

# Remedial Investigation and Interim Action Report Coleman Oil Yakima Bulk Fuel

Site Name: Coleman Oil Yakima Bulk Fuel  
Site Address: 1 East I Street, Yakima 98901

Agreed Order: DE 15639  
ERTS ID Nos.: 663825, 670092  
Ecology Site Cleanup ID: 13200  
Facility/Site ID: 4233

Prepared for:  
Mr. Jim Cach  
Coleman Oil Company  
335 Mill Road  
Lewiston, Idaho 83501

PBS Project No. 41392

October 11, 2023



214 EAST GALER STREET  
SUITE 300  
SEATTLE, WA 98102  
206.233.9639 MAIN  
866.727.0140 FAX  
PBSUSA.COM

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## Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirements
Bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylenes
COC	Contaminant/Chemical of Concern
CSID	Cleanup Site Identification number
CSM	Conceptual Site Model
CUL	Clean-up Levels
Ecology	Washington State Department of Ecology
FOC	Fraction of Organic Carbon
FSID	Facility Site identification number
GME	Groundwater monitoring event
MTCA	Model Toxics Control Act
PAHs	Polycyclic Aromatic Hydrocarbons
pCOC	potential contaminants of concern
PID	Photoionization detector
PSD	particle size distribution
PTAP	Petroleum Technical Assistance Program
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RCW	Revised Code of Washington
SAP	Sampling and Analysis Plan
TEE	Terrestrial Ecological Evaluation
TPH	total petroleum hydrocarbon
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds
WAC	Washington State Administrative Code

## 1 COVER LETTER

October 11, 2023

John Mefford  
Toxics Cleanup Program Site Manager  
WA State Department of Ecology – Central Regional Office  
1250 W Alder Street  
Union Gap, WA 98903

RE: Coleman Oil Yakima Bulk Fuel

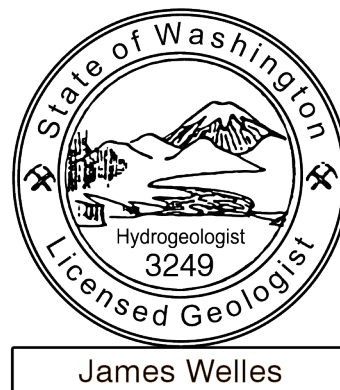
Dear Mr. Mefford,

PBS has completed Remedial Investigation (RI) and Interim Actions (IA) activities, in general accordance with the Work Plans developed under the Agreed Order, at the property located at 1 East I Street in Yakima, Washington. The RI was conducted to characterize the magnitude and extent of releases of gasoline and diesel to the subsurface in the vicinity of underground fuel product piping. IA were conducted to reduce the contamination at the site that resulted from these releases.

Sincerely,  
PBS Engineering and Environmental Inc.

---

James Welles, LHG  
Senior Hydrogeologist



## 2 INTRODUCTION

PBS Engineering and Environmental (PBS) prepared this Remedial Investigation (RI) and Interim Action (IA) report, on behalf of the Coleman Oil Company (Coleman Oil), regarding the property located at 1 East I Street in Yakima, Washington. The investigation and report was prepared to meet the substantive requirements of the RI as outlined in the Washington State Model Toxics Control Act (MTCA) Chapter 173-340-350 under Washington Administrative Code (WAC).

### 2.1 Site Discovery and Release Reporting

On March 21, 2016, on site personnel noted what appeared to be a fuel product seeping to the surface through a crack in the asphalt (<1-gallon). This observation was made when diesel fuel was being pumped through a subsurface line beneath that location. The following actions were undertaken at that time by on site personnel:

- Ceased pumping fuel through the line.
- Mopped up fuel product on the surface using absorptive pads from the spill kit.
- Removed asphalt and overburden soil from on top of the line (pipe run is approximately 1-foot below grade).
- Observed and plugged the hole in the line.
- Excavated impacted soil laterally and approximately 2-3 feet below the breached fuel line.
- Stockpiled impacted soil (approximately 7 cubic yards) on plastic sheeting and covered with plastic sheeting.

Coleman Oil personnel reported the release (diesel release) to the Washington State Department of Ecology (Ecology) within 24 hours per Washington Administrative Code (WAC) 173-340-300. Ecology assigned Environmental Report Tracking System (ERTS) number 663825 to the release.

Additionally, a December 2016 release of gasoline product to the subsurface (gasoline release) from a shallow pipe was confirmed through pressure testing by Coleman Oil personnel, and by the presence of previously unobserved free product in the closest groundwater monitoring well (MW2). This release was reported to Ecology on December 14, 2016 and was assigned ERTS number 670092.

### 2.2 Hazardous Substance Source Control

The point sources of the 2016 releases have been identified and the piping removed. Bulk fuel is currently stored in new ASTs (2017) with above-grade transfer components. Underground storage and piping of fuel products are no longer utilized at the property.

### 2.3 Agreed Order

Coleman Oil entered an Agreed Order (No. DE 15639) with other potentially liable parties (PLPs) and Ecology. The effective date of the Agreed Order is March 29, 2018. The PLPs are currently:

- Coleman Oil Company, LLC (Coleman Oil)
- BNSF Railway Company (BNSF)
- Carol Jean Wondrack
- Wondrack Distributing, Inc.
- Chevron Environmental Management Company (Chevron)

This Order requires the PLPs to complete a Remedial Investigation (RI), Feasibility Study (FS), and to prepare Draft Cleanup Action Plan (DCAP) for the site.

PBS prepared a Remedial Investigation Work Plan (RIWP) and an Interim Action Work Plan (IAWP), both dated August 2018, collectively referred to as the work plans. The purpose of the work plans was to detail methods and locations of proposed work intended to meet the objectives of the Remedial Investigation.

This RI report includes a summary of previous investigations and presents the execution and findings of the activities described in the work plans (August 2018 to present). It is noted that work was conducted in phases as information was obtained sequentially. RI and IA work was guided by the results/observations made as work progressed. Status updates and proposed scopes were communicated to PLPs and Ecology.

## 2.4 General Site Information

The approximate 1.0-acre property comprises one parcel (181313-14070) in Yakima, Washington at the northeast corner of the intersection of East I Street and the BNSF Railroad. The site is currently developed as a bulk fuel storage and distribution facility.

<b>Site Name:</b>	Coleman Oil Yakima Bulk Fuel Plant
<b>Site Location:</b>	1 East I Street Yakima, Washington 98901 Northeast Quarter of Section 13, Township 13 North, Range 18 East of the Willamette Base and Meridian
<b>Ecology Site Cleanup ID:</b>	13200
<b>Ecology Facility/Site ID:</b>	4233
<b>Agreed Order Number:</b>	DE15639
<b>Site Description:</b>	The site is currently developed as a bulk fuel plant. The site is generally flat.
<b>Current Operator:</b>	Coleman Oil Company 335 Mill Road Lewiston, Idaho 83501
<b>Current Owner:</b>	Carol Jean Wondrack
<b>Previous Owners / Operators:</b>	Chevron U.S.A. / Wondrack Distributing, Inc
<b>Project Consultant Contact Information:</b>	PBS Engineering and Environmental James Welles, LHG 214 East Galer Street, Suite 300 Seattle, WA 98102 Email – james.welles@pbsusa.com
<b>Ecology Site Manager:</b>	John Mefford Toxics Cleanup Program Department of Ecology Central Regional Office 1250 W Alder Street Union Gap, Washington Email – john.mefford@ecy.wa.gov

## 2.5 Site History

Tax parcel #18131314070 was acquired by Standard Oil Company in 1908. It was owned by the Standard Oil Company and thereafter its successor in interest, Chevron U.S.A., until 1986 when it was acquired by Joseph E. Wondrack and Carol J. Wondrack. It has been owned by Carol Jean Wondrack since February 2010. It is understood that Coleman Oil is in a purchase agreement for the parcel with Carol Jean Wondrack. The west adjacent parcel 181313-99997 is owned by BNSF Railroad as successor in interest to the Northern Pacific Railway Company, which acquired its interest in the parcel from the United States of America, pursuant to Section 2 of the Northern Pacific Land Grant Act of 1864.

It is noted that western portion of the facility was formerly mapped on the Yakima County Assessor's website as being part of west adjacent tax parcel 181313-99997. Previous PBS reports reference both parcels as comprising the site. It is understood that a transaction and re-parceling took place and the property is now a single parcel, owned by Carol Jean Wondrack on the County Assessors webpage on the date of this report. The entirety of the property is currently mapped as tax parcel 181313-14070.

Wondrack Distributing, Inc. operated the bulk fuel distributing facility located at the property from 1976 to August 1, 2015. Since August 1, 2015, the bulk fuel distributing facility has been operated by the Coleman Oil Company.

During late 2017 to early 2018, Coleman Oil made several modifications to the fuel transfer and storage infrastructure. Six aboveground storage tanks (ASTs) were removed from the north central and northeastern portions of the property, and a new secondary containment and fueling area was constructed in their place. Four active ASTs remain in the northwestern portion of the property.

Underground product piping is not utilized in the current system. Fuel in the ASTs is bottom loaded and unloaded at the south and eastern sides of the ASTs within the secondary containment system. The fueling canopy in the southcentral portion of the site is no longer in use. One heating oil underground storage tank (UST) was discovered and removed from the site during excavation of a subsurface diesel fuel line as described in July 2018 Data Summary Report (PBS-2018a).

## 2.6 Site Use

The property is currently developed as a petroleum storage, distribution and active fueling facility. Site features include four active ASTs, associated fuel transfer components, a secondary containment structure, an out-of-use fueling canopy and several structures used as office space and equipment storage. There are currently no proposed plans for change of land use or redevelopment for the site.

## 2.7 Regional Geology/Hydrogeology

### 2.7.1 Geology

The site is located in the Yakima Valley, which lies within the central portion of the Columbia River Plateau physiographic province. This province is comprised of a series of flood basalts covering much of central and eastern Washington. The basalt flows of the Columbia River Basalt Group (CRBG) are late Miocene Epoch and early Pliocene Epoch (between 17 and 6 million years ago) in age, forming an extensive volcanic plateau.

The Yakima Valley lies between anticlinal ridges that generally trend east-west as part of the Yakima Fold Belt; which consists of basaltic lava flows that have faulted and folded from the late Tertiary to the present. Glacial outwash and river-deposited silt, sand and gravel deposits overlie the Columbia River Basalt.

The property is located within the flood plain of the Yakima River and is underlain in most areas by Quaternary-age alluvium and unconsolidated terrace deposits. The alluvium is composed of unconsolidated silt, sand, gravel, and cobble. It ranges in thickness from 0 to 120 feet with an average thickness of 20 feet (USGS, 2009). The underlying terrace deposits consist of coarse-grained gravel with discontinuous layers of silt, clay, sand, or cemented gravel. The terrace gravel generally occurs at the surface away from the river, and beneath the alluvium adjacent to the river. The thickness of this unit ranges from 0 to 350 feet with an average thickness of 90 feet (USGS, 2009). These unconsolidated Quaternary deposits are overlain in some areas by artificial fill material up to 20 feet deep, and are underlain by consolidated, Tertiary-age, continental sediments, primarily of the Upper Ellensburg Formation. Source: <https://fortress.wa.gov/ecy/publications/documents/1703008.pdf>

### **2.7.2 Hydrogeology**

The Yakima River basin aquifer system underlies about 6,200 square miles in south-central Washington. The aquifer system consists of basin-fill deposits occurring in six structural-sedimentary basins, the Columbia River Basalt Group (CRBG), and generally older bedrock. The basin-fill deposits were divided into 19 hydrogeologic units, the CRBG was divided into three units separated by two interbed units, and the bedrock was divided into four units (the Paleozoic, the Mesozoic, the Tertiary, and the Quaternary bedrock units). The thickness of the basin-fill units and the depth to the top of each unit and interbed of the CRBG were mapped. Only the surficial extent of the bedrock units was mapped due to insufficient data. Average mapped thickness of the different units ranged from 10 to 600 feet.

Lateral hydraulic conductivity (Kh) of the units vary widely indicating the heterogeneity of the aquifer system. Average or effective Kh values of the water-producing zones of the basin-fill units are on the order of 1 to 800 ft/d and are about 1 to 10 ft/d for the CRBG units as a whole<sup>1</sup>. Effective or average Kh values for the different rock types of the Paleozoic, Mesozoic, and Tertiary units appear to be about 0.0001 to 3 ft/d. The more permeable Quaternary bedrock unit may have Kh values that range from 1 to 7,000 ft/d. Vertical hydraulic conductivity (Kv) of the units is largely unknown. Kv values have been estimated to range from about 0.009 to 2 ft/d for the basin-fill units and Kv values for the clay-to-shale parts of the units may be as small as 10<sup>-10</sup> to 10<sup>-7</sup> ft/d. Reported Kv values for the CRBG units ranged from 4×10<sup>-7</sup> to 4 ft/d.

### **2.7.3 Surface Water**

Surface water has not been identified on the site or in the vicinity. The closest identified surface water to the site is the Yakima River, located approximately two miles to the northeast. The calculated groundwater flow direction is to the south-southeast, which is the approximate direction the Yakima River flows through this area of the valley.

## **3 REGULATORY CRITERIA**

### **3.1 Contaminated Site Cleanup**

Contaminated site assessment and cleanup is conducted in accordance with the substantive requirements of the Model Toxics Control Act (MTCA), Chapter 70.105D of the Revised Code of Washington (RCW) and its implementation regulations, Chapter 173-340 of the Washington Administrative Code (WAC).

In accordance with MTCA, development of preliminary cleanup levels includes identifying potential exposure pathways for human and ecological impacts based on the planned land use. MTCA provides for three methods (Method A, B, or C) for establishing cleanup standards. Method A (unrestricted land use) is typically used as the default criterion. Methods B and C are used when developing site-specific cleanup levels.

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<sup>1</sup> [https://wa.water.usgs.gov/projects/yakimagw/summary\\_of\\_results.htm](https://wa.water.usgs.gov/projects/yakimagw/summary_of_results.htm)

MTCA Method A Cleanup Levels (CULs) for soil and groundwater are presented in the tables, along with detected contaminant concentrations.

### **3.2 Vapor Intrusion**

The evaluation of vapor intrusion in Washington is conducted in general accordance with Ecology's *Guidance for Evaluating Vapor Intrusion in Washington State: Investigation and Remedial Action* (Publication No. 09-09-047: March 2022) and the screening and cleanup levels presented in the Cleanup Levels and Risk Calculations (CLARC) data tables (updated January 2023), collectively referred to as the VI Guidance.

## **4 REMEDIAL INVESTIGATIONS AND INTERIM ACTIONS**

Remedial Investigations (RI) including sampling of soil, soil vapor, and groundwater have been conducted at the subject property. Interim Actions (IA) performed to reduce contamination, most specifically non-aqueous phase hydrocarbons (NAPL or fuel product), have been conducted. RI and IA actions are presented in this section.

### **4.1 Sampling and Analysis Methodologies**

Site characterization activities were completed according to the methods described below.

#### **4.1.1 Soil Sampling**

Soil sampling methodologies included sampling directly from hand digging tools during surface sampling, acetate liners during direct push drilling, from polyethylene bags during sonic drilling, or from steel 18-inch split spoon samplers while drilling with hollow-stemmed auger methods. Hand digging tools and split spoon samplers were decontaminated with a non-phosphate detergent wash followed by a potable water rinse.

In the event drilling was used to collect soil samples, soil cores generated from the boring were logged continuously, noting grain size, density, color, odor, and moisture. Soils were also screened for volatile contaminants using a photoionization detector (PID) as cores were produced.

Samples were collected directly into laboratory-provided glassware and labeled with the sample name and date and time of collection. When applicable, field staff followed EPA's Method 5035A and Ecology's guidance, *Collecting and Preparing Soil Samples for VOC Analysis*. Samples were kept on ice for transport to the project laboratory under chain-of-custody documentation. Field personnel donned new disposable nitrile gloves when collecting each sample.

#### **4.1.2 Groundwater Sampling**

Groundwater purging and sampling was conducted using a peristaltic pump, employing low flow sampling techniques. The sample intake was placed approximately 2-feet below the water table and within the screened interval. Groundwater chemistry parameters (conductivity, pH, temperature, dissolved oxygen and oxidation-reduction potential) were recorded during purging using a YSI Model 556MSP water-quality analyzer equipped with a flow-through cell. Groundwater samples were collected when those parameters were observed to have stabilized.

Groundwater samples were collected directly into laboratory-provided glassware and labeled with the sample name and collection date and time. Samples were kept on ice for transport to the project laboratory under chain-of-custody documentation. Field personnel wore new disposable nitrile gloves when collecting samples.

It is noted that in instances where measurable NAPL was present in a well at the time of the groundwater monitoring event, a groundwater sample was not collected from that well. During NAPL sampling events,

NAPL samples were collected using a disposable bailer. The bailer was lowered slowly into the well without penetrating the NAPL-groundwater interface to minimize mixing of groundwater and NAPL in the sample.

#### **4.1.3 Soil Vapor Sampling**

Soil vapor samples were collected from a soil probe, using Teflon tubing, into a one-liter Summa canister fitted with flow controllers set at a flow rate of approximately 160 milliliters mL/minute. The canisters were batch-certified for volatile organic compounds as well as helium, which was used as a tracer gas for leak detection. A shroud was placed over the sample point and helium was introduced into the shroud. The concentration of helium in the shroud was held constant throughout the sampling event and recorded prior to sampling, mid-sampling, and at the end of sampling. The sample collection method was employed to ensure that ambient air was not pulled through the sample train and/or seals.

#### **4.1.4 Laboratory Methodologies**

Soil and groundwater samples were analyzed for the following parameters by the methods indicated below:

- Diesel (TPH-D) and Heavy Oil (TPH-HO) range Total Petroleum Hydrocarbons by method NWTPH-Dx.
- Gasoline range Total Petroleum Hydrocarbons (TPH-G) by method NWTPH-Gx.
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by method EPA 8021.

Additionally, select soil samples were also analyzed for:

- Arsenic, cadmium, chromium, lead and mercury by method EPA 200.8.
- Polycyclic aromatic hydrocarbons (PAH) by EPA Method 8270D SIM.

Select groundwater samples were also analyzed for:

- Ethylene dibromide (EDB) and ethylene dichloride (EDC) by EPA 8260 SIM (water).
- PAHs by EPA Method 8270 SIM.
- Lead and mercury by method EPA 6020.
- Hexane and methyl tertiary butyl ether (MTBE) by method EPA 8260.

Soil vapor samples were analyzed for the following parameters by the methods indicated below:

- BTEX and naphthalene by method EPA TO-15.
- Aliphatic hydrocarbons by method Massachusetts APH, Revision 1, December 2009.
- Helium by method EPA 3C Modified.

Samples were analyzed within the applicable hold times and the laboratory reports did not note any issues with the analyses that would negatively impact data usability.

## **4.2 Previous Environmental Investigations**

### **4.2.1 Site Characterization Report (June 2015)**

PBS conducted site characterization activities in April 2015 for Wondrack Distributing, which included:

- Near surface soil sampling within three feet of ground surface using hand tools at locations across the property (S1-S9, S26-S37, Figure 2).
- Advancement of twelve direct push soil borings to depths between 5 and 10 feet below ground surface (bgs) (B1 – B11, B13, Figure 2).
- Advancement of one direct push soil boring to groundwater. The boring met drilling refusal at 19 feet bgs, and groundwater was not sufficient to be sampled (B12, Figure 2).

The results of the investigation are presented in PBS Site Characterization Report – Yakima Bulk Fuel Plant dated June 2015 (PBS-2015).



It is noted that property modifications, post 2017, included significant disturbance and grading to/of near surface soils in the northern portion of the property (approximately 1/3) and, therefore, results from near surface soil samples collected during the April 2015 investigation are not relied upon for site characterization. Samples not relied upon are presented in strikethrough text in Table 1 and include:

- S1 through S9.
- S29 through S33.
- S35 through S37.

#### **4.2.2 Data Summary Report (July 2018)**

Coleman Oil entered an Agreed Order (No. DE 15639) with other potentially liable parties (PLPs) and Ecology, effective March 29, 2018. The Order requires the PLPs to complete a Data Summary Report, RI, FS, and to prepare DCAP for the Site. PBS completed the Data Summary Report for Coleman Oil dated July 19, 2018. The Data Summary Report detailed site activities from the time of the 2016 diesel release until the generating of the RI and IA Work Plans (August 2018). The following site characterization and interim action activities are described in the Data Summary Report:

- Installation of monitoring wells (RW1 and MW1 through MW6).
- Three groundwater monitoring events including the gauging and sampling of onsite wells.
- Eight NAPL removal events resulted in the removal of four gallons of diesel NAPL from MW3 and 48.5 gallons of diesel NAPL from RW1.
- Eleven multiphase extraction (MPE) events utilizing a vacuum truck with a catchment vessel resulting in the removal of approximately 3,616 gallons of NAPL and contaminated groundwater for offsite disposal.
- Aquifer testing which included the performance of a rising head slug test in monitoring wells MW4 and MW6.
- Collection of NAPL samples from monitoring wells MW3 and MW5.

The results of the investigation and interim actions described above are presented in PBS Data Summary Report dated July 19, 2018 (PBS-2018a).

### **4.3 Site Characterization Activities (July 2018 through July 2022)**

The following section describes site characterization activities conducted at the site since the issuance of the July 2018 Data Summary Report, which is the last formal document relating to environmental cleanup at the site. The activities described in this section were performed in general accordance with the work plans.

#### **4.3.1 Soil Boring and Monitoring Well Installation (December 2018)**

On December 19 and 20, 2018, seven soil borings (BH1 – BH7) were advanced at the Site using a sonic drilling rig for the collection of unsaturated soil samples and “grab” groundwater samples. The borings were advanced to a depth of 25 feet bgs. Three additional soil borings were advanced to a depth of 30 feet bgs and completed as groundwater monitoring wells (MW8 through MW10).

Two soil samples were retained from each boring for laboratory analysis. The monitoring wells were installed to a depth of 30-feet, with 2-inch PVC casing diameter and 15-foot PVC screen.

Boring and monitoring well locations are shown on Figure 2. Boring logs describing the subsurface lithology, sample depths, PID readings and well construction (if applicable) are presented in Appendix A – Soil Boring and Well Construction Logs.

#### **4.3.2 Groundwater Monitoring Event (March 2019)**

On March 19, 2019, a groundwater monitoring event (GME) was conducted and included sampling of groundwater or NAPL from onsite monitoring wells. Prior to sampling, the wells were gauged using an interface probe, and depth to groundwater and NAPL, if present, were recorded. NAPL samples were collected from wells RW1, MW2, MW3, MW4, MW5, and MW8. NAPL samples were not collected from wells MW1 and MW6 as the thickness of the NAPL in these wells at the time of the GME was insufficient for sample collection.

Groundwater sampling data sheets are presented in Appendix B – Sampling Datasheets.

#### **4.3.3 Non-Aqueous Phase Liquid (NAPL) Transmissivity Testing (March 2019)**

On March 26, 2019, PBS conducted a NAPL baildown test at well RW1, for the purpose of estimating NAPL transmissivity (T: feet<sup>2</sup>/day). Prior to beginning the baildown test, a NAPL thickness of 0.50-feet was measured within the four-inch diameter well using an interface probe. Following gauging, NAPL was rapidly removed from the well with a bailer. Following removal of NAPL (<0.01-feet of NAPL in well), the well was gauged periodically for approximately 4 hours. During this period, the NAPL thickness recovered to 0.03-feet (<1 minute after ceasing extraction). This recovered volume likely represented draining of NAPL from the filter pack into the well. The total NAPL recovery was 0.04-feet (8%) over the monitored recovery period (3.8-hours). RW1 was gauged approximately 46-hours later, and recovery was 0.14-feet (28%). Based on slow recovery and site history of fluctuating product thickness, an accurate transmissivity value could not be calculated for NAPL at RW-1.

#### **4.3.4 Additional Soil Investigation and Soil Vapor Probe Installation (June 2019)**

On June 4, 2019, for the purpose of continued source investigation, five soil borings (BH8 through BH13) were completed by a direct push drilling rig operated by Holt Services, Inc. PBS oversaw the advancement of the borings and collected soil samples for laboratory analysis from each boring. Refusal was generally encountered at approximately 10-feet below ground surface (bgs) across the site. Due to the relatively shallow depths of drilling refusal, groundwater was not encountered nor sampled in borings BH8 through BH13. Two soil samples from each boring were retained for laboratory analysis.

One soil vapor probe (designated VB1) was installed between the diesel point of release and the eastern extent of the Site office building. The boring was completed to a total depth of 8-feet bgs and the stainless-steel soil vapor probe is set from 6.0 to 6.5 ft bgs. The sand interval 5- to 8-feet bgs is considered to be the sample interval.

Boring locations are shown on Figure 2. Boring logs describing the subsurface lithology, sample depths, PID readings and vapor probe construction are presented in Appendix A.

#### **4.3.5 Additional Soil Boring and Monitoring Well Installations (December 2019 – February 2022)**

Based on data collected during investigations, additional locations were identified that were considered valuable to defining site contamination. Additional soil borings, monitoring wells and sampling were conducted to better define the extent of contamination.

On December 16-18, 2019, a total of five soil borings were advanced at the site, using a sonic drilling rig. Two (BH14-BH15) were advanced for the collection of soil samples and select “grab” groundwater samples. Three borings (MW7, MW11, MW12) were completed as groundwater monitoring wells. It is noted that MW8, MW9 and MW10 were installed (December 2018) prior to MW7 due to delays resulting from a pending access agreement with BNSF to facilitate installation of the well.

On September 3-4, 2020, monitoring wells MW13 and MW14 were installed in hydraulically down-gradient locations along North Front Street to the south of the property.

On April 8, 2021, monitoring well MW15 was installed to the southeast of the source area, on the south side of I street at the RS Mechanical property (4 East I Street).

On February 24, 2022, monitoring well MW16 was installed on the south side of the R S Mechanical building, to define the southeast extent of the site.

Two soil samples were sampled from each soil boring.

The monitoring wells were installed to a depth of 30 feet, with 2-inch PVC casing diameter and 15-foot screens.

Boring and monitoring well locations are shown on Figure 2. Boring logs are presented in Appendix A.

#### **4.3.6 Groundwater Sampling Events (February 2020 – July 2022)**

Between February 2020 and July 2022, four groundwater sampling events were conducted. Sampling events are summarized as follows:

- February 2020: Limited sampling of recently installed wells MW7, MW9 and MW10. NAPL sampled from wells MW11 and MW12.
- November 2020: Groundwater samples collected from wells MW2, MW7, MW8, MW9, MW10, MW13 and MW14. NAPL sampled from wells MW5 and MW12.
- July 2021: Groundwater samples collected from wells MW1, MW2, MW4, MW6, MW7, MW9, MW10, MW11, MW13, MW14, MW15 and MWBNSF1.
- March 2022: Limited sampling of recently installed well MW16 and nearby wells MW10, MW14 and MWBNSF1.
- July 2022: Groundwater samples collected from wells MW1, MW2, MW5, MW6, MW7, MW9, MW10, MW13, MW14, MW15, MW16 and MWBNSF1.

Note well MWBNSF1 is an Ecology and BNSF well located on BNSF property south of the property and is used to define the extent of the site to the southwest.

Copies of groundwater sampling data sheets are included in Appendix B Sampling Datasheets.

Groundwater elevation contours, flow direction and gradient from the July 2022 event along with a rose diagram depicting flow direction and gradient of past GMEs are presented in Figure 3.

#### **4.3.7 Monitoring Well Survey**

Accurately measuring the elevation of the top of casing (TOC) of monitoring wells allows for the determination of groundwater elevation, by measuring the depth to water from the TOC. On March 12, 2016, surveying of TOC, latitude, and longitude of monitoring wells MW1 through MW6 was completed by a licensed Registered Land Surveyor in the State of Washington.

Monitoring wells MW7 through MW14 were surveyed on November 24, 2020.

The survey reports are presented in Appendix C.

#### **4.3.8 Multiphase Extraction Events (February 2020 through July 2022)**

Multiphase extraction (MPE or vacuum extraction) is a process of rapidly removing NAPL, contaminated groundwater and vapor from the subsurface. PBS oversaw US Ecology, of Pasco, WA, who utilized a vacuum rig with downhole intake (stinger) and catchment vessel to remove contaminated media from the subsurface through select wells on-site. Contaminated media was removed from the wells using transparent, reinforced down-well tubing and vacuum.

Beginning in October 2016, PBS has overseen twenty-six (26) MPE events. A total of approximately 8,400 gallons of liquid has been removed from the site and disposed of off-site.

Based on visual observations made in vacuum truck, and conversations with NRC/US Ecology, PBS roughly estimates that 10% (or 800 gallons) of the removed liquid material was NAPL product.

It is unknown what volume of the contaminant load was removed as vapor.

A summary of MPEs is presented in Table 7.

### **5 REMEDIAL INVESTIGATION RESULTS**

The results of site characterization activities described above are summarized below by media.

#### **5.1 Soil**

Field screening of the soil samples for petroleum volatile organics with the PID instrument during advancement of onsite borings indicated low to no detection in soil from surface to approximate depth of the seasonal high groundwater table.

##### **5.1.1 Legacy Soil Contamination**

Concentrations of TPH in the diesel and heavy oil range exceeded the of MTCA Method A Cleanup Levels (CULs) in near surface soil samples collected in 2015 within 3-feet of the ground surface in the northwest, northeast and southeast corners of the Site, and in the vicinity of the fueling canopy. Additionally, cadmium and lead were detected in one near surface soil sample in the northwest corner of the property. Contaminants have not been detected in exceedance of CULs at depths greater than 3-feet bgs at the Site, with the exception of contaminated soils encountered during remedial excavation as described below.

During the late 2017 to early 2018 time period, Coleman Oil has made several modifications to the fuel transfer and storage infrastructure. Six aboveground storage tanks (ASTs) were removed from the north central and northeastern portions of the property, and a new secondary containment and fueling area was constructed in their place. Four active ASTs remain in the northwestern portion of the property.

It is noted that property modifications included significant disturbance and grading to/of near surface soils in the northern portion of the property (approximately 1/3) and, therefore, results from near surface soil samples collected during the April 2015 investigation are not relied upon for site characterization. Though locational data are not relied upon, contaminants will be considered to exist in shallow soil in earthworks areas unless data shows otherwise. Legacy shallow soil contamination (upper 3-feet) is included in the conceptual site model (CSM).

Samples not relied upon are presented in strikethrough text in Table 1 and include:

- S1 through S9.
- S29 through S33.

- S35 through S37.

Although the above samples results are not relied upon, contaminants with concentrations exceeding the CUL are considered pCOCs. Borings BH1, BH2, BH4, MW-8 and MW-9 were installed in the northeastern portion of the property following soil disturbances in this area and are representative of current contaminant concentrations in soil. Detected concentrations of pCOCs in soil samples collected from these borings were below respective CULs.

Samples with contaminant concentrations exceeding CULs, which were not disturbed during property modifications, contained diesel and heavy oil range TPH in the vicinity of the fueling canopy (samples S26 and S28) and in the southeast corner of the property (S39).

### **5.1.2 Contaminated Soil Remaining in Place West of Remedial Excavation**

As described in Section 3.2.2 and in the Data Summary Report (PBS-2018a), remedial excavation was conducted to the west of the fueling canopy following discovery of the diesel release. Confirmation soil sampling indicated that remedial excavation was effective at removing petroleum contaminated soil (PCS) to the north, east and south of the release. However, removal of contaminated soil to the west was not feasible due to structural impediments. Removal of contaminated soil at depths greater than 18 feet bgs was not feasible due to the presence of the groundwater table.

Confirmation soil sampling results indicate that PCS exceeding CULs remains in place between the remedial excavation and office.

Soil contamination in the vicinity of the remedial excavation is confirmed by TPH in exceedance of CULs encountered at depths of 19 and 16 feet in wells MW1 and MW3, respectively. These wells are located in the northwest and southwest corners, and immediately outside of the remedial excavation.

Contaminants were not detected in exceedance of CULs in soil samples collected from soil borings advanced and completed as wells MW2 and MW3.

### **5.1.3 Subsurface Investigation Conducted from 2018 through 2022**

Petroleum contaminants of concern (COCs) were not detected above CULs in soil samples collected from soil borings BH1 through BH15 and MW7 through MW16 advanced at the Site from 2018 through 2022.

### **5.1.4 Soil Summary**

Soil analytical results are presented in Table 1. Sample locations and extents of soil contamination (based on relied upon data) are presented in Figure 4 and Cross-section Figures 9 and 10.

Laboratory reports and chain of custody documentation are included in Appendix E.

## **5.2 Groundwater**

### **5.2.1 Elevation, Flow Direction and Gradient**

Groundwater flow direction and gradient estimates were determined graphically on a scaled site plan using groundwater elevation data. Groundwater flow direction is consistently to the southeast with an average gradient of approximately 0.015 ft/ft. Groundwater and NAPL elevation data are presented in Table 2.

Groundwater flow direction and gradient from July 2022, along with a rose diagram summarizing groundwater flow direction and gradient determined using previous data are presented in Figure 3. Hydrographs depicting groundwater and NAPL elevations and product thickness are presented in Figure 7.

### **5.2.2 Analytical**

Concentrations of petroleum COCs exceed the CULs throughout most of the property. The extent of groundwater contamination has been defined in the upgradient, downgradient and lateral direction, with the exception of directly to the west, where impacted MW5 is the furthest explored before the site extends onto the BNSF property in that direction.

Select groundwater samples were also analyzed for EDB, EDC, hexane, MTBE, PAHs and lead. Naphthalene was detected above the CUL in well MW6 in samples collected in December of 2016 and June of 2017. EDB, EDC, hexane, MTBE, PAHs and lead were not detected in exceedance of CULs.

Groundwater sample locations are presented in Figure 2. Concentrations of TPHs are presented on Figures 5 and 6, along with identified NAPL.

Groundwater analytical results are presented in Table 2.

Laboratory reports and chain of custody documentation are presented in Appendix E.

## **5.3 Non-Aqueous Phase Liquid (NAPL)**

### **5.3.1 Physical - Transmissivity**

Based on the data from the baildown test, the transmissivity of the product at the site is less than the 0.1 to 0.8 ft<sup>2</sup>/day range considered as the practical cutoff for hydraulic recoverability of product.

### **5.3.2 Analytical**

Analysis and visual assessment of NAPL samples by the laboratory indicates two distinguishable NAPL compositions are present on site as follows:

- NAPL samples collected in the vicinity of the gasoline and diesel releases, and down-gradient consist of a mixture of fresh and weathered gasoline and fresh and weathered diesel fuels (wells RW1, MW1 through MW3, MW5 and MW6, MW11 and MW12).
- NAPL samples collected to the northeast (upgradient) of the gasoline and diesel releases consist of only weathered diesel fuel (wells MW4 and MW8).

Analytical results of NAPL samples are presented in Table 3. Sample locations are presented on Figure 2.

Laboratory reports and chain of custody documentation are presented in Appendix E.

## **5.4 Aquifer Testing**

The rising head test data collected on June 9, 2017 was processed using hydrogeological modeling software (AQTESOLV v4.5). The calculations were performed using the Bouwer-Rice solution. The Bouwer-Rice solution was developed for open boreholes or screened wells that partially or fully penetrate an unconfined aquifer and was therefore deemed the most appropriate solution to be used for the site.

The recovery was curved at the most valuable part of recovery, so the line matching was placed tangent to the curve at approximately 80% recovery.

The two calculated hydraulic conductivities (K values) were 1.79 feet per day (ft/day) at MW4 and 1.183 ft/day for MW6 (PBS, 2018a).

The calculated hydraulic conductivities are indicative of silty sands (Fetter, 1994), which is generally consistent with the subsurface lithology observed during well installations. The mean of the two K values is 1.487 feet/day and is the adopted K value for the site.

## **5.5 Vapor Intrusion**

### **5.5.1 Soil Vapor**

Concentrations of petroleum COCs were not detected above the adopted criteria in soil vapor sample (VB1), which was collected immediately outside of the onsite office between the office and remedial excavation.

Sub-slab soil gas results are presented in Table 5. The sample location is presented in Figure 2. The laboratory report and chain of custody documentation is presented in Appendix E.

## **6 CONCEPTUAL SITE MODEL**

Assessing a site with known or suspected contamination requires a conceptual understanding of potential or suspected sources of hazardous substances, types and concentrations of hazardous substances, potentially contaminated media, and actual and potential exposure pathways and receptors. This is called a conceptual site model (CSM). This section provides a narrative CSM for this site. The CSM is comprised of this narrative and Figures 8 through 11.

### **6.1 Contaminant Release**

Two discrete and apparent releases of diesel and gasoline fuels to the subsurface were identified in March and December of 2016, respectively. There is evidence of more weathered petroleum in both the gasoline and diesel range that indicated undefined prior release events at the Site. The point locations of both 2016 releases are well understood and are depicted on Figure 2. The exact volumes of the respective releases are currently unknown.

### **6.2 Soil Fate and Transport**

The following sections discuss potential and confirmed (p or c) COCs and their occurrence within each media.

#### **6.2.1 Legacy Soil Contamination**

In an investigation that occurred in 2015, prior to the known fuel releases, TPH in the diesel and heavy oil range were detected in near surface soils at several locations across the property, at concentrations in exceedance of CULs. Additionally, cadmium and lead were detected in near surface soils, in exceedance of CULs, in the northwestern portion of the property near the ASTs. The source of these pCOCs is unknown.

It is noted that property modifications included significant disturbance and grading to/of near surface soils in the northern portion of the property (approximately northern 1/3 of property). pCOCs are therefore assumed to exist in near surface soil samples (upper 2-foot depth) beneath structures and in shallow earthworks areas unless data shows otherwise.

Contaminants have not been detected in exceedance of CULs at depths greater than 3-feet bgs at the Site, with the exception of contaminated soils encountered during remedial excavation as described below.

### **6.2.2 2016 Releases**

Releases of gasoline, diesel, heavy oil and BTEX constituents from ASTs and associated subsurface piping, affecting soil, were discovered during fuel pumping and tightness testing in 2016. The sources of the releases are two separate subsurface fuel lines which conveyed fuel from the ASTs in the northwestern portion of the property to the fueling canopy in the southcentral portion of the property. Both subsurface fuel lines have since been abandoned and replaced by above-ground piping.

Following remedial excavation to the west of the fueling canopy, confirmation soil sampling indicated contaminant concentrations to the north, east and south of the excavation were below CULs. However, contaminated soil remained in place to the west of and beneath the excavation. Further excavation to the west and deeper was prohibited by the presence of the site structure and water table, respectively.

### **6.2.3 Contaminants of Concern**

Based on the product reportedly stored at the Property, soil samples collected during the 2015 investigation were analyzed for TPHs as pCOCs. Select soil samples were also analyzed for BTEX and metals. Based on the products reportedly released at the property in 2016, soil samples collected from the site from 2016 through 2020 were analyzed for TPHs and BTEX. Select soil samples were also analyzed for lead and carcinogenic PAHs.

The following constituents have been detected in Site soils at concentrations exceeding CULs and are known to have been stored and/or released at the Site, and are therefore considered COCs in soil:

- TPH in the gasoline range
- TPH in the diesel range
- TPH in the heavy oil range
- Cadmium
- Lead
- Naphthalene

### **6.2.4 Occurrence**

#### **Legacy Soil Contamination**

The extent of contamination in soil exceeding CULs is limited to the upper three feet of Site soils in the following areas:

- North 1/3 portion of the site beneath new structures and in the northeast where potentially accessible.
- In the vicinity of the fueling canopy.
- In the southeastern corner of the site near East I Street.

