS AUTHORIZED AS A



GEOLOGIST

SCOTT MICHAEL GROAT
99 S CEDAR ST
POST FALLS ID 83854-9740

22034387

License Number

11/17/2022

Issue Date

12/03/2023

Expiration Date

Teresa Berntsen

Teresa Berntsen, Director



STATE OF WASHINGTON

DEPARTMENT OF LICENSING – BUSINESS AND PROFESSIONS DIVISION

THIS CERTIFIES THAT THE PERSON OR BUSINESS NAMED BELOW IS AUTHORIZED AS A



GEOLOGIST IN TRAINING

ETHAN JEFFREY DUCKEN

510 E 33rd Ave

Spokane WA 99203-2611

22010959

License Number

05/04/2022

Issue Date

//

Expiration Date

Teresa Berntsen

Teresa Berntsen, Director



APPENDIX B

Summary of Historical Data

HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA

Whitty's Chevron

370 West Fifth Avenue
Colville, Washington

Boring ID	Sampling Date	ERP (feet)	DS (feet)	TD (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)
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	---	---	---	---	---	---	---	---	---

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-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	5.81	93.69	---	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
	3/7/2022	99.50	4.65	94.85	---	253.00	ND	253.00	ND	ND	ND	ND	ND
	9/27/2022	99.50	5.97	93.53	---	830.00	ND	830.00	ND	1.61	ND	ND	ND
3/28/2023	99.50	4.85	94.65	---	173.00	ND	173.00	ND	6.05	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
	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	

2001 MTCA Method A Cleanup Levels for Groundwater	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	9/17/2019	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	5.41	93.60	---	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	
	3/7/2022	99.01	4.91	94.10	---	703.00	ND	703.00	828.00	0.95	ND	ND	ND	
	9/27/2022	99.01	5.68	93.33	---	17,600	ND	17,600	256.00	21.50	5.81	ND	ND	
3/28/2023	99.01	4.53	94.48	---	355.00	ND	355.00	429.00	104.00	20.50	0.46	10.32		
MW-1	1/10/1990	100.00	5.59	94.41	ND	---	---	---	---	ND	ND	ND	ND	
<i>Decommissioned</i>														
MW-2	1/10/1990	98.92	4.51	94.41	2,460	---	---	---	---	1,643.0	409.00	ND	2955.00	
<i>Decommissioned</i>														
<i>New Well Installed</i>														
	10/14/2020	98.92	5.83	93.09	---	249.00	ND	249.00	106.00	ND	ND	ND	ND	
MW-02	3/25/2021	98.92				534.00	3,300.00	3,834.00	725.00	8.04	ND	27.70	1.74	
	9/22/2021	98.92				1,010.00	ND	1,010.00	872.00	3.57	ND	4.73	ND	
	3/25/2022	98.92				1,750.00	ND	1,750.00	828.00	2.95	ND	4.10	ND	
	9/27/2022	98.92				1,260.00	ND	1,260.00	953.00	2.63	ND	1.49	ND	
	3/28/2023	98.92	4.59	94.33	---	1,250.00	ND	1,250.00	489.00	4.97	ND	1.58	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	ND	ND	ND	ND	ND	ND	
	3/7/2022	98.56	4.41	94.15	---	913.00	ND	913.00	111.00	2.64	ND	0.94	ND	
9/27/2022	98.56	5.56	92.91	---	552.00	ND	552.00	ND	ND	ND	ND	ND		
3/28/2023	98.56	5.32	93.24	---	518.00	ND	518.00	389.00	88.30	20.30	0.54	3.00		
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	3/10/2020	98.27	4.12	94.15	---	ND	602.00	602.00	80.10	ND	ND	2.61	ND
	<i>New Well Installed</i>													
		10/14/2020	98.27	4.80	93.47	---	707.00	ND	707.00	818.00	10.50	1.19	9.92	1.91
	MW-06	3/25/2021	98.27	5.64	92.63	---	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	
3/7/2022		98.27	4.55	93.72	---	1,130.00	ND	1,130.00	1,840.00	68.70	2.48	33.00	5.93	
9/27/2022		98.27	4.69	93.58	---	1,800.00	ND	1,800.00	1,400.00	115.00	2.47	35.60	4.30	
3/28/2023		98.27	4.73	93.54	---	1,250.00	ND	1,250.00	1,180.00	70.20	ND	15.50	3.94	
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)	NWTPH-Gx (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	
MW-06	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	1440.00	1440.00	90.20	ND	ND	ND	ND	
	3/10/2020	97.27	4.51	92.76	---	ND	1580.00	1580.00	ND	ND	ND	ND	ND	
	<i>Lab Filtered</i>	3/10/2020	97.27	4.51	92.76	---	ND	1350.00	1350.00	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	5.91	91.36	---	128.00	372.00	500.00	499	4.01	ND	1.70	1.33
		9/22/2021	97.27	6.10	91.17	---	597.00	ND	597.00	575	2.32	ND	0.75	ND
		3/7/2022	97.27	5.48	91.79	---	600.00	ND	600.00	292	1.34	ND	ND	ND
		9/27/2022	97.27	6.12	91.15	---	550.00	ND	550.00	470	2.69	ND	ND	ND
	3/28/2023	97.27	5.65	91.62	---	374.00	ND	374.00	80	2.09	ND	ND	ND	
MW-07	<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	5.95	89.32	---	ND	105.00	105.00	ND	ND	ND	ND	
		9/22/2021	95.27	5.47	89.80	---	ND	112.00	ND	ND	ND	ND	ND	
		3/7/2022	95.27	4.45	93.86	---	244.00	ND	244.00	ND	ND	ND	ND	
		9/27/2022	95.27	5.81	89.46	---	838.00	ND	838.00	ND	ND	ND	ND	
		3/28/2023	95.27	5.34	89.93	---	225.00	ND	225.00	ND	ND	ND	ND	
2001 MTCA Method A Cleanup Levels for Groundwater					NE	500			800	5	1000	700	1000	