### **2016 Releases**

Soil contamination remains beneath the remedial excavation and between the western boundary of the remedial excavation and the eastern edge of the adjacent building. Contaminated soil remaining in place in the vicinity of the remedial excavation extends from several feet below ground surface to the depth of the groundwater table, approximately 18 feet bgs. The Site boundary (i.e. extent of contamination) is defined by soil boring and monitoring well locations with contaminant concentrations in soil below their respective CULS as described below:

The point of compliance for soil is throughout the Site from the surface down to a depth of 15 feet bgs. The following sample locations with soil concentrations below CULs bound the extent of contaminated soil at the Site:



<b>DIRECTION</b>	<b>Soil Boring / Monitoring Well</b>	<b>Associated Report</b>
NORTH	MW6, MW7, MW9	Remedial Investigation
SOUTH	MW11, MW12	Remedial Investigation
	BH5	
EAST	B1, B12, BH3	Site Characterization Report (PBS, 2015) and Remedial Investigation
	MW9, MW10	Remedial Investigation
WEST	MW5, MW7	Data Summary Report (PBS, 2017) & Remedial Investigation
	BH14 & BH15	Remedial Investigation
VERTICAL	Groundwater Table – approx. 18 feet bgs	Remedial Investigation

The release is defined in lateral and vertical directions, except for to the north of the ASTs in the northwestern portion of the Site. Analytical results for soil samples collected from borings and monitoring wells listed in the table above are below CULs. The soil point of compliance is met with the exception of shallow soil (upper 3-foot) and the locations depicted on Figure 4. The vertical extent of soil contamination is presented in Figures 9 and 10.

### 6.2.5 Removal

Given the proximity of soil contamination to the west of the remedial excavation to the adjacent building, removal of this contaminated soil by excavation is not feasible due to structural impediments. These are the same structural impediments which prevented removal of the material during remedial excavation in 2016. Similarly, removal of contaminated soil beneath the ASTs in the northwestern portion of the site and beneath the fueling canopy is not feasible due to structural impediments. Contaminated soil in the northeastern and southeastern portions of the site may be accessible for removal by excavation.

## 6.3 NAPL Fate and Transport

Contaminants from the source areas migrated as NAPL vertically due to gravity through the vadose zone eventually reaching groundwater. Based on the understanding of the composition of NAPL at the Site through laboratory analysis and process knowledge, the NAPL is understood to have a density less than that of water and as such is expected to travel laterally upon reaching the water table, rather than penetrating vertically into the water table. While it is understood that Site NAPL will not significantly penetrate the groundwater table vertically due to its density and immiscibility, NAPL of sufficient thickness can depress the elevation of underlying water table.

### 6.3.1 Composition

NAPL samples were collected from select monitoring wells during four different GMEs as described in Sections 3.2.3, 3.3.2 and 3.3.8. Analysis and visual assessment of NAPL samples by the laboratory indicates that the NAPL plume contains three distinguishable compositions.

- A mixture of fresh and weathered gasoline and diesel fuels (FWGD NAPL)
- A mixture of fresh and weathered diesel fuel only (FWD NAPL)
- Weathered diesel fuel only (WD NAPL)

### 6.3.2 NAPL Occurrence

The vertical extent of NAPL in groundwater is predominantly located in the interval between the measured depth to NAPL and the measured depth to water. NAPL in the vicinity of the fueling canopy and diesel and

gasoline results was measured to be between 0.01 and 0.26 feet in thickness in the most recent groundwater monitoring event. NAPL thickness increased to the south and southeast, with the greatest measured NAPL thickness of 8.86 feet in MW12 located to the south of the property across East I Street.

Extents of measurable NAPL:

DIRECTION	Soil Boring / Monitoring Well	REFERENCE/CONSULTANT
NORTH	MW7, MW8, MW9	Remedial Investigation
SOUTH	MWBNSF1, MW13, MW14, MW16	Remedial Investigation
EAST	MW9, MW10	Remedial Investigation
WEST	Undefined	
VERTICAL	20-foot bgs Site wide, 30 feet bgs at MW12	PBS – May 10, 2018

The extent of NAPL is defined vertically and laterally in three out of four cardinal directions. The western extent of the NAPL plume remains undefined.

Typical concerns for this type of contamination by petroleum NAPL include lateral migration of NAPL to uncontaminated areas and mixing of NAPL with groundwater resulting in further contamination of groundwater.

#### 6.4 Groundwater Fate and Transport

Concentrations of COCs were confirmed to be present in Site soils in 2015 prior to the 2016 diesel and gasoline releases (PBS, 2015). Groundwater samples were not collected in the 2015 Site investigation, and as such, it is unknown if contaminants confirmed to be present in soil in 2015 had reached the groundwater table prior to discovery of the 2016 diesel and gasoline releases.

The diesel release was discovered in March of 2016 as described in Section 2.1. Following initial response and remedial excavation, monitoring wells were installed to assess impacts to groundwater. Analysis of samples collected from the wells in May of 2016 confirmed the presence of TPHs and BTEX constituents in groundwater in exceedance of their respective CULs. Additionally, gauging of onsite wells confirmed the presence of NAPL approximately 4.5 feet thick in wells RW1 and MW3.

The gasoline release was discovered in December of 2016 as described in Section 2.1. Following discovery of the gasoline release, additional monitoring wells (MW4 through MW6) were installed to further assess and bound the extents of COCs in groundwater. Analysis of groundwater samples collected from MW1 through MW6 on December 13, 2016 confirmed the presence of TPHs and BTEX constituents already known to be present in groundwater at the Site. In addition to already known COCs at the Site, naphthalene was detected in exceedance of the CUL in well MW6.

Based on the timeline of events established above, confirmed sources of contamination to groundwater include:

- A March 2016 release of diesel to the subsurface from a subsurface fuel line
- A December 2016 release of gasoline to the subsurface from a subsurface fuel line.

It is suspected that a preexisting TPH-D plume in groundwater originating from near the northern property boundary and former ASTs was present at the Site prior to the discovery of the 2016 diesel and gasoline releases. This is evidenced by the following findings:

- TPH-D was confirmed in soil above CULs in the northern portions of the property in 2015, prior to the 2016 diesel release.
- NAPL has been observed in upgradient well MW8 since its installation.
- TPH-D has been detected in exceedance of CULs in upgradient wells MW8 and MW9.
- NAPL has not been observed nor contaminants detected in well MW10, which is cross-gradient and significantly closer to the known sources of contamination relative to MW8 and MW9.
- Upgradient well MW8 contained the second highest concentration of TPH-D detected at the Site. Second only to MW1 immediately following discovery of and adjacent to the diesel release.
- Based on groundwater flow direction, if groundwater impacts at MW8 were the result of the 2016 diesel release, concentrations at MW8 would be expected to be lower than those in wells downgradient from the release.
- Laboratory analysis of the NAPL samples collected on March 19, 2019 from wells MW4 and MW8 located upgradient from the 2016 diesel release indicated the NAPL composition to be entirely weathered diesel fuel.
- Analysis of NAPL samples collected on March 19, 2019 from wells in the vicinity of the diesel release (RW1, MW2, MW3) indicated the NAPL composition to be either fresh and mixed fresh and weathered diesel.
- Analysis of NAPL samples collected in 2020 from wells MW11 and MW12 located downgradient from the 2016 diesel release indicated NAPL composition to be either mixed or fresh diesel fuel.
- The presence of diesel NAPL categorized as weathered in the upgradient wells three years after the diesel release and the presence of diesel NAPL categorized as fresh in downgradient wells four years after the diesel release indicates that the diesel NAPL in the upgradient locations predates the 2016 diesel release and subsequent downgradient fresh diesel NAPL.

Contaminants from the above sources migrated as NAPL vertically due to gravity through the vadose zone eventually reaching groundwater. NAPL and Site COCs (with the exception of naphthalene) are known to have densities less than that of water and as such are expected to travel laterally upon reaching the water table, rather than penetrating vertically into the water table. While it is understood that Site NAPL will not significantly penetrate the groundwater table vertically due to its density and immiscibility, NAPL of sufficient thickness can depress the elevation of underlying water table.

#### **6.4.1 COCs**

The following constituents have been detected in Site groundwater at concentrations exceeding CULs and are known to have been stored and/or released at the Site, and are therefore considered primary COCs in soil:

- TPH as gasoline range organics
- TPH as diesel range organics
- BTEX

The following constituents have been detected in Site groundwater at concentrations exceeding CULs at the site, are associated with the primary COCs at the site, and are therefore considered secondary COCs at the Site:

- Naphthalene

Select groundwater samples were also analyzed for EDB, EDC, hexane, MTBE, PAHs and lead. These contaminants have not been detected above CULs in groundwater and have therefore been ruled out as COCs in groundwater at the Site.

#### 6.4.2 Groundwater Occurrence

The vertical extent of the groundwater exceeding CULs is limited to the top interval of the groundwater interface. Based on seasonal fluctuations in groundwater elevations, this corresponds to a depth on site of approximately 15 to 25 feet bgs across the majority of the Site. The vertical extents of groundwater contamination at MW12 extend as far as 35 feet bgs due to significant depression of the water table elevation by overlying NAPL. The lateral extent of groundwater contamination extends from the northeast corner of the property southwest towards the BNSF railroad and south across East I Street as depicted in Figures 5A through 5D.

The Site boundary (i.e. extent of contamination) is vertically defined based on the COCs (with the exception of naphthalene) having specific gravities lighter than water and residing in the top 1 to 2 feet of the water table surface. It is noted that in locations with measurable NAPL thickness, the water table surface refers to the interface between NAPL and groundwater. The vertical extent of the secondary COC naphthalene remains undefined. The Site boundary is laterally defined by soil boring and monitoring well locations with contaminant concentrations in groundwater below their respective CULs, as described below:

The following locations represent the boundaries of groundwater contamination, as defined by locations where groundwater concentrations are in compliance with CULs:

DIRECTION	Soil Boring / Monitoring Well	REFERENCE/CONSULTANT
NORTH	MW7, MW9	Remedial Investigation
SOUTH	MWBNSF1, MW14, MW16	Remedial Investigation
EAST	MW9, MW10, MW16	Remedial Investigation
WEST	MW7, Undefined, MWBNSF1	-
VERTICAL	25 feet bgs Site wide, 35 feet bgs at MW12	Remedial Investigation

The extent of groundwater contamination is defined vertically and laterally in three out of four cardinal directions. The western extent of groundwater contamination remains undefined.

Typical concerns for this type of petroleum contamination in groundwater include migration of contaminants to groundwater resources such as supply or irrigation wells, seeping of contamination into surface water bodies, and vapor intrusion into nearby occupied structures.

PBS performed a sensitive receptor search to identify groundwater uses and surface water within a half mile of the site. Nearby water wells are presented in Figure 8. One private water well was identified within the search radius to the southwest of the Site. However, the groundwater flow direction has been established as toward the southeast, and the southeast extent of groundwater contamination has been demonstrated to be between MW13 and MW14. Ongoing groundwater monitoring will be conducted to document groundwater quality and that COCs do not pose a threat to downgradient water resources.

#### 6.5 Exposure Pathways

A potentially complete exposure pathway consists of: 1) an identified contaminant source; 2) a transport pathway to locations (exposure points) where potential receptors might come in contact with the contaminant

of interest (COI); and 3) an exposure route (e.g., soil ingestion, vapor inhalation, drinking water) through which potential receptors might be exposed to COI.

### **6.5.1 Direct Contact**

The site is paved and otherwise covered by structures, and soil is not exposed at the surface. Direct exposure to contaminated soil and/or groundwater by the public or site occupants is considered unlikely.

Direct contact with contaminated soil and/or groundwater by site workers conducting excavation earthworks is possible and even likely, depending on the location and depth of excavation work.

### **6.5.2 Air/ Soil Vapor**

PBS conducted a Vapor Intrusion (VI) Evaluation for the Site.

A vapor probe (VB1) was installed within the area of remaining soil contamination in the vicinity of the remedial excavation as shown on Figure 4, within approximately 10 lateral feet of the occupied on-property office. Contaminants of concern were not detected at concentrations above Sub-Slab Soil Gas Screening Levels, indicating the the VI exposure pathway to indoor air within the adjacent structure is incomplete.

### **6.5.3 Surface Water**

The closest surface water bodies to the site are Rotary Lake approximately 0.9 miles north and the Yakima River approximately 2-miles to the east. The extent of contaminated media is well understood in these directions and impacts to these surface water bodies are not considered a complete pathway.

### **6.5.4 CSM Conclusion**

Direct contact with contaminated soil and/or groundwater by site workers conducting excavation earthworks was identified as a complete exposure pathway. No other complete exposure pathways for human and/or ecological receptors were identified. Please refer to Conceptual Site Model, Figures 8 through 11, for visual depictions of contaminated media and exposure pathways.

## **7 PROPOSED CLEANUP STANDARDS**

### **7.1 General**

In accordance with MTCA, cleanup levels were developed to include identified potential exposure pathways for human and environmental receptors based on the current and future planned land use. The property is currently zoned for industrial use, and future zoning is not anticipated to change. The current and near-term use of the property is a commercial fueling station, although future uses are unknown and, as such, the adopted cleanup criteria are protective for unrestricted land use.

The adopted cleanup criteria for soil at the Site will be the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (MTCA Method A) as defined in WAC 173-340-720, 173-340-740, and 173-340-747.

The adopted cleanup criteria for groundwater at the Site will be the MTCA Method A Groundwater Cleanup Levels (MTCA Method A) as defined in WAC 173-340-720, 173-340-740, and 173-340-747.

Vapor Intrusion Method B Sub-Slab Soil Gas Screening Levels were used as cleanup criteria for soil vapor, as defined in Ecology's Cleanup Levels and Risk Calculations (CLARC) Vapor Intrusion Method B Table updated January 2023.

## 7.2 Terrestrial Ecological Evaluation

The site is excluded from TEE requirements per Barriers to Exposure and Undeveloped Land: WAC 173-340-7491. A Technical Memorandum documenting exclusion of the property from TEE requirements was prepared for the Site. Exclusion was based on contaminated soil being covered with physical barriers and the lack of contiguous undeveloped land greater than 1.5 acres in area within 500 feet of the Site.

A copy of the submitted Technical Memorandum is presented in Appendix D.

## 8 SUMMARY AND CONCLUSIONS

The following summary and conclusions are presented:

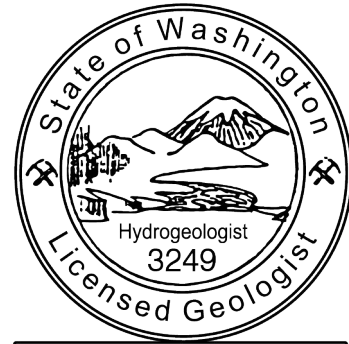
- The property is currently operating as the Coleman Oil Yakima fuel storage and distribution facility, which is comprised of an AST system, office and storage structures.
- A release of diesel fuel to the subsurface was identified in March of 2016. A release of gasoline fuel to the subsurface was identified in December of 2016. Evidence of prior petroleum release has been identified.
- Impacted soil in the vicinity of the diesel release was largely removed by excavation and off-site disposal. However, post excavation soil sampling results indicate that petroleum contamination remains in place between the remedial excavation and primary office building. Leaving soil contamination in place may require land use restriction (environmental covenant).
- From March 2016 through August 2022, PBS conducted site assessment activities to delineate the extent and magnitude of petroleum contamination in soil and groundwater, as it relates to contaminant releases at the property.
- Additional soil contamination has not been identified in the soil borings during monitoring well installations.
- Based on the findings of the subsurface investigations conducted onsite, the western, hydraulically lateral, extent of groundwater contamination toward the BNSF railroad is undefined at the Site. Groundwater contamination in this direction may also be influenced by a release at the Nakano Foods Site to the west, which is characterized by the presence of separate phase product. The northern, southern and eastern lateral extents of groundwater contamination have been defined. Groundwater compliance points have been established in these directions.
- Non-aqueous phase hydrocarbons (NAPL, or fuel product) is present on the site at the groundwater table. The NAPL plume contains two distinct compositions: weathered diesel fuel and mixed fresh and weathered diesel and gasoline fuels. The presence of weathered fuel indicates prior undefined releases have occurred at the property.
- Based on the vapor intrusion evaluation conducted at the site, vapor intrusion is not considered a complete exposure pathway.
- Based on the Conceptual Site Model developed for the site, one potentially complete exposure pathway was identified, which is dermal contact by excavation workers. No other complete exposure pathways for human and/or ecological receptors were identified.
- Site Characterization related to the 2016 fuel releases is considered complete to the extent that a Cleanup Action can be selected and implemented for the site.

## 9 LIMITATIONS AND CLOSURE

PBS has prepared this report for use by Coleman Oil. The site is managed under a State Agreed Order, and it is understood that this report may become available to the public.

The findings and conclusions of this work are based on professional judgment concerning the significance of the data gathered during the course of this investigation.

Sincerely,  
PBS Engineering and Environmental Inc.



James Welles

James Welles, LHG  
Senior Hydrogeologist

Date

Reviewed by: Thomas Mergy  
Environmental Services Manager

## 10 REFERENCES

(PBS, 2015) *Site Characterization Report – Yakima Bulk Plant*, PBS Engineering and Environmental, June 2015.

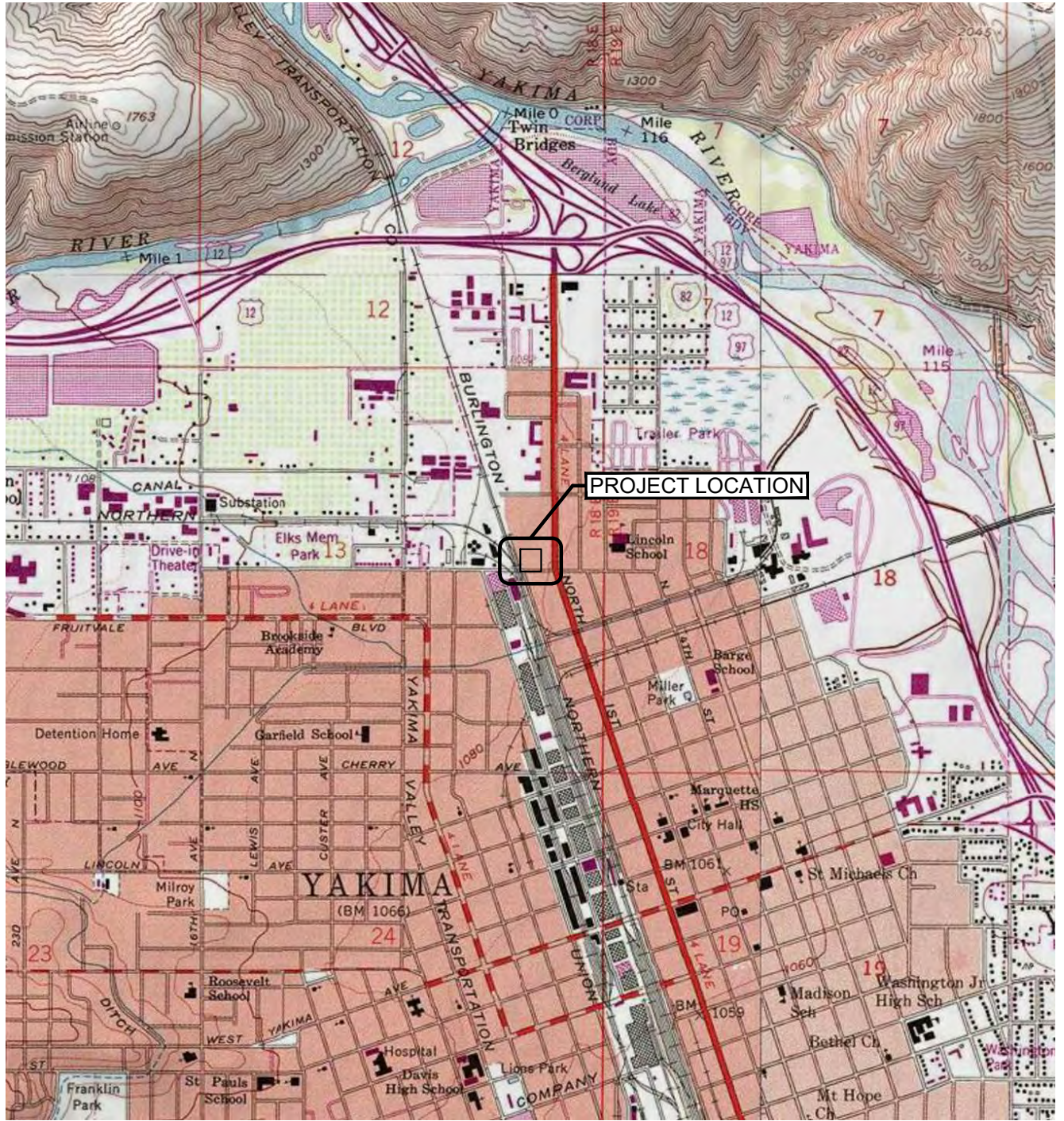
(PBS, 2018a) *Data Summary Report – Coleman Oil Yakima Bulk Plant*, PBS Engineering and Environmental, July 19, 2018.

(PBS, 2018b) *Remedial Investigation Work Plan – Coleman Oil Yakima Bulk Plant*, PBS Engineering and Environmental, August 16, 2018.

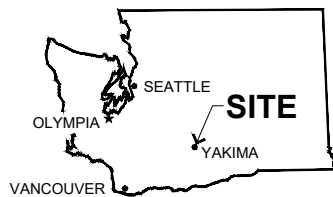
(PBS, 2018c) *Interim Action Work Plan – Coleman Oil Yakima Bulk Plant*, PBS Engineering and Environmental, August 16, 2018.



# Figures



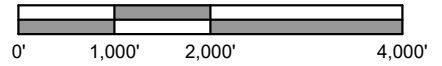
SOURCE: USGS YAKIMA WEST, WA QUADRANGLE 1985



**WASHINGTON**



Scale 1" = 2,000'



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**VICINITY MAP**  
1 EAST I STREET  
YAKIMA, WASHINGTON

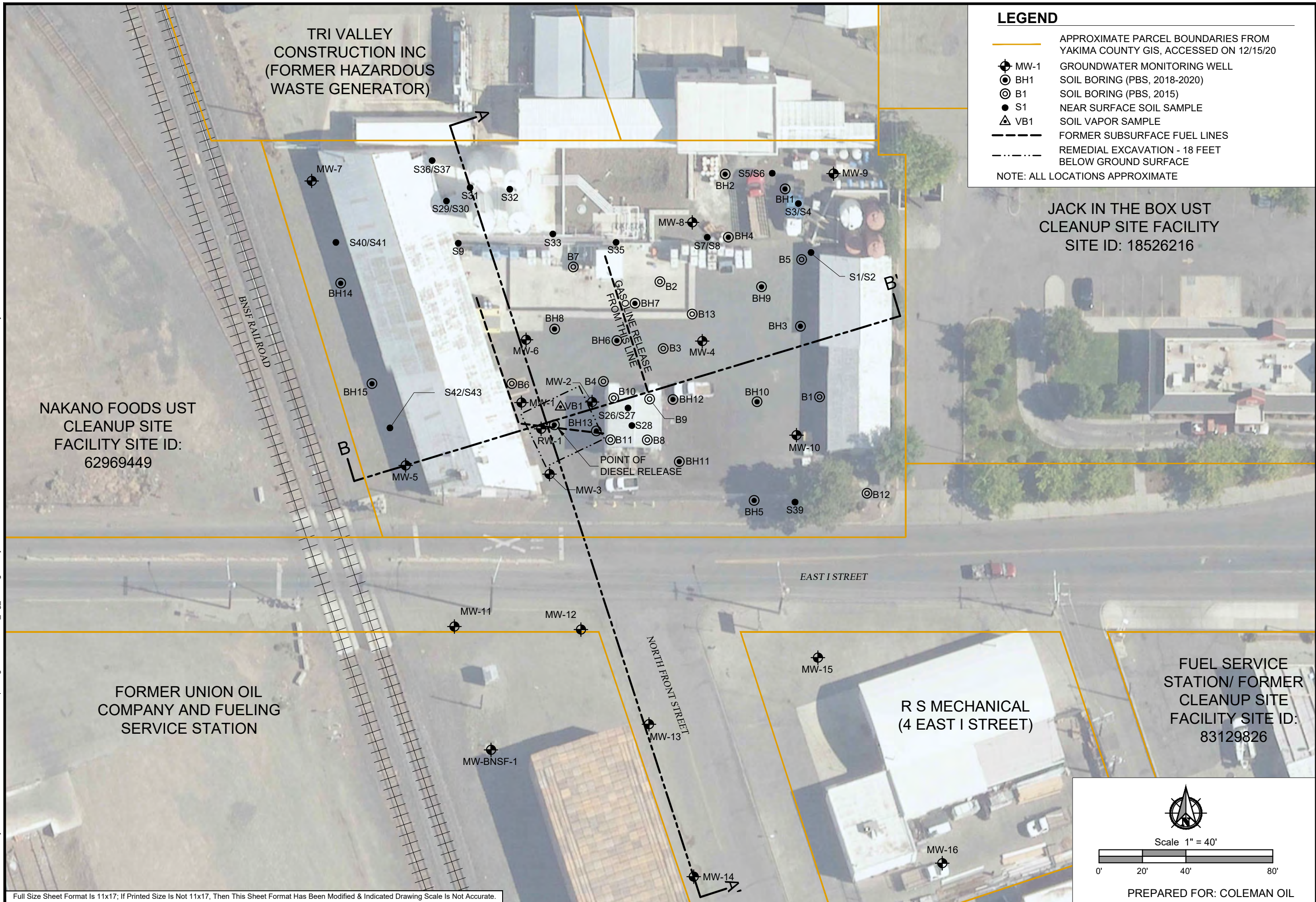
OCT 2023  
41392.000

FIGURE

**1**



Filename: L:\Projects\4100041392\_Coleman Oil\CAD\RI Report Figures\41392.000\_Fig\_2-7.dwg Layout Tab: FIG 2 - SITE PLAN SAMPLE LOCATIONS User: Katie Breynan CAD Plot Date/Time: 11/18/2022 9:27:04 AM



**LEGEND**

- APPROXIMATE PARCEL BOUNDARIES FROM YAKIMA COUNTY GIS, ACCESSED ON 12/15/20
  - ⊕ MW-1 GROUNDWATER MONITORING WELL
  - ⊙ BH1 SOIL BORING (PBS, 2018-2020)
  - ⊙ B1 SOIL BORING (PBS, 2015)
  - S1 NEAR SURFACE SOIL SAMPLE
  - △ VB1 SOIL VAPOR SAMPLE
  - FORMER SUBSURFACE FUEL LINES
  - - - - REMEDIAL EXCAVATION - 18 FEET BELOW GROUND SURFACE
- NOTE: ALL LOCATIONS APPROXIMATE

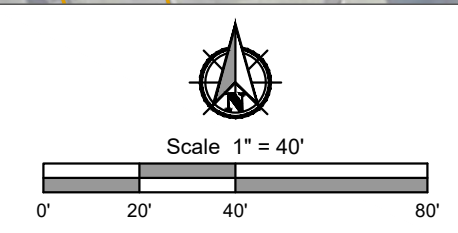
JACK IN THE BOX UST  
CLEANUP SITE FACILITY  
SITE ID: 18526216

NAKANO FOODS UST  
CLEANUP SITE  
FACILITY SITE ID:  
62969449

FORMER UNION OIL  
COMPANY AND FUELING  
SERVICE STATION

R S MECHANICAL  
(4 EAST I STREET)

FUEL SERVICE  
STATION/ FORMER  
CLEANUP SITE  
FACILITY SITE ID:  
83129826



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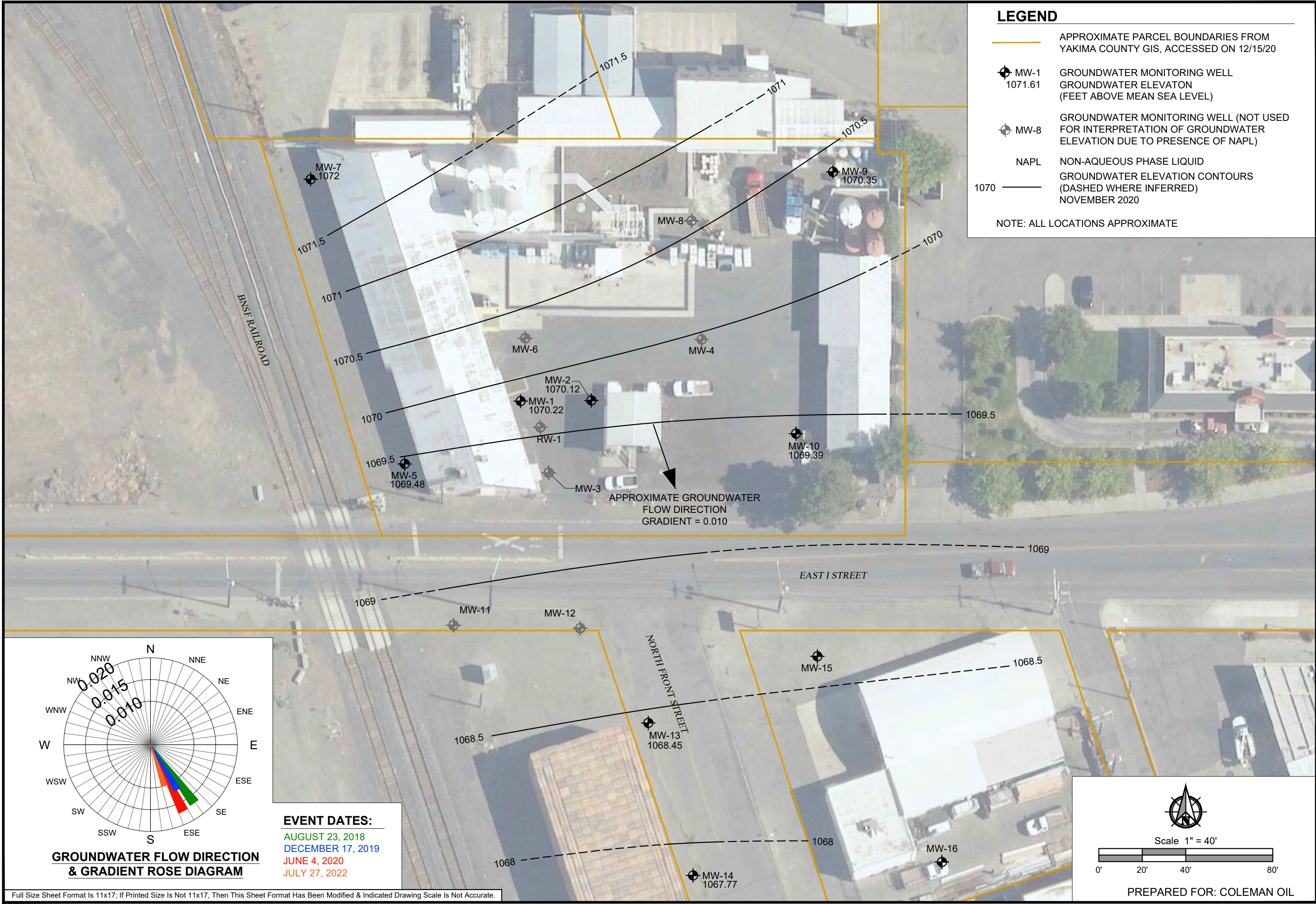
SITE PLAN: SAMPLE LOCATIONS  
**COLEMAN OIL**  
1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	<b>2</b>

Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.



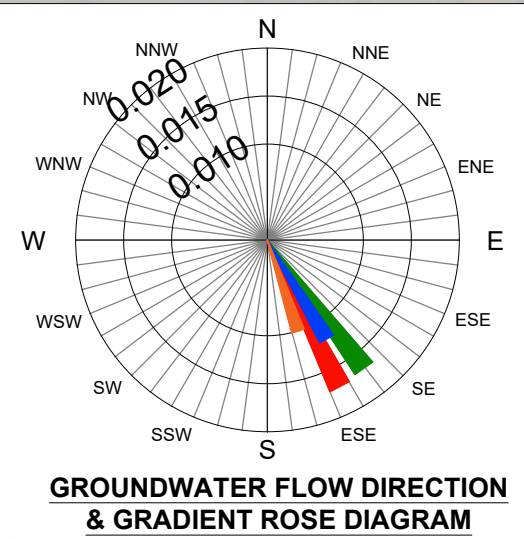
Filename: L:\Projects\4100041392\Coleman Oil\CAD\RI Report Figures\41392.000\_Fig\_2-7.dwg Layout Tab: FIG 3 - GROUNDWATER FLOW DIRECTION User: Katie Breyman CAD Plot Date/Time: 11/18/2022 10:07:02 AM



**LEGEND**

- APPROXIMATE PARCEL BOUNDARIES FROM YAKIMA COUNTY GIS, ACCESSED ON 12/15/20
- MW-1 1071.61 GROUNDWATER MONITORING WELL GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- MW-8 GROUNDWATER MONITORING WELL (NOT USED FOR INTERPRETATION OF GROUNDWATER ELEVATION DUE TO PRESENCE OF NAPL)
- NAPL GROUNDWATER ELEVATION CONTOURS (DASHED WHERE INFERRED) NOVEMBER 2020

NOTE: ALL LOCATIONS APPROXIMATE



**EVENT DATES:**  
 AUGUST 23, 2018  
 DECEMBER 17, 2019  
 JUNE 4, 2020  
 JULY 27, 2022

Scale 1" = 40'

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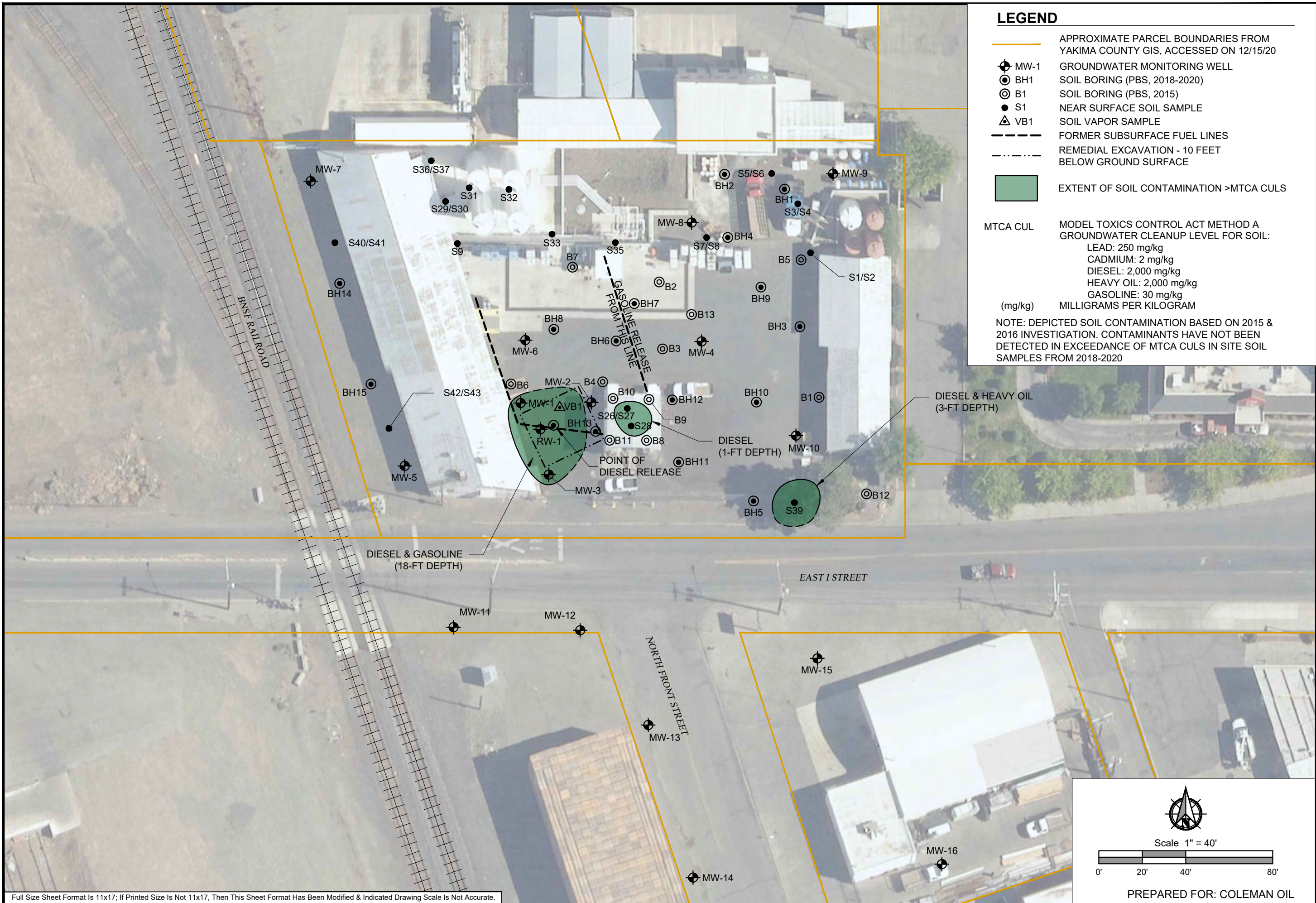
**SITE PLAN - GROUNDWATER ELEVATION CONTOUR**  
**COLEMAN OIL**  
 1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	<b>3</b>

Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.



Filename: L:\Projects\4100041392\Coleman Oil\CAD\RI Report Figures\41392.000\_Fig\_2-7.dwg Layout Tab: FIG 4- CONTAMINATION IN SOIL User: Katie Breymann CAD Plot Date/Time: 11/18/2022 10:07:52 AM



**LEGEND**


-  APPROXIMATE PARCEL BOUNDARIES FROM YAKIMA COUNTY GIS, ACCESSED ON 12/15/20
  -  MW-1 GROUNDWATER MONITORING WELL
  -  BH1 SOIL BORING (PBS, 2018-2020)
  -  B1 SOIL BORING (PBS, 2015)
  -  S1 NEAR SURFACE SOIL SAMPLE
  -  VB1 SOIL VAPOR SAMPLE
  -  FORMER SUBSURFACE FUEL LINES
  -  REMEDIAL EXCAVATION - 10 FEET BELOW GROUND SURFACE
  -  EXTENT OF SOIL CONTAMINATION >MTCA CULS
- MTCA CUL** MODEL TOXICS CONTROL ACT METHOD A GROUNDWATER CLEANUP LEVEL FOR SOIL:
- LEAD: 250 mg/kg
  - CADMIUM: 2 mg/kg
  - DIESEL: 2,000 mg/kg
  - HEAVY OIL: 2,000 mg/kg
  - GASOLINE: 30 mg/kg
- (mg/kg) MILLIGRAMS PER KILOGRAM
- NOTE: DEPICTED SOIL CONTAMINATION BASED ON 2015 & 2016 INVESTIGATION. CONTAMINANTS HAVE NOT BEEN DETECTED IN EXCEEDANCE OF MTCA CULS IN SITE SOIL SAMPLES FROM 2018-2020

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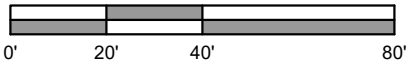


**EXTENT OF DIESEL AND HEAVY OIL IN SOIL**  
**COLEMAN OIL**  
1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	<b>4</b>



Scale 1" = 40'

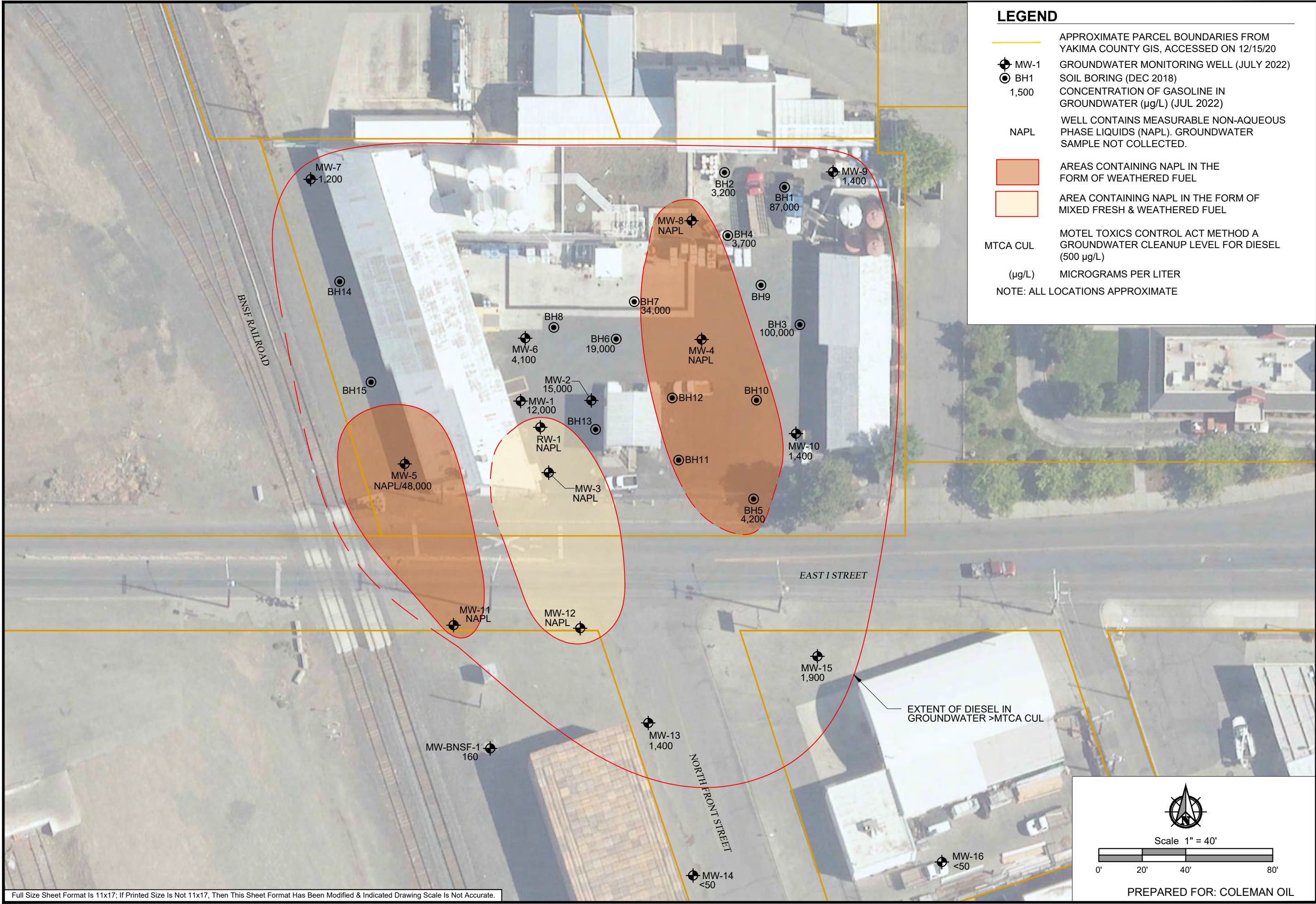


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Filename: L:\Projects\41000\41392\Coleman Oil\CAD\RI Report Figures\41392\_000\_Fig\_2-7.dwg Layout Tab: FIG 5 - DIESEL & NAPL CONTAMINATION User: Katie Breyman CAD Plot Date/Time: 6/6/2023 2:31:02 PM



**LEGEND**

- APPROXIMATE PARCEL BOUNDARIES FROM YAKIMA COUNTY GIS, ACCESSED ON 12/15/20
- MW-1 GROUNDWATER MONITORING WELL (JULY 2022)
- BH1 SOIL BORING (DEC 2018)
- 1,500 CONCENTRATION OF GASOLINE IN GROUNDWATER (µg/L) (JUL 2022)
- NAPL WELL CONTAINS MEASURABLE NON-AQUEOUS PHASE LIQUIDS (NAPL). GROUNDWATER SAMPLE NOT COLLECTED.
- AREAS CONTAINING NAPL IN THE FORM OF WEATHERED FUEL
- AREA CONTAINING NAPL IN THE FORM OF MIXED FRESH & WEATHERED FUEL
- MTCA CUL MOTEL TOXICS CONTROL ACT METHOD A GROUNDWATER CLEANUP LEVEL FOR DIESEL (500 µg/L)
- (µg/L) MICROGRAMS PER LITER

NOTE: ALL LOCATIONS APPROXIMATE

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EXTENT OF NAPL & DIESEL IN GROUNDWATER

# COLEMAN OIL

1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	5

Scale 1" = 40'

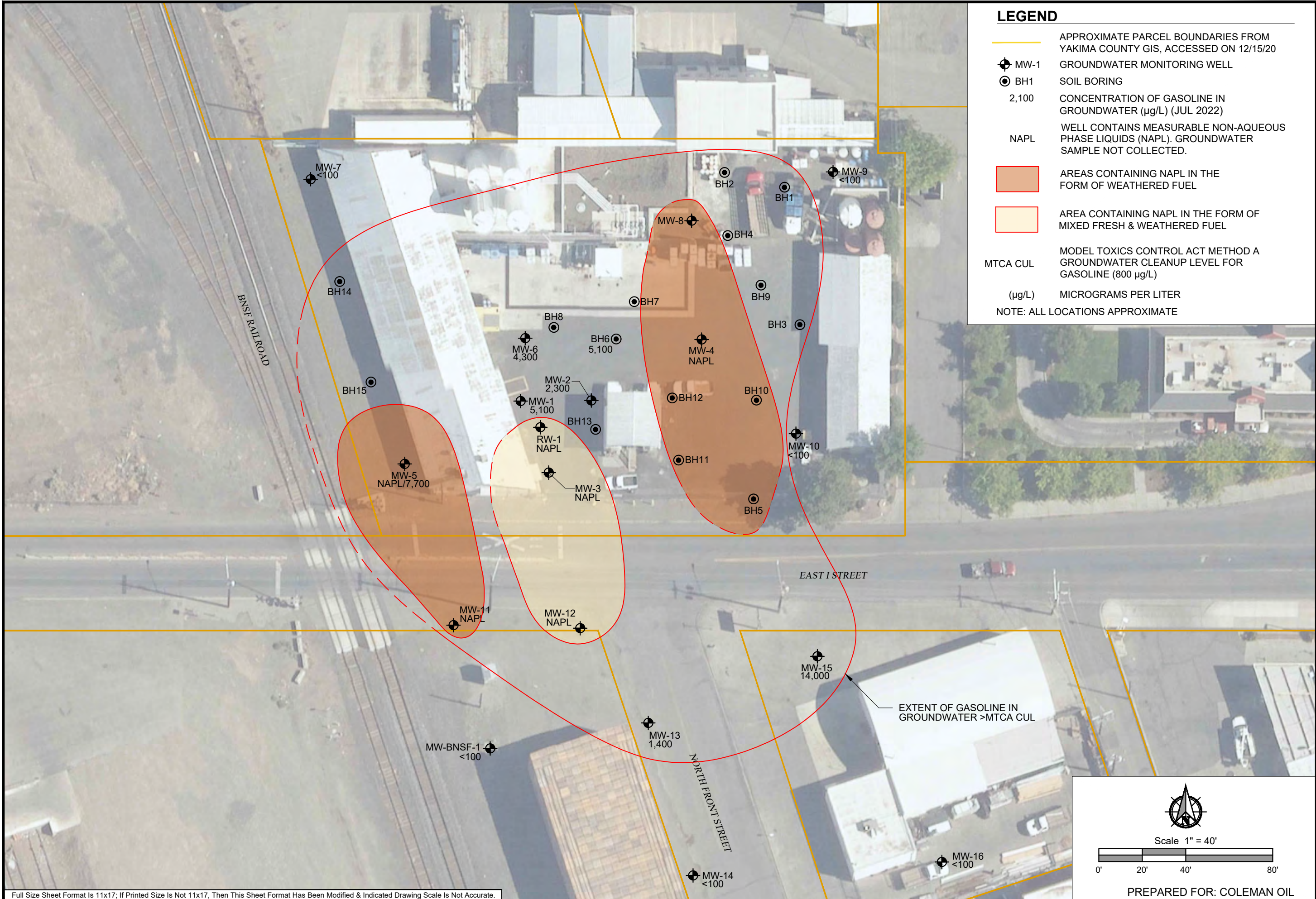
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PREPARED FOR: COLEMAN OIL

Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.



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 Layout Tab: FIG 6 - GASOLINE CONTAMINATION   
 User: Katie Breymann   
 CAD Plot Date/Time: 6/8/2023 2:36:34 PM



### LEGEND

- APPROXIMATE PARCEL BOUNDARIES FROM YAKIMA COUNTY GIS, ACCESSED ON 12/15/20
- MW-1 GROUNDWATER MONITORING WELL
- BH1 SOIL BORING
- 2,100 CONCENTRATION OF GASOLINE IN GROUNDWATER (µg/L) (JUL 2022)
- NAPL WELL CONTAINS MEASURABLE NON-AQUEOUS PHASE LIQUIDS (NAPL). GROUNDWATER SAMPLE NOT COLLECTED.
- AREAS CONTAINING NAPL IN THE FORM OF WEATHERED FUEL
- AREA CONTAINING NAPL IN THE FORM OF MIXED FRESH & WEATHERED FUEL
- MTCA CUL MODEL TOXICS CONTROL ACT METHOD A GROUNDWATER CLEANUP LEVEL FOR GASOLINE (800 µg/L)
- (µg/L) MICROGRAMS PER LITER
- NOTE: ALL LOCATIONS APPROXIMATE

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## EXTENT OF GASOLINE IN GROUNDWATER

# COLEMAN OIL

1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	6

Scale 1" = 40'

0'    20'    40'    80'

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Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.



Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

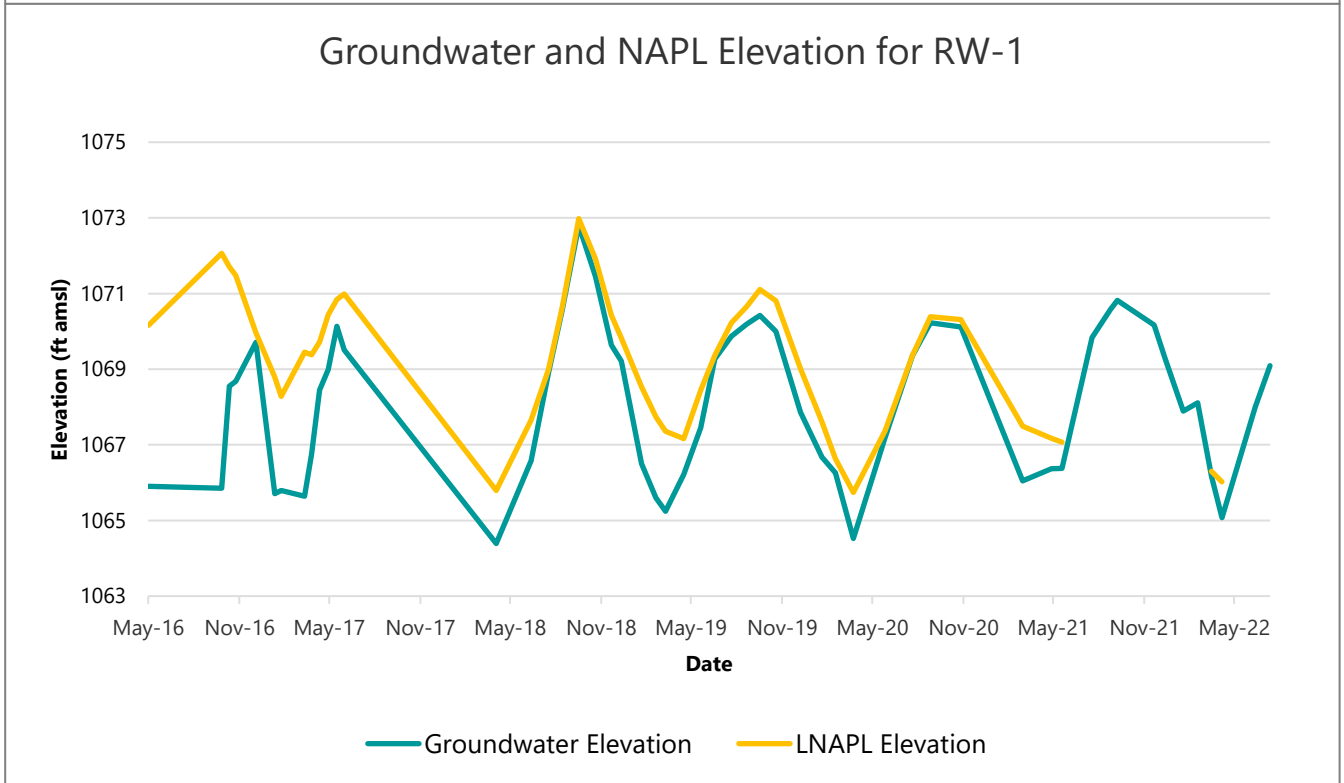
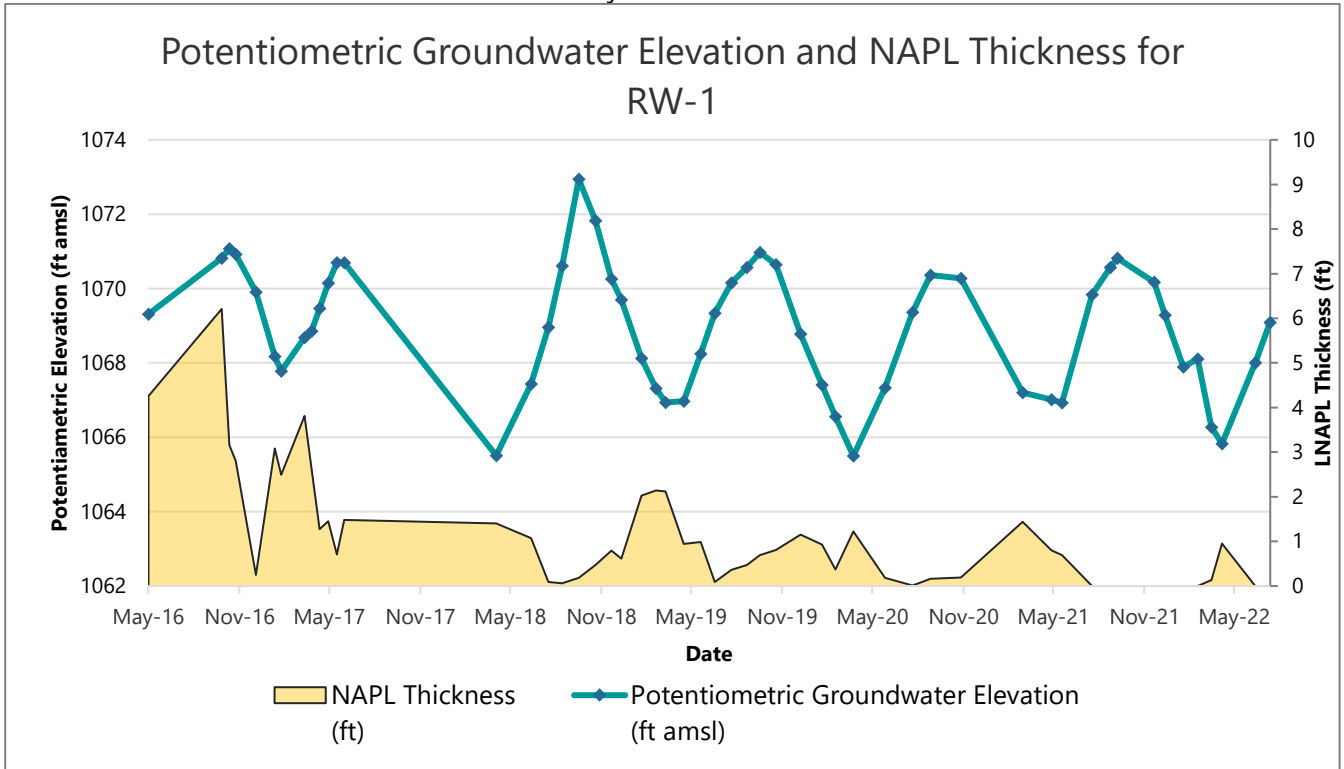




Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

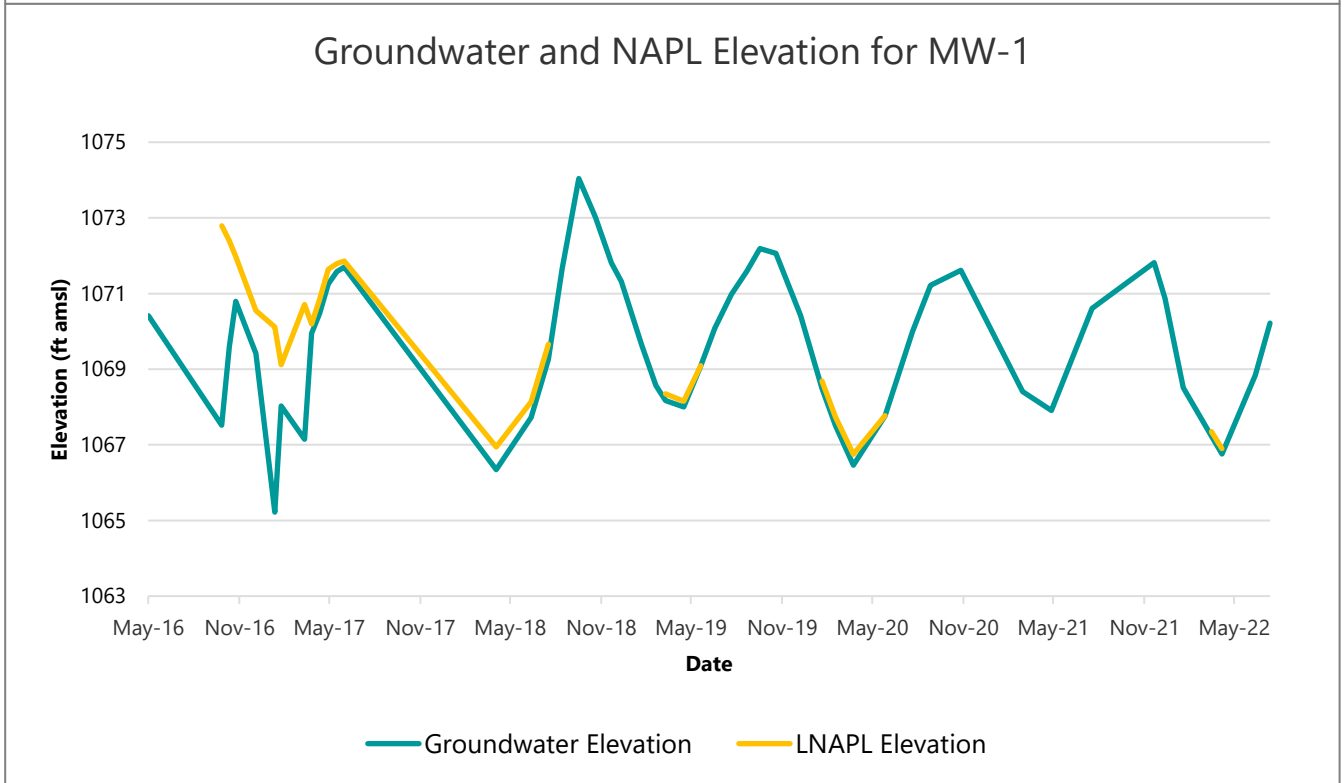
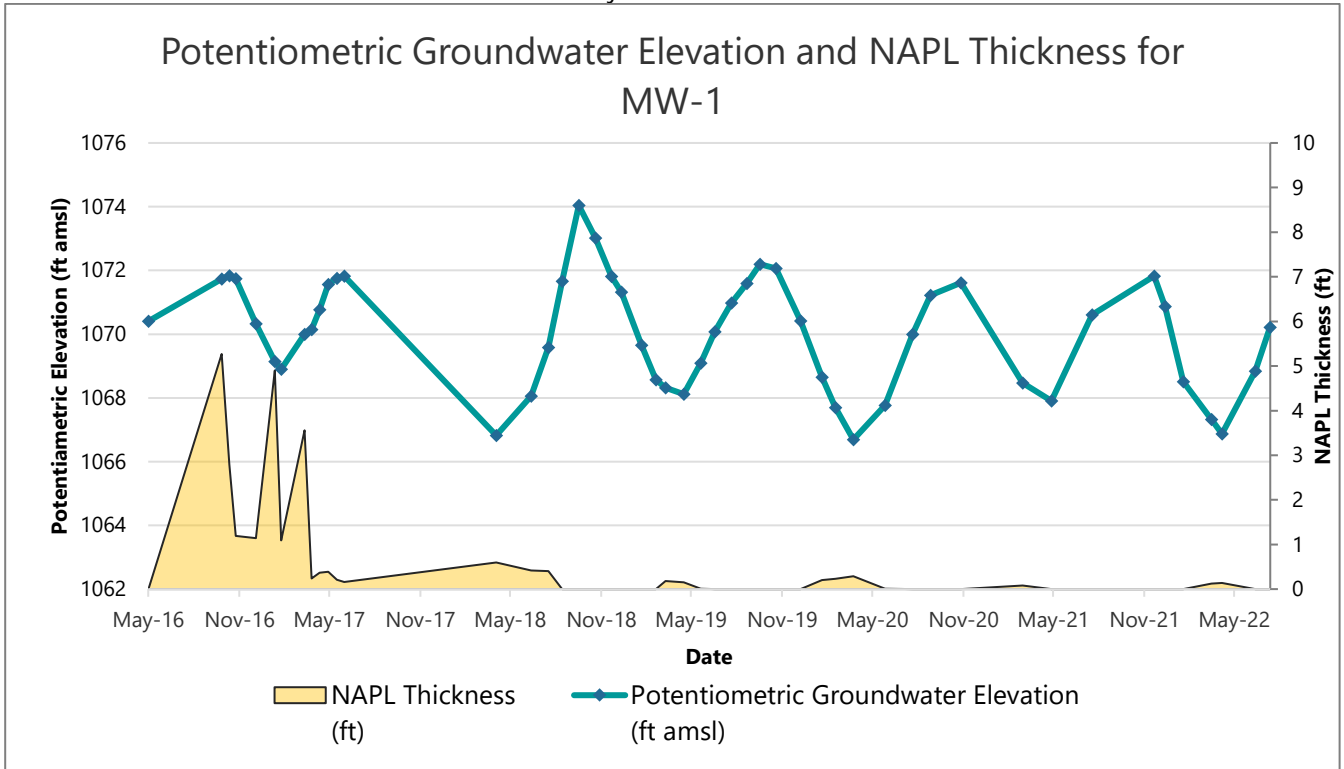


Figure 7  
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 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

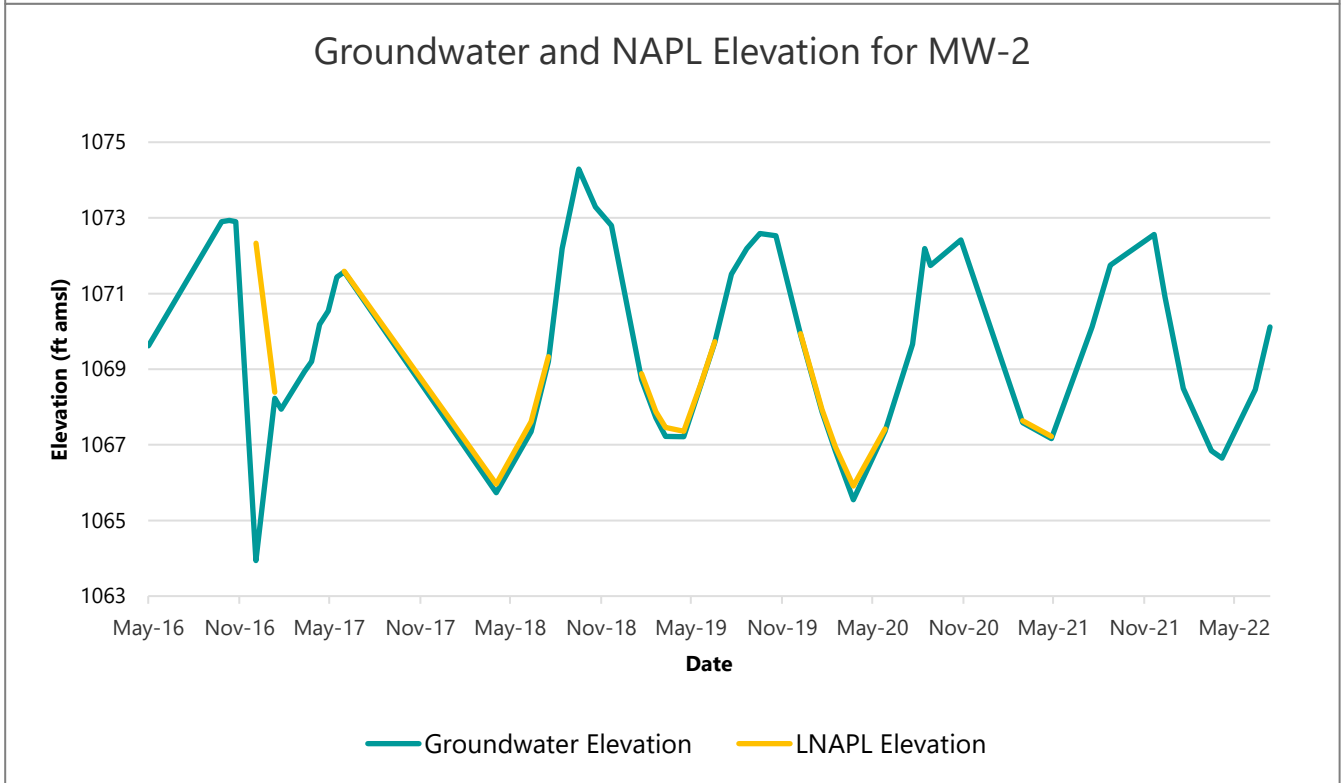
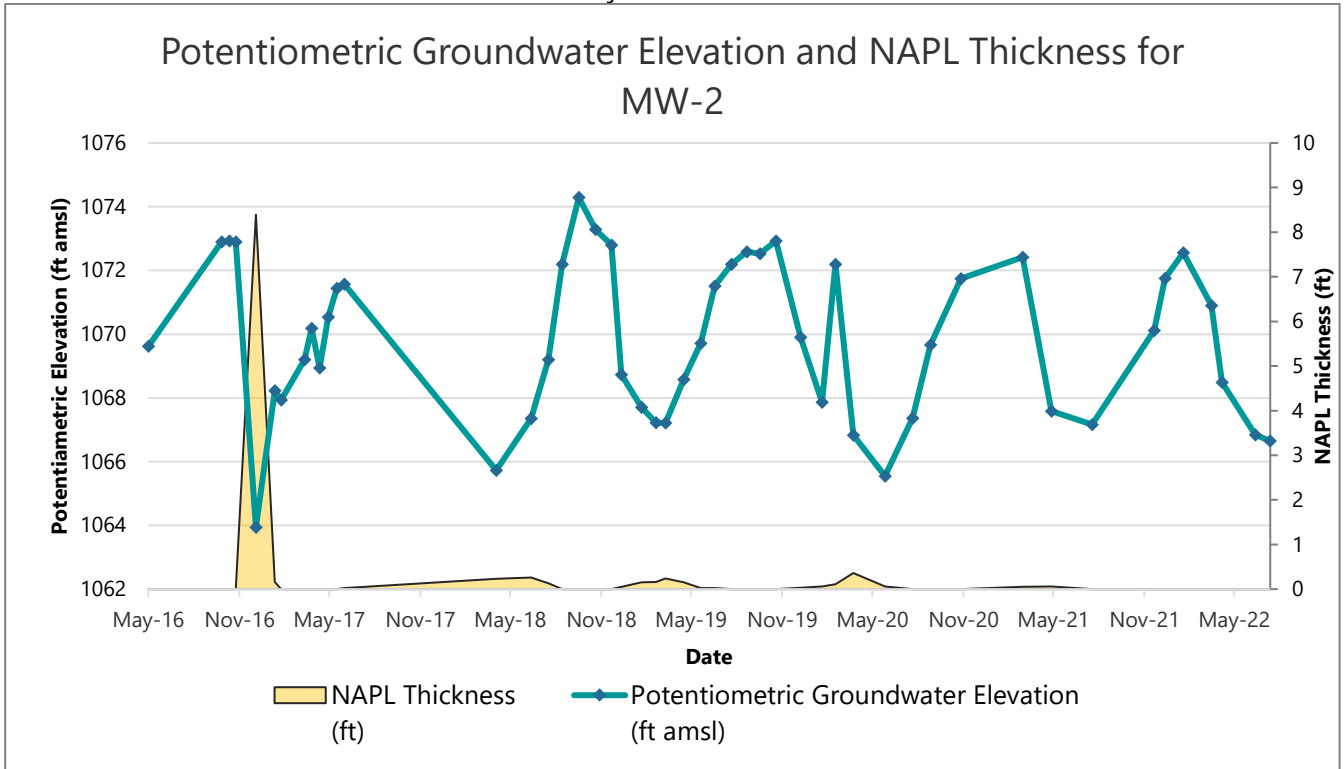


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

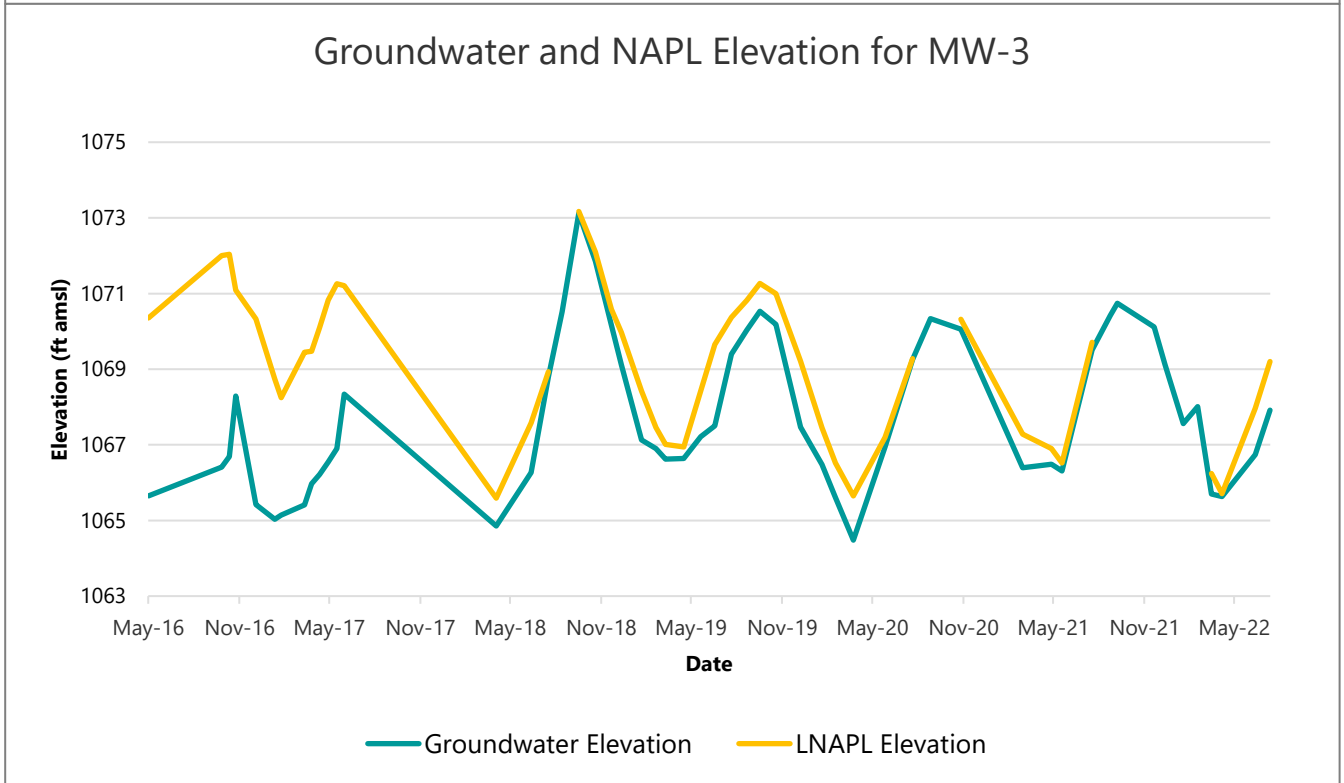
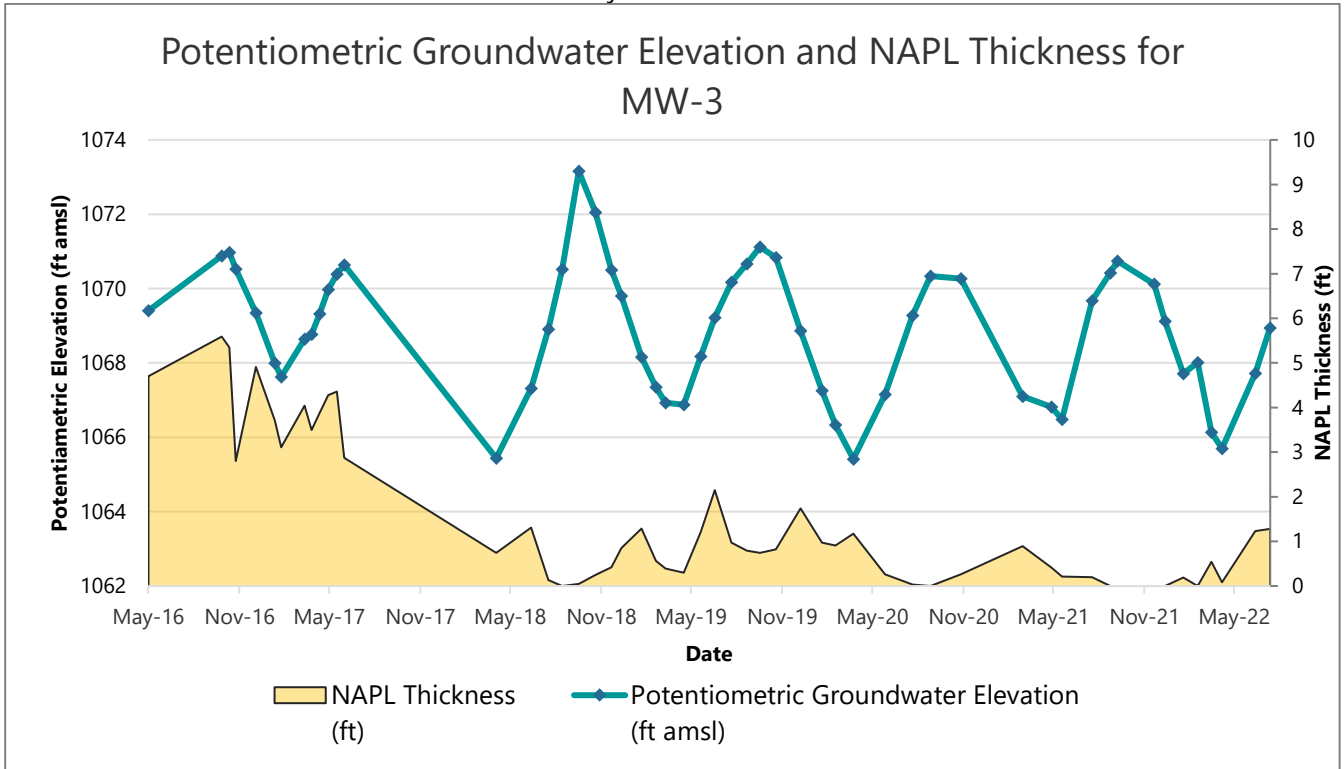


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

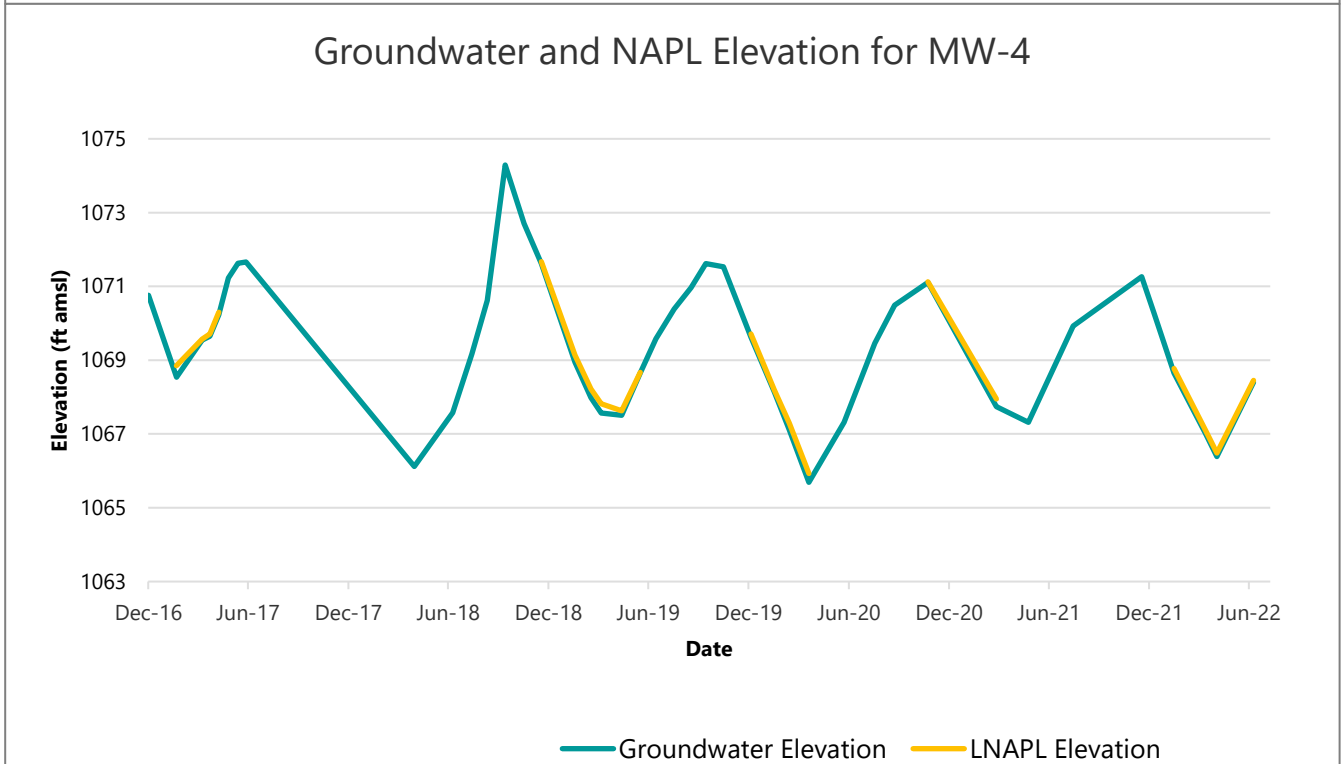
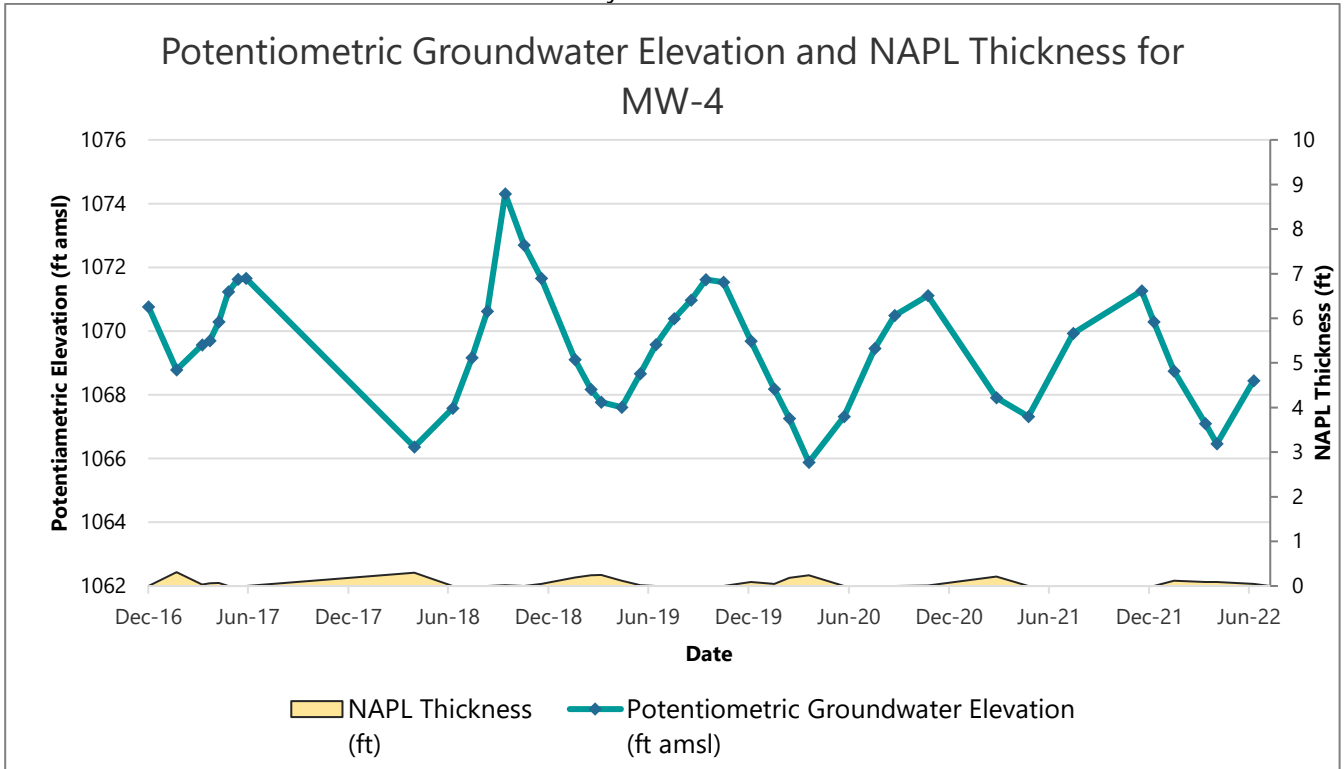