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

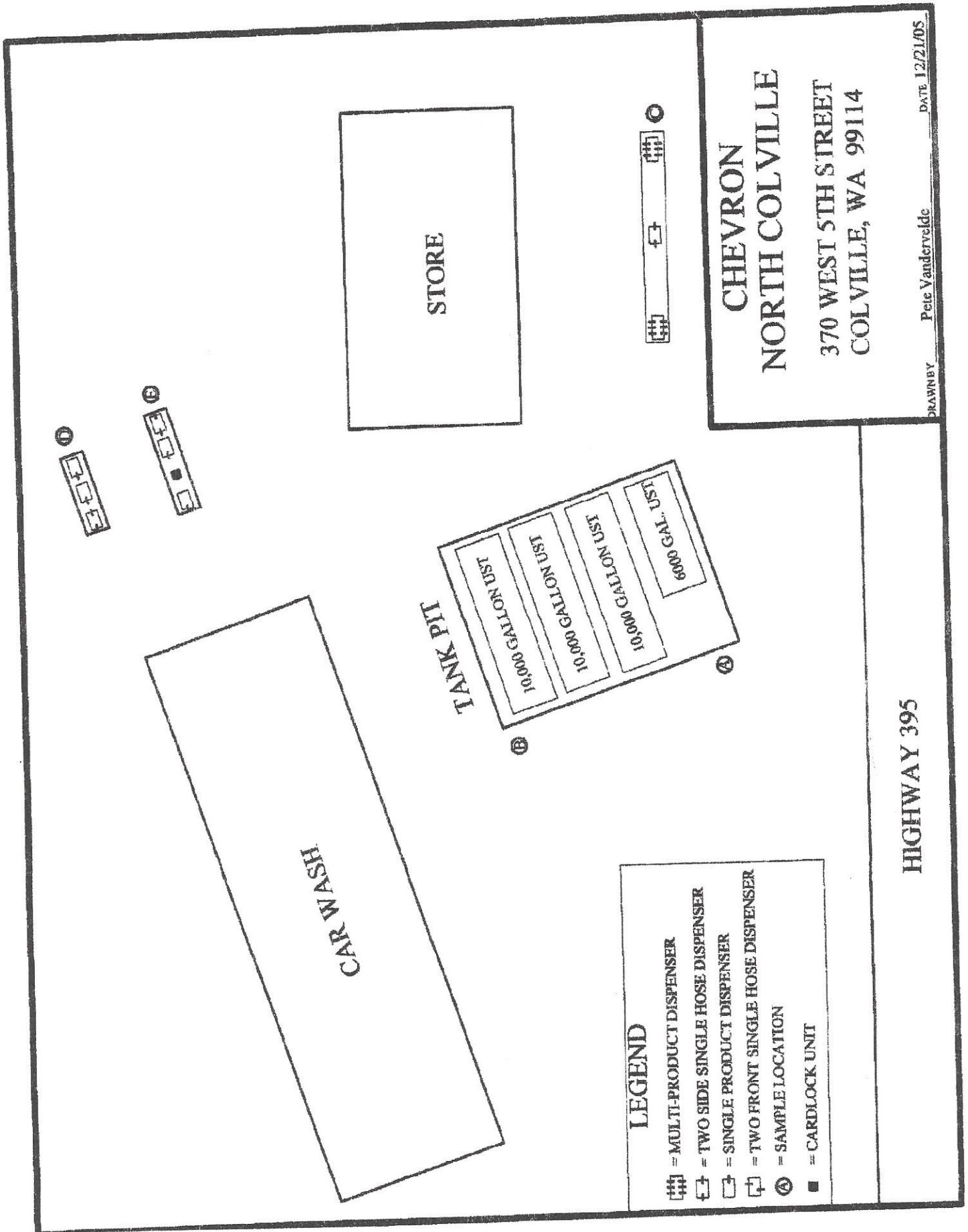


TABLE 1
SOIL SAMPLE RESULTS
CHEVRON
NORTH COLVILLE

DEPTH OF SAMPLE	15'	14'	5'	5'	5'	5'
ANALYSES	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
BENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ETHYLBENZENE	0.12	<0.025	<0.025	<0.025	<0.025	<0.025
MTBE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
TOLUENE	0.229	<0.05	0.111	0.066	<0.05	<0.05
XYLENE	0.69	<0.05	0.099	0.081	<0.05	<0.05
TOTAL LEAD	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
2,2,4,4-Tetrahydrocannabinol	118	NWIPH-D
p-Toluenol	10	NWIPH-D