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

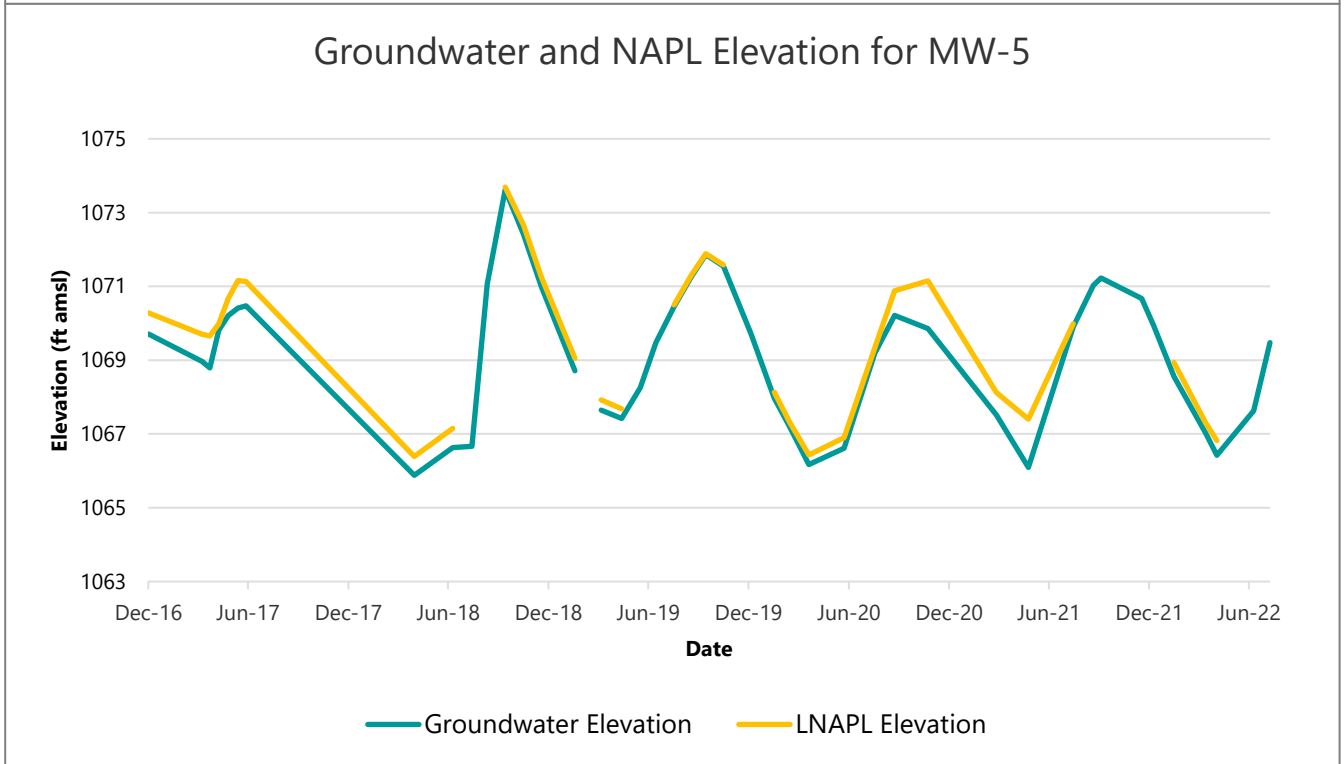
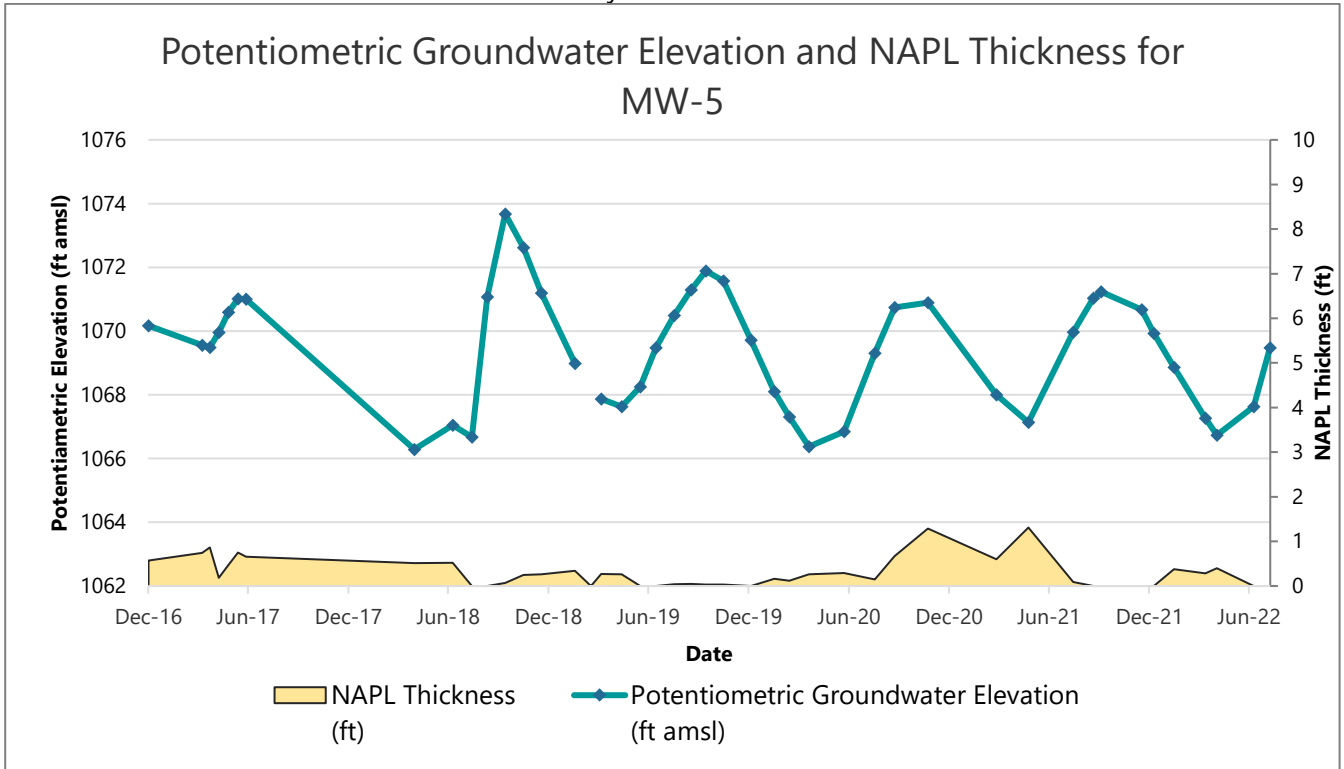


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

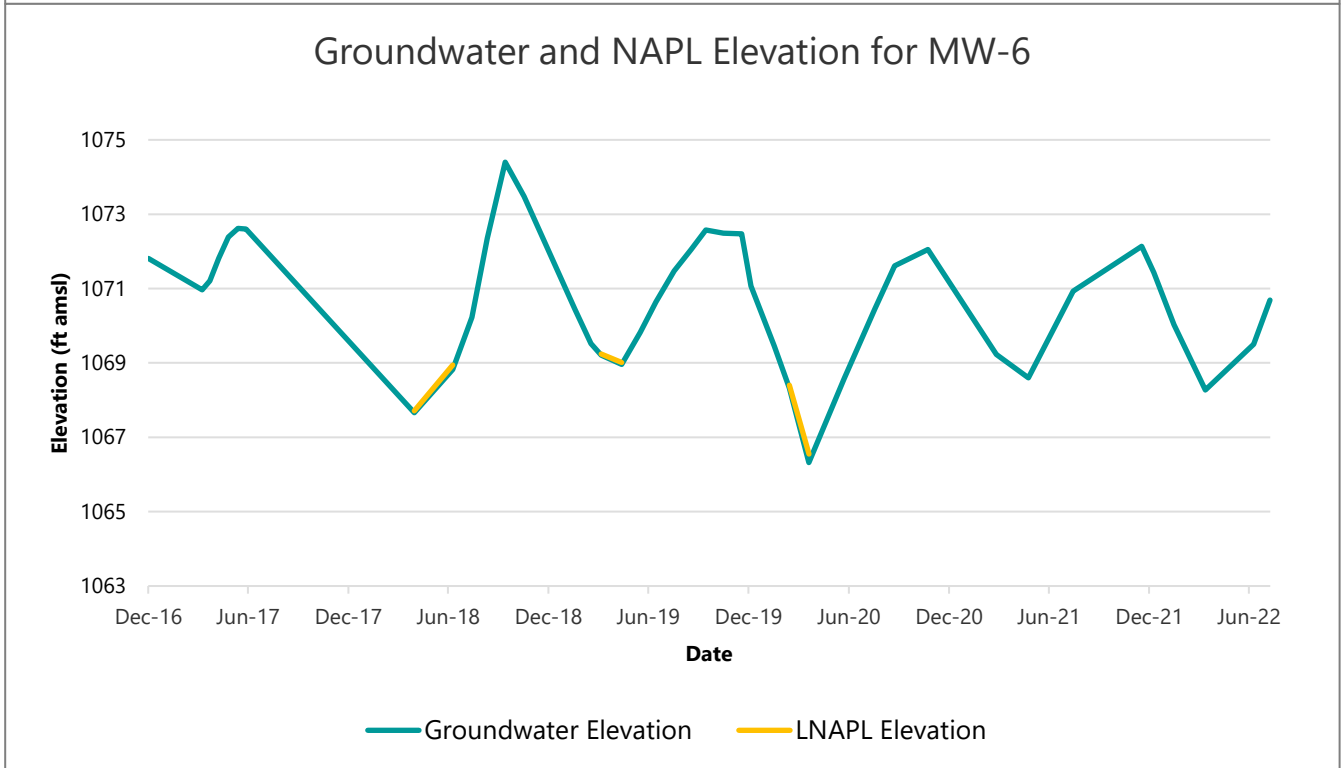
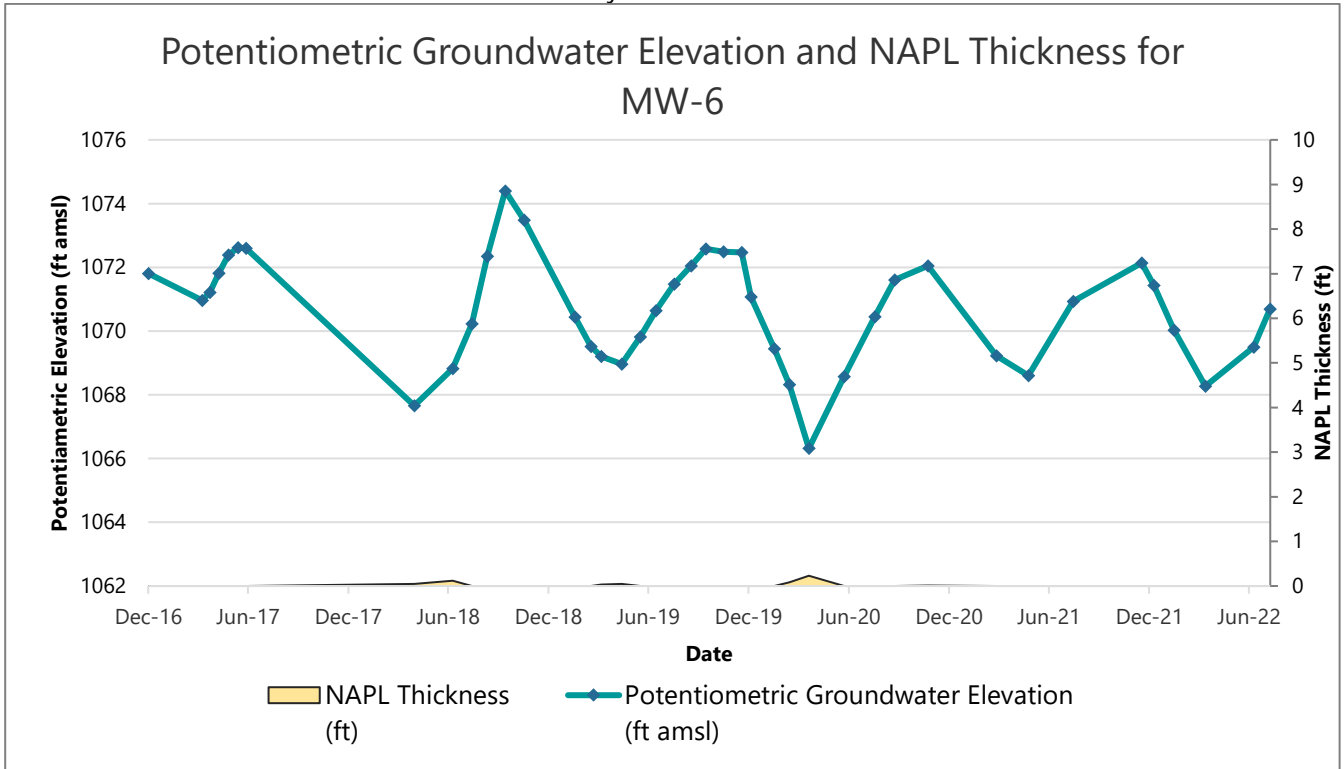


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

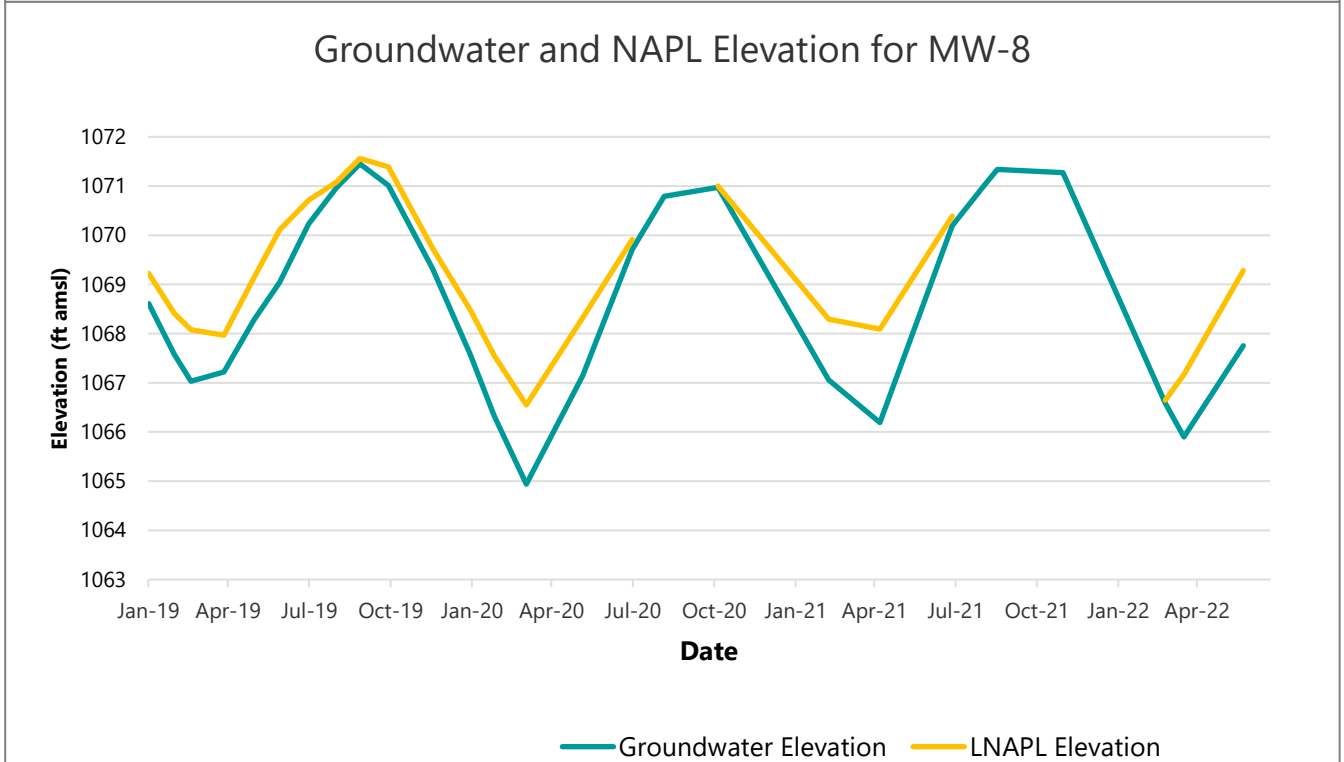
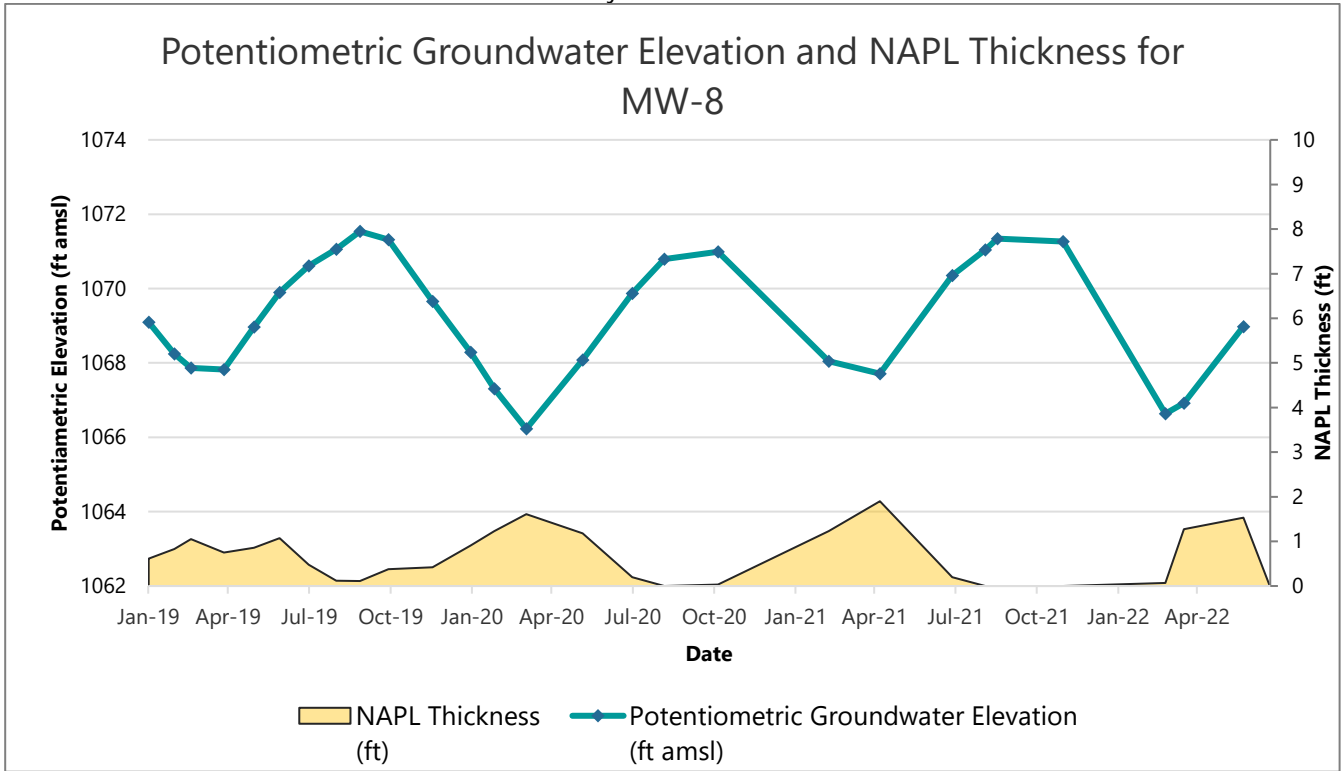


Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

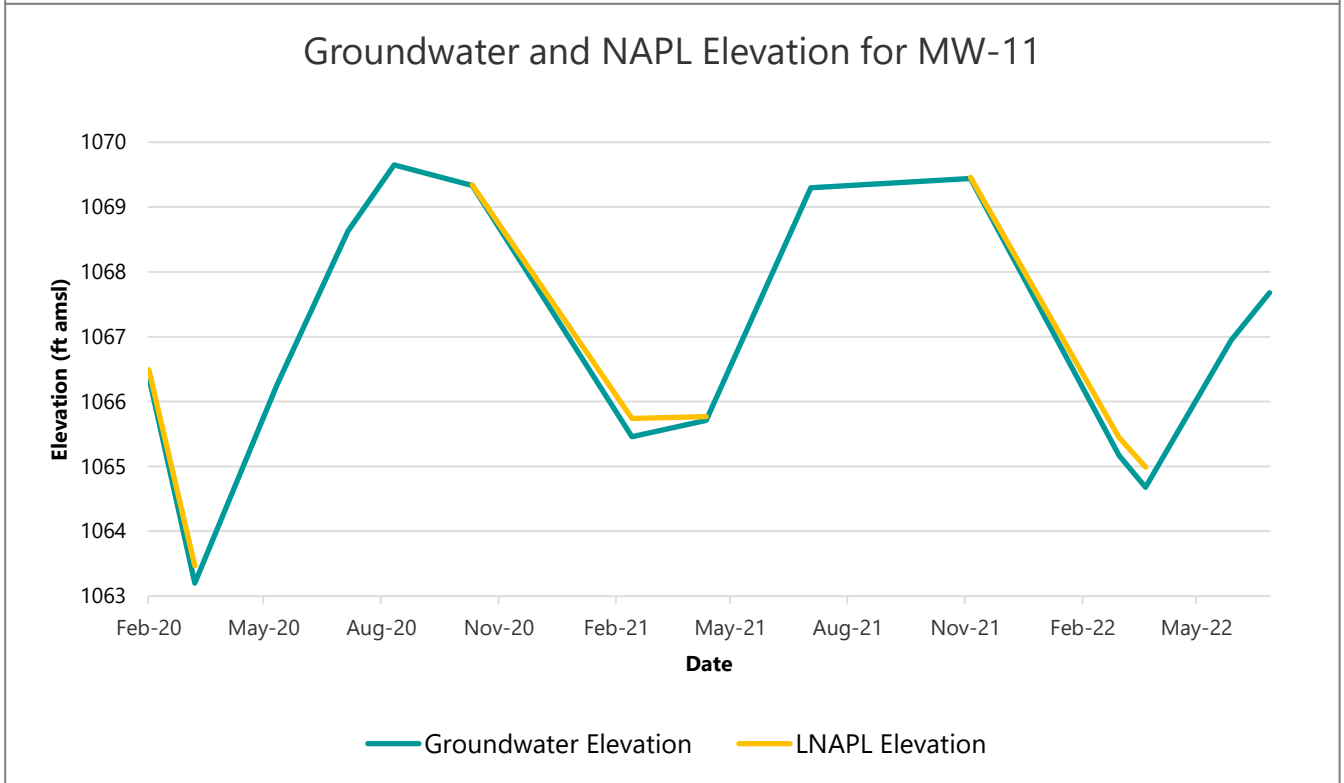
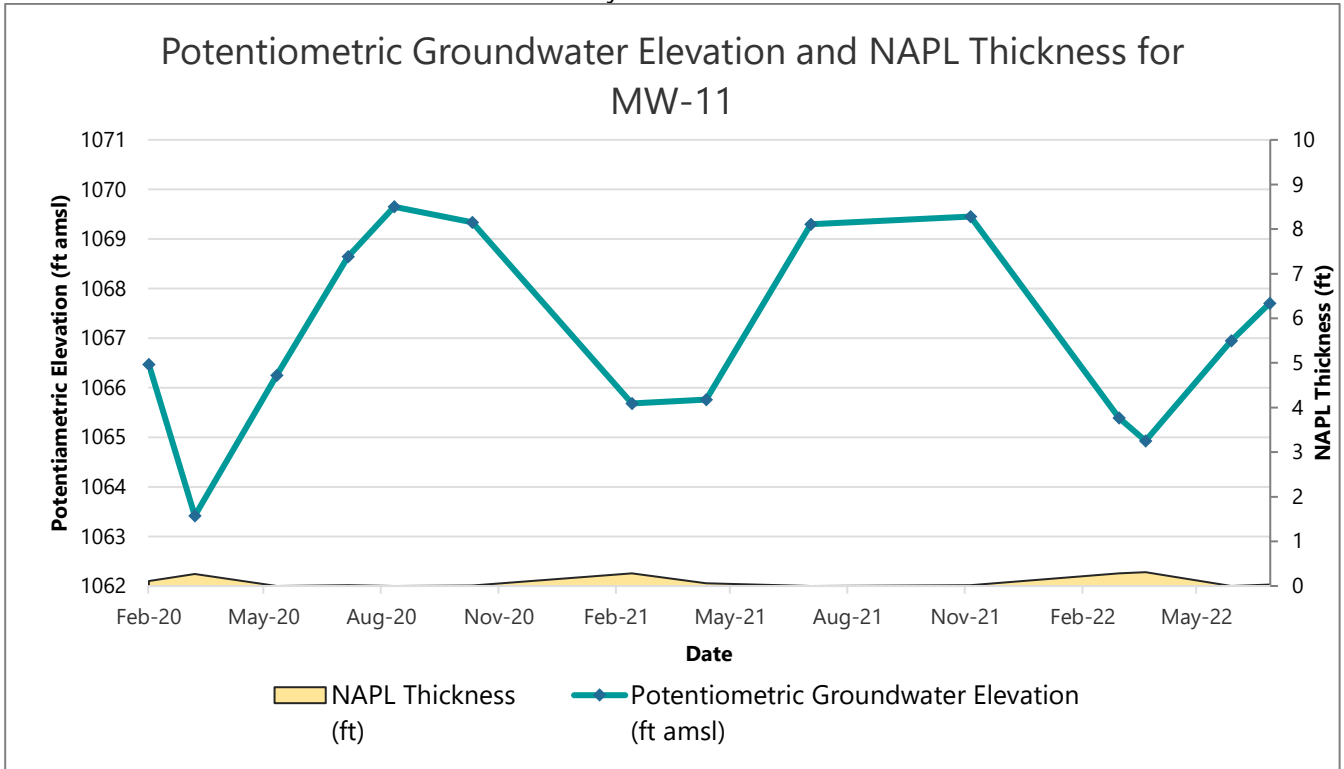
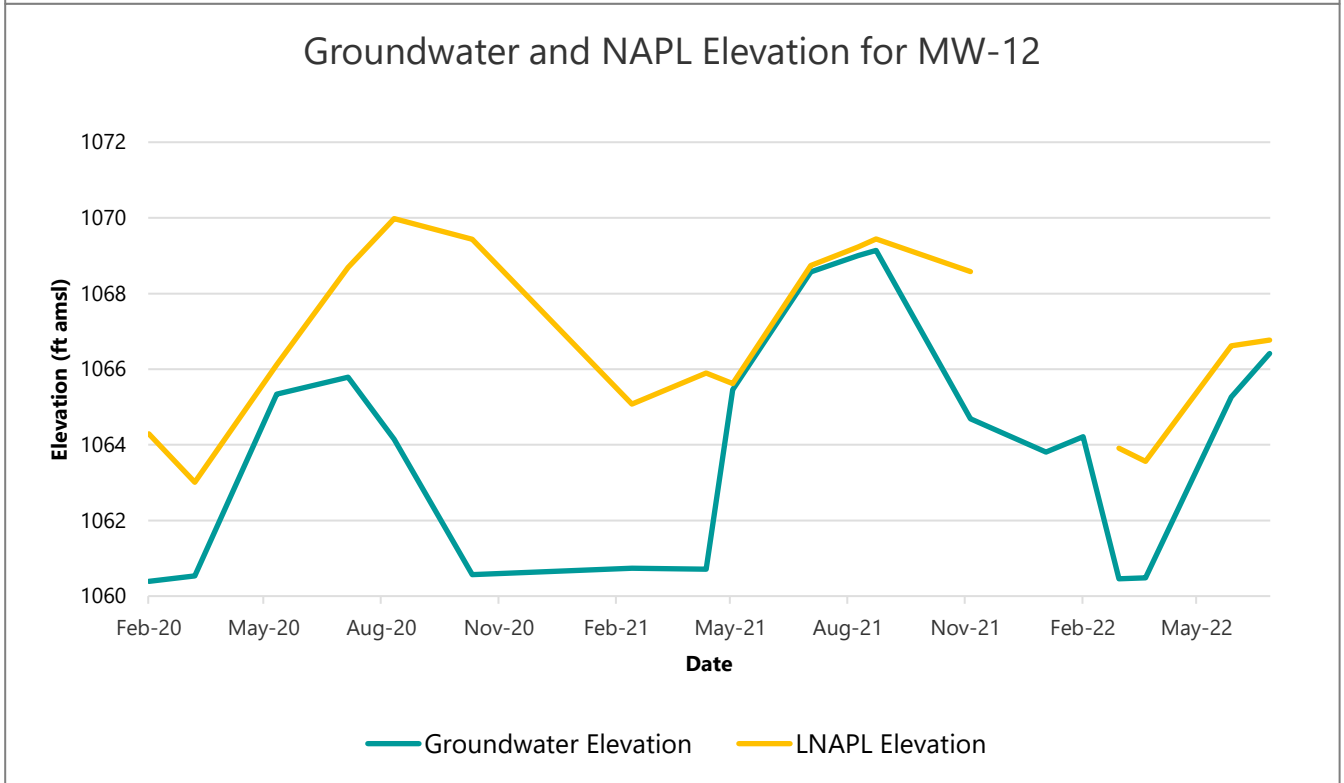
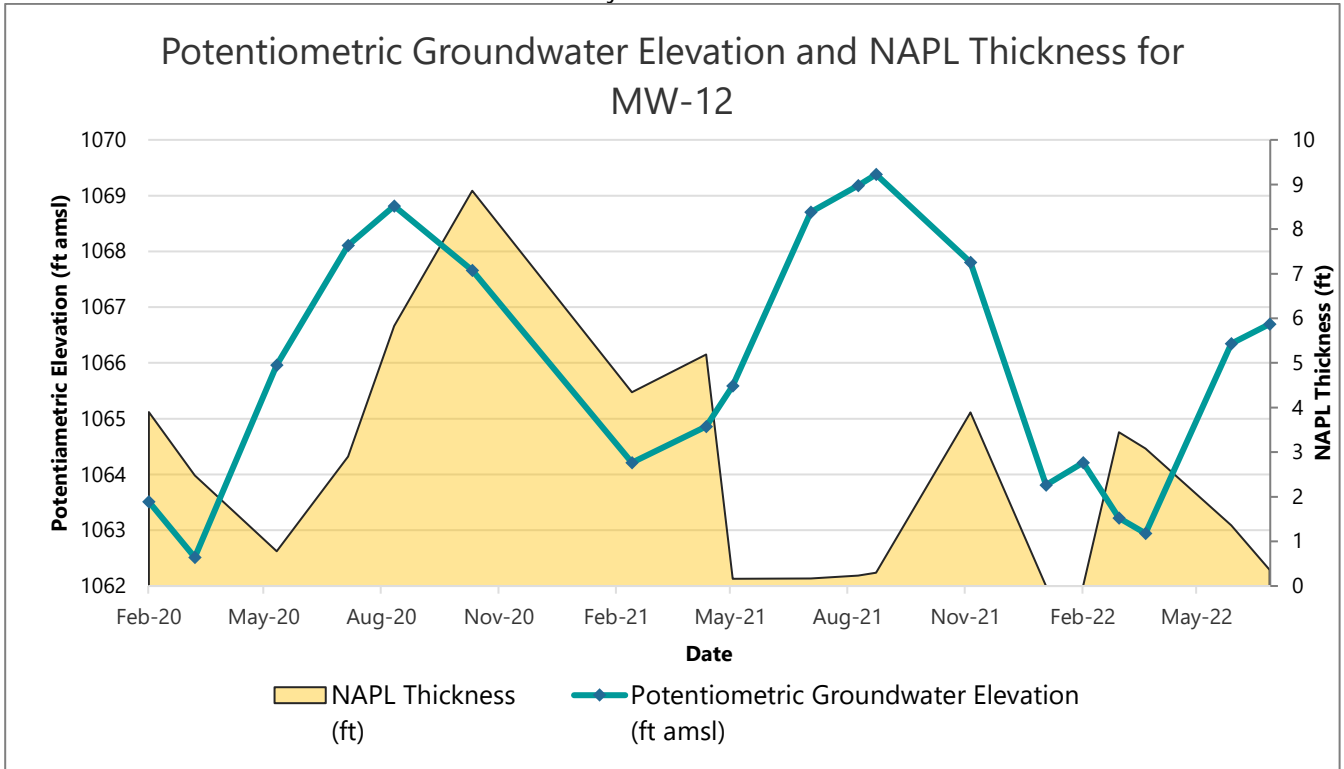






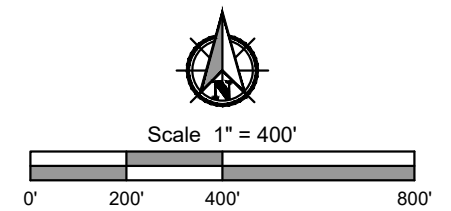
Figure 7  
 Hydrographs  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000





**LEGEND**

-  APPROXIMATE LOCATION OF WATER WELLS BASED ON A REVIEW OF AVAILABLE WELL LOGS
-  APPROXIMATE GROUNDWATER FLOW DIRECTION



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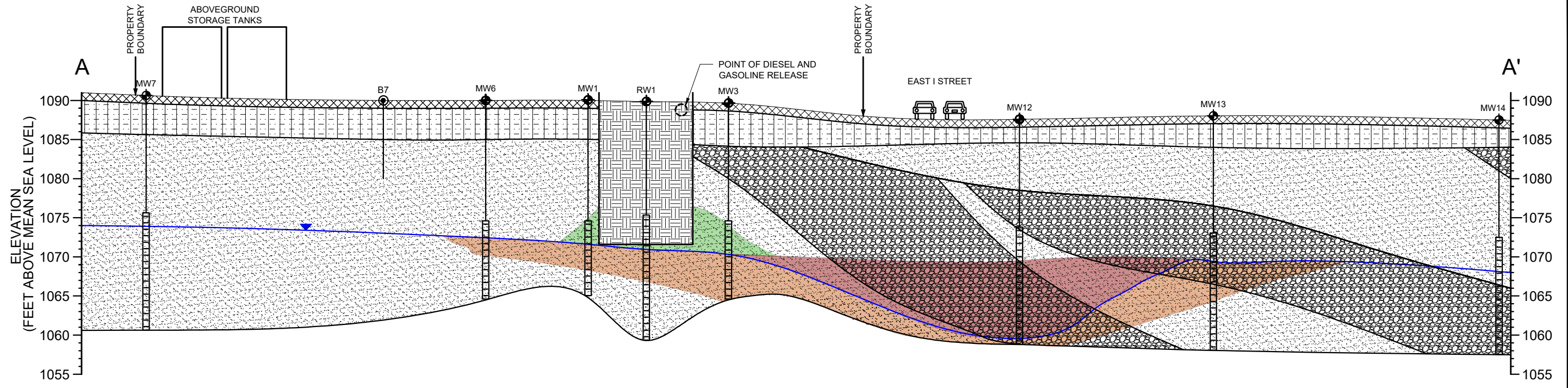


CONCEPTUAL SITE MODEL - SENSITIVE RECEPTOR SURVEY  
**COLEMAN OIL**  
1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	<b>8</b>



Filename: L:\Projects\41000\41392\Coleman Oil\CAD\RI Report Figures\41392.000\_Fig\_2-7.dwg   
 Layout Tab: FIG 9 - A-A' CROSS SECTION   
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1
**CROSS-SECTION A-A'**  
 0'      20'      40'      80'  
 2X VERTICAL EXAGGERATION

LEGEND	
	DIRECT PUSH/SONIC SOIL BORING
	MONITORING WELL
	WELL SCREEN
	GROUNDWATER (NOV 2020)
	FORMER SUBSURFACE FUEL LINE
	NON-AQUEOUS PHASE LIQUID
	MODEL TOXINS CONTROL ACT METHOD A CLEANUP LEVEL
	ASPHALT/ ARTIFICIAL FILL
	SILTY SAND WITH GRAVEL (SM)
	WELL GRADED SAND WITH GRAVEL AND SILT (SW)
	WELL GRADED GRAVEL WITH SAND (GW)
	AREA OF SOIL EXCAVATION AND CLEAN BACKFILL
	NAPL (NOV 2020)
	GROUNDWATER WITH CONCENTRATION OF GASOLINE AND/OR DIESEL >MTCA CUL
	SOIL CONTAMINANT CONCENTRATIONS >MTCA CUL