SPECTRA LABORATORIES

2221 ROSS WAY, TACOMA, WA 98421
 (253) 272-4850

MSDR 1010



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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

SPECTRA LABORATORIES



Steve Hibbs, Laboratory Manager

sh/hh



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-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

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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

Scott Groat
207 W Boone Ave.
Spokane, WA 99201

RE: Whitten Oil

Work Order Number: 2303667

April 07, 2023

Attention Scott Groat:

Fremont Analytical, Inc. received 9 sample(s) on 3/30/2023 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



CLIENT: Fulcrum Environmental
Project: Whitten Oil
Work Order: 2303667

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2303667-001	WOS-032823-MW03	03/28/2023 4:15 PM	03/30/2023 9:27 AM
2303667-002	WOS-032823-MW07	03/28/2023 3:17 PM	03/30/2023 9:27 AM
2303667-003	WOS-032823-MW02	03/28/2023 12:11 PM	03/30/2023 9:27 AM
2303667-004	WOS-032823-MW04	03/28/2023 10:55 AM	03/30/2023 9:27 AM
2303667-005	WOS-032823-MW06	03/28/2023 2:52 PM	03/30/2023 9:27 AM
2303667-006	WOS-032823-MW08	03/28/2023 12:05 PM	03/30/2023 9:27 AM
2303667-007	WOS-032823-CW01	03/28/2023 12:01 PM	03/30/2023 9:27 AM
2303667-008	WOS-032823-CW02	03/28/2023 10:26 AM	03/30/2023 9:27 AM
2303667-009	Trip Blank	03/21/2023 11:08 AM	03/30/2023 9:27 AM

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

CLIENT: Fulcrum Environmental

Project: Whitten Oil

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: 3/28/2023 4:15:00 PM

Project: Whitten Oil

Lab ID: 2303667-001

Matrix: Water

Client Sample ID: WOS-032823-MW03

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

Batch ID: 39910 Analyst: AP

Diesel Range Organics	518	98.0		µg/L	1	4/4/2023 6:08:45 PM
Heavy Oil	ND	98.0		µg/L	1	4/4/2023 6:08:45 PM
Total Petroleum Hydrocarbons	518	196		µg/L	1	4/4/2023 6:08:45 PM
Surr: 2-Fluorobiphenyl	77.4	50 - 150		%Rec	1	4/4/2023 6:08:45 PM
Surr: o-Terphenyl	102	50 - 150		%Rec	1	4/4/2023 6:08:45 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material
Detection is biased high by overlap with gasoline-range material

Gasoline by NWTPH-Gx

Batch ID: 39900 Analyst: CC

Gasoline Range Organics	389	50.0		µg/L	1	4/2/2023 9:21:02 AM
Surr: Toluene-d8	91.9	65 - 135		%Rec	1	4/2/2023 9:21:02 AM
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	4/2/2023 9:21:02 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900 Analyst: SH

Benzene	88.3	4.40	D	µg/L	10	4/4/2023 7:45:14 PM
Toluene	20.3	10.0	D	µg/L	10	4/4/2023 7:45:14 PM
Ethylbenzene	0.543	0.400		µg/L	1	4/2/2023 9:21:02 AM
m,p-Xylene	1.23	1.00		µg/L	1	4/2/2023 9:21:02 AM
o-Xylene	1.75	0.500		µg/L	1	4/2/2023 9:21:02 AM
Surr: Dibromofluoromethane	111	80 - 120		%Rec	1	4/2/2023 9:21:02 AM
Surr: Toluene-d8	116	80 - 120		%Rec	1	4/2/2023 9:21:02 AM
Surr: 1-Bromo-4-fluorobenzene	104	80 - 120		%Rec	1	4/2/2023 9:21:02 AM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 3:17:00 PM

Project: Whitten Oil

Lab ID: 2303667-002

Matrix: Water

Client Sample ID: WOS-032823-MW07

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

Batch ID: 39910

Analyst: AP

Diesel Range Organics	225	100		µg/L	1	4/4/2023 6:19:37 PM
Heavy Oil	ND	100		µg/L	1	4/4/2023 6:19:37 PM
Total Petroleum Hydrocarbons	225	200		µg/L	1	4/4/2023 6:19:37 PM
Surr: 2-Fluorobiphenyl	66.4	50 - 150		%Rec	1	4/4/2023 6:19:37 PM
Surr: o-Terphenyl	88.8	50 - 150		%Rec	1	4/4/2023 6:19:37 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Gasoline by NWTPH-Gx

Batch ID: 39900

Analyst: CC

Gasoline Range Organics	ND	50.0		µg/L	1	4/2/2023 9:51:15 AM
Surr: Toluene-d8	90.6	65 - 135		%Rec	1	4/2/2023 9:51:15 AM
Surr: 4-Bromofluorobenzene	99.9	65 - 135		%Rec	1	4/2/2023 9:51:15 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900

Analyst: CC

Benzene	ND	0.440		µg/L	1	4/2/2023 9:51:15 AM
Toluene	ND	1.00		µg/L	1	4/2/2023 9:51:15 AM
Ethylbenzene	ND	0.400		µg/L	1	4/2/2023 9:51:15 AM
m,p-Xylene	ND	1.00		µg/L	1	4/2/2023 9:51:15 AM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 9:51:15 AM
Surr: Dibromofluoromethane	98.7	80 - 120		%Rec	1	4/2/2023 9:51:15 AM
Surr: Toluene-d8	116	80 - 120		%Rec	1	4/2/2023 9:51:15 AM
Surr: 1-Bromo-4-fluorobenzene	101	80 - 120		%Rec	1	4/2/2023 9:51:15 AM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 12:11:00 PM

Project: Whitten Oil

Lab ID: 2303667-003

Matrix: Water

Client Sample ID: WOS-032823-MW02

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

Batch ID: 39910 Analyst: AP

Diesel Range Organics	1,250	104		µg/L	1	4/4/2023 6:30:36 PM
Heavy Oil	ND	104		µg/L	1	4/4/2023 6:30:36 PM
Total Petroleum Hydrocarbons	1,250	207		µg/L	1	4/4/2023 6:30:36 PM
Surr: 2-Fluorobiphenyl	83.5	50 - 150		%Rec	1	4/4/2023 6:30:36 PM
Surr: o-Terphenyl	96.5	50 - 150		%Rec	1	4/4/2023 6:30:36 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material
Detection is biased high by overlap with gasoline-range material

Gasoline by NWTPH-Gx

Batch ID: 39900 Analyst: CC

Gasoline Range Organics	489	50.0		µg/L	1	4/2/2023 10:21:26 AM
Surr: Toluene-d8	90.9	65 - 135		%Rec	1	4/2/2023 10:21:26 AM
Surr: 4-Bromofluorobenzene	106	65 - 135		%Rec	1	4/2/2023 10:21:26 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900 Analyst: SH

Benzene	4.97	0.440		µg/L	1	4/4/2023 11:16:19 PM
Toluene	ND	1.00		µg/L	1	4/4/2023 11:16:19 PM
Ethylbenzene	1.58	0.400		µg/L	1	4/4/2023 11:16:19 PM
m,p-Xylene	ND	1.00		µg/L	1	4/2/2023 10:21:26 AM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 10:21:26 AM
Surr: Dibromofluoromethane	94.8	80 - 120		%Rec	1	4/4/2023 11:16:19 PM
Surr: Toluene-d8	99.0	80 - 120		%Rec	1	4/4/2023 11:16:19 PM
Surr: 1-Bromo-4-fluorobenzene	103	80 - 120		%Rec	1	4/4/2023 11:16:19 PM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 10:55:00 AM

Project: Whitten Oil

Lab ID: 2303667-004

Matrix: Water

Client Sample ID: WOS-032823-MW04

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

Batch ID: 39910

Analyst: AP

Diesel Range Organics	1,250	98.7		µg/L	1	4/4/2023 6:52:20 PM
Heavy Oil	ND	98.7		µg/L	1	4/4/2023 6:52:20 PM
Total Petroleum Hydrocarbons	1,250	197		µg/L	1	4/4/2023 6:52:20 PM
Surr: 2-Fluorobiphenyl	88.8	50 - 150		%Rec	1	4/4/2023 6:52:20 PM
Surr: o-Terphenyl	104	50 - 150		%Rec	1	4/4/2023 6:52:20 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material
Detection is biased high by overlap with gasoline-range material

Gasoline by NWTPH-Gx

Batch ID: 39900

Analyst: CC

Gasoline Range Organics	1,180	50.0		µg/L	1	4/2/2023 10:51:40 AM
Surr: Toluene-d8	92.7	65 - 135		%Rec	1	4/2/2023 10:51:40 AM
Surr: 4-Bromofluorobenzene	109	65 - 135		%Rec	1	4/2/2023 10:51:40 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900

Analyst: SH

Benzene	70.2	4.40	D	µg/L	10	4/4/2023 8:15:24 PM
Toluene	ND	10.0	D	µg/L	10	4/4/2023 8:15:24 PM
Ethylbenzene	15.5	4.00	D	µg/L	10	4/4/2023 8:15:24 PM
m,p-Xylene	3.94	1.00		µg/L	1	4/2/2023 10:51:40 AM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 10:51:40 AM
Surr: Dibromofluoromethane	112	80 - 120		%Rec	1	4/2/2023 10:51:40 AM
Surr: Toluene-d8	118	80 - 120		%Rec	1	4/2/2023 10:51:40 AM
Surr: 1-Bromo-4-fluorobenzene	105	80 - 120		%Rec	1	4/2/2023 10:51:40 AM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 2:52:00 PM