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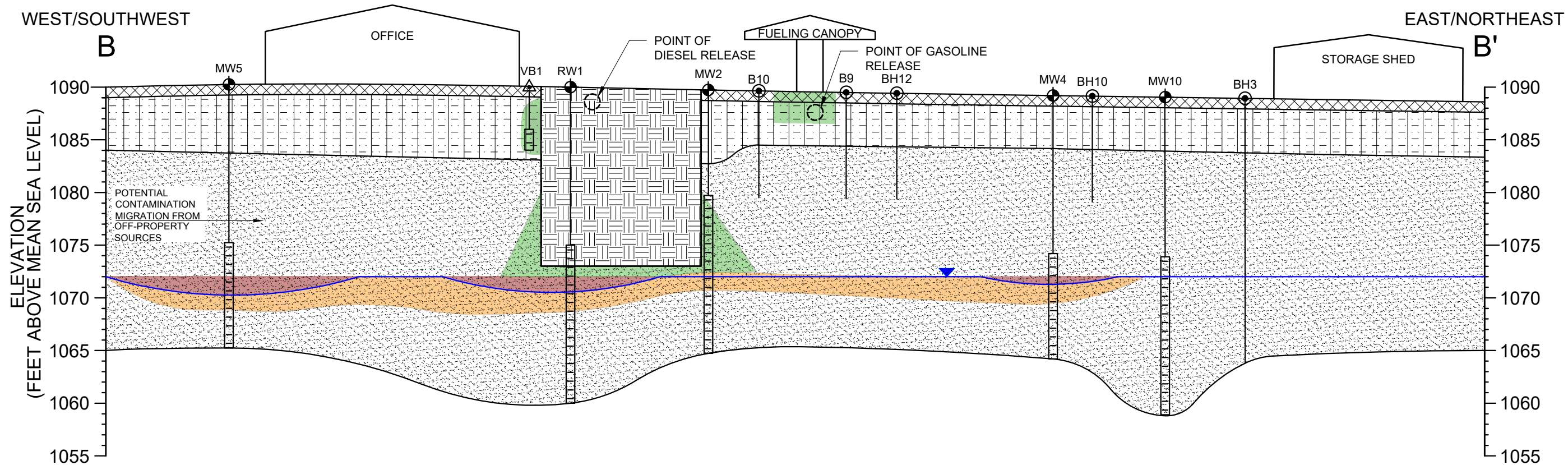
CONCEPTUAL SITE MODEL - CROSS-SECTIONS  
**COLEMAN OIL**  
 1 EAST I STREET, YAKIMA, WASHINGTON

PROJECT	41392.000
DATE	OCT 2023
SHEET ID	<b>9</b>

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1
**CROSS-SECTION B-B'**  
 0'    20'    40'    80'  
 2X VERTICAL EXAGGERATION

**LEGEND**

<ul style="list-style-type: none"> <li> BH-1    DIRECT PUSH/SONIC SOIL BORING</li> <li> MW1/RW1    MONITORING WELL</li> <li> WELL SCREEN</li> <li> VB1    SOIL VAPOR WELL</li> <li> WELL SCREEN</li> <li> GROUNDWATER (NOV 2020)</li> <li> FORMER SUBSURFACE FUEL LINE</li> <li>NAPL    NON-AQUEOUS PHASE LIQUID</li> <li>MTCA CUL    MODEL TOXINS CONTROL ACT METHOD A CLEANUP LEVEL</li> </ul>	<ul style="list-style-type: none"> <li> ASPHALT/ ARTIFICIAL FILL</li> <li> SILTY SAND WITH GRAVEL (SM)</li> <li> WELL SORTED SAND WITH GRAVEL AND SILT (SW)</li> <li> AREA OF SOIL EXCAVATION AND CLEAN BACKFILL</li> <li> NAPL (NOV 2020)</li> <li> GROUNDWATER WITH CONCENTRATION OF GASOLINE AND/OR DIESEL &gt;MTCS CUL</li> <li> SOIL CONTAMINANT CONCENTRATIONS &gt;MTCA CUL</li> </ul>
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PBS Engineering and Environmental Inc.  
 214 East Galer Street, Ste. 300  
 Seattle, WA 98102  
 206.233.9639  
 pbsusa.com



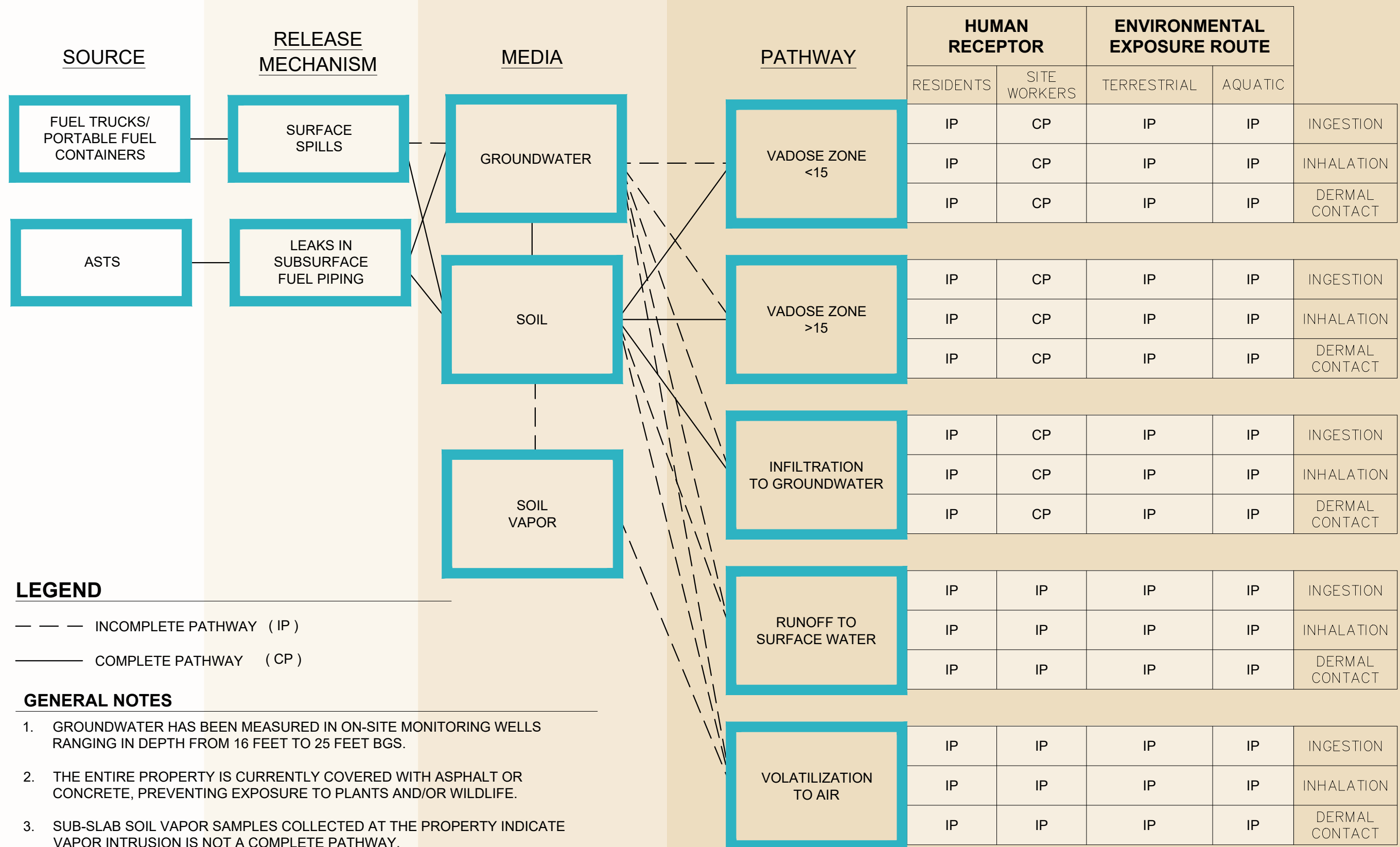
**CONCEPTUAL SITE MODEL - CROSS-SECTIONS**  
**COLEMAN OIL**  
 1 EAST I STREET, YAKIMA, WASHINGTON

<b>PROJECT</b>
41392.000
<b>DATE</b>
OCT 2023
<b>SHEET ID</b>
<b>10</b>

Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

PREPARED FOR: COLEMAN OIL

Filename: L:\Projects\41000\41392\Coleman Oil\CAD\RI Report Figures\41392.000\_Fig\_2-7.dwg  
 Layout Tab: FIG 11 - CSM FLOW CHART  
 User: Katie Breymann  
 CAD Plot Date/Time: 11/18/2022 11:10:19 AM



# Tables

**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
Coleman Oil: 1 East I St., Yakima, WA  
PBS Project No. 41392.000

Location - Depth	Sample Date	TPH			BTEX				TPH - HCID			Metals				
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Gasoline	Diesel	Heavy Oil	Arsenic	Cadmium	Chromium	Lead	Mercury
Comparison Criteria	MTCA Method A Cleanup Levels For Soil <sup>a</sup>	100 30	2,000	2,000	1500	7	6	9	100 30	2,000	2,000	20	2	III: 2,000 IV: 19	250	2
<b>Soil Sampling: Site characterization - April 2015</b>																
S1_0.5	4/3/2015	-	-	-	-	-	-	-	<20	<50	2,600 <sup>est.</sup>	-	-	-	-	-
S2_0.75	4/3/2015	-	-	-	-	-	-	-	<20	<50	590 <sup>est.</sup>	-	-	-	-	-
S3_0.4	4/3/2015	<20	2,100	11,000	-	-	-	-	<20	<50	>250	-	-	-	-	-
S4_0.8	4/3/2015	<20	270x	1,100	-	-	-	-	<20	<50	>250	-	-	-	-	-
S5_0.5	4/3/2015	-	-	-	-	-	-	-	<20	<50	600 <sup>est.</sup>	-	-	-	-	-
S6_1	4/3/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
S7_0.5	4/3/2015	-	-	-	-	-	-	-	<20	390x <sup>est.</sup>	470 <sup>est.</sup>	-	-	-	-	-
S8_0.25	4/3/2015	<20	550x	1,100	-	-	-	-	<20	>50x	>250	-	-	-	-	-
S9_0.25	4/8/2015	-	-	-	-	-	-	-	<20	<50	6,700 <sup>est.</sup>	-	-	-	-	-
B1_4.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B3_2	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B2_5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B5_3.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B5_6.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B6_2.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	4.56	-	-	2.62	-
B7_5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B8_1.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B9_4.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B9_9.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B10_4.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B11_2	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B12_5.5	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
B13_10	4/8/2015	-	-	-	-	-	-	-	<20	<50	<250	-	-	-	-	-
S26_1	4/14/2015	-	15,000	980	-	-	-	-	<20	>50	>250	-	-	-	-	-
S27_2	4/14/2015	-	-	-	-	-	-	-	<20	160 <sup>est.</sup>	<250	-	-	-	-	-
S28_0.6	4/14/2015	-	-	-	-	-	-	-	<20	10,000 <sup>est.</sup>	1,500 <sup>est.</sup>	-	-	-	-	-
S29_1	4/14/2015	-	-	-	-	-	-	-	<20	7,300 <sup>est.</sup>	7,400 <sup>est.</sup>	8	2.35	5.91	332	<1
S30_2	4/14/2015	-	3,200	5,000	-	-	-	-	<20	>50	>250	<1	<1	<1	<1	<1
S31_1.5	4/14/2015	-	-	-	-	-	-	-	<20	3,300 <sup>est.</sup>	2,100 <sup>est.</sup>	-	-	-	-	-
S32_0.5	4/14/2015	-	-	-	-	-	-	-	<20	2,400 <sup>est.</sup>	1,200 <sup>est.</sup>	-	-	-	-	-
S33_0.5	4/14/2015	-	-	-	-	-	-	-	<20	2,100 <sup>est.</sup>	510 <sup>est.</sup>	-	-	-	-	-
S34_0.5	4/14/2015	-	-	-	-	-	-	-	<20	320 <sup>est.</sup>	<250	-	-	-	-	-
S35_0.5	4/14/2015	-	-	-	-	-	-	-	<20	90 <sup>est.</sup>	<250	-	-	-	-	-
S36_0.5	4/14/2015	-	52,000	5,300	-	-	-	-	<20	>50	>250	-	-	-	-	-
S37_2.75	4/14/2015	-	530	<250	-	-	-	-	<20	>50	310 <sup>est.</sup>	-	-	-	-	-
S38_0.5	4/14/2015	-	-	-	-	-	-	-	>20	<50	<250	-	-	-	-	-
S39_3	4/14/2015	-	15,000	31,000	-	-	-	-	-	-	-	-	-	-	-	-
S40_0.5 <sup>b</sup>	4/14/2015	<2	-	-	<0.02	<0.02	<0.02	<0.06	>20	<50	<250	-	-	-	-	-
S41_0.5	4/14/2015	-	-	-	-	-	-	-	>20	<50	<250	-	-	-	-	-
S42_0.5	4/14/2015	-	660	310	-	-	-	-	<20	290 <sup>est.</sup>	<250	-	-	-	-	-
S43_1	4/14/2015	-	-	-	-	-	-	-	<20	99 <sup>est.</sup>	<250	-	-	-	-	-
<b>Soil Sampling: Excavation confirmation sampling - March 23, 2016</b>																
NSW1-4	Native	-	11,000	270x	-	-	-	-	-	-	-	-	-	-	-	-
WSW1-4	Native	-	26,000	570x	-	-	-	-	-	-	-	-	-	-	-	-
B1-5.5	Native	5,100	34,000	770x	0.79	14	20	110	-	-	-	-	-	-	-	-
<b>Soil Sampling: Heating oil tank decommissioning - March 28, 2016</b>																
T1-WSW-5	Native	-	9500	<250	-	-	-	-	-	-	-	-	-	-	-	-
T1-ESW-5	Native	-	920	<250	-	-	-	-	-	-	-	-	-	-	-	-
T1-B-7	Native	340	190	<250	<0.02	<0.063	0.18	2.3	-	-	-	-	-	-	-	-



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
Coleman Oil: 1 East I St., Yakima, WA  
PBS Project No. 41392.000

Location - Depth	Sample Date	TPH			BTEX				TPH - HCID			Metals				
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Gasoline	Diesel	Heavy Oil	Arsenic	Cadmium	Chromium	Lead	Mercury
<b>Comparison Criteria</b>	<b>MTCA Method A Cleanup Levels For Soil<sup>a</sup></b>	<b>100 30</b>	<b>2,000</b>	<b>2,000</b>	<b>1500</b>	<b>7</b>	<b>6</b>	<b>9</b>	<b>100 30</b>	<b>2,000</b>	<b>2,000</b>	<b>20</b>	<b>2</b>	<b>III: 2,000 IV: 19</b>	<b>250</b>	<b>2</b>
<b>Soil Sampling: Excavation confirmation sampling - March 30, 2016</b>																
NSW2 - 15	3/30/2016	<2	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
ESW1 - 15	3/30/2016	3	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
SSW1 - 15	3/30/2016	5.5	<50	<250	<0.02	0.039	0.024	0.14	-	-	-	-	-	-	-	-
WSW2 - 11	3/30/2016	<b>3,400</b>	<b>9,900***</b>	330x	<0.02	3.1	<b>7.5</b>	<b>62</b>	-	-	-	-	-	-	-	-
B2 - 18 <sup>c</sup>	3/30/2016	<b>1,600</b>	<b>25,000***</b>	570x	<b>0.65</b>	5.1	<b>7.3</b>	<b>44</b>	-	-	-	-	-	-	4.94	-
<b>Soil Sampling: Monitoring wells MW1 through MW3 - April 27, 2016</b>																
MW1-19	4/27/2016	-	<b>5,800</b>	<250	-	-	-	-	-	-	-	-	-	-	-	-
MW2-25	4/27/2016	-	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-
MW3-16	4/27/2016	-	<b>15,000</b>	390x	-	-	-	-	-	-	-	-	-	-	-	-
<b>Soil Sampling: Monitoring wells MW4 through MW6 - November 8-9, 2016</b>																
MW4-6	11/8/2016	<2	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW5-10	11/8/2016	-	<50	<250	-	-	-	-	-	-	-	-	-	-	-	-
MW5-20	11/8/2016	140	1,100	<250	<0.02	<0.02	0.27	1.1	-	-	-	-	-	-	-	-
MW6-10	11/9/2016	<2	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
<b>Soil Sampling: Soil borings BH1 through BH7 and monitoring wells MW8 through MW10 - December 18-20, 2018</b>																
BH1-2	12/19/2018	27	630	<250	<0.02	0.12	0.053	0.44	-	-	-	-	-	-	-	-
BH1-12	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH2-2	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH2-14	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH3-2	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH3-14	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH4-2	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH4-12	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH5-2	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH5-13	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH6-2	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	0.074	-	-	-	-	-	-	-	-
BH6-14	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH7-2	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH7-13	12/20/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW8-3	12/18/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW8-11	12/18/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW9-2.5	12/18/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW9-15	12/18/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW10-2	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW10-14	12/19/2018	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
<b>Soil Sampling: Soil borings BH8 through BH13 - June 6, 2019</b>																
BH8-4	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH8-12	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH9-4	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH9-8	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH10-4	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH10-6	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH11-4	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH11-8	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH12-3	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-



**TABLE 1**  
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Coleman Oil: 1 East I St., Yakima, WA  
PBS Project No. 41392.000

Location - Depth	Sample Date	TPH			BTEX				TPH - HCID			Metals				
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Gasoline	Diesel	Heavy Oil	Arsenic	Cadmium	Chromium	Lead	Mercury
Comparison Criteria	MTCA Method A Cleanup Levels For Soil <sup>a</sup>	100 30	2,000	2,000	1500	7	6	9	100 30	2,000	2,000	20	2	III: 2,000 IV: 19	250	2
BH12-8	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH13-4	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH-13-9	6/6/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
<b>Soil Sampling: Soil borings BH14 and BH15 and monitoring wells MW7, MW11 and MW12 - December 16, 2019</b>																
MW7-6.5	12/18/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW7-16	12/18/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW11-5.5	12/16/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW11-12	12/16/2019	<5	<50	<250	<0.02	0.023	<0.02	0.082	-	-	-	-	-	-	-	-
MW12-6	12/17/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW12-14	12/17/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH14-6	12/18/2019	<5	110	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH14-16	12/18/2019	<5	59	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH15-6	12/18/2019	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
BH15-16	12/18/2019	16	<50	<250	<0.02	0.078	<0.02	0.30	-	-	-	-	-	-	-	-
<b>Soil Sampling: Monitoring wells MW13 and MW14 - September 3-4, 2020</b>																
MW13-5	9/3/2020	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW13-12	9/3/2020	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW14-5	9/4/2020	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW14-13.5	9/4/2020	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
<b>Soil Sampling: Monitoring well MW15 April 8, 2021</b>																
MW15-5	4/8/2021	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW15-12	4/8/2021	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
<b>Soil Sampling: Monitoring well MW16 February 24, 2022</b>																
MW16-5	2/24/2022	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-
MW16-12	2/24/2022	<5	<50	<250	<0.02	<0.02	<0.02	<0.06	-	-	-	-	-	-	-	-

**Notes:**

Gasoline analyzed by Northwest Total Petroleum Hydrocarbon Method - Volatile Petroleum Products (Extended) (NWTPH-Gx)  
Diesel and Heavy Oil analyzed by Northwest Total Petroleum Hydrocarbon Method - Semi-volatile Petroleum Products (Extended) (NWTPH-Dx)  
BTEX constituents analyzed by Environmental Protection Agency Method 8021B  
TPH-HCID columns present results of TPH-G, TPH-D and TPH-HO analyzed by Northwest Total Petroleum Hydrocarbon Identification Method (TPH-HCID)  
Metals analyzed by EPA Methods 200.8 and/or 6020  
**BOLD** indicates concentration exceeding MTCA Method A Cleanup Levels for Soil

**Footnotes:**

<sup>a</sup> From Model Toxics Control Act Table 740-1 Soil Cleanup Levels for Unrestricted Land Use  
<sup>b</sup> Sample S40 was also analyzed for SVOCs by EPA Method 8270D SIM and PCBs by EPA Method 8082A; no analytes were detected above the respective cleanup level.  
<sup>c</sup> Sample B2-18C was also analyzed for carcinogenic polycyclic aromatic hydrocarbons by EPA Method 8270D SIM. Naphthalene was detected above the respective cleanup level at a concentration of 7.2 mg/kg.  
<sup>est.</sup> The concentration reported is an estimate.

**Abbreviations & Acronyms:**

<	Not detected at or above the given laboratory reporting limit.	TPH	- total petroleum hydrocarbons
<del>strikethrough text</del>	represents soil sample location later removed or otherwise disturbed by	BTEX	- Benzene, ethylbenzene, toluene and xylenes
x	The sample chromatographic pattern does not resemble the fuel standard used for quantitation	Gasoline	- gasoline range TPHs
--	Not analyzed.	Diesel	- diesel range TPH
		Heavy Oil	- Heavy oil range TPH
		mg/kg	- milligrams per kilogram



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
Coleman Oil: 1 East I St., Yakima, WA  
PBS Project No. 41392.000

Location - Depth	Sample Date	TPH			BTEX				TPH - HCID			Metals				
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Xylenes	Gasoline	Diesel	Heavy Oil	Arsenic	Cadmium	Chromium	Lead	Mercury
Comparison Criteria	MTCA Method A Cleanup Levels For Soil <sup>a</sup>	100 30	2,000	2,000	1500	7	6	9	100 30	2,000	2,000	20	2	III: 2,000 IV: 19	250	2

**TABLE 2**  
**GROUNDWATER ANALYTICAL RESULTS**  
 Coleman Oil: 1 East I St., Yakima, WA  
 PBS Project No. 41392.000

Results in ug/L																
Location/ Depth	Sample Date	TPHs			VOCs								SVOCs			Metals
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl Benzene	Xylenes	MTBE	EDC	EDB	Hexane	B(a)P	Naph	cPAHs <sup>a</sup>	Lead
Comparison Criteria	MTCA Method A Cleanup Levels For Groundwater <sup>b</sup>	800	500	500	1500	1,000	700	1,000	20	5	0.01	-	0.1	160	0.1	15
RW1	5/9/2016	Not sampled due to the presence of LNAPL: 4.26 feet thickness														
	12/13/2016	Not sampled due to the presence of LNAPL: 0.25 feet thickness														
	6/9/2017	Not sampled due to the presence of LNAPL: 1.48 feet thickness														
	3/19/2019	Not sampled due to the presence of LNAPL: 2.12 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.37 feet thickness														
MW1	11/4/2020	Not sampled due to the presence of LNAPL: 0.19 feet thickness														
	5/9/2016	4,300	12,000	1,100	49	78	89	440	-	-	-	-	<1.2*	56	<1.2*	<1.2*
	12/13/2016	Not sampled due to the presence of LNAPL: 1.14 feet thickness														
	6/9/2017	Not sampled due to the presence of LNAPL: 0.16 feet thickness														
	3/19/2019	Not sampled due to the presence of LNAPL: 0.18 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.23 feet thickness														
MW2	11/4/2020	Not sampled due to the presence of LNAPL: 0.01 feet thickness														
	7/28/2021	7,000	14,000 / 4,400 <sup>c</sup>	<250	620	<40	130	480	--	--	--	--	--	--	--	--
	7/22/2022	5,100	12,000	840	810	<40	60	<120	--	--	--	--	--	--	--	--
	5/9/2016	420	1,300	250	<1	<1	1.1	<3	--	--	--	--	--	--	--	--
	12/13/2016	Not sampled due to the presence of LNAPL - 8.39 feet thickness														
	6/9/2017	83,000	-	-	2,900	9,900	1,000	5,900	<1	<1	<1	140	-	-	-	-
MW3	3/19/2019	Not sampled due to the presence of LNAPL: 0.24 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.11 feet thickness														
	11/5/2020	2,300	1,500	<250	59	6	94	310	--	--	--	--	--	--	--	--
	7/28/2021	4,000	4,900 / 2000 <sup>c</sup>	<250	95	<20	28	<60	--	--	--	--	--	--	--	--
	7/22/2022	2,300	15,000	770	90	<5	14	20	--	--	--	--	--	--	--	--
	5/9/2016	Not sampled due to the presence of LNAPL: 4.7 feet thickness														
MW4	12/13/2016	Not sampled due to the presence of LNAPL: 4.91 feet thickness														
	6/9/2017	Not sampled due to the presence of LNAPL: 2.87 feet thickness														
	3/19/2019	Not sampled due to the presence of LNAPL: 0.39 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.91 feet thickness														
	11/4/2020	Not sampled due to the presence of LNAPL: 0.26 feet thickness														
	7/28/2021	Not sampled due to the presence of LNAPL: 0.20 feet thickness														
MW5	7/22/2022	Not sampled due to the presence of LNAPL: 1.28 feet thickness														
	12/13/2016	12,000	3,200	460	500	<100	130	<300	-	-	-	-	<0.06	160	<0.06	<0.06
	6/9/2017	7,600	4,300	870	240	12	120	<30	<1	<1	<1	12	<0.06	160	<0.06	<1
	3/19/2019	Not sampled due to the presence of LNAPL: 0.25 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.18 feet thickness														
	11/4/2020	Not sampled due to the presence of LNAPL: 0.01 feet thickness														
MW6	7/27/2021	2,300	230	<250	37	<20	95	<60	--	--	--	--	--	--	--	
	7/22/2022	Not sampled due to the presence of LNAPL														
	12/13/2016	Not sampled due to the presence of LNAPL: 0.57 feet thickness														
	6/9/2017	Not sampled due to the presence of LNAPL: 0.66 feet thickness														
	3/19/2019	Not sampled due to the presence of LNAPL: 0.27 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 0.12 feet thickness														
MW7	11/4/2020	Not sampled due to the presence of LNAPL: 1.29 feet thickness														
	7/28/2021	Not sampled due to the presence of LNAPL: 0.09 feet thickness														
	7/24/2022	7,700	48,000	2,100	83	20	32	100	--	--	--	--	--	--	--	--
	12/13/2016	13,000	3,100	<250	110	<100	130	<300	-	-	-	-	<0.06	310	<0.06	<0.06
	6/9/2017	7,600	3,700	<400	140	100	110	69	<1	<1	<1*	49	<0.06	250	<0.06	<1
	3/19/2019	Not sampled due to the presence of LNAPL: 0.03 feet thickness														
MW8	2/25/2020	Not sampled due to the presence of LNAPL: 0.08 feet thickness														
	11/4/2020	Not sampled due to the presence of LNAPL: 0.01 feet thickness														
	7/27/2021	4,200	3,900 / 960 <sup>c</sup>	370 / <250	37	<20	51	74	--	--	--	--	--	--	--	--
	7/22/2022	4,300	4,100	530	28	<20	38	<60	--	--	--	--	--	--	--	--
	2/25/2020	<100	540	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	--
	11/5/2020	<100	150	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	--
MW9	7/28/2021	<100	410 / <50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/22/2022	<100	1,200	350	<1	<1	<1	<3	--	--	--	--	--	--	--	
	3/19/2019	Not sampled due to the presence of LNAPL: 0.86 feet thickness														
	2/25/2020	Not sampled due to the presence of LNAPL: 1.23 feet thickness														
	11/5/2020	2,100	7,100	1,000	160	7	4	8	--	--	--	--	--	--	--	--
	7/28/2021	Not sampled due to the presence of LNAPL: 0.20 feet thickness														
MW10	7/22/2022	Not sampled due to the presence of LNAPL														
	3/19/2019	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	2/25/2020	<100	500	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	11/5/2020	210	1,300	380	<1	<1.6	<1	3.2	--	--	--	--	--	--	--	
	7/27/2021	<100	1,200 / <50 <sup>c</sup>	350 / <250 <sup>c</sup>	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/22/2022	<100	1,600	590	<1	<1	<1	<3	--	--	--	--	--	--	--	
MW11	3/19/2019	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	2/25/2020	<100	160	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	11/5/2020	<100	130	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/27/2021	<100	930 / <50 <sup>c</sup>	260 / <250 <sup>c</sup>	<1	<1	<1	<3	--	--	--	--	--	--	--	
	3/25/2022	<100	240x / <50 <sup>c</sup>	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/22/2022	<100	1,400	400	<1	<1	<1	<3	--	--	--	--	--	--	--	
MW12	2/25/2020	Not sampled due to the presence of LNAPL: 0.11 feet thickness														
	11/4/2020	Not sampled due to the presence of LNAPL: 0.01 feet thickness														
	7/28/2021	2,200	3,100 / 860 <sup>c</sup>	300 / <250 <sup>c</sup>	45	<10	38	100	--	--	--	--	--	--	--	
	7/22/2022	Not sampled due to the presence of LNAPL: 0.03 feet thickness														
MW13	2/25/2020	Not sampled due to the presence of LNAPL: 3.90 feet thickness														
	11/4/2020	Not sampled due to the presence of LNAPL: 8.86 feet thickness														
	7/28/2021	Not sampled due to the presence of LNAPL: 0.17 feet thickness														
MW14	7/22/2022	Not sampled due to the presence of LNAPL: 0.36 feet thickness														
	11/5/2020	<100	520	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/28/2021	300	550 / 150 <sup>c</sup>	<250	3.5	<1	<1	<3	--	--	--	--	--	--	--	
	7/24/2022	1,400	1,400	<250	<1	<1	18	35	--	--	--	--	--	--	--	
MW15	11/5/2020	270	53	<250	4.4	<1	4.8	12	--	--	--	--	--	--	--	
	7/28/2021	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	3/25/2022	<100	110x / <50 <sup>c</sup>	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
MW16	7/21/2022	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/21/2022	<100	110	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
MW17	7/28/2021	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	3/25/2022	<100	<50	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
MW18	7/24/2022	<100	160	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	
	7/24/2022	<100	160	<250	<1	<1	<1	<3	--	--	--	--	--	--	--	

**TABLE 2  
GROUNDWATER ANALYTICAL RESULTS**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Results in ug/L																
Location/ Depth	Sample Date	TPHs			VOCs								SVOCs			Metals
		Gasoline	Diesel	Heavy Oil	Benzene	Toluene	Ethyl Benzene	Xylenes	MTBE	EDC	EDB	Hexane	B(a)P	Naph	cPAHs <sup>a</sup>	Lead
Comparison Criteria	MTCA Method A Cleanup Levels For Groundwater <sup>b</sup>	800	500	500	1500	1,000	700	1,000	20	5	0.01	-	0.1	160	0.1	15
<b>"Grab" groundwater samples from temporary well screen in soil borings</b>																
BH1-W	12/19/18	<b>7,300</b>	<b>87,000</b>	<2,500	<b>18</b>	18	54	97	<1	<1	<1*	--	--	--	--	--
BH2-W	12/19/18	<b>8,600</b>	<b>3,200</b>	<400	<b>240</b>	<20	160	170	<1	<1	<1*	--	--	--	--	--
BH3-W	12/20/18	<b>8,900</b>	<b>100,000</b>	<b>2,800</b>	<b>89</b>	47	180	130	<1	<1	<1*	--	--	--	--	--
BH4-W	12/19/18	<b>3,900</b>	<b>3,700</b>	<400	<b>200</b>	<20	<20	<60	<1	<1	<1*	--	--	--	--	--
BH5-W	12/20/18	<b>27,000</b>	<b>4,200</b>	<320	<b>1,300</b>	730	<b>1,200</b>	<b>4,400</b>	<1	<1	<1*	--	--	--	--	--
BH6-W	12/20/18	<b>5,100</b>	<b>19,000</b>	390	<5	10	58	78	<1	<1	<1*	--	--	--	--	--
BH7-W	12/20/18	<b>4,300</b>	<b>34,000</b>	<b>1,400</b>	<b>38</b>	17	95	81	<1	<1	<1*	--	--	--	--	--
BH14W	12/18/19	<b>35,000</b>	--	--	<1	<1	250	290	--	--	--	--	--	--	--	--

*Notes:*

Gasoline analyzed by Northwest Total Petroleum Hydrocarbon Method - Volatile Petroleum Products (Extended) (NWTPH-Gx)  
 Diesel and heavy oil analyzed by Northwest Total Petroleum Hydrocarbon Method - Semi-volatile Petroleum Products (Extended) (NWTPH-Dx)

VOCs analyzed by Environmental Protection Agency Method 8021B (BTEX only) and 8260C  
 SVOCs analyzed by Environmental Protection Agency Method 8270D SIM

Metals analyzed by Environmental Protection Agency Method 6020A

**BOLD** indicates concentration exceeding MTCA Method A Cleanup Levels for Groundwater

x indicates the sample chromatographic pattern does not resemble the fuel standard used for quantitation

*Footnotes:*

<sup>a</sup> Value for total cPAHs by toxicity equivalency methodology in WAC 173-340-708(8) and table 708.2

<sup>b</sup> From Model Toxics Control Act Table 720-1 Soil Cleanup Levels for Unrestricted Land Use

<sup>c</sup> NWTPH Value(pre-silica gel) / NWTPH value (post-silica gel)

*Abbreviations & Acronyms:*

<## - not detected at or above given laboratory reporting limit

\* - Detection limit exceeded the MTCA Method A value

TPH - total petroleum hydrocarbons

Gx - gasoline range hydrocarbons

Dx - diesel range hydrocarbons

VOCs - volatile organic compounds

MTBE - methyl tert-butyl ether

EDC - 1,2 dichloroethane

EDB - ethylene dibromide

SVOCs - semi-volatile organic compounds

B(a)P - benzo(a)pyrene

Naph - total naphthalenes (naphthalene+ 1-methyl naphthalene + 2-methyl naphthalene)

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

LNAPL - light, non-aqueous phase liquid

**TABLE 3**  
**NAPL CHARACTERISTICS**  
Coleman Oil: 1 East I St., Yakima, WA  
PBS Project No. 41392.000

Sample	Location Description	Sample Color	Approximate % Gasoline	Approximate % Diesel	Gasoline Degree of Weathering	Diesel Degree of Weathering	Specific Gravity	Viscosity <sup>a</sup> (cSt)
<b>Product Sampling: June 9, 2017<sup>b</sup></b>								
MW3 <sup>b</sup>	Approximately 15 feet downgradient of point of diesel release	Not Noted	Present	Present	1500	Weathered	--	--
MW5 <sup>b</sup>	West of the release between the office building and the railroad	Not Noted	Not present	Present	NA	Weathered	--	--
<b>Product Sampling: March 19, 2019<sup>c</sup></b>								
RW1	Adjacent to point of diesel release	Amber	50	50	Weathered	Mixed	0.817	2.28
MW2	Between point of diesel release and line of gasoline release	Amber	20	80	Weathered	Fresh	0.786	--
MW3	Approximately 15 feet downgradient of point of diesel release	Amber	10	90	Weathered	Mixed	0.810	2.21
MW4	Approximately 25 feet east of line of gasoline release	Black	<10	100	NA	Weathered	0.830	--
MW5	West of the release between the office building and the railroad	Black	50	50	Weathered	Weathered	0.828	--
MW8	Approximately 15 feet east of northernmost extent of line of gasoline release	Black	<10	100	NA	Weathered	0.841	3.82
<b>Product Sampling: February 25, 2020<sup>c</sup></b>								
MW11		Black	10	90	Weathered	Mixed	--	--
MW12		Black	10	90	Weathered	Mixed	--	--
<b>Product Sampling: November 5, 2020<sup>c</sup></b>								
MW5		black	70	30	Weathered	Weathered		
MW12		Black	<10	100	NA	Fresh		

Abbreviations & Acronyms:  
cSt - centistokes

Footnotes:

<sup>a</sup> Analyzed by ASTM D-445 method by Spectra Laboratories

<sup>b</sup> Analyzed for whole oil C3-C44N by Pace Analytical Energy Services. Only presence and nature of fuel type given, percentages of each constituent not provided.

<sup>c</sup> Analyzed by Northwest Total Petroleum Hydrocarbon Method - Semi-volatile Petroleum Products (Extended) (NWTPH-Dx). Chromatograms interpreted by analytical laboratory (Friedman & Bruya, Inc.) for component percentages and weathering.