Project: Whitten Oil

Lab ID: 2303667-005

Matrix: Water

Client Sample ID: WOS-032823-MW06

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

Batch ID: 39910

Analyst: AP

Diesel Range Organics	374	96.3		µg/L	1	4/4/2023 7:03:10 PM
Heavy Oil	ND	96.3		µg/L	1	4/4/2023 7:03:10 PM
Total Petroleum Hydrocarbons	374	193		µg/L	1	4/4/2023 7:03:10 PM
Surr: 2-Fluorobiphenyl	101	50 - 150		%Rec	1	4/4/2023 7:03:10 PM
Surr: o-Terphenyl	119	50 - 150		%Rec	1	4/4/2023 7:03:10 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Gasoline by NWTPH-Gx

Batch ID: 39900

Analyst: CC

Gasoline Range Organics	80.0	50.0		µg/L	1	4/2/2023 11:21:53 AM
Surr: Toluene-d8	91.9	65 - 135		%Rec	1	4/2/2023 11:21:53 AM
Surr: 4-Bromofluorobenzene	103	65 - 135		%Rec	1	4/2/2023 11:21:53 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900

Analyst: SH

Benzene	2.09	0.440		µg/L	1	4/4/2023 11:46:31 PM
Toluene	ND	1.00		µg/L	1	4/2/2023 11:21:53 AM
Ethylbenzene	ND	0.400		µg/L	1	4/2/2023 11:21:53 AM
m,p-Xylene	ND	1.00		µg/L	1	4/2/2023 11:21:53 AM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 11:21:53 AM
Surr: Dibromofluoromethane	115	80 - 120		%Rec	1	4/2/2023 11:21:53 AM
Surr: Toluene-d8	120	80 - 120		%Rec	1	4/2/2023 11:21:53 AM
Surr: 1-Bromo-4-fluorobenzene	103	80 - 120		%Rec	1	4/2/2023 11:21:53 AM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 12:05:00 PM

Project: Whitten Oil

Lab ID: 2303667-006

Matrix: Water

Client Sample ID: WOS-032823-MW08

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

Batch ID: 39910

Analyst: AP

Diesel Range Organics	195	104		µg/L	1	4/4/2023 7:14:00 PM
Heavy Oil	ND	104		µg/L	1	4/4/2023 7:14:00 PM
Total Petroleum Hydrocarbons	ND	208		µg/L	1	4/4/2023 7:14:00 PM
Surr: 2-Fluorobiphenyl	89.1	50 - 150		%Rec	1	4/4/2023 7:14:00 PM
Surr: o-Terphenyl	105	50 - 150		%Rec	1	4/4/2023 7:14:00 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Gasoline by NWTPH-Gx

Batch ID: 39900

Analyst: CC

Gasoline Range Organics	ND	50.0		µg/L	1	4/2/2023 11:52:05 AM
Surr: Toluene-d8	89.6	65 - 135		%Rec	1	4/2/2023 11:52:05 AM
Surr: 4-Bromofluorobenzene	103	65 - 135		%Rec	1	4/2/2023 11:52:05 AM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900

Analyst: SH

Benzene	6.02	0.440		µg/L	1	4/5/2023 12:16:40 AM
Toluene	ND	1.00		µg/L	1	4/2/2023 11:52:05 AM
Ethylbenzene	ND	0.400		µg/L	1	4/2/2023 11:52:05 AM
m,p-Xylene	ND	1.00		µg/L	1	4/2/2023 11:52:05 AM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 11:52:05 AM
Surr: Dibromofluoromethane	118	80 - 120		%Rec	1	4/2/2023 11:52:05 AM
Surr: Toluene-d8	117	80 - 120		%Rec	1	4/2/2023 11:52:05 AM
Surr: 1-Bromo-4-fluorobenzene	103	80 - 120		%Rec	1	4/2/2023 11:52:05 AM



Analytical Report

Work Order: 2303667
Date Reported: 4/7/2023

Client: Fulcrum Environmental

Collection Date: 3/28/2023 12:01:00 PM

Project: Whitten Oil

Lab ID: 2303667-007

Matrix: Water

Client Sample ID: WOS-032823-CW01

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

Batch ID: 39910 Analyst: AP

Diesel Range Organics	173	99.1		µg/L	1	4/4/2023 7:24:49 PM
Heavy Oil	ND	99.1		µg/L	1	4/4/2023 7:24:49 PM
Total Petroleum Hydrocarbons	ND	198		µg/L	1	4/4/2023 7:24:49 PM
Surr: 2-Fluorobiphenyl	82.6	50 - 150		%Rec	1	4/4/2023 7:24:49 PM
Surr: o-Terphenyl	104	50 - 150		%Rec	1	4/4/2023 7:24:49 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Gasoline by NWTPH-Gx

Batch ID: 39900 Analyst: CC

Gasoline Range Organics	ND	50.0		µg/L	1	4/2/2023 12:22:17 PM
Surr: Toluene-d8	88.2	65 - 135		%Rec	1	4/2/2023 12:22:17 PM
Surr: 4-Bromofluorobenzene	103	65 - 135		%Rec	1	4/2/2023 12:22:17 PM

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900 Analyst: SH

Benzene	6.05	0.440		µg/L	1	4/5/2023 12:46:50 AM
Toluene	ND	1.00		µg/L	1	4/2/2023 12:22:17 PM
Ethylbenzene	ND	0.400		µg/L	1	4/2/2023 12:22:17 PM
m,p-Xylene	ND	1.00		µg/L	1	4/2/2023 12:22:17 PM
o-Xylene	ND	0.500		µg/L	1	4/2/2023 12:22:17 PM
Surr: Dibromofluoromethane	102	80 - 120		%Rec	1	4/2/2023 12:22:17 PM
Surr: Toluene-d8	119	80 - 120		%Rec	1	4/2/2023 12:22:17 PM
Surr: 1-Bromo-4-fluorobenzene	103	80 - 120		%Rec	1	4/2/2023 12:22:17 PM



Client: Fulcrum Environmental

Collection Date: 3/28/2023 10:26:00 AM

Project: Whitten Oil

Lab ID: 2303667-008

Matrix: Water

Client Sample ID: WOS-032823-CW02

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

Batch ID: 39926 Analyst: KJ

Diesel Range Organics	355	94.3		µg/L	1	4/5/2023 5:54:30 PM
Heavy Oil	ND	94.3		µg/L	1	4/5/2023 5:54:30 PM
Total Petroleum Hydrocarbons	355	189		µg/L	1	4/5/2023 5:54:30 PM
Surr: 2-Fluorobiphenyl	96.0	50 - 150		%Rec	1	4/5/2023 5:54:30 PM
Surr: o-Terphenyl	102	50 - 150		%Rec	1	4/5/2023 5:54:30 PM

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Gasoline by NWTPH-Gx

Batch ID: 39900 Analyst: CC

Gasoline Range Organics	429	50.0		µg/L	1	4/2/2023 1:22:43 PM
Surr: Toluene-d8	90.2	65 - 135		%Rec	1	4/2/2023 1:22:43 PM
Surr: 4-Bromofluorobenzene	104	65 - 135		%Rec	1	4/2/2023 1:22:43 PM

NOTES:

Detection is biased high due to non-petroleum compounds

Volatile Organic Compounds by EPA Method 8260D

Batch ID: 39900 Analyst: SH

Benzene	104	4.40	D	µg/L	10	4/7/2023 8:05:04 AM
Toluene	20.5	10.0	D	µg/L	10	4/7/2023 8:05:04 AM
Ethylbenzene	0.463	0.400		µg/L	1	4/2/2023 1:22:43 PM
m,p-Xylene	2.10	1.00		µg/L	1	4/2/2023 1:22:43 PM
o-Xylene	8.22	0.500		µg/L	1	4/2/2023 1:22:43 PM
Surr: Dibromofluoromethane	115	80 - 120		%Rec	1	4/2/2023 1:22:43 PM
Surr: Toluene-d8	119	80 - 120		%Rec	1	4/2/2023 1:22:43 PM
Surr: 1-Bromo-4-fluorobenzene	104	80 - 120		%Rec	1	4/2/2023 1:22:43 PM

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

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

Sample ID: MB-39910	SampType: MBLK	Units: µg/L			Prep Date: 4/3/2023	RunNo: 82933					
Client ID: MBLKW	Batch ID: 39910				Analysis Date: 4/4/2023	SeqNo: 1725650					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	ND	96.0									
Heavy Oil	ND	96.0									
Total Petroleum Hydrocarbons	ND	192									
Surr: 2-Fluorobiphenyl	13.9		24.01		58.0	50	150				
Surr: o-Terphenyl	20.4		24.01		85.1	50	150				

Sample ID: LCS-39910	SampType: LCS	Units: µg/L			Prep Date: 4/3/2023	RunNo: 82933					
Client ID: LCSW	Batch ID: 39910				Analysis Date: 4/4/2023	SeqNo: 1725651					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Petroleum Hydrocarbons	643	195	1,220	0	52.7	48	113				
Surr: 2-Fluorobiphenyl	10.5		24.41		43.0	50	150				S
Surr: o-Terphenyl	21.9		24.41		89.7	50	150				

NOTES:

S - Outlying surrogate recovery(ies) observed. Spike recovery within range.

Sample ID: 2304026-001BDUP	SampType: DUP	Units: µg/L			Prep Date: 4/3/2023	RunNo: 82933					
Client ID: BATCH	Batch ID: 39910				Analysis Date: 4/4/2023	SeqNo: 1725654					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	ND	99.3						0		30	
Heavy Oil	ND	99.3						0		30	
Total Petroleum Hydrocarbons	ND	199						0		30	
Surr: 2-Fluorobiphenyl	16.9		24.83		68.2	50	150		0		
Surr: o-Terphenyl	22.2		24.83		89.4	50	150		0		

Sample ID: 2303667-007BDUP	SampType: DUP	Units: µg/L			Prep Date: 4/3/2023	RunNo: 82933					
Client ID: WOS-032823-CW01	Batch ID: 39910				Analysis Date: 4/4/2023	SeqNo: 1726717					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	178	97.6						173.3	2.82	30	