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
RW-1	15.05-30.05	5/10/2016	NA*	19.38	23.64	4.26	NA*
		10/5/2016	NA*	17.48	23.69	6.21	NA*
		10/20/2016	NA*	17.83	20.99	3.16	1500
		11/2/2016	NA*	18.06	20.86	2.80	NA*
		12/13/2016	NA*	19.58	19.83	0.25	NA*
		1/20/2017	NA*	20.75	23.83	3.08	NA*
		2/2/2017	NA*	21.26	23.75	2.49	NA*
		3/21/2017	NA*	20.09	23.90	3.81	NA*
		4/4/2017	NA*	20.16	22.78	2.62	NA*
		4/20/2017	NA*	19.82	21.09	1.27	NA*
		5/8/2017	NA*	19.10	20.55	1.45	NA*
		5/25/2017	NA*	18.70	19.41	0.71	NA*
		6/9/2017	NA*	18.55	20.03	1.48	NA*
		4/12/2018	NA*	23.75	25.15	1.40	NA*
		6/21/2018	NA*	21.89	22.96	1.07	NA*
		7/26/2018	NA*	20.56	20.65	0.09	NA*
		8/23/2018	NA*	18.92	18.98	0.06	NA*
		9/25/2018	NA*	16.56	16.74	0.18	NA*
		10/29/2018	NA*	17.62	18.09	0.47	NA*
		11/30/2018	NA*	19.12	19.91	0.79	NA*
		12/20/2018	NA*	19.72	20.33	0.61	NA*
		1/30/2019	NA*	21.01	23.04	2.03	NA*
		2/28/2019	NA*	21.80	23.94	2.14	NA*
		3/19/2019	NA*	22.18	24.30	2.12	NA*
		4/25/2019	NA*	22.38	23.32	0.94	NA*
		5/29/2019	NA*	21.10	22.09	0.99	NA*
		6/27/2019	NA*	20.18	20.27	0.09	NA*
		7/30/2019	NA*	19.31	19.67	0.36	NA*
		8/30/2019	NA*	18.88	19.35	0.47	NA*
		9/26/2019	NA*	18.43	19.12	0.69	NA*
		10/28/2019	NA*	18.73	19.54	0.81	NA*
		12/17/2019	NA*	20.53	21.68	1.15	NA*
		1/29/2020	NA*	21.94	22.87	0.93	NA*
		2/25/2020	NA*	22.91	23.28	0.37	NA*
		4/1/2020	NA*	23.80	25.02	1.22	NA*
		6/4/2020	NA*	22.17	22.35	0.18	NA*
		7/30/2020	NA*	20.17	20.18	0.01	NA*
		9/4/2020	NA*	19.15	19.31	0.16	NA*
		11/4/2020	NA*	19.23	19.42	0.19	NA*
		3/9/2021	NA*	22.05	23.49	1.44	NA*
5/6/2021	NA*	22.37	23.17	0.80	NA*		
5/27/2021	NA*	22.47	23.16	0.69	NA*		
7/27/2021	NA*	--	19.70	--	NA*		
9/2/2021	NA*	--	18.97	--	NA*		
9/16/2021	NA*	--	18.72	--	NA*		
11/29/2021	NA*	--	19.37	--	NA*		
12/21/2021	NA*	--	20.25	--	NA*		
1/27/2022	NA*	--	21.65	--	NA*		
2/25/2022	NA*	--	21.43	--	NA*		
3/25/2022	NA*	23.24	23.37	0.13	NA*		
4/15/2022	NA*	23.52	24.47	0.95	NA*		
6/21/2022	NA*	--	21.54	--	NA*		
7/21/2022	NA*	--	20.45	--	NA*		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-1	9.9-25.9	5/10/2016	1089.54	--	19.13	--	1070.41
		10/5/2016	1089.54	16.75	22.02	5.27	1071.74
		10/20/2016	1089.54	17.15	19.94	2.79	1071.83
		11/2/2016	1089.54	17.56	18.75	1.19	1071.74
		12/13/2016	1089.54	18.99	20.13	1.14	1070.32
		1/20/2017	1089.54	19.42	24.32	4.90	1069.14
		2/2/2017	1089.54	20.42	21.51	1.09	1068.90
		3/21/2017	1089.54	18.83	22.39	3.56	1070.00
		4/4/2017	1089.54	19.35	19.59	0.24	1070.14
		4/20/2017	1089.54	18.7	19.07	0.37	1070.77
		5/8/2017	1089.54	17.9	18.29	0.39	1071.56
		5/25/2017	1089.54	17.75	17.96	0.21	1071.75
		6/9/2017	1089.54	17.68	17.84	0.16	1071.83
		4/12/2018	1089.54	22.6	23.20	0.60	1066.82
		6/21/2018	1089.54	21.4	21.82	0.42	1068.06
		7/26/2018	1089.54	19.88	20.28	0.40	1069.58
		8/23/2018	1089.54	--	17.88	--	1071.66
		9/25/2018	1089.54	--	15.50	--	1074.04
		10/29/2018	1089.54	--	16.52	--	1073.02
		11/30/2018	1089.54	--	17.73	--	1071.81
		12/20/2018	1089.54	--	18.22	--	1071.32
		1/30/2019	1089.54	--	19.89	--	1069.65
		2/28/2019	1089.54	--	20.97	--	1068.57
		3/19/2019	1089.54	21.19	21.37	0.18	1068.31
		4/25/2019	1089.54	21.39	21.54	0.15	1068.12
		5/29/2019	1089.54	20.45	20.46	0.01	1069.09
		6/27/2019	1089.54	--	19.46	--	1070.08
		7/30/2019	1089.54	--	18.56	--	1070.98
		8/30/2019	1089.54	--	17.95	--	1071.59
		9/26/2019	1089.54	--	17.35	--	1072.19
		10/28/2019	1089.54	--	17.48	--	1072.06
		12/17/2019	1089.54	--	19.12	--	1070.42
		1/29/2020	1089.54	20.85	21.05	0.20	1068.65
		2/25/2020	1089.54	21.8	22.03	0.23	1067.69
		4/1/2020	1089.54	22.79	23.08	0.29	1066.69
		6/4/2020	1089.54	21.77	21.78	0.01	1067.77
		7/30/2020	1089.54	--	19.54	--	1070.00
		9/4/2020	1089.54	--	18.32	--	1071.22
		11/4/2020	1089.54	--	17.93	--	1071.61
		3/9/2021	1089.54	21.05	21.13	0.08	1068.47
5/6/2021	1089.54	--	21.63	--	1067.91		
7/27/2021	1089.54	--	18.93	--	1070.61		
11/29/2021	1089.54	--	17.72	--	1071.82		
12/21/2021	1089.54	--	18.67	--	1070.87		
1/27/2022	1089.54	--	21.03	--	1068.51		
3/25/2022	1089.54	22.19	22.31	0.12	1067.33		
4/15/2022	1089.54	22.64	22.78	0.14	1066.87		
6/21/2022	1089.54	--	20.70	--	1068.84		
7/21/2022	1089.54	--	19.32	--	1070.22		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-2	10.3-25.3	5/10/2016	1089.44	--	19.82		1069.62
		10/5/2016	1089.44	--	16.54	--	1072.90
		10/20/2016	1089.44	--	16.51	--	1072.93
		11/2/2016	1089.44	--	16.54	--	1072.90
		12/13/2016	1089.44	17.11	25.50	8.39	1063.94
		1/20/2017	1089.44	21.05	21.21	0.16	1068.23
		2/2/2017	1089.44	--	21.50	--	1067.94
		4/4/2017	1089.44	--	20.24	--	1069.20
		4/20/2017	1089.44	--	19.26	--	1070.19
		3/21/2017	1089.44	--	20.50	--	1068.94
		5/8/2017	1089.44	--	18.90	--	1070.54
		5/25/2017	1089.44	--	18.00	--	1071.44
		6/9/2017	1089.44	17.85	17.87	0.02	1071.57
		4/12/2018	1089.44	23.48	23.71	0.23	1065.73
		6/21/2018	1089.44	21.83	22.09	0.26	1067.35
		7/26/2018	1089.44	20.11	20.24	0.13	1069.20
		8/23/2018	1089.44	--	17.25	--	1072.19
		9/25/2018	1089.44	--	15.15	--	1074.29
		10/29/2018	1089.44	--	16.15	--	1073.29
		11/30/2018	1089.44	--	16.64	--	1072.80
		1/30/2019	1089.44	20.56	20.71	0.15	1068.73
		2/28/2019	1089.44	21.57	21.73	0.16	1067.71
		3/19/2019	1089.44	21.98	22.22	0.24	1067.22
		4/25/2019	1089.44	22.08	22.23	0.15	1067.21
		5/29/2019	1089.44	20.84	20.86	0.02	1068.58
		6/27/2019	1089.44	19.71	19.73	0.02	1069.71
		7/30/2019	1089.44	--	17.93	--	1071.51
		8/30/2019	1089.44	--	17.25	--	1072.19
		9/26/2019	1089.44	--	16.85	--	1072.59
		10/28/2019	1089.44	--	16.91	--	1072.53
		10/20/2016	1089.44	--	16.51	--	1072.93
		12/17/2019	1089.44	19.50	19.53	0.03	1069.91
		1/29/2020	1089.44	21.51	21.57	0.06	1067.87
		8/23/2020	1089.44	--	17.25	--	1072.19
		2/25/2020	1089.44	22.5	22.61	0.11	1066.83
		4/1/2020	1089.44	23.53	23.89	0.36	1065.55
		6/4/2020	1089.44	22.02	22.08	0.06	1067.36
		7/30/2020	1089.44	--	19.78	--	1069.66
		9/4/2020	1089.44	--	17.70	--	1071.74
		11/4/2020	1089.44	--	17.02	--	1072.42
3/9/2021	1089.44	21.80	21.85	0.05	1067.59		
5/6/2021	1089.44	22.22	22.28	0.06	1067.16		
7/27/2021	1089.44	--	19.32	--	1070.12		
9/2/2021	1089.44	--	17.69	--	1071.75		
11/29/2021	1089.44	--	16.88	--	1072.56		
12/21/2021	1089.44	--	18.54	--	1070.90		
1/27/2022	1089.44	--	20.95	--	1068.49		
3/25/2022	1089.44	--	22.60	--	1066.84		
4/15/2022	1089.44	--	22.79	--	1066.65		
6/21/2022	1089.44	--	20.98	--	1068.46		
7/21/2022	1089.44	--	19.32	--	1070.12		



**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-3	14-24	5/10/2016	1089.15	18.80	23.50	4.70	1069.41
		10/5/2016	1089.15	17.15	22.74	5.59	1070.88
		10/20/2016	1089.15	17.11	22.46	5.35	1070.97
		11/2/2016	1089.15	18.06	20.86	2.80	1070.53
		12/13/2016	1089.15	18.82	23.73	4.91	1069.35
		1/20/2017	1089.15	20.41	24.12	3.71	1068.00
		2/2/2017	1089.15	20.90	24.01	3.11	1067.63
		3/21/2017	1089.15	19.70	23.74	4.04	1068.64
		4/4/2017	1089.15	19.68	23.18	3.50	1068.77
		4/20/2017	1089.15	19.05	22.93	3.88	1069.32
		5/8/2017	1089.15	18.32	22.60	4.28	1069.97
		5/25/2017	1089.15	17.89	22.25	4.36	1070.39
		6/9/2017	1089.15	17.94	20.81	2.87	1070.64
		4/12/2018	1089.15	23.56	24.30	0.74	1065.44
		6/21/2018	1089.15	21.57	22.88	1.31	1067.32
		7/26/2018	1089.15	20.22	20.35	0.13	1068.90
		8/23/2018	1089.15	--	18.63	--	1070.52
		9/25/2018	1089.15	15.98	16.03	0.05	1073.16
		10/29/2018	1089.15	17.05	17.30	0.25	1072.05
		11/30/2018	1089.15	18.57	18.99	0.42	1070.50
		12/20/2018	1089.15	19.18	20.03	0.85	1069.80
		1/30/2019	1089.15	20.73	22.02	1.29	1068.16
		2/28/2019	1089.15	21.69	22.25	0.56	1067.35
		3/19/2019	1089.15	22.14	22.53	0.39	1066.93
		4/25/2019	1089.15	22.21	22.51	0.30	1066.88
		5/29/2019	1089.15	20.73	21.94	1.21	1068.18
		6/27/2019	1089.15	19.50	21.65	2.15	1069.22
		7/30/2019	1089.15	18.78	19.75	0.97	1070.18
		8/30/2019	1089.15	18.33	19.12	0.79	1070.66
		9/26/2019	1089.15	17.88	18.62	0.74	1071.12
		10/28/2019	1089.15	18.15	18.97	0.82	1070.84
		12/17/2019	1089.15	19.94	21.68	1.74	1068.86
		1/29/2020	1089.15	21.70	22.67	0.97	1067.26
		2/25/2020	1089.15	22.63	23.54	0.91	1066.34
		4/1/2020	1089.15	23.50	24.67	1.17	1065.42
		6/4/2020	1089.15	21.95	22.21	0.26	1067.15
		7/30/2020	1089.15	19.87	19.90	0.03	1069.27
		9/4/2020	1089.15	--	18.81	--	1070.34
		11/4/2020	1089.15	18.83	19.09	0.26	1070.27
		3/9/2021	1089.15	21.87	22.76	0.89	1067.10
		5/6/2021	1089.15	22.25	22.66	0.41	1066.82
		5/27/2021	1089.15	22.63	22.84	0.21	1066.48
7/27/2021	1089.15	19.44	19.64	0.20	1069.67		
9/2/2021	1089.15	--	18.73	--	1070.42		
9/16/2021	1089.15	--	18.41	--	1070.74		
11/29/2021	1089.15	--	19.03	--	1070.12		
12/21/2021	1089.15	--	20.03	--	1069.12		
1/27/2022	1089.15	21.40	21.59	0.19	1067.71		
2/25/2022	1089.15	--	21.14	--	1068.01		
3/25/2022	1089.15	22.91	23.45	0.54	1066.13		
4/15/2022	1089.15	23.44	23.52	0.08	1065.69		
6/21/2022	1089.15	21.18	22.41	1.23	1067.72		
7/21/2022	1089.15	19.95	21.23	1.28	1068.94		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-4	15-25	12/13/2016	1088.85	--	18.09	--	1070.76
		2/2/2017	1088.85	20.00	20.31	0.31	1068.79
		3/21/2017	1088.85	19.28	19.31	0.03	1069.57
		4/4/2017	1088.85	19.14	19.20	0.06	1069.70
		4/20/2017	1088.85	18.55	18.62	0.07	1070.29
		5/8/2017	1088.85	--	17.62	--	1071.23
		5/25/2017	1088.85	--	17.22	--	1071.63
		6/9/2017	1088.85	--	17.19	--	1071.66
		4/12/2018	1088.85	22.43	22.73	0.30	1066.36
		6/21/2018	1088.85	--	21.27	--	1067.58
		7/26/2018	1088.85	--	19.68	--	1069.17
		8/23/2018	1088.85	--	18.23	--	1070.62
		9/25/2018	1088.85	14.54	14.56	0.02	1074.31
		10/29/2018	1088.85	--	16.15	--	1072.70
		11/30/2018	1088.85	17.18	17.23	0.05	1071.66
		1/30/2019	1088.85	19.71	19.90	0.19	1069.10
		2/28/2019	1088.85	20.63	20.87	0.24	1068.17
		3/19/2019	1088.85	21.03	21.28	0.25	1067.77
		4/25/2019	1088.85	21.22	21.34	0.12	1067.61
		5/29/2019	1088.85	20.18	20.20	0.02	1068.67
		6/27/2019	1088.85	--	19.27	--	1069.58
		7/30/2019	1088.85	--	18.46	--	1070.39
		8/30/2019	1088.85	--	17.88	--	1070.97
		9/26/2019	1088.85	--	17.23	--	1071.62
		10/28/2019	1088.85	--	17.32	--	1071.53
		12/17/2019	1088.85	19.14	19.23	0.09	1069.69
		1/29/2020	1088.85	20.66	20.71	0.05	1068.18
		2/25/2020	1088.85	21.56	21.74	0.18	1067.25
		4/1/2020	1088.85	22.92	23.16	0.24	1065.88
		6/4/2020	1088.85	--	21.53	--	1067.32
		7/30/2020	1088.85	--	19.39	--	1069.46
		9/4/2020	1088.85	--	18.36	--	1070.49
11/4/2020	1088.85	17.73	17.74	0.01	1071.12		
3/9/2021	1088.85	20.90	21.11	0.21	1067.91		
5/6/2021	1088.85	--	21.53	--	1067.32		
7/27/2021	1088.85	--	18.92	--	1069.93		
11/29/2021	1088.85	--	17.59	--	1071.26		
12/21/2021	1088.85	--	18.56	--	1070.29		
1/27/2022	1088.85	20.08	20.20	0.12	1068.75		
3/25/2022	1088.85	21.74	21.83	0.09	1067.09		
4/15/2022	1088.85	22.37	22.46	0.09	1066.46		
6/21/2022	1088.85	20.40	20.45	0.05	1068.44		
7/21/2022	1088.85	--	--*	--	--		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)	
MW-5	15-25	12/13/2016	1090.01	19.73	20.30	0.57	1070.17	
		3/21/2017	1090.01	20.31	21.05	0.74	1069.56	
		4/4/2017	1090.01	20.36	21.22	0.86	1069.48	
		4/20/2017	1090.01	20.02	20.20	0.18	1069.95	
		5/8/2017	1090.01	19.33	19.80	0.47	1070.59	
		5/25/2017	1090.01	18.85	19.60	0.75	1071.01	
		6/9/2017	1090.01	18.88	19.54	0.66	1071.00	
		4/12/2018	1090.01	23.62	24.13	0.51	1066.29	
		6/21/2018	1090.01	22.86	23.38	0.52	1067.05	
		7/26/2018	1090.01	--	23.34	--	--	1066.67
		8/23/2018	1090.01	--	18.94	--	--	1071.07
		9/25/2018	1090.01	16.32	16.39	0.07	--	1073.68
		10/28/2018	1090.01	17.34	17.59	0.25	--	1072.62
		11/30/2018	1090.01	18.76	19.02	0.26	--	1071.20
		1/30/2019	1090.01	20.96	21.30	0.34	--	1068.98
		2/28/2019	1090.01	--	--	--	--	--
		3/19/2019	1090.01	22.09	22.36	0.27	--	1067.87
		4/25/2019	1090.01	22.33	22.59	0.26	--	1067.628
		5/29/2019	1090.01	--	21.76	--	--	1068.25
		6/27/2019	1090.01	--	20.53	--	--	1069.48
		7/30/2019	1090.01	19.51	19.55	0.04	--	1070.492
		8/30/2019	1090.01	18.71	18.76	0.05	--	1071.29
		9/26/2019	1090.01	18.12	18.15	0.03	--	1071.884
		10/28/2019	1090.01	18.43	18.46	0.03	--	1071.574
		12/17/2019	1090.01	--	20.29	--	--	1069.72
		1/29/2020	1090.01	21.88	22.04	0.16	--	1068.098
		2/25/2020	1090.01	22.68	22.8	0.12	--	1067.306
		4/1/2020	1090.01	23.58	23.84	0.26	--	1066.38
		6/4/2020	1090.01	23.11	23.40	0.29	--	1066.84
		7/30/2020	1090.01	20.67	20.82	0.15	--	1069.31
		9/4/2020	1090.01	19.13	19.80	0.67	--	1070.75
		11/4/2020	1090.01	18.86	20.15	1.29	--	1070.89
		3/9/2021	1090.01	21.89	22.49	0.60	--	1068.00
		5/6/2021	1090.01	22.61	23.92	1.31	--	1067.14
7/27/2021	1090.01	20.02	20.11	0.09	--	1069.97		
9/2/2021	1090.01	--	18.98	--	--	1071.03		
9/16/2021	1090.01	--	18.78	--	--	1071.23		
11/29/2021	1090.01	--	19.34	--	--	1070.67		
12/21/2021	1090.01	--	20.08	--	--	1069.93		
1/27/2022	1090.01	21.07	21.45	0.38	--	1068.86		
3/25/2022	1090.01	22.69	22.97	0.28	--	1067.26		
4/15/2022	1090.01	23.19	23.59	0.40	--	1066.74		
6/21/2022	1090.01	--	22.38	--	--	1067.63		
7/21/2022	1090.01	--	20.53	--	--	1069.48		

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**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-6	15-25	12/13/2016	1089.21	--	17.40	--	1071.81
		3/21/2017	1089.21	--	18.25	--	1070.97
		4/4/2017	1089.21	--	18.00	--	1071.21
		4/20/2017	1089.21	--	17.39	--	1071.82
		5/8/2017	1089.21	--	16.82	--	1072.39
		5/25/2017	1089.21	--	16.59	--	1072.62
		6/9/2017	1089.21	--	16.61	--	1072.60
		4/12/2018	1089.21	21.50	21.55	0.05	1067.66
		6/21/2018	1089.21	20.27	20.39	0.12	1068.82
		7/26/2018	1089.21	--	18.98	--	1070.23
		8/23/2018	1089.21	--	16.86	--	1072.35
		9/25/2018	1089.21	--	14.81	--	1074.40
		10/29/2018	1089.21	--	15.73	--	1073.48
		11/30/2019	1089.21	--	16.74	--	1072.47
		1/30/2019	1089.21	--	18.77	--	1070.44
		2/28/2019	1089.21	--	19.69	--	1069.52
		3/19/2019	1089.21	19.97	20.00	0.03	1069.21
		4/25/2019	1089.21	20.20	20.25	0.05	1068.96
		5/29/2019	1089.21	--	19.39	--	1069.82
		6/27/2019	1089.21	--	18.57	--	1070.64
		7/30/2019	1089.21	--	17.74	--	1071.47
		8/30/2019	1089.21	--	17.16	--	1072.05
		9/26/2019	1089.21	--	16.63	--	1072.58
		10/28/2019	1089.21	--	16.72	--	1072.49
		12/17/2019	1089.21	--	18.14	--	1071.07
		1/29/2020	1089.21	--	19.76	--	1069.45
		2/25/2020	1089.21	20.81	20.89	0.08	1068.32
		4/1/2020	1089.21	22.66	22.89	0.23	1066.32
		6/4/2020	1089.21	--	20.64	--	1068.57
		7/30/2020	1089.21	--	18.76	--	1070.45
		9/4/2020	1089.21	--	17.60	--	1071.61
		11/4/2020	1089.21	17.15	17.16	0.01	1072.05
		3/9/2021	1089.21	--	19.98	--	1069.23
5/6/2021	1089.21	--	20.61	--	1068.60		
7/27/2021	1089.21	--	18.28	--	1070.93		
11/29/2021	1089.21	--	17.07	--	1072.14		
12/21/2021	1089.21	--	17.78	--	1071.43		
1/27/2022	1089.21	--	19.18	--	1070.03		
3/25/2022	1089.21	--	20.94	--	1068.27		
6/21/2022	1089.21	--	19.71	--	1069.50		
7/21/2022	1089.21	--	18.52	--	1070.69		
MW-7	15-30	12/17/2019	1090.40	--	20.29	--	1070.11
		1/29/2020	1090.40	--	19.93	--	1070.47
		2/25/2020	1090.40	--	20.96	--	1069.44
		4/1/2020	1090.40	--	21.95	--	1068.45
		6/4/2020	1090.40	--	21.22	--	1069.18
		7/30/2020	1090.40	--	18.85	--	1071.55
		9/4/2020	1090.40	--	17.33	--	1073.07
		11/4/2020	1090.40	--	16.49	--	1073.91
		3/9/2021	1090.40	--	19.89	--	1070.51
		5/6/2021	1090.40	--	20.84	--	1069.56
		7/27/2021	1090.40	--	18.04	--	1072.36
		9/2/2021	1090.40	--	16.73	--	1073.67
		11/29/2021	1090.40	--	16.4	--	1074
		12/21/2021	1090.40	--	17.17	--	1073.23
		1/27/2022	1090.40	--	18.88	--	1071.52
3/25/2022	1090.40	--	20.94	--	1069.46		
6/21/2022	1090.40	--	20.12	--	1070.28		
7/21/2022	1090.40	--	18.40	--	1072		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-8	15-30	1/30/2019	1089.47	20.25	20.86	0.61	1069.10
		2/28/2019	1089.47	21.06	21.89	0.83	1068.24
		3/19/2019	1089.47	21.39	22.44	1.05	1067.87
		4/25/2019	1089.47	21.50	22.25	0.75	1067.82
		5/29/2019	1089.47	20.33	21.19	0.86	1068.97
		6/27/2019	1089.47	19.36	20.43	1.07	1069.90
		7/30/2019	1089.47	18.76	19.24	0.48	1070.61
		8/30/2019	1089.47	18.39	18.51	0.12	1071.06
		9/26/2019	1089.47	17.91	18.02	0.11	1071.54
		10/28/2019	1089.47	18.08	18.46	0.38	1071.31
		12/17/2019	1089.47	19.73	20.15	0.42	1069.66
		1/29/2020	1089.47	21.00	21.91	0.91	1068.29
		2/25/2020	1089.47	21.92	23.15	1.23	1067.30
		4/1/2020	1089.47	22.92	24.53	1.61	1066.23
		6/4/2020	1089.47	21.15	22.33	1.18	1068.08
		7/30/2020	1089.47	19.56	19.76	0.20	1069.87
		9/4/2020	1089.47	--	18.68	--	1070.79
		11/4/2020	1089.47	18.47	18.50	0.03	1070.99
		3/9/2021	1089.47	21.18	22.41	1.23	1068.04
		5/6/2021	1089.47	21.38	23.28	1.90	1067.71
		7/27/2021	1089.47	19.08	19.28	0.20	1070.35
		9/2/2021	1089.47	--	18.43	--	1071.04
		9/16/2021	1089.47	--	18.13	--	1071.34
		11/29/2021	1089.47	--	18.20	--	1071.27
		3/25/2022	1089.47	22.82	22.89	0.07	1066.64
		4/15/2022	1089.47	22.30	23.57	1.27	1066.92
6/21/2022	1089.47	20.19	21.72	1.53	1068.97		
7/21/2022	1089.47	--	--*	--			
MW-9	15-30	1/30/2019	1089.07	--	21.08	--	1067.99
		2/28/2019	1089.07	--	22.03	--	1067.04
		3/19/2019	1089.07	--	22.45	--	1066.62
		4/25/2019	1089.07	--	22.44	--	1066.63
		5/29/2019	1089.07	--	20.85	--	1068.22
		6/27/2019	1089.07	--	18.90	--	1070.17
		7/30/2019	1089.07	--	18.20	--	1070.87
		8/30/2019	1089.07	--	17.86	--	1071.21
		9/26/2019	1089.07	--	17.55	--	1071.52
		10/28/2019	1089.07	--	17.74	--	1071.33
		12/17/2019	1089.07	--	19.15	--	1069.92
		1/29/2020	1089.07	--	21.27	--	1067.80
		2/25/2020	1089.07	--	22.48	--	1066.59
		4/1/2020	1089.07	--	23.54	--	1065.53
		6/4/2020	1089.07	--	21.65	--	1067.42
		7/30/2020	1089.07	--	19.32	--	1069.75
		9/4/2020	1089.07	--	18.27	--	1070.80
		11/4/2020	1089.07	--	18.20	--	1070.87
		3/9/2021	1089.07	--	22.13	--	1066.94
		5/6/2021	1089.07	--	21.97	--	1067.10
		7/27/2021	1089.07	--	18.70	--	1070.37
		9/2/2021	1089.07	--	18.16	--	1070.91
		11/29/2021	1089.07	--	18.17	--	1070.90
		3/25/2022	1089.07	--	23.09	--	1065.98
		6/21/2022	1089.07	--	20.64	--	1068.43
		7/21/2022	1089.07	--	18.72	--	1070.35

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-10	15-30	1/30/2019	1087.75	--	19.21	--	1068.54
		2/28/2019	1087.75	--	20.07	--	1067.68
		3/19/2019	1087.75	--	20.45	--	1067.30
		4/25/2019	1087.75	--	20.48	--	1067.27
		5/29/2019	1087.75	--	19.20	--	1068.55
		6/27/2019	1087.75	--	18.28	--	1069.47
		7/30/2019	1087.75	--	17.54	--	1070.21
		8/30/2019	1087.75	--	17.05	--	1070.70
		9/26/2019	1087.75	--	16.56	--	1071.19
		10/28/2019	1087.75	--	16.69	--	1071.06
		12/17/2019	1087.75	--	18.61	--	1069.14
		1/29/2020	1087.75	--	19.86	--	1067.89
		2/25/2020	1087.75	--	20.95	--	1066.80
		4/1/2020	1087.75	--	21.95	--	1065.80
		6/4/2020	1087.75	--	20.11	--	1067.64
		7/30/2020	1087.75	--	18.44	--	1069.31
		9/4/2020	1087.75	--	17.55	--	1070.20
		11/4/2020	1087.75	--	17.12	--	1070.63
		3/9/2021	1087.75	--	20.56	--	1067.19
		5/6/2021	1087.75	--	20.53	--	1067.22
7/27/2021	1087.75	--	18.06	--	1069.69		
11/29/2021	1087.75	--	16.87	--	1070.88		
1/27/2022	1087.75	--	19.08	--	1068.67		
3/25/2022	1087.75	--	21.44	--	1066.31		
6/21/2022	1087.75	--	19.48	--	1068.27		
7/21/2022	1087.75	--	18.36	--	1069.39		
MW-11	15-29.5	2/25/2020	1088.99	22.50	22.61	0.11	1066.47
		4/1/2020	1088.99	25.52	25.79	0.27	1063.42
		6/4/2020	1088.99	--	22.74	--	1066.25
		7/30/2020	1088.99	20.34	20.36	0.02	1068.65
		9/4/2020	1088.99	--	19.34	--	1069.65
		11/4/2020	1088.99	19.65	19.66	0.01	1069.34
		3/9/2021	1088.99	23.25	23.53	0.28	1065.68
		5/6/2021	1088.99	23.22	23.28	0.06	1065.76
		7/27/2021	1088.99	--	19.69	--	1069.30
		11/29/2021	1088.99	19.53	19.55	0.02	1069.46
		3/25/2022	1088.99	23.54	23.82	0.28	1065.39
		4/15/2022	1088.99	24.00	24.31	0.31	1064.93
6/21/2022	1088.99	--	22.04	--	1066.95		
7/21/2022	1088.99	21.28	21.31	0.03	1067.70		
MW-12	15-29.4	2/25/2020	1088.44	24.15	28.05	3.90	1063.51
		4/1/2020	1088.44	25.43	27.91	2.48	1062.51
		6/4/2020	1088.44	22.32	23.10	0.78	1065.96
		7/30/2020	1088.44	19.75	22.65	2.90	1068.11
		9/4/2020	1088.44	18.46	24.29	5.83	1068.81
		11/4/2020	1088.44	19.01	27.87	8.86	1067.66
		3/9/2021	1088.44	23.36	27.70	4.34	1064.21
		5/6/2021	1088.44	22.54	27.73	5.19	1064.86
		5/27/2021	1088.44	22.82	22.98	0.16	1065.59
		7/27/2021	1088.44	19.70	19.87	0.17	1068.71
		9/2/2021	1088.44	19.21	19.44	0.23	1069.18
		9/16/2021	1088.44	19.00	19.30	0.30	1069.38
		11/29/2021	1088.44	19.86	23.75	3.89	1067.80
		1/27/2022	1088.44	--	24.63	--	1063.81
		2/25/2022	1088.44	--	24.23	--	1064.21
		3/25/2022	1088.44	24.53	27.98	3.45	1063.22
4/15/2022	1088.44	24.88	27.96	3.08	1062.94		
6/21/2022	1088.44	21.82	23.18	1.36	1066.35		
7/21/2022	1088.44	21.67	22.03	0.36	1066.70		

**TABLE 4**  
**GROUNDWATER AND NAPL ELEVATION DATA**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Well ID	Well Screen Interval (ft bgs)	Date	TOC Elevation (ft)	Depth to NAPL (ft btoc)	Depth to Water (ft btoc)	NAPL Thickness (ft)	Potentiometric Groundwater Elevation (ft amsl)
MW-13	15-26	11/4/2020	1087.42	--	18.36	--	1069.06
		3/9/2021		--	21.93		
		5/6/2021		--	21.78		
		7/27/2021	1087.42	--	18.30	--	1069.12
		11/29/2021	1087.42	--	18.42	--	1069.00
		3/25/2022	1087.42	--	23.88	--	1063.54
		6/21/2022	1087.42	--	20.68	--	1066.74
		7/21/2022	1087.42	--	18.97	--	1068.45
MW-14	15-30	11/4/2020	1086.98	--	19.29	--	1067.69
		3/9/2021		--	23.19		
		5/6/2021		--	22.01		
		7/27/2021	1086.98	--	18.34	--	1068.64
		11/29/2021	1086.98	--	19.75	--	1067.23
		3/25/2022	1086.98	--	23.99	--	1062.99
		6/21/2022	1086.98	--	20.63	--	1066.35
		7/21/2022	1086.98	--	19.21	--	1067.77
MW-15	15-30	5/6/2021		--	21.69		
		7/27/2021	NA*	--	18.05	--	NA*
		9/2/2021	NA*	--	17.25	--	NA*
		11/29/2021	NA*	--	17.70	--	NA*
		2/25/2022	NA*	--	23.98	--	NA*
		3/25/2022	NA*	--	22.93	--	NA*
		4/15/2022	NA*	--	23.30	--	NA*
		6/21/2022	NA*	--	20.26	--	NA*
7/21/2022	NA*	--	18.93	--	NA*		
MW-16	15-30	3/25/2022	NA*	--	25.00	--	NA*
		6/21/2022	NA*	--	20.66	--	NA*
		7/21/2022	NA*	--	19.32	--	NA*
MWBNSF1	unknown	3/9/2021		--	25.05		
		5/6/2021		--	24.68		
		7/27/2021	NA*	--	20.85	--	NA*
		9/2/2021	NA*	--	20.08	--	NA*
		11/29/2021	NA*	--	21.41	--	NA*
		3/25/2022	NA*	--	26.46	--	NA*
		7/21/2022	NA*	--	21.69	--	NA*

Notes:

-- = no product measured in the well

--\* = measurement error

NA\* = TOC and/or groundwater elevation not known due to broken well casing or not surveyed

Abbreviations & Acronyms:

ft = feet

btoc = below top of casing

amsl = above mean sea level

napl = non-aqueous phase liquid

<sup>a</sup> POT\_ELEV = TOC\_ELEV - [DTW - (PTH \* PD)] where:

POT\_ELEV = potentiometric surface elevation

TOC\_ELEV = top of casing elevation

DTW = depth to water

PTH = product thickness

PD = product density (0.8)

**TABLE 5**  
**SUB-SLAB SOIL GAS ANALYTICAL RESULTS**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Results ( $\mu\text{g}/\text{m}^3$ )												
Sample Location	Date	Helium <sup>a</sup> (%)	TPH				Volatile and Semi-Volatile Compounds					
			Aliphatic Hydrocarbons (EC5-8)	Aliphatic Hydrocarbons (EC9-12)	Aromatic Hydrocarbons (EC9-10)	TPH (aliphatic C5-C12)	Benzene	Toluene	Ethylbenzene	Xylene-o	Xylene-m,p	Naphthalene
Adopted Criteria <sup>b</sup>		NA	NE	NE	NE	1,500	11	76,000	15,000	1,500	1,500	2.45
VB1	November 4, 2020	<0.6	<150	200	<92	350	<1.2	<70	<1.6	<1.6	5	<0.97

$\mu\text{g}/\text{m}^3$  - micrograms per cubic meter

TPH - Total Petroleum Hydrocarbons

APH - Air-phase Hydrocarbons (C5-C8 Aliphatics, C9-C12 Aliphatics, C9-C10 Aromatics)

NA - not applicable

NE - not established for this compound

<0.078 - not detected above laboratory method detection limit of  $0.78 \mu\text{g}/\text{m}^3$

**Bold** indicates exceedance of Screening Level

<sup>a</sup>Washington State Department of Ecology's Guidance for Evaluating Soil Vapor Intrusion in Washington State refers users to the Revised California Active Soil Gas Sampling Advisory for developing site soil gas sampling plans. Per the California Guidance, an ambient air leak up to 5% is acceptable if quantitative tracer testing is performed by shrouding.

<sup>b</sup>Washington State Department of Ecology Model Toxics Control Act (MTCA) Method B Clean Up for indoor air is used to develop this Screening Level for Sub-Slab Soil Gas using an attenuation factor of 0.03 per guidance in Memorandum 18 (Ecy doc. 17-09-043: May 2018).



**TABLE 6**  
**MULTIPHASE EXTRACTION SUMMARY**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

MPE Event Date	Product Thickness <sup>1</sup> (feet)						Removal Volume <sup>2</sup> (gallons)						
	RW1	MW3	MW12	MW15	MW1	MW2	RW1	MW3	MW12	MW15	MW1	MW2	Totals
10.5.16	6.2	5.6	-	-	5.27	0	184	158	-	-	52	0	394
10.20.16	3.16	5.36	-	-	2.79	0	1500	178	-	-	94	0	458
11.2.16	2.8	5.17	-	-	1.19	0	280	266	-	-	154	0	700
12.29.16	-	-	-	-	-	-	93	101	-	-	78	186	458
1.20.17	3.08	4.9	-	-	3.71	0.16	15	15	-	-	15	15	60
2.2.17	2.49	3.11	-	-	1.1	0	51	51	-	-	51	0	153
3.21.17	3.81	4.04	-	-	3.56	0	64	60	-	-	60	0	184
4.4.17*	2.62	3.5	-	-	0.24	0	20	30	-	-	30	0	140
4.20.17**	1.27	3.88	-	-	0.37	0	64	105	-	-	63	0	274
5.8.17	1.45	4.28	-	-	0.39	0	230	221	-	-	74	0	525
5.25.17	0.71	4.36	-	-	0.21	0	224	74	-	-	224	0	522
2.12.20	0.42	0.79	-	-	-	-	223	224	-	-	0	0	447
9.11.20	0.25	0	-	-	-	-	248	247	-	-	0	0	495
9.21.20	0.11	0	-	-	-	-	225	225	-	-	0	0	450
3.9.21	1.44	0.89	4.34	-	0.08	0.05	118	58	58	-	0	0	235
5.6.21	0.2	0.41	5.19	-	0	0.06	145	63	42	-	0	0	250
5.27.21	0.31	0.21	0.16	-	-	-	163	72	90	-	0	0	325
6.18.21	0	0		0	0	0	84	83	0	83	0	0	250
12.21.21	0	0	-	-	0	0	67	77	67	38	0	0	250
1.27.22	0	0.19	0	-	0	0	110	80	60	0	0	0	250
2.25.22	0	0	0	0	-	-	125	28	28	69	0	0	250
3.25.22	0.13	0.46	3.45	0	0.12	0	65	65	130	65	0	0	325
4.15.22	0.95	0.08	3.08	0	0.14	0	87	87	87	0	0	0	260
5.22.22	Unknown						62	62	62	62	0	0	250
6.21.22	0	1.23	1.36	0	-	-	83	83	83	0	0	0	250
7.18.22	0	1.38	0.18	0	-	-	50	100	50	50	0	0	250
<b>Totals:</b>							<b>4580</b>	<b>2813</b>	<b>757</b>	<b>367</b>	<b>895</b>	<b>201</b>	<b>8405</b>

1 - measured prior to vacuum extraction

2 - combination of LNAPL product and contaminated groundwater

\* - also pumped 30 gallons of water and product from each MW4 and MW5

\*\* - also pumped 42 gallons of water and product from MW4

**TABLE 7**  
**PRODUCT RECOVERY FROM IN-WELL SORBENTS**

Coleman Oil: 1 East I St., Yakima, WA

PBS Project No. 41392.000

Date	Product Thickness					Removal (gal)				
	RW1	MW3	MW5	MW8	MW12	RW1	MW3	MW5	MW8	MW12
7.28.21	0.00	0.20	0.09	0.20	0.17	Initial Sorbent Deployment				
8.6.21	-	-	-	-	-	-	#####	0.077	0.064	0.075
8.19.21	-	-	-	-	-	-	0.086	0.077	-	0.082
9.2.21	0.00	0.00	0.00	0.00	0.23	-	-	-	-	0.073
9.16.21	0.00	0.00	0.00	0.00	0.30	0.042	0.075	0.069	0.018	0.076
11.29.21	0.00	0.00	0.00	0.00	3.89	0.063	0.067	0.081	-	0.078
12.21.21	0.00	0.00	0.00	-	-	0.013	0.043	0.065	0.053	0.057
4.15.2022	0.95	0.08	0.40	0.27	3.08					
<b>Total</b>						<b>0.117</b>	<b>1500.27</b>	<b>0.37</b>	<b>0.136</b>	<b>0.44</b>

# **Appendix A**

## **Soil Boring and Well Construction Logs**



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING RW-1**

PBS PROJECT NUMBER:  
41392.000

BORING RW-1 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT						
0.0 - 10.0		Loose dark gray poorly graded GRAVEL (GP) with sand; medium sand; fine, subangular gravel; moist						<ul style="list-style-type: none"> <li>5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill</li> <li>4-inch PVC blank casing</li> </ul>
10.0 - 18.0		Well graded SAND (SW) with silt, gravel and cobbles; dark gray brown; loose; fine to coarse sand; coarse subrounded gravel; cobbles up to 4"; moist.		0.0			80	Hydrated Bentonite Seal
18.0 - 20.0		- grades to dense						
20.0 - 22.0		- grades to wet						
22.0 - 25.0			4/27/2016 	820				
25.0 - 28.0							95	Sand Filter Pack
28.0 - 30.0								4-inch 0.010-slotted PVC screen
30.0		Final depth 30.0 feet bgs; Groundwater encountered at approximately 18 feet					95	

BORING LOG-ENVY CORE\_41392.000\_MW1-12\_RW1 - COPY.GPJ\_DATATMPL.GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 4/27/16



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-1**

PBS PROJECT NUMBER:  
41392.000

BORING MW-1 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 8.0		Silty SAND (SM) with sand and gravel; brown; moderate plasticity; fine sand; fine, subrounded gravel; moist; [FILL].						5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill 2-inch PVC blank casing
8.0 - 10.0		Well graded SAND (SW) with silt, gravel, and cobbles to 4"; fine to coarse sand; coarse, subrounded gravel; moist.					90	Hydrated Bentonite Seal
10.0 - 25.0		- grades to wet	4/27/2016 	0.0 1000				Sand Filter Pack 2-inch 0.010-slotted PVC screen
25.0		Final depth 25.0 feet bgs; Groundwater encountered at approximately 18 feet		25			95	

BORING LOG-ENVY CORE 41392.000\_MW1-12\_RW1 - COPY.GPJ\_DATAIMPL.GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 4/27/16



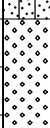
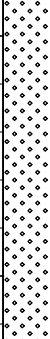

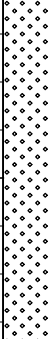



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-2**

PBS PROJECT NUMBER:  
41392.000

BORING MW-2 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 6.0		Silty SAND (SM) with gravel; brown; moderate plasticity; fine sand; fine, subrounded gravel; moist; [FILL].					70	<ul style="list-style-type: none"> <li>5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill</li> <li>2-inch PVC blank casing</li> </ul>
6.0 - 10.0		Well graded SAND (SW) with silt, gravel, and cobbles to 4"; gray; medium dense; low plasticity; fine to coarse sand; coarse, subrounded gravel; moist.		0.0				Hydrated Bentonite Seal
10.0 - 18.0		- grades to wet	4/27/2016 	0.0				Sand Filter Pack
18.0 - 25.0				0.0				2-inch 0.010-slotted PVC screen
25.0		Final depth 25.0 feet bgs; Groundwater encountered at approximately 18 feet		76				

BORING LOG-ENVY CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 4/27/16




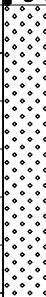

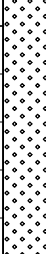


COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-3**

PBS PROJECT NUMBER:  
41392.000

BORING MW-3 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 5.0		Silty SAND (SM) with gravel; brown; moderate plasticity; fine sand; fine, subrounded gravel; moist; [FILL].					80	5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill 2-inch PVC blank casing
5.0 - 10.0		Well graded GRAVEL (GW) with sand; gray; fine to coarse sand; fine to coarse subrounded gravel; damp.						Hydrated Bentonite Seal
10.0 - 15.0		Well graded SAND (SW) with silt, gravel, and cobbles; gray; loose; fine to coarse sand; coarse, subrounded gravel; moist.					95	Sand Filter Pack
15.0 - 20.0		- wet; color change to gray/black, cobbles up to 5"		1200				
20.0 - 25.0			4/27/2016	464			95	2-inch 0.010-slotted PVC screen
25.0		Final depth 25.0 feet bgs; Groundwater encountered at approximately 18 feet		418				

BORING LOG-ENV CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 4/27/16



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-4**

PBS PROJECT NUMBER:  
41392.000

BORING MW-4 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Silty SAND (SM) with gravel, and cobbles; brown; loose; fine sand; coarse, subrounded gravel; moist; [FILL].						5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
5.0		Well graded SAND (SW) with gravel and cobbles; gray; medium dense; fine to coarse sand; coarse, subrounded gravel; moist		0.0	MW-4		90	2-inch PVC blank casing
10.0				15				Hydrated Bentonite Seal
15.0				0.0			90	
20.0				3.0			50	Sand Filter Pack
25.0				220				2-inch 0.010-slotted PVC screen
30.0				300+				
		Final depth 25.0 feet bgs; Groundwater encountered at approximately 18 feet						

BORING LOG-ENV CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 11/08/17





COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-5**

PBS PROJECT NUMBER:  
41392.000

BORING MW-5 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Silty SAND (SM) with gravel and cobbles; brown; moderate plasticity; fine sand; coarse, subrounded gravel; moist; [FILL].						5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
5.0		Well graded SAND (SW) with gravel and cobbles; gray; medium dense; fine to coarse sand; coarse, subrounded gravel; moist.					70	2-inch PVC blank casing
10.0				0.0				Hydrated Bentonite Seal
15.0							70	Sand Filter Pack
20.0		wet	11/8/2016 	15	MW-5a			2-inch 0.010-slotted PVC screen
25.0		color change to gray/black		250+			90	
25.0		Final depth 25.0 feet bgs; Groundwater encountered at approximately 18 feet						
30.0								

BORING LOG-ENVY CORE 41392.000\_MW1-12\_RW1 - COPY.GPJ\_DATA\TEMP\GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 11/08/17



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-6**

PBS PROJECT NUMBER:  
41392.000

BORING MW-6 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Silty SAND (SM) with gravel, and organics; brown; loose; moderate plasticity; fine sand; fine, subrounded gravel; moist; [FILL].						5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
5.0		Well graded SAND (SW) with gravel and cobbles; gray; medium dense; fine sand; coarse, subrounded gravel; moist		0.3				2-inch PVC blank casing
10.0				73	MW-6			Hydrated Bentonite Seal
15.0								Sand Filter Pack
20.0			11/8/2016 	300+				2-inch 0.010-slotted PVC screen
25.0		Final depth 25.0 feet bgs; Groundwater encountered at approximately 17 ft		300+				
30.0								

BORING LOG-ENV CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21-JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: M. Bagley  
COMPLETED: 11/08/17



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-7**

PBS PROJECT NUMBER:  
41392.000

BORING MW-7 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Gray gravel [FILL].						
0.0 - 5.0		Silty SAND (SM) with gravel; tan brown; medium dense; fine sand; fine to coarse subrounded gravel up to 1.5"; moist; no plasticity; [FILL].		0.0			100	5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
5.0 - 8.0		Well graded SAND (SW) with gravel; tan brown; fine to coarse sand; fine to coarse subrounded to subangular gravel; damp.		0.0			100	
8.0 - 10.0		cobbles @ 8'		0.0	MW-7-6.5	■	100	Hydrated Bentonite Seal 2-inch PVC blank casing
10.0 - 15.0		moist at 15'.		0.0			100	
15.0 - 20.0		cobbles @ 20'; wet; color change to gray.		0.0	MW-7-16	■	100	
20.0 - 25.0				0.0			100	Sand Filter Pack
25.0 - 30.0				0.0			100	2-inch 0.010-slotted PVC screen
30.0		Final depth 30.0 feet bgs.		0.1			100	

BORING LOG-ENV CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/18/19



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-8**

PBS PROJECT NUMBER:  
41392.000

BORING MW-8 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Gray rock chips; FILL						5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
0.0 - 9.0		Silty SAND (SM); tan brown; medium dense; non-plastic; fine sand; fine, subrounded gravel; moist; [FILL].		0.1				2-inch PVC blank casing
9.0 - 14.0		Well graded SAND (SW) with gravel and large cobbles; brown; dense; fine to coarse sand; coarse, subangular gravel; moist.		0.1				Hydrated Bentonite Seal
14.0 - 23.0		increased percentage gravel from 9 - 14'		0.1				
23.0 - 29.0		Increased percentage gravel, cobbles and boulders from 23 - 30'		0.4				
29.0 - 30.0		Color change to brown; wet		2.8				
30.0				2.2				very strong petroleum odor; heavy sheen.
				478				Sand Filter Pack
				809				2-inch 0.010-slotted PVC screen
				701				
				80				
				1.7				
				0.9				
				1.9				
30.0		Final depth 30 feet bgs.						