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

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

Sample ID: 2303667-007BDUP	SampType: DUP	Units: µg/L	Prep Date: 4/3/2023	RunNo: 82933							
Client ID: WOS-032823-CW01	Batch ID: 39910		Analysis Date: 4/4/2023	SeqNo: 1726717							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Heavy Oil	ND	97.6						0		30	
Total Petroleum Hydrocarbons	ND	195						0		30	
Surr: 2-Fluorobiphenyl	23.2		24.41		94.9	50	150		0		
Surr: o-Terphenyl	26.9		24.41		110	50	150		0		

NOTES:

Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Sample ID: 2303667-007BMS	SampType: MS	Units: µg/L	Prep Date: 4/3/2023	RunNo: 82933							
Client ID: WOS-032823-CW01	Batch ID: 39910		Analysis Date: 4/4/2023	SeqNo: 1726718							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Petroleum Hydrocarbons	1,100	199	1,242	173.3	74.3	25.4	127				
Surr: 2-Fluorobiphenyl	21.1		24.83		85.0	50	150				
Surr: o-Terphenyl	26.6		24.83		107	50	150				

Sample ID: MB-39926	SampType: MBLK	Units: µg/L	Prep Date: 4/4/2023	RunNo: 82984							
Client ID: MBLKW	Batch ID: 39926		Analysis Date: 4/5/2023	SeqNo: 1726935							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel Range Organics	ND	94.8									
Heavy Oil	ND	94.8									
Total Petroleum Hydrocarbons	ND	190									
Surr: 2-Fluorobiphenyl	19.7		23.69		83.3	50	150				
Surr: o-Terphenyl	23.5		23.69		99.4	50	150				

Sample ID: LCS-39926	SampType: LCS	Units: µg/L	Prep Date: 4/4/2023	RunNo: 82984							
Client ID: LCSW	Batch ID: 39926		Analysis Date: 4/5/2023	SeqNo: 1726936							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Petroleum Hydrocarbons	827	189	1,181	0	70.0	48	113				
Surr: 2-Fluorobiphenyl	18.2		23.62		77.0	50	150				

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

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

Sample ID: LCS-39926	SampType: LCS	Units: µg/L	Prep Date: 4/4/2023	RunNo: 82984							
Client ID: LCSW	Batch ID: 39926		Analysis Date: 4/5/2023	SeqNo: 1726936							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: o-Terphenyl	26.0		23.62		110	50	150				

Sample ID: 2303713-001BDUP	SampType: DUP	Units: µg/L	Prep Date: 4/4/2023	RunNo: 82984							
Client ID: BATCH	Batch ID: 39926		Analysis Date: 4/5/2023	SeqNo: 1726949							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	ND	94.8						0		30	
Heavy Oil	ND	94.8						0		30	
Total Petroleum Hydrocarbons	ND	190						0		30	
Surr: 2-Fluorobiphenyl	11.4		23.71		48.1	50	150		0		S
Surr: o-Terphenyl	21.5		23.71		90.7	50	150		0		

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Sample ID: 2303713-016BDUP	SampType: DUP	Units: µg/L	Prep Date: 4/4/2023	RunNo: 82984							
Client ID: BATCH	Batch ID: 39926		Analysis Date: 4/5/2023	SeqNo: 1726954							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	ND	94.8						0		30	
Heavy Oil	ND	94.8						0		30	
Total Petroleum Hydrocarbons	ND	190						0		30	
Surr: 2-Fluorobiphenyl	6.70		23.69		28.3	50	150		0		S
Surr: o-Terphenyl	12.1		23.69		51.0	50	150		0		

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID: MB-39900	SampType: MBLK	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82892							
Client ID: MBLKW	Batch ID: 39900		Analysis Date: 4/1/2023	SeqNo: 1724881							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics	ND	50.0									Q
Surr: Toluene-d8	24.5		25.00		98.0	65	135				
Surr: 4-Bromofluorobenzene	24.3		25.00		97.3	65	135				

NOTES:

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: LCS-39900	SampType: LCS	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82892							
Client ID: LCSW	Batch ID: 39900		Analysis Date: 4/1/2023	SeqNo: 1724882							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics	435	50.0	500.0	0	87.0	65	135				
Surr: Toluene-d8	23.9		25.00		95.6	65	135				
Surr: 4-Bromofluorobenzene	25.7		25.00		103	65	135				

Sample ID: 2303654-002ADUP	SampType: DUP	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82892							
Client ID: BATCH	Batch ID: 39900		Analysis Date: 4/2/2023	SeqNo: 1724848							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics	ND	50.0						0		30	
Surr: Toluene-d8	23.5		25.00		94.1	65	135		0		
Surr: 4-Bromofluorobenzene	25.1		25.00		100	65	135		0		

Sample ID: 2303654-003AMS	SampType: MS	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82892							
Client ID: BATCH	Batch ID: 39900		Analysis Date: 4/2/2023	SeqNo: 1724850							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics	388	50.0	500.0	0	77.6	65	135				
Surr: Toluene-d8	23.4		25.00		93.7	65	135				
Surr: 4-Bromofluorobenzene	25.7		25.00		103	65	135				

Work Order: 2303667
CLIENT: Fulcrum Environmental
Project: Whitten Oil

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID: 2303667-007ADUP	SampType: DUP	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82892							
Client ID: WOS-032823-CW01	Batch ID: 39900		Analysis Date: 4/2/2023	SeqNo: 1724867							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics	ND	50.0						0		30	
Surr: Toluene-d8	22.6		25.00		90.3	65	135		0		
Surr: 4-Bromofluorobenzene	25.4		25.00		102	65	135		0		

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260D

Sample ID: LCS-39900	SampType: LCS	Units: µg/L				Prep Date: 3/31/2023	RunNo: 82891				
Client ID: LCSW	Batch ID: 39900					Analysis Date: 4/1/2023	SeqNo: 1724726				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	22.5	0.440	20.00	0	112	80	120				
Toluene	22.6	1.00	20.00	0	113	80	120				
Ethylbenzene	19.7	0.400	20.00	0	98.3	80	120				
m,p-Xylene	37.1	1.00	40.00	0	92.7	80	120				
o-Xylene	18.2	0.500	20.00	0	91.1	80	120				
Surr: Dibromofluoromethane	25.3		25.00		101	80	120				
Surr: Toluene-d8	26.9		25.00		108	80	120				
Surr: 1-Bromo-4-fluorobenzene	25.7		25.00		103	80	120				

Sample ID: MB-39900	SampType: MBLK	Units: µg/L				Prep Date: 3/31/2023	RunNo: 82891				
Client ID: MBLKW	Batch ID: 39900					Analysis Date: 4/1/2023	SeqNo: 1724723				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.440									
Toluene	ND	1.00									
Ethylbenzene	ND	0.400									
m,p-Xylene	ND	1.00									
o-Xylene	ND	0.500									
Surr: Dibromofluoromethane	22.3		25.00		89.2	80	120				
Surr: Toluene-d8	26.7		25.00		107	80	120				
Surr: 1-Bromo-4-fluorobenzene	24.7		25.00		98.7	80	120				

Sample ID: 2303654-002ADUP	SampType: DUP	Units: µg/L				Prep Date: 3/31/2023	RunNo: 82891				
Client ID: BATCH	Batch ID: 39900					Analysis Date: 4/2/2023	SeqNo: 1724693				
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	1.00						0		30	
Ethylbenzene	ND	0.400						0		30	
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	0.500						0		30	

Work Order: 2303667
 CLIENT: Fulcrum Environmental
 Project: Whitten Oil

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260D

Sample ID: 2303654-002ADUP	SampType: DUP	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82891							
Client ID: BATCH	Batch ID: 39900	Analysis Date: 4/2/2023	SeqNo: 1724693								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	28.2		25.00		113	80	120		0		
Surr: Toluene-d8	28.6		25.00		114	80	120		0		
Surr: 1-Bromo-4-fluorobenzene	24.5		25.00		98.2	80	120		0		

Sample ID: 2303667-007ADUP	SampType: DUP	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82891							
Client ID: WOS-032823-CW01	Batch ID: 39900	Analysis Date: 4/2/2023	SeqNo: 1724710								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	1.00						0		30	
Ethylbenzene	ND	0.400						0		30	
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	0.500						0		30	
Surr: Dibromofluoromethane	25.6		25.00		102	80	120		0		
Surr: Toluene-d8	30.2		25.00		121	80	120		0		S
Surr: 1-Bromo-4-fluorobenzene	25.3		25.00		101	80	120		0		

NOTES:

S - Outlying surrogate recovery(ies) observed (high bias). Sample is non-detect; result meets QC requirements.

Sample ID: 2303667-007AMS	SampType: MS	Units: µg/L	Prep Date: 3/31/2023	RunNo: 82891							
Client ID: WOS-032823-CW01	Batch ID: 39900	Analysis Date: 4/2/2023	SeqNo: 1724711								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	34.3	0.440	20.00	7.818	132	72.6	141				
Toluene	25.9	1.00	20.00	0	129	71.4	141				
Ethylbenzene	18.5	0.400	20.00	0	92.3	71.4	142				
m,p-Xylene	35.1	1.00	40.00	0	87.7	72.2	142				
o-Xylene	17.1	0.500	20.00	0	85.6	75.2	136				
Surr: Dibromofluoromethane	28.5		25.00		114	51.6	145				
Surr: Toluene-d8	28.6		25.00		115	80	120				
Surr: 1-Bromo-4-fluorobenzene	26.6		25.00		106	80	120				

Work Order: 2303667
CLIENT: Fulcrum Environmental
Project: Whitten Oil

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260D

Sample ID: LCS-39900	SampType: LCS	Units: %Rec	Prep Date: 3/31/2023	RunNo: 82891							
Client ID: LCSW	Batch ID: 39900		Analysis Date: 4/5/2023	SeqNo: 1726329							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Dibromofluoromethane	27.2		25.00		109	80	120			
Surr: Toluene-d8	27.5		25.00		110	80	120			
Surr: 1-Bromo-4-fluorobenzene	23.5		25.00		93.9	80	120			

Client Name: FES	Work Order Number: 2303667
Logged by: Matt Langston	Date Received: 3/30/2023 9:27:00 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	3.0

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