BORING LOG-ENVY CORE 41392.000\_MW1-12\_RW1 - COPY.GPJ\_DATAIMPL.GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: P. Brice  
COMPLETED: 12/18/18



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-9**

PBS PROJECT NUMBER:  
41392.000

BORING MW-9 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Silty SAND (SM); brown; medium dense; non-plastic; fine sand; fine gravel; dry [FILL].		0.0				5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill 2-inch PVC blank casing
5.0		Well graded SAND (SW) with gravel and cobbles to 4"; gray brown; dense; non-plastic; fine to coarse sand; coarse, subrounded gravel; dry.		0.0				Hydrated Bentonite Seal
10.0				0.1				
15.0		Becomes very moist		0.1				slight petroleum odor
20.0		Grades to medium to coarse sand and becomes wet		0.1				
25.0				0.2				Sand Filter Pack 2-inch 0.010-slotted PVC screen
30.0		color change to light brown		0.0				slight petroleum odor
		Final depth 30 feet bgs.		0.1				

BORING LOG-ENVY CORE 41392.000 MW1-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: P. Brice  
COMPLETED: 12/18/18



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-10**

PBS PROJECT NUMBER:  
41392.000

BORING MW-10 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION	
0.0		ASPHALT; FILL							
0.0 - 4.5		Silty SAND (SM); dark red-brown; medium dense; non-plastic; fine sand; fine gravel; moist; [FILL].		0.7	MW10-2			5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill	
4.5 - 5.0		Grades to dense with coarse, subrounded gravel		0.3					2-inch PVC blank casing
5.0 - 10.0		Well graded SAND (SW) with gravel and large cobbles; gray-brown medium dense; non-plastic; fine to coarse sand; coarse, subangular gravel; dry - Becomes surrounded gravel		0.2	MW10-14			Hydrated Bentonite Seal	
10.0 - 15.0		color change to brown		0.2					slight petroleum odor
15.0 - 20.0		increased percentage coarse vs fine sand; fining upwards sequence.		0.3					
20.0 - 25.0				0.6					
25.0 - 30.0				0.5					
30.0		Final depth 30.0 feet bgs.		0.5					
				0.3				Sand Filter Pack	
				0.3				2-inch 0.010-slotted PVC screen	
				0.3				slight petroleum odor	
				0.4					

BORING LOG-ENVY CORE\_41392.000\_MW10-12\_RW1 - COPY.GPJ\_DATAIMPL.GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 8-inch

LOGGED BY: P. Brice  
COMPLETED: 12/19/18



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-11**

PBS PROJECT NUMBER:  
41392.000

BORING MW-11 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Well sorted GRAVEL (GW); tan; coarse sand; fine to coarse subrounded gravel; damp; [FILL].		0.0				<p>5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill</p> <p>2-inch PVC blank casing Hydrated Bentonite Seal</p> <p>Sand Filter Pack</p> <p>2-inch 0.010-slotted PVC screen</p>
		Silty SAND (SM) with gravel; brown; medium dense; fine sand; coarse subrounded gravel; moist.		0.0			100	
		Well sorted SAND (SW) with gravel; dark brown to black; fine to coarse sand; fine to coarse subangular to subrounded gravel; damp.		0.0				
5.0		cobbles from 5 - 10'		0.0	MW-11-5.5			
				0.0			100	
				0.0				
10.0		Well graded GRAVEL (GW) with sand; gray brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; moist.		0.0	MW-11-12			
		increased percentage gravel from 10 - 18'		0.0			100	
		boulder at 15'; cobbles from 15 - 18'.		1.0				
				0.6				
		boulder at 18'.		37.2				
				0.0			100	
				0.0				
20.0		Well graded SAND (SW) with gravel; tan brown; fine to coarse sand; course subangular gravel; wet.		1.1				
				0.3				
				0.0			100	
				0.0				
				1.5				
25.0		boulder at 25'		23.9				
		increased percentage coarse vs fine sand		16.7				
				0.6			100	
				0.3				
				2.2				
30.0		Final depth 30.0 feet bgs.		0.2			100	

BORING LOG-ENVY CORE 41392.000 MW11-12 RW1 - COPY.GPJ DATATMPL.GDT PRINT DATE: 1/11/21-JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/16/19



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-12**

PBS PROJECT NUMBER:  
41392.000

BORING MW-12 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Poorly graded GRAVEL (GP); coarse sand; coarse subrounded gravel; damp; [FILL].		0.0				5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
		Silty SAND (SM) with gravel; tan brown; medium stiff; fine sand; fine to coarse subrounded gravel; damp.		0.0				
5.0		Well graded SAND (SW) with gravel; tan brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; cobbles; damp.		0.0		MW-12-6	100	2-inch PVC blank casing Hydrated Bentonite Seal
				0.0				
10.0		Well graded GRAVEL (GW) with sand; tan; fine to coarse sand; fine to coarse subrounded gravel; cobbles; damp.		0.0		MW-12-14	100	Sand Filter Pack 2-inch 0.010-slotted PVC screen
				0.0				
15.0		Well graded SAND (SW) with gravel; tan brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; cobbles; damp.		0.0			100	strong petroleum odor 23 to 30'
				0.1				
				0.6				
				0.3				
				0.1				
				0.1				
				0.3				
				0.1				
				71.1				
				44.7				
				63.9				
				562.3				
				676				
				869				
				1189				
				1077				
				225				
				7.8				
30.0		Final depth 30.0 feet bgs.		6.9				

BORING LOG-ENVY CORE 41392.000\_MW1-12\_RW1 - COPY.GPJ\_DATA\TPL\_GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: M. Bagley  
COMPLETED: 12/17/19





COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-13**

PBS PROJECT NUMBER:  
41392.000

BORING MW-13 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		2" ASPHALT; FILL.						
0.0 - 4.5		Poorly graded GRAVEL (GP); fine to coarse sand; fine to coarse subangular gravel; moist; road base [FILL].		0.0				
4.5 - 5.0		Brown Silty SAND (SM) with gravel; fine to coarse sand; fine to coarse subangular gravel; moist.		0.0			100	
5.0 - 10.0		Gray to brown well graded SAND (SW) with gravel; fine to coarse sand; fine to coarse subangular gravel; dry.		0.0	MW-13-5	■	100	5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
10.0 - 15.0		Medium stiff brown Silty SAND (SM) with gravel; fine to coarse sand; coarse subrounded gravel; moist.		0.0			100	2-inch PVC blank casing Hydrated Bentonite Seal
15.0 - 22.0		Well graded GRAVEL (GW) with sand; gray; fine to coarse sand; fine to coarse subangular gravel; occasional subrounded cobbles up to 5"; moist.		0.0	MW-13-12	■	100	
22.0 - 25.0		Well graded SAND (SW) with gravel; gray to brown; fine to coarse sand; fine to coarse subangular gravel; wet.		0.0			100	PID Malfunction. 17' - 25' Fuel odor; strong at 17', decreasing to faint at 25'.
25.0 - 30.0		Well graded SAND (SW) with gravel; gray to brown; fine to coarse sand; fine to coarse subangular gravel; wet.	ATD 				100	Sand Filter Pack 2-inch 0.010-slotted PVC screen
30.0		Final depth 30.0 feet bgs; Groundwater encountered at 25'.					100	

BORING LOG-ENVY CORE\_41392.000\_MW13-12\_RW1 - COPY.GPJ\_DATA\TEMP\GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 9/03/20



COLEMAN OIL - YAKIMA  
1 EAST I STREET  
YAKIMA, WASHINGTON

**BORING MW-14**

PBS PROJECT NUMBER:  
41392.000

BORING MW-14 LOCATION:  
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		2" ASPHALT; FILL.						
0.0 - 3.5		Poorly graded GRAVEL (GP); non-plastic; fine to coarse sand; fine to coarse subangular gravel; dry; road base [FILL].						PID malfunction: no readings.
3.5 - 5.0		Medium stiff brown Silty SAND (SM) with occasional gravel; non-plastic; fine to coarse sand; coarse subangular gravel; dry. Boulder at 3.5'					100	5-inch x 12-inch flush-mount monument with 1 foot of concrete backfill
5.0 - 6.0		Well graded GRAVEL (GW) with silt and sand; fine to coarse sand; fine to coarse subangular gravel; dry. Fist-sized cobble at 6'			MW-14-5	■		
6.0 - 7.0		Well graded SAND (SW) with gravel; gray brown; fine to coarse sand; fine to coarse subangular gravel; dry. 3" cobbles at 6.5' and 7'					100	2-inch PVC blank casing
7.0 - 23.0		Well graded GRAVEL (GW) with sand; gray brown; fine to coarse sand; fine to coarse subangular gravel; occasional subrounded cobbles up to 5"; moist. Becomes wet at 23'			MW-14-13.5	■		Hydrated Bentonite Seal
23.0 - 27.5		Well graded GRAVEL (GW) with sand; gray brown; fine to coarse sand; fine to coarse subangular gravel; occasional subrounded cobbles up to 5"; moist. Becomes wet at 23'					100	Sand Filter Pack
27.5 - 30.0		Fist-sized cobble at 27.5'					100	2-inch 0.010-slotted PVC screen
30.0		Final depth 30.0 feet bgs; Groundwater encountered at 27.5'.					100	Slight weathered fuel odor.
								Slight fuel odor.

BORING LOG-ENVY CORE\_41392.000\_MW14-12\_RW1 - COPY.GPJ\_DATAIMPL.GDT\_PRINT DATE: 1/11/21:JW

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 9/04/20



COLEMAN OIL

**BORING BH1**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH1 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Coarse rock chips						
2.0		Silty SAND (SM) with gravel; reddish brown; no plasticity; fine sand; fine gravel; damp; [FILL].		2.2 8.0	BH1-2			
4.0		Well graded SAND (SW) with gravel and trace cobbles; light gray; fine to coarse sand; fine to coarse subrounded gravel; damp.		1.7 1.8			100	
6.0		Silty SAND layer 10-13'; (SM) with gravel; tan brown; fine to coarse sand; fine to coarse subrounded gravel; damp; fining upwards sequence.		0.5 0.6	BH1-12			
8.0				1.0				
10.0				0.9			100	
12.0				0.4				
14.0				262				Petroleum odor
16.0		color change to gray; transition from damp to moist		2.0				
18.0		increased percentage coarse vs fine sand from 18 - 25'		403				weathered petroleum odor
20.0		transition moist to wet		177			100	petroleum odor
22.0				1.6				weathered petroleum odor; sheen observed on groundwater sample
24.0								
26.0								
28.0								
30.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/19/18



COLEMAN OIL

BORING BH2

1 E. I STREET  
 YAKIMA, WASHINGTON  
 PBS PROJECT NUMBER:  
 41392.000

BORING BH2 LOCATION:  
 (See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		SAND with gravel (SP); tan; coarse sand; fine subrounded gravel; moist; [FILL].						
2.0		Silty SAND (SM) with gravel; reddish brown; no plasticity; fine sand; fine gravel; damp; [FILL].		1.0	BH2-2			
4.0				0.4				
6.0		Well graded SAND (SW) with gravel and trace cobbles; light gray; fine to coarse sand; fine to coarse subrounded gravel; damp.		0.6			100	
8.0				0.4				
10.0				10.4				
12.0		Silty SAND layer 10-13'; (SM) with gravel; tan gray; trace cobbles; fine to coarse sand; coarse subrounded gravel; damp; fining upwards sequence.		0.7				
14.0					BH2-14		100	
16.0		petroleum odor at 16 feet		758				Petroleum odor
18.0		transition from moist to wet						Strong petroleum odor
20.0				493				
22.0		increased percentage coarse vs fine sand from 13 - 25'		1.5				
24.0				1.5			100	weathered petroleum odor 20 - 25 feet
26.0				1.4				
30.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
 DRILLED BY: Holt Services  
 BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
 COMPLETED: 12/19/18



COLEMAN OIL

BORING BH3

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH3 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
2.0		Silty SAND (SM) with gravel; medium stiff; reddish brown; no plasticity; fine sand; fine subrounded gravel; moist.		0.5				
3.0				0.3	BH3-2			
6.0		Well graded SAND with gravel (SW); brown/tan; fine to coarse sand; coarse subangular gravel; moist.		0.5			100	
8.0		color change to reddish brown; transition from subangular to subrounded gravel.		0.3				
10.0		transition from moist to dry		0.3				
12.0		Silty SAND layer 10-13' (SM) with gravel and cobbles; light gray; medium to coarse sand; coarse subrounded gravel; damp; fining upwards sequence.		0.6				
14.0				0.3	BH3-14		100	
16.0		transition from moist to wet increased percentage coarse vs fine sand		0.7				
18.0				236				petroleum odor
20.0				506				strong petroleum odor
22.0				1668			100	
24.0		increased percentage cobbles		59				sheen observed on groundwater sample
26.0								
28.0								
30.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/20/18



COLEMAN OIL

BORING BH4

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH4 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Coarse rock chips. [Fill]						
2.0		Silty SAND (SM) with gravel; reddish brown; no plasticity; medium stiff; fine sand; fine subrounded gravel; damp; [FILL].			BH4-2			
4.0				0.1				
6.0		Well graded SAND with gravel and cobbles (SW); reddish brown; fine to coarse sand; fine to coarse subrounded gravel; moist.		0.5			100	
8.0				0.2				
10.0				0.1				
12.0		Silty SAND layer from 10-13'; (SM) with gravel; tan gray; fine to coarse sand; coarse subrounded gravel; trace cobbles; damp; fining upwards sequence. increased percentage coarse vs fine sand from 13-25'		1.6	BH4-12			
14.0				1.0			100	
16.0				451				strong petroleum odor
18.0				498				strong petroleum odor
20.0		strong petroleum odor 16 to 23 feet		520				
22.0		transitions from moist to wet at 22 feet		287			100	
24.0				56				strong petroleum odor
26.0				1.6				sheen observed on groundwater sample

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/19/18



COLEMAN OIL

**BORING BH5**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH5 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
0.0 - 2.0		Silty SAND (SM) with gravel; medium stiff; reddish brown; no plasticity; fine sand; fine subrounded gravel; damp; [ FILL].		0.3	BH5-2			
2.0 - 6.0		Silty SAND with gravel and cobbles (SM); brown/tan; fine to coarse sand; fine to coarse subrounded gravel; damp.		0.2			100	
6.0 - 8.0		Well graded SAND (SW) with gravel; gray tan; fine to coarse sand; fine to coarse subrounded gravel; damp.		0.3				
8.0 - 10.0				0.4				
10.0 - 12.0				0.3				
12.0 - 14.0				0.4				
14.0 - 16.0				0.5	BH5-13			
16.0 - 18.0				0.2			100	
18.0 - 20.0				4.8				petroleum odor
20.0 - 22.0				148				
22.0 - 24.0				36				
24.0 - 26.0				88				petroleum odor
26.0 - 28.0				100				slight petroleum odor
28.0 - 30.0				100				
		transition from moist to wet at 21 feet		3.1				sheen observed on groundwater sample

BORING LOG-ENV CORE-41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/20/18



COLEMAN OIL

**BORING BH6**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH6 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
0.0 - 2.0		Silty SAND (SM) with gravel; stiff; reddish brown; no plasticity; fine sand; fine to coarse subrounded gravel; moist; [FILL].		0.2	BH6-2			
2.0 - 8.0		Well graded SAND with gravel and cobbles (SW); gray brown; fine to coarse sand; fine to coarse subrounded gravel; damp.		0.3			100	
8.0 - 10.0				0.2				
10.0 - 13.0		Silty SAND layer from 10-13'; (SM) with gravel and cobbles; brown; fine to coarse sand; coarse subrounded gravel; damp; fining upwards sequence.		0.2				
13.0 - 14.0				0.2	BH6-14		100	
14.0 - 16.0				0.2				
16.0 - 18.0				1.3				
18.0 - 20.0				0.6				
20.0 - 22.0		transition from moist to wet at 20 feet		2.2				strong petroleum odor
22.0 - 24.0				122			100	
24.0 - 26.0				1.4				petroleum odor
26.0 - 30.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/20/18





COLEMAN OIL

BORING BH7

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH7 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
2.0		Silty SAND (SM) with gravel; medium stiff; reddish brown; no plasticity; fine sand; fine subrounded gravel; moist; [FILL].		0.4	BH7-2			
4.0		fine to coarse gravel from 3 to 8 feet		0.2			100	
8.0		Well graded Sand with gravel (SW); brown gray; fine to coarse sand; fine to coarse subrounded gravel; moist.		0.2				
10.0		Silty SAND layer from 10-13'; (SM) with gravel and cobbles; brown gray; fine to coarse sand; coarse subrounded gravel; moist; fining upwards sequence. cobbles from 10 to 15 feet		0.4	BH7-13			
12.0		color change to reddish brown; increased percentage coarse vs fine sand		1.2			100	
16.0		transition from moist to wet at 18 feet		2.3				weathered petroleum odor
18.0				383				strong petroleum odor
20.0				927				
22.0				225			100	
24.0				2.3				thick sheen and strong petroleum odor observed on groundwater sample
26.0								
28.0								
30.0								

BORING LOG-ENV CORE-41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/20/18



COLEMAN OIL

**BORING BH8**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH8 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt.						
0.0 - 2.0		Gravel fill.						
2.0 - 4.0		Silty SAND (SM) with gravel; brown; fine sand; fine subangular gravel; moist.		0.0	BH8-4		60	
4.0 - 6.0		Well sorted SAND (SW) with gravel; brown gray; fine to coarse sand; coarse subrounded gravel; damp.		0.0				
6.0 - 8.0				0.0			100	
8.0 - 10.0				0.0				
10.0 - 12.0		Silty SAND layer from 10-13'; (SM) with gravel and cobbles; brown gray; fine to coarse sand; coarse subrounded gravel; damp; fining upwards sequence.		0.1	BH8-12		100	
12.0 - 14.0								
14.0 - 15.0		increased percentage coarse vs fine sand from 13-15'						
15.0 - 16.0								
16.0 - 18.0								
18.0 - 20.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: P. Brice  
COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH9**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH9 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
2.0		Silty SAND with gravel (SM); dense; no plasticity; fine sand; fine subrounded gravel; moist.		0.0			60	
4.0		Well graded SAND with gravel (SW); gray brown; fine to coarse sand; fine to coarse subrounded gravel; damp.		0.0	BH9-4			
6.0		transition from fine to coarse subrounded gravel to coarse subangular gravel		0.0				
8.0				0.0	BH9-8		100	
10.0				0.0				
12.0								
14.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: P. Brice  
COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH10**

1 E. I STREET  
 YAKIMA, WASHINGTON  
 PBS PROJECT NUMBER:  
 41392.000

BORING BH10 LOCATION:  
 (See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
1.0		Silty SAND (SM) with gravel; dense; no plasticity; brown; fine sand; coarse subrounded gravel; moist; [FILL].		0.0				
2.0							60	
3.0								
4.0		Well graded SAND with gravel (SW); gray brown; fine to coarse sand; fine to coarse subangular to subrounded gravel; damp.		0.0	BH10-4			
5.0				0.0				
6.0					BH10-6		100	
7.0								
8.0								
9.0								
10.0								

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
 DRILLED BY: Holt Services  
 BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: P. Brice  
 COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH11**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH11 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt and road base						
2.0		Silty SAND (SM) with gravel; stiff; no plasticity; brown; fine sand; fine subangular gravel; moist; [FILL].		0.0			60	
4.0				0.0	BH11-4			
6.0		Well graded SAND with gravel (SW); gray brown; fine to coarse sand; coarse subangular to subrounded gravel; damp.		0.0				
8.0				0.0	BH11-8		100	
10.0				0.0				
12.0								
14.0								

BORING LOG-ENV CORE-41392.000 BH11-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: P. Brice  
COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH12**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH12 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt.						
0.0 - 7.5		Silty SAND (SM) with gravel; dense; no plasticity; brown; fine sand; fine subrounded gravel; moist.			BH12-3		60	
7.5 - 10.0		Well graded SAND with gravel (SW); brown; fine to coarse sand; coarse subangular to subrounded gravel; damp.		0.0				
10.0 - 14.0				0.0	BH12-8		100	
14.0 - 15.0							100	

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: P. Brice  
COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH13**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH13 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Asphalt/road base						
2.0		Silty SAND (SM) with gravel; brown; fine sand; fine subangular gravel; moist; [FILL].		0.0			60	
4.0				0.0	BH13-4			
6.0		Well graded SAND with gravel (SW); brown gray; fine to coarse sand; coarse subangular to subrounded gravel; damp.		0.0				
8.0				0.0			100	
10.0				0.0	BH13-9			
12.0							100	
14.0								

BORING LOG-ENV CORE-41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: P. Brice  
COMPLETED: 6/04/19



COLEMAN OIL

**BORING BH14**

1 E. I STREET  
YAKIMA, WASHINGTON  
PBS PROJECT NUMBER:  
41392.000

BORING BH14 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Poorly graded GRAVEL with sand (GP); coarse sand; coarse subangular gravel; [FILL].		0.0				
2.0		Silty SAND (SM) with gravel; brown; medium dense; fine sand; fine subrounded gravel; moist; [FILL].		0.0			100	
4.0		Well graded SAND with gravel (SW); tan brown; fine to coarse sand; coarse subangular to subrounded gravel; damp to moist.		0.0				
6.0				0.5				
8.0				0.1	BH14-6	█		
10.0				0.1			100	
12.0		cobbles at 12'		0.1				
14.0				0.1				
16.0				0.1	BH14-16			
18.0				0.1			100	
20.0				18.9				
22.0				20.5				
24.0				357				
26.0				582			100	
28.0				415				
30.0				820				Strong petroleum odor 23-25'
				234				
				4.5				
				1.1			100	
				0.8				
				0.0				
				0.0				

BORING LOG-ENV CORE-41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
COMPLETED: 12/18/19





COLEMAN OIL

**BORING BH15**

1 E. I STREET  
 YAKIMA, WASHINGTON  
 PBS PROJECT NUMBER:  
 41392.000

BORING BH15 LOCATION:  
 (See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		Poorly graded GRAVEL with sand (GP); coarse sand; coarse subangular gravel; [FILL].		0.0				
2.0		Silty SAND (SM) with gravel; brown; fine sand; fine subrounded gravel; moist.		0.0			100	
4.0		Well graded SAND with gravel (SW); tan brown; fine to coarse sand; coarse subangular to subrounded gravel; damp to moist.		0.0				
6.0		cobbles at 6'		0.2	BH15-6		100	
8.0				0.0				
10.0				0.0				
12.0				0.2			100	
14.0				0.1				
16.0				0.0				
18.0				5.6				
20.0				0.9			100	
22.0				0.8				
24.0				0.8				
26.0				1.0				
28.0				1.1	BH15-22		100	Strong petroleum odor from 21 to 22'
30.0				409				

BORING LOG-ENV CORE - 41392.000 BH1-BH15.GPJ DATATMPL.GDT PRINT DATE: 1/20/20

BORING METHOD: Sonic Drilling  
 DRILLED BY: Holt Services  
 BORING BIT DIAMETER: 4-inch

LOGGED BY: P. Brice  
 COMPLETED: 12/18/19



COLEMAN OIL  
1 E. I STREET  
YAKIMA, WASHINGTON

**BORING VB-1**

PBS PROJECT NUMBER:  
41392.000

BORING VB-1 LOCATION:  
(See Figure 2)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION	
0.0		<b>GRAVEL with sand (GP); dark gray; fine to coarse sand; subangular fine gravel; moist; [Fill].</b>							
1.0									
2.0									
3.0									
4.0									
5.0						0.0			20
6.0									
7.0						0.0			
8.0						2.6			
8.0						0.0			33


BORING LOG-ENV CORE - 41392.000 VB-1.GPJ DATATMPL.GDT PRINT DATE: 6/14/19 JW

BORING METHOD: Direct Push  
DRILLED BY: Holt Services  
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: P. Brice  
COMPLETED: 12/19/18

# **Appendix B**

## **Sampling Datasheets**


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/2019
		<b>Monitoring Well ID</b> MW-1
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>
<b>Screen Interval (feet bgs)</b>	9.9-25.9	<b>Sample Time</b>
<b>Well depth (feet bgs)</b>	25.9	<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected <b>type:</b> _____ ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>		
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b> P. Brice
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b> Sunny, 50° F

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 21.19 feet bTOC**  
**Depth to Water: 21.37 feet bTOC**  
**Product thickness: 0.18 feet**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000  <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant  <b>Date:</b> 3/19/19	
		<b>Monitoring Well ID</b>	<b>MW-2</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	10.3-25.3	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25.3	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>


WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 21.98 feet bTOC**  
**Depth to Water: 22.22 feet bTOC**  
**Product thickness: 0.24 feet**

**Product sample collected with bailer**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000  <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant  <b>Date:</b> 3/19/19
		<b>Monitoring Well ID</b> MW-3
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>
<b>Screen Interval (feet bgs)</b>	14-24	<b>Sample Time</b>
<b>Well depth (feet bgs)</b>	24	<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected <b>type:</b> _____ ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>		
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b> P. Brice
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b> Sunny, 50° F

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.14 feet bTOC**  
**Depth to Water: 22.53 feet bTOC**  
**Product thickness: 0.39 feet**

**Product sample collected with bailer**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/19	
		<table style="width:100%; border: none;"> <tr> <td style="border: none;"><b>Monitoring Well ID</b></td> <td style="border: none;">MW-4</td> </tr> </table>	<b>Monitoring Well ID</b>
<b>Monitoring Well ID</b>	MW-4		
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25	<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	
		<b>P. Brice</b> <b>Sunny, 50° F</b>	


WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 21.03 feet bTOC**  
**Depth to Water: 21.28 feet bTOC**  
**Product thickness: 0.25 feet**  
  
**Product sample collected with bailer**

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Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/19
		<b>Monitoring Well ID</b> MW-5
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>		
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>
		<b>P. Brice</b>  <b>Sunny, 50° F</b>

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.09 feet bTOC**  
**Depth to Water: 22.36 feet bTOC**  
**Product thickness: 0.27 feet**

**Product sample collected with bailer**

Signature of Field Personnel: PB





PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 3/19/19

Monitoring Well ID MW-6

Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-25	Sample Time	
Well depth (feet bgs)	25	QC Sample type: _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	-	Field Personnel	P. Brice
Purge Rate (L/min)		Weather Conditions	Sunny, 50° F


**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					<input type="checkbox"/> ltr	<input type="checkbox"/> gal
<b>Total Volume Purged</b>											

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.97 feet bTOC**  
**Depth to Water: 20.00 feet bTOC**  
**Product thickness: 0.03 feet**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No: 41392.000</b>  <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b>  <b>Date: 3/19/19</b>	
		<b>Monitoring Well ID</b>	<b>MW-8</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	14-29	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29	<b>QC Sample type:</b> _____ <input type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>


WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 21.39 feet bTOC**  
**Depth to Water: 22.44 feet bTOC**  
**Product thickness: 1.05 feet**

**Product sample collected with bailer**

Signature of Field Personnel: PB


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/19	
		<b>Monitoring Well ID</b>	MW-9
<b>Initial DTW (feet bgs)</b>	22.45	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	16-31	<b>Sample Time</b>	1342
<b>Well depth (feet bgs)</b>	31	<b>QC Sample type:</b> <input type="checkbox"/> Not collected ID__Dup1_____ Time_1200__	
<b>Depth of pump/tubing inlet (feet bgs)</b>	25		
<b>Sampling method (describe pump or sampler)</b>	Peristaltic	<b>Field Personnel</b>	C. Grant
<b>Purge Rate (L/min)</b>	0.1	<b>Weather Conditions</b>	Sunny, 50° F

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
								<b>pump on</b>	
		13.93	0.421	2.55	7.09	121.5	2.93	clear	
		13.96	0.420	2.20	7.10	110.7	0.82		
		13.97	0.419	2.02	7.11	98.1	0.50		
		13.99	0.419	1.90	7.12	91.2	0.80		
		13.99	0.418	1.89	7.12	75.5	1.17		
		13.95	0.417	1.79	7.12	64.2	1.04		
		13.98	0.417	1.74	7.12	62.4	0.78		
								<b>Pump off</b>	
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

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Signature of Field Personnel: CG

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/19	
		<b>Monitoring Well ID</b> MW-10	
<b>Initial DTW (feet bgs)</b>	20.45	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	<b>1155</b>
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____	<input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>	22.5		
<b>Sampling method (describe pump or sampler)</b>	Peristaltic	<b>Field Personnel</b>	<b>C. Grant</b>
<b>Purge Rate (L/min)</b>	0.1	<b>Weather Conditions</b>	<b>Sunny, 50° F</b>

WELL PURGING INFORMATION									
<input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
								<b>Pump on</b>	
		<b>12.75</b>	<b>3.12</b>	<b>0.486</b>	<b>6.59</b>	<b>237.2</b>	<b>4.86</b>	<b>Floating particles</b>	
		<b>13.02</b>	<b>2.00</b>	<b>0.455</b>	<b>6.02</b>	<b>236.4</b>	<b>3.28</b>	<b>Clear</b>	
		<b>13.16</b>	<b>2.54</b>	<b>0.453</b>	<b>6.61</b>	<b>236.4</b>	<b>1.64</b>		
		<b>13.24</b>	<b>3.0</b>	<b>0.451</b>	<b>6.60</b>	<b>237.4</b>	<b>1.09</b>		
		<b>13.28</b>	<b>2.43</b>	<b>0.449</b>	<b>6.61</b>	<b>238.8</b>	<b>1.21</b>		
		<b>13.31</b>	<b>2.30</b>	<b>0.448</b>	<b>6.61</b>	<b>239.4</b>	<b>1.67</b>		
								<b>Pump off</b>	
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: CG

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 3/19/19	
		<b>Monitoring Well ID</b>	RW-1
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____ ID _____ Time _____	<input type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			ID _____ Time _____
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>


WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.18 feet bTOC**  
**Depth to Water: 24.30 feet bTOC**  
**Product thickness: 2.12 feet**

**Product sample collected with bailer**

Signature of Field Personnel: PB


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 2/25/2020	<b>Monitoring Well ID</b> MW-1
		<b>Initial DTW (feet bgs)</b>	<b>Sample ID (if not well ID)</b>
		<b>Screen Interval (feet bgs)</b> 9.9-25.9 <b>Well depth (feet bgs)</b> 25.9 <b>Depth of pump/tubing inlet (feet bgs)</b>	<b>Sample Time</b>  <b>QC Sample type:</b> _____ <input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Sampling method (describe pump or sampler)</b> -	<b>Field Personnel</b> P. Brice		
<b>Purge Rate (L/min)</b>	<b>Weather Conditions</b> Sunny, 45° F		

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 21.80 feet bTOC**  
**Depth to Water: 22.03 feet bTOC**  
**Product thickness: 0.23 feet**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000	<b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant
		<b>Date:</b> 2/25/2020	
		<b>Monitoring Well ID</b>	MW-2
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	10.3-25.3	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25.3	<b>QC Sample type:</b> _____	<input checked="" type="checkbox"/> Not collected ID_____ Time_____
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	P. Brice
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	Sunny, 45° F

**WELL PURGING INFORMATION**


Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged** \_\_\_\_\_

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.50 feet bTOC**  
**Depth to Water: 22.61 feet bTOC**  
**Product thickness: 0.11 feet**

Signature of Field Personnel: PB

	PBS Engineering and Environmental Inc.  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	Project No: 41392.000	Project Name/Location: Coleman Oil Yakima Bulk Fuel Plant
		Date: 2/25/2020	
Initial DTW (feet bgs)		Monitoring Well ID	MW-3
Screen Interval (feet bgs)	14-24	Sample ID (if not well ID)	
Well depth (feet bgs)	24	Sample Time	
Depth of pump/tubing inlet (feet bgs)		QC Sample type: _____	<input checked="" type="checkbox"/> Not collected ID_____ Time_____
Sampling method (describe pump or sampler)	-	Field Personnel	P. Brice
Purge Rate (L/min)		Weather Conditions	Sunny, 45° F

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
 Depth to product: 22.63 feet bTOC  
 Depth to Water: 23.54 feet bTOC  
 Product thickness: 0.91 feet

Signature of Field Personnel: PB





**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 2/25/2020

**Monitoring Well ID** MW-4


<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID_____ Time_____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)**  
 Well was not sampled due to presence of product.  
 Depth to product: 21.56 feet bTOC  
 Depth to Water: 21.74 feet bTOC  
 Product thickness: 0.18 feet

Signature of Field Personnel: PB


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000  <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant  <b>Date:</b> 2/25/2020	<b>Monitoring Well ID</b> MW-5
		<b>Initial DTW (feet bgs)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	P. Brice
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	Sunny, 45° F

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.68 feet bTOC**  
**Depth to Water: 22.80 feet bTOC**  
**Product thickness: 0.12 feet**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 2/25/2020	
		<b>Monitoring Well ID</b>	<b>MW-6</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 20.81 feet bTOC**  
**Depth to Water: 20.89 feet bTOC**  
**Product thickness: 0.08 feet**

Signature of Field Personnel: PB



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No: 41392.000**

**Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant**

**Date: 2/25/2020**

**Monitoring Well ID: MW-7**

<b>Initial DTW (feet bgs)</b>	20.96	<b>Sample ID (if not well ID)</b>	<b>MW7-022520</b>
<b>Screen Interval (feet bgs)</b>	15-29.4	<b>Sample Time</b>	<b>1307</b>
<b>Well depth (feet bgs)</b>	29.4	<b>QC Sample type:</b> _____	<input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>	23		
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>	0.1	<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

**WELL PURGING INFORMATION**


<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
				<input type="checkbox"/> mS/cm	<input checked="" type="checkbox"/> µS/cm					<input type="checkbox"/> ltr	<input type="checkbox"/> gal
	20.96	14.10	1.40	458	6.79	9.0	-				
		14.13	1.00	456	6.80	4.9	-				
		14.20	0.98	457	6.79	1.4	-				
		14.16	0.88	457	6.78	-1.3	-				
		14.22	0.70	457	6.78	-2.5	-				

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Turbidimeter not functioning. Purge water clear, no odor, trace floating particles.**

Signature of Field Personnel: PB


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No: 41392.000</b>  <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b>  <b>Date: 2/25/2020</b>	
		<b>Monitoring Well ID</b>	<b>MW-8</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	14-29	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29	<b>QC Sample type:</b> _____ <input type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 23.15 feet bTOC**  
**Depth to Water: 21.92 feet bTOC**  
**Product thickness: 1.23 feet**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No: 41392.000</b>  <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b>  <b>Date: 2/25/2020</b>	
		<b>Monitoring Well ID</b>	<b>MW-9</b>
<b>Initial DTW (feet bgs)</b>	22.48	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	16-31	<b>Sample Time</b>	<b>1211</b>
<b>Well depth (feet bgs)</b>	31	<b>QC Sample type:</b> <input type="checkbox"/> Not collected ID <u>Dup1-022520</u> Time <u>1200</u>	
<b>Depth of pump/tubing inlet (feet bgs)</b>	24.5		
<b>Sampling method (describe pump or sampler)</b>	Peristaltic	<b>Field Personnel</b>	<b>A. McGuire</b>
<b>Purge Rate (L/min)</b>	0.1	<b>Weather Conditions</b>	<b>Sunny, 45° F</b>


WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
	<b>22.48</b>	<b>13.80</b>	<b>2.30</b>	<b>530</b>	<b>6.94</b>	<b>-9.0</b>	-	<b>Clear</b>	
		<b>13.73</b>	<b>1.75</b>	<b>531</b>	<b>6.94</b>	<b>-10.5</b>	-		
		<b>13.79</b>	<b>1.61</b>	<b>531</b>	<b>6.93</b>	<b>-14.1</b>	-		
		<b>13.86</b>	<b>1.44</b>	<b>531</b>	<b>6.94</b>	<b>-17.1</b>	-		
		<b>13.93</b>	<b>1.25</b>	<b>531</b>	<b>6.94</b>	<b>-19.1</b>	-		
		<b>13.96</b>	<b>1.19</b>	<b>530</b>	<b>6.93</b>	<b>-20.5</b>	-		
		<b>13.97</b>	<b>1.07</b>	<b>530</b>	<b>6.93</b>	<b>-21.8</b>	-		
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Turbidimeter not functioning. Water clear, no odor.**

Signature of Field Personnel: AM



	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 2/25/2020	
		<b>Monitoring Well ID</b>	<b>MW-10</b>
<b>Initial DTW (feet bgs)</b>	20.95	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	<b>1122</b>
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>	22.5		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>P. Brice / A. McGuire</b>
<b>Purge Rate (L/min)</b>	0.1	<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
1100	20.95	13.41	2.44	1126	6.28	-12.3	-	clear	
1103		13.53	2.24	1123	6.28	-7.0	-	clear	
1106		13.87	2.01	1120	6.27	-3.1	-	clear	
1109		13.81	1.84	1123	6.30	-0.6	-	clear	
1112		13.89	1.65	1122	6.29	0.6	-	clear	
1116		14.03	1.44	1123	6.29	1.4	-	clear	
1119		14.11	1.33	1123	6.29	1.5	-	clear	
1122		14.13	1.24	1125	6.29	1.4	-	clear	
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Turbidimeter not functioning. Water clear, no odor**

Signature of Field Personnel: AG/PB





**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No: 41392.000**

**Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant**

**Date: 2/25/2020**

**Monitoring Well ID MW12**

**Initial DTW (feet bgs)**

**Sample ID (if not well ID)**

**Screen Interval (feet bgs)**

15-29.4

**Sample Time**

**Well depth (feet bgs)**

29.4

**QC Sample**

Not collected

**Depth of pump/tubing inlet (feet bgs)**

**type:** \_\_\_\_\_

ID\_\_\_\_\_ Time\_\_\_\_\_

**Sampling method (describe pump or sampler)**

-

**Field Personnel**

**P. Brice / A. McGuire**

**Purge Rate (L/min)**

**Weather Conditions**

**Sunny, 45° F**

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> µS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 24.15 feet bTOC**  
**Depth to Water: 28.05 feet bTOC**  
**Product thickness: 3.9 feet**

**Product sample collected with bailer.**

Signature of Field Personnel: PB/AG



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No: 41392.000**

**Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant**

**Date: 2/25/2020**

**Monitoring Well ID: RW-1**

<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____ ID _____ Time _____	<input type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P. Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 45° F</b>

**WELL PURGING INFORMATION**


Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 22.91 feet bTOC**  
**Depth to Water: 23.28 feet bTOC**  
**Product thickness: 0.37 feet**

Signature of Field Personnel: PB


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 11/4/2020	
		<b>Monitoring Well ID</b>	<b>MW-1</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	9.9-25.9	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25.9	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>J. Welles</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 17.92 feet bTOC**  
**Depth to Water: 17.93 feet bTOC**  
**Product thickness: 0.01 feet**

Signature of Field Personnel: JW


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No: 41392.000</b>  <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b>  <b>Date: 11/5/2020</b>	
		<b>Monitoring Well ID</b>	<b>MW-2</b>
<b>Initial DTW (feet bgs)</b>	16.99	<b>Sample ID (if not well ID)</b>	<b>MW2-110520</b>
<b>Screen Interval (feet bgs)</b>	10.3-25.3	<b>Sample Time</b>	<b>1158</b>
<b>Well depth (feet bgs)</b>	25.3	<b>QC Sample type:</b> _____ <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>	19		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>J. Welles</b>
<b>Purge Rate (L/min)</b>	0.22	<b>Weather Conditions</b>	<b>Rain, 50° F</b>

WELL PURGING INFORMATION									
<input checked="" type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
3	17.41	17.5	3.3	334.5	6.45	-35.8	-		0.75
6	17.46	17.6	2.5	336.0	6.49	-46.9	-		1.75
9	17.49	17.7	2.2	343.5	6.49	-57.4	-		2
12	17.61	17.9	2.0	355.3	6.36	-70.2	-		3
15	17.64	17.9	1.7	359.8	6.41	-77.8	-		3.5
18		17.4	1.5	359.1	6.43	-83.2	-		4
<b>Total Volume Purged</b>									<b>4</b>

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: JW



	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000  <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant  <b>Date:</b> 11/5/2020	
		<b>Monitoring Well ID</b>	<b>MW-3</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	14-24	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	24	<b>QC Sample type:</b> _____	<input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>J. Welles</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Rain, 50° F</b>


WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.09 feet bTOC**  
**Depth to Water: 18.83 feet bTOC**  
**Product thickness: 0.26 feet**

**Product sample collected with bailer.**

Signature of Field Personnel: JW


	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No: 41392.000</b> <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b> <b>Date: 11/4/2020</b>	
		<b>Monitoring Well ID</b>	<b>MW-4</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>J. Welles</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 17.73 feet bTOC**  
**Depth to Water: 17.74 feet bTOC**  
**Product thickness: 0.01 feet**

Signature of Field Personnel: JW

	<b>PBS Engineering and Environmental Inc.</b>	<b>Project No:</b> 41392.000
	<b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 11/5/2020
<b>Initial DTW (feet bgs)</b>		<b>Monitoring Well ID</b> MW-5
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample ID (if not well ID)</b>
<b>Well depth (feet bgs)</b>	25	<b>Sample Time</b>
<b>Depth of pump/tubing inlet (feet bgs)</b>		<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected type: _____ ID _____ Time _____
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b> J. Welles
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b> Rain, 50° F

WELL PURGING INFORMATION									
Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 18.88 feet bTOC**  
**Depth to Water: 20.18 feet bTOC**  
**Product thickness: 1.3 feet**

**Product sample collected with bailer.**

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 11/4/2020

Monitoring Well ID MW-6

Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-25	Sample Time	
Well depth (feet bgs)	25	QC Sample type: _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	-	Field Personnel	J. Welles
Purge Rate (L/min)		Weather Conditions	Sunny, 50° F

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					<input type="checkbox"/> ltr	<input type="checkbox"/> gal
<b>Total Volume Purged</b>											

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
 Depth to product: 17.15 feet bTOC  
 Depth to Water: 17.16 feet bTOC  
 Product thickness: 0.01 feet

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 11/5/2020

**Monitoring Well ID** MW-7

<b>Initial DTW (feet bgs)</b>	16.48	<b>Sample ID (if not well ID)</b>	<b>MW7-001520</b>
<b>Screen Interval (feet bgs)</b>	15-29.4	<b>Sample Time</b>	<b>1057</b>
<b>Well depth (feet bgs)</b>	29.4	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>	18		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>J Welles</b>
<b>Purge Rate (L/min)</b>	0.22	<b>Weather Conditions</b>	<b>Cloudy, 50° F</b>


**WELL PURGING INFORMATION**

Time <input checked="" type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
3	16.63	16.8	14.5	309.8	6.49	187.1	-		0.75
6	16.69	16.8	18.5	310.2	6.42	187.0	-		1.5
9	16.68	16.8	17.5	309.9	6.38	187.3	-		2
12	16.71	16.8	14.7	309.0	6.35	188.2	-		2.75
15	16.71	16.8	11.9	308.4	6.32	189.0	-		3

**Total Volume Purged** 3

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: JW

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 11/5/2020
		<b>Monitoring Well ID</b> MW-8
<b>Initial DTW (feet bgs)</b>	18.49	<b>Sample ID (if not well ID)</b> MW8-110520
<b>Screen Interval (feet bgs)</b>	14-29	<b>Sample Time</b> 1249
<b>Well depth (feet bgs)</b>	29	<b>QC Sample type:</b> _____ <input type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>	20.5	
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b> J Welles
<b>Purge Rate (L/min)</b>	0.22	<b>Weather Conditions</b> Rain, 50° F

WELL PURGING INFORMATION									
<input checked="" type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
3	18.55	15.5	4.5	536	6.33	-35.7	-		0.75
6	18.55	15.6	4.0	536	6.32	-44.4	-		1
9	18.56	15.6	3.0	539	6.30	-51.7	-		1.75
12	18.58	15.7	3.1	544	6.32	-55.9	-		2.5
15		15.7	1.9	540	6.35	-59.1	-		3.25
<b>Total Volume Purged</b>									<b>3.25</b>


**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Depth to product: 18.46 feet bTOC**  
**Depth to Water: 18.49 feet bTOC**  
**Product thickness: 0.03 feet**

**Attempt to collect product sample with bailer, insufficient product thickness for sample collection.**

**Proceed to groundwater sampling. Sheen observed on purge water while sampling.**

Signature of Field Personnel: PB

	<b>PBS Engineering and Environmental Inc.</b>	<b>Project No: 41392.000</b> <b>Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant</b> <b>Date: 11/5/2020</b>	
	<b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Monitoring Well ID</b>	<b>MW-9</b>
<b>Initial DTW (feet bgs)</b>	18.20	<b>Sample ID (if not well ID)</b>	<b>MW9-110520</b>
<b>Screen Interval (feet bgs)</b>	16-31	<b>Sample Time</b>	<b>0912</b>
<b>Well depth (feet bgs)</b>	31	<b>QC Sample type:</b> <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>	20		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>J. Welles</b>
<b>Purge Rate (L/min)</b>	0.23	<b>Weather Conditions</b>	<b>partly cloudy, 50° F</b>


**WELL PURGING INFORMATION**

Time <input checked="" type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
3	18.45	16.5	9.8	488.1	6.72	123.1	-		0.5
6	18.49	16.4	9.7	486.0	6.68	121.7	-		1.5
9	18.49	16.4	4.5	477.2	6.69	118.6	-		2
12	18.50	16.4	8.1	473.6	6.67	115.0	-		2.5
15	18.51	16.4	6.2	472.9	6.67	111.8	-		3.25
18	18.52	16.4	8.2	472.5	6.69	108.7	-		4
21	18.54	16.4	5.0	470.0	6.68	105.9	-		4.5
24	18.52	16.4	4.6	467.6	6.69	103.4	-		5.25
<b>Total Volume Purged</b>									<b>5.25</b>

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: JW




	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000
		<b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 11/5/2020
		<b>Monitoring Well ID</b> MW-10
<b>Initial DTW (feet bgs)</b>	17.13	<b>Sample ID (if not well ID)</b> MW10-110520
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b> 1011
<b>Well depth (feet bgs)</b>	30	<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>	19	
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b> J Welles
<b>Purge Rate (L/min)</b>	0.25	<b>Weather Conditions</b> Partly Cloudy, 50° F

WELL PURGING INFORMATION									
Time <input checked="" type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
0		17.6	25.0	588	6.79	146.7	-		0
3	17.17	17.6	20.8	587	6.69	148.1	-		0.75
6	17.15	17.6	22.8	584	6.54	150.3	-		1.5
6	17.15	17.6	22.2	588	6.46	153.4	-		2.25
12	17.16	17.6	18.8	591	6.43	156.3	-		3
15	17.16	17.6	20.3	588	6.41	158.6	-		4
18	17.16	17.5	19.7	590	6.40	160.8	-		4.5
21	17.18	17.5	16.7	588	6.39	162.9	-		5.25
24	17.18	17.4	19.8	589	6.38	165.1	-		6
27	17.18	17.4	18.0	590	6.38	166.7	-		6.75
30	17.19	17.4	16.4	590	6.37	168.9	-		7.75
<b>Total Volume Purged</b>									<b>8</b>

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: JW

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000  <b>Project Name/ Location:</b> Coleman Oil Yakima Bulk Fuel Plant  <b>Date:</b> 11/4/2020	
		<b>Monitoring Well ID</b>	<b>MW11</b>
<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-29.5	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29.5	<b>QC Sample type:</b> _____ <input type="checkbox"/> Not collected ID_____ Time_____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>J Welles</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 50° F</b>

WELL PURGING INFORMATION									
<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.65 feet bTOC**  
**Depth to Water: 19.66 feet bTOC**  
**Product thickness: 0.01 feet**

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000

**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant

**Date:** 11/4/2020

**Monitoring Well ID** MW12

**Initial DTW (feet bgs)**

**Sample ID (if not well ID)**

**Screen Interval (feet bgs)**

15-29.4

**Sample Time**

**Well depth (feet bgs)**

29.4

**QC Sample**

Not collected

**Depth of pump/tubing inlet (feet bgs)**

**type:** \_\_\_\_\_

ID \_\_\_\_\_ Time \_\_\_\_\_

**Sampling method (describe pump or sampler)**

-

**Field Personnel**

**J Welles**

**Purge Rate (L/min)**

**Weather Conditions**

**Sunny, 50° F**

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.01 feet bTOC**  
**Depth to Water: 27.87 feet bTOC**  
**Product thickness: 8.86 feet**

**Product sample collected with bailer.**

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

GROUNDWATER SAMPLING FORM (YSI Pro)

Project No: 41392.000
Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant
Date: 11/4/2020

Monitoring Well ID MW13

Table with 4 columns: Parameter, Value, Sample ID/Time, and Field Personnel. Includes rows for Initial DTW, Screen Interval, Well depth, Depth of pump/tubing inlet, Sampling method, Purge Rate, Sample ID, Sample Time, QC Sample type, Field Personnel, and Weather Conditions.

WELL PURGING INFORMATION

Table with 10 columns: Time (elapsed/actual), DTW (feet), Temp. (C), Dissolved oxygen (mg/L), Specific conductivity (mS/cm/µS/cm), pH, ORP (mV), Turbidity (NTU), Observations, Volume purged (ltr/gal). Contains 10 rows of data with values for each parameter.

Total Volume Purged 5

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

YSI shutoff 9 minutes into sampling. Sampling parameters took several minutes to stabilize on the meter. Sampling parameters at the 9 minute mark were suspect and were not recorded.

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 11/4/2020

**Monitoring Well ID** MW14

<b>Initial DTW (feet bgs)</b>	19.28	<b>Sample ID (if not well ID)</b>	<b>MW14-110420</b>
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	<b>1445</b>
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____	<input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>	21		
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>J Welles</b>
<b>Purge Rate (L/min)</b>	0.23	<b>Weather Conditions</b>	<b>Sunny, 50° F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input checked="" type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
1		16.4	5.1	398.1	7.45	181.6	-		0.25
5		16.6	1.4	402.2	6.87	190.3	-		2
8		16.6	1.4	399.3	6.78	190.7	-		3
11		16.6	1.4	399.4	6.80	189.0	-		3.75
14	19.32	16.6	1.4	396.5	6.80	187.9	-		4.5
<b>Total Volume Purged</b>									<b>4.5</b>

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)  
 Purge rate reduced to 0.23 L/min after 2 min. Initial purge rate exceeded target. Total purge exceeds flow rate x elapsed time due to initial higher flow rate.

Signature of Field Personnel: JW



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 11/4/2020

Monitoring Well ID RW-1

Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	
Well depth (feet bgs)	30	QC Sample type: _____ ID _____ Time _____	<input type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	-	Field Personnel	J Welles
Purge Rate (L/min)		Weather Conditions	Sunny, 50° F

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged
				<input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.23 feet bTOC**  
**Depth to Water: 19.42 feet bTOC**  
**Product thickness: 0.19 feet**

Signature of Field Personnel: JW



**PBS Engineering and  
Environmental Inc.**

**GROUNDWATER  
SAMPLING  
FORM (YSI Pro)**

**Project No: 41392.000**  
**Project Name/ Location:** **Coleman Oil Yakima Bulk Fuel Plant**  
**Date:** **7/28/2021**

**Monitoring Well ID**

**MW-1**

**Initial DTW (feet bgs)**

18.93

**Sample ID (if not well ID)**

**Screen Interval (feet bgs)**

9.9-25.9

**Sample Time**

**12:33**

**Well depth (feet bgs)**

25.9

**QC Sample  
type:**

Not collected

**Depth of pump/tubing  
inlet (feet bgs)**

22

**Duplicate**

ID MW-Dup Time 12:00

**Sampling method  
(describe pump or sampler)**

Low Flow/Peristaltic Pump

**Field Personnel**

**P Brice/C. Gundert**

**Purge Rate (L/min)**

0.20

**Weather Conditions**

**Partly cloudy, hot, 87 °F**

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
				<input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm						
12:11	18.93	17.07	2.50	1.200		6.31	-13.4	19.50		
12:15		16.64	1.290	1.177		6.08	-12.9	23.03		
12:18		16.52	1.01	1.158		6.06	-19.1	24.49		
12:21		16.62	0.91	1.136		6.11	-27.3	23.08		
12:24		16.64	0.89	1.109		6.23	-32.1	23.28		
12:27		16.58	0.59	1.082		6.23	-40.6	24.05		
12:30		16.46	0.85	1.049		6.24	-43.3	22.25		
12:33		16.57	0.78	1.021		6.25	-46.5	25.05		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB





PBS Engineering and Environmental Inc.

GROUNDWATER SAMPLING FORM (YSI Pro)

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/28/2021

Monitoring Well ID MW-2

Table with 4 columns: Parameter, Value, Sample ID, Sample Time. Rows include Initial DTW, Screen Interval, Well depth, Depth of pump/tubing inlet, Sampling method, Purge Rate, Sample ID, Sample Time, QC Sample type, Field Personnel, and Weather Conditions.

WELL PURGING INFORMATION

Table with 10 columns: Time, DTW, Temp, Dissolved oxygen, Specific conductivity, pH, ORP, Turbidity, Observations, Volume purged. Rows show data for various times from 13:17 to 13:50.

Total Volume Purged

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Flow rate was lowered as the tubing was plugging with a black substance.

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/28/2021

Monitoring Well ID: MW-3

Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	14-24	Sample Time	
Well depth (feet bgs)	24	QC Sample type: _____ <input type="checkbox"/> Not collected ID _____ Time _____	
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	-	Field Personnel	P Brice/C. Gundert
Purge Rate (L/min)		Weather Conditions	Sunny, 83 °F

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged
				<input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm					<input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
 Depth to product: 19.44 feet bTOC  
 Depth to Water: 19.64 feet bTOC  
 Product thickness: 0.20 feet

Sorbent sock deployed in the well at ~13:45 on 7/28/2021

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/27/2021

Monitoring Well ID: MW-4

Initial DTW (feet bgs)	18.92	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-25	Sample Time	16:10
Well depth (feet bgs)	25	QC Sample type: _____ ID _____ Time _____ <input checked="" type="checkbox"/> Not collected	
Depth of pump/tubing inlet (feet bgs)	21		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	P Brice/C. Gundert
Purge Rate (L/min)	0.13	Weather Conditions	87 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
				<input checked="" type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					<input checked="" type="checkbox"/> ltr	<input type="checkbox"/> gal
15:49	18.92	20.22	1.70	0.530		6.65	-19.7	4.29			
15:52		20.12	1.02	0.526		6.47	-19.2	3.83			
15:55		20.01	0.86	0.524		6.42	-25.4	26.01			
15:58		19.81	0.77	0.521		6.44	-32.6	27.80			
16:01		19.45	0.71	0.516		6.43	-38.7	31.09			
16:04		19.34	0.68	0.515		6.47	-45.2	33.67			
16:07		19.20	0.66	0.513		6.47	-48.9	35.86			
16:10		19.04	0.64	0.511		6.47	-49.6	24.41			
<b>Total Volume Purged</b>											

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/28/2021

Monitoring Well ID: MW-5

Initial DTW (feet bgs)

Sample ID (if not well ID)

Screen Interval (feet bgs)

15-25

Sample Time

Well depth (feet bgs)

25

QC Sample

Not collected

Depth of pump/tubing inlet (feet bgs)

type: \_\_\_\_\_

ID \_\_\_\_\_ Time \_\_\_\_\_

Sampling method (describe pump or sampler)

-

Field Personnel

P Brice/C. Gundert

Purge Rate (L/min)

Weather Conditions

83 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
Depth to product: 20.02 feet bTOC  
Depth to Water: 20.11 feet bTOC  
Product thickness: 0.09 feet

Sorbent sock deployed in the well at ~14:45 on 7/28/2021

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: **41392.000**  
Project Name/ Location: **Coleman Oil Yakima Bulk Fuel Plant**  
Date: **7/27/2021**

Monitoring Well ID **MW-6**

<b>Initial DTW (feet bgs)</b>	18.28	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	<b>15:15</b>
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>	20.5		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>P Brice/C. Gundert</b>
<b>Purge Rate (L/min)</b>	0.13	<b>Weather Conditions</b>	<b>87 °F</b>

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
14:45	18.28	16.94	1.20	1.026	6.26	-22.0	16.15		
14:48		16.78	1.13	1.016	6.23	-25.2	14.66		
14:51		16.78	0.97	1.007	6.25	-31.5	13.13		
14:54		16.67	0.88	0.971	6.30	-39.7	11.78		
14:57		16.80	0.77	0.947	6.37	-44.6	10.30		
15:00		16.72	0.76	0.906	6.42	-47.6	11.32		
15:03		16.55	0.72	0.883	6.44	-57.6	10.62		
15:06		16.49	0.71	0.854	6.44	-56.1	9.07		
15:09		16.44	0.68	0.821	6.45	-56.1	8.10		
15:12		16.68	0.64	0.808	6.49	-59.8			
15:15		16.60	0.65	0.782	6.53	-62.5	7.05		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB

Revised 2/23/2015



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/28/2021

Monitoring Well ID MW-7

Initial DTW (feet bgs)	18.04	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-29.4	Sample Time	14:48
Well depth (feet bgs)	29.4	QC Sample type: _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)	20		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	P Brice/C. Gundert
Purge Rate (L/min)	0.18	Weather Conditions	91 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
14:33	18.04	17.09	22.5	0.327	6.40	-29.2	21.87		
14:36		16.79	1.44	0.315	5.70	0.7	16.43		
14:39		16.66	1.25	0.311	5.63	1.5	15.69		
14:42		16.35	1.11	0.307	5.65	-2.0	13.00		
14:45		16.02	1.02	0.305	5.69	-5.9	11.11		
14:48		16.19	0.99	0.306	5.74	-11.9	9.86		

**Total Volume Purged**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/28/2021

**Monitoring Well ID** MW-8

<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	14-29	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29	<b>QC Sample type:</b> _____ ID _____ Time _____	<input type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P Brice</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>90 °F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.  
 Depth to product: 19.08 feet bTOC  
 Depth to Water: 19.28 feet bTOC  
 Product thickness: 0.20 feet**

**Sorbent sock deployed in the well at ~13:10 on 7/28/2021**

Signature of Field Personnel: PMB









PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/28/2021

Monitoring Well ID: MW-11

Initial DTW (feet bgs)	19.69	Sample ID (if not well ID)	10:44
Screen Interval (feet bgs)	15-29.5	Sample Time	
Well depth (feet bgs)	29.5	QC Sample type: _____ <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
Depth of pump/tubing inlet (feet bgs)	22		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	P Brice/C. Gundert
Purge Rate (L/min)	0.2	Weather Conditions	Sunny, 82 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
10:23	19.69	15.83	2.71	1.023	6.31	6.7	9.97		
10:26		15.36	1.34	1.008	6.18	5.3	11.59		
10:29		15.28	1.03	0.988	6.19	-2.4	10.56		
10:32		15.13	0.90	0.970	6.23	-9.6	10.42		
10:35		15.04	0.79	0.950	6.29	-17.8	10.34		
10:38		15.03	0.72	0.958	6.34	-23.0	11.05		
10:41		14.98	0.71	0.935	6.38	-19.7	10.58		
10:44		15.00	0.70	0.929	6.39	-31.8			

Total Volume Purged

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

### GROUNDWATER SAMPLING FORM (YSI Pro)

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/28/2021

**Monitoring Well ID** MW-12

<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-29.4	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29.4	<b>QC Sample</b> type: _____ ID_____ Time_____	<input type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>P Brice/C. Gundert</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>80 °F</b>

#### WELL PURGING INFORMATION

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged
									<input type="checkbox"/> ltr <input type="checkbox"/> gal
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

**Well was not sampled due to presence of product.**  
**Depth to product: 19.70 feet bTOC**  
**Depth to Water: 19.87 feet bTOC**  
**Product thickness: 0.17 feet**  
  
**Sorbent sock deployed in the well at ~10:04 on 7/28/2021**

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/28/2021

Monitoring Well ID MW-13

Initial DTW (feet bgs)	18.30	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	08:16
Well depth (feet bgs)	30	QC Sample type: _____ <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
Depth of pump/tubing inlet (feet bgs)	20.5		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	P Brice/C. Gundert
Purge Rate (L/min)		Weather Conditions	74 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm					
07:52	18.30	15.81	1.73	0.601	6.37	-53.8	7.09		
07:55		15.69	1.39	0.596	6.32	-48.3	7.34		
07:58		15.63	1.19	0.591	6.37	-45.7	7.00		
08:01		15.54	1.08	0.587	6.43	-38.3	7.14		
08:04		15.55	0.97	0.585	6.50	-47.2	7.04		
08:07		15.57	0.88	0.583	6.56	-43.8	5.49		
08:10		15.60	0.80	0.582	6.61	-50.6	4.89		
08:13		15.53	0.76	0.578	6.65	-54.2	6.01		
08:16		15.60	0.75	0.577	6.67	-56.8	6.85		

Total Volume Purged

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000

**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant

**Date:** 7/28/2021

**Monitoring Well ID** MW-14

**Initial DTW (feet bgs)** 18.34

**Sample ID (if not well ID)**

**Screen Interval (feet bgs)** 15-30

**Sample Time** 08:58

**Well depth (feet bgs)** 30

**QC Sample**  Not collected  
 type: \_\_\_\_\_ ID \_\_\_\_\_ Time \_\_\_\_\_

**Depth of pump/tubing inlet (feet bgs)** 21

**Sampling method (describe pump or sampler)** Low Flow/Peristaltic Pump

**Field Personnel** P Brice/C. Gundert

**Purge Rate (L/min)** 0.18

**Weather Conditions** 76 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
				<input checked="" type="checkbox"/> mS/cm	<input type="checkbox"/> µS/cm					
08:43	18.34	15.20	3.45	0.334		7.03	-41.3	2.48		
08:46		14.97	1.10	0.324		6.44	-13.5	2.96		
08:49		14.76	0.88	0.324		6.30	-9.8	3.05		
08:52		14.78	0.79	0.324		6.35	-13.5	2.69		
08:55		14.77	0.71	0.323		6.41	-16.7	3.96		
08:58		14.85	0.64	0.323		6.44	-22.7	2.47		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/28/2021

Monitoring Well ID: MW-15

Initial DTW (feet bgs)	18.05	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	11:30
Well depth (feet bgs)	30	QC Sample type: _____ ID_____ Time_____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)	20		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	P Brice
Purge Rate (L/min)	0.16	Weather Conditions	85 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
11:15	18.05	15.69	1.20	0.735	6.52	-14.1	3.90		
11:18		15.71	0.85	0.736	6.44	-15.2	4.00		
11:21		15.73	0.73	0.736	6.45	-21.7	3.20		
11:24		15.77	0.71	0.736	6.52	-31.9	3.53		
11:27		15.83	0.68	0.734	6.56	-37.9	3.26		
11:30		15.78	0.66	0.732	6.59	-41.6	3.29		

Total Volume Purged

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB





PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: **41392.000**

Project Name/ Location: **Coleman Oil Yakima Bulk Fuel Plant**

Date: **7/28/2021**

Monitoring Well ID **MWBNSF1**

Initial DTW (feet bgs)	20.85	Sample ID (if not well ID)	
Screen Interval (feet bgs)		Sample Time	<b>09:41</b>
Well depth (feet bgs)		QC Sample type: _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)	23		
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	<b>P Brice/C. Gundert</b>
Purge Rate (L/min)	0.18	Weather Conditions	<b>Sunny, 50° F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
				<input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm					
<b>09:31</b>	<b>20.84</b>	<b>16.31</b>	<b>5.27</b>	<b>0.569</b>	<b>6.38</b>	<b>-11.2</b>	<b>3.24</b>		
<b>09:35</b>		<b>15.84</b>	<b>5.21</b>	<b>0.569</b>	<b>6.43</b>	<b>-11.8</b>	<b>3.04</b>		
<b>09:38</b>		<b>15.77</b>	<b>5.05</b>	<b>0.569</b>	<b>6.43</b>	<b>-11.5</b>	<b>2.35</b>		
<b>09:41</b>		<b>15.74</b>	<b>4.98</b>	<b>0.569</b>	<b>6.42</b>	<b>-10.8</b>	<b>2.67</b>		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: **PMB**



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/22/2022

Monitoring Well ID MW-1

Initial DTW (feet bgs)	19.35	Sample ID (if not well ID)	
Screen Interval (feet bgs)	9.9-25.9	Sample Time	15:05
Well depth (feet bgs)	25.9	QC Sample type: _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	W Garcia
Purge Rate (L/min)	1	Weather Conditions	Sunny, 92 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input checked="" type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					
14:50	19.47	31.23	0.38	0.801		6.92	-102	86.4		
14:53	19.58	30.45	0.12	0.799		6.86	-89	60.8		
14:56	19.62	29.29	0.06	0.792		6.50	-56	55.6		
14:59	19.65	29.23	0.06	0.787		6.50	-24	41.3		
15:02	19.67	29.20	0.06	0.789		6.50	-24	39.7		
15:05	19.68	29.18	0.06	0.787		6.51	-24	36.0		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/22/2022

**Monitoring Well ID** MW-2

<b>Initial DTW (feet bgs)</b>	19.35	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	10.3-25.3	<b>Sample Time</b>	13:25
<b>Well depth (feet bgs)</b>	25.3	<b>QC Sample type:</b> _____ ID_____ Time_____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	W Garcia
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b>	Sunny, 90 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
13:10	21.11	25.10	1.42	0.863	6.65	-88	88.1		
13:13	21.13	24.23	1.56	0.863	6.66	-87	56.3		
13:16	21.18	24.10	1.87	0.863	6.68	-90	47.8		
13:19	21.23	24.05	1.90	0.863	6.65	-95	44.1		
13:22	21.27	24.00	1.93	0.863	6.64	-98	43.9		
13:25	21.30	23.99	1.99	0.863	6.64	-99	41.4		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/21/2022

Monitoring Well ID: MW-3

Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	14-24	Sample Time	
Well depth (feet bgs)	24	QC Sample type: _____ ID _____ Time _____	<input type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	-	Field Personnel	W. Garcia
Purge Rate (L/min)		Weather Conditions	86 °F

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
 Depth to product: 19.95 feet bTOC  
 Depth to Water: 21.23 feet bTOC  
 Product thickness: 1.28 feet

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

### GROUNDWATER SAMPLING FORM (YSI Pro)

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/21/2022

Monitoring Well ID: MW-4

Initial DTW (feet bgs)

Sample ID (if not well ID)

Screen Interval (feet bgs)

15-25

Sample Time

Well depth (feet bgs)

25

QC Sample

Not collected

Depth of pump/tubing inlet (feet bgs)

type: \_\_\_\_\_

ID \_\_\_\_\_ Time \_\_\_\_\_

Sampling method (describe pump or sampler)

-

Field Personnel

W Garcia

Purge Rate (L/min)

Weather Conditions

#### WELL PURGING INFORMATION

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

Total Volume Purged

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
Depth to product: 19.23 feet bTOC  
Depth to Water: - feet bTOC  
Product thickness: 5.77\* feet  
\*Suspected malfunction of interface probe.

Signature of Field Personnel: WG



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/24/2022

**Monitoring Well ID** MW-5

<b>Initial DTW (feet bgs)</b>	20.54	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-25	<b>Sample Time</b>	<b>16:13</b>
<b>Well depth (feet bgs)</b>	25	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b>	<b>Sunny, 96°F</b>

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
15:55	21.40	25.57	1.36	1.32	6.80	-88	54.8		
15:58	21.40	24.52	0.24	1.27	6.78	-98	55.3		
16:01	21.40	24.68	0.40	1.24	6.76	-97	56.1		
16:04	21.40	24.31	0.44	1.24	6.73	-98	56.1		
16:07	21.38	23.76	0.14	1.25	6.72	-97	56.4		
16:10	21.40	23.83	0.16	1.26	6.68	-95	58.2		
16:13	21.40	23.79	0.19	1.27	6.71	-96	59.1		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG





**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No: 41392.000**

**Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant**

**Date: 7/22/2022**

**Monitoring Well ID MW-7**

<b>Initial DTW (feet bgs)</b>	18.36	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-29.4	<b>Sample Time</b>	<b>16:08</b>
<b>Well depth (feet bgs)</b>	29.4	<b>QC Sample</b> type: _____ <input type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b>	<b>Sunny, 93 °F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
				<input checked="" type="checkbox"/> mS/cm	<input type="checkbox"/> μS/cm					<input checked="" type="checkbox"/> ltr	<input type="checkbox"/> gal
15:50	18.52	27.21	1.75	0.483		6.71	82	96.4			
15:53	18.52	26.93	1.68	0.481		6.63	75	36.3			
15:56	18.52	26.81	1.63	0.479		6.58	71	22.8			
15:59	18.52	26.73	1.57	0.475		6.55	69	19.4			
16:02	18.52	26.67	1.51	0.473		6.46	70	16.5			
16:05	18.52	26.63	1.87	0.474		6.43	70	15.2			
16:08	18.52	26.60	1.43	0.472		6.40	69	14.1			
<b>Total Volume Purged</b>											

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG





**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/21/2022

**Monitoring Well ID** MW-8

<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	14-29	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29	<b>QC Sample</b> <input type="checkbox"/> Not collected ID_____ Time_____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 81 °F</b>


**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity		pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal
				<input type="checkbox"/> mS/cm	<input type="checkbox"/> µS/cm					

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)  
**Well was not sampled due to presence of product.**  
**Depth to product: 19.15 feet bTOC**  
**Depth to Water: - feet bTOC**  
**Product thickness: 9.85\* feet**  
**\*Suspected malfunction of interface probe.**

Signature of Field Personnel: WG

	<b>PBS Engineering and Environmental Inc.</b>  <b>GROUNDWATER SAMPLING FORM (YSI Pro)</b>	<b>Project No:</b> 41392.000 <b>Project Name/Location:</b> Coleman Oil Yakima Bulk Fuel Plant <b>Date:</b> 7/22/2022
		<b>Monitoring Well ID:</b> MW-9
<b>Initial DTW (feet bgs)</b>	18.75	<b>Sample ID (if not well ID)</b>
<b>Screen Interval (feet bgs)</b>	16-31	<b>Sample Time</b> <b>12:10</b>
<b>Well depth (feet bgs)</b>	31	<b>QC Sample type:</b> _____ <input checked="" type="checkbox"/> Not collected ID _____ Time _____
<b>Depth of pump/tubing inlet (feet bgs)</b>		
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b> <b>W Garcia</b>
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b> <b>Sunny, 88° F</b>

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
11:55	18.84	23.00	0.20	0.613	7.12	76	58.6		
11:58	18.88	23.06	0.14	0.622	7.02	79	48.4		
12:01	18.91	22.91	0.14	0.630	6.98	80	44.5		
12:04	18.96	22.81	0.24	0.633	9.69	78	38.7		
12:07	18.97	22.82	0.26	0.632	6.95	76	34.3		
12:10	18.99	22.83	0.29	0.630	6.95	77	32.3		
<b>Total Volume Purged</b>									

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000  
**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant  
**Date:** 7/22/2022

**Monitoring Well ID** MW-10

<b>Initial DTW (feet bgs)</b>	18.34	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	<b>10:31</b>
<b>Well depth (feet bgs)</b>	30	<b>QC Sample</b> <input checked="" type="checkbox"/> Not collected ID _____ Time _____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	- Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b>	<b>Sunny, 84 °F</b>

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
10:10	18.48	26.95	0.69	0.889	7.26	92	19.9		
10:13	18.56	24.38	0.77	0.902	7.16	94	16.7		
10:16	18.60	21.43	0.96	0.955	7.05	96	12.0		
10:19	18.65	21.24	0.81	0.952	7.01	96	12.6		
10:22	18.68	20.95	0.75	0.957	6.99	96	12.7		
10:25	18.70	20.84	0.68	0.958	6.98	97	12.6		
10:28	18.72	20.89	0.64	0.956	6.98	98	12.5		
10:31	18.74	20.86	0.63	0.957	6.98	97	12.2		

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000

**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant

**Date:** 7/21/2022

**Monitoring Well ID** MW-11

<b>Initial DTW (feet bgs)</b>		<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-29.5	<b>Sample Time</b>	
<b>Well depth (feet bgs)</b>	29.5	<b>QC Sample</b> <input type="checkbox"/> Not collected ID_____ Time_____	
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	-	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>		<b>Weather Conditions</b>	<b>Sunny, 89 °F</b>

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
Depth to product: 21.28 feet bTOC  
Depth to Water: 21.31 feet bTOC  
Product thickness: 0.03 feet

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000

**Project Name/ Location:** Coleman Oil Yakima Bulk Fuel Plant

**Date:** 7/21/2022

**Monitoring Well ID** MW-12

**Initial DTW** (feet bgs)

**Sample ID** (if not well ID)

**Screen Interval** (feet bgs)

15-29.4

**Sample Time**

**Well depth** (feet bgs)

29.4

**QC Sample**

Not collected

**Depth of pump/tubing inlet** (feet bgs)

**type:** \_\_\_\_\_

ID \_\_\_\_\_ Time \_\_\_\_\_

**Sampling method** (describe pump or sampler)

-

**Field Personnel**

**WG**

**Purge Rate** (L/min)

**Weather Conditions**

**Sunny, 89 °F**

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input type="checkbox"/> ltr <input type="checkbox"/> gal

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well was not sampled due to presence of product.  
Depth to product: 21.67 feet bTOC  
Depth to Water: 22.03 feet bTOC  
Product thickness: 0.36 feet

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000

Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant

Date: 7/24/22

Monitoring Well ID MW-13

Initial DTW (feet bgs)	19.01	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	14:36
Well depth (feet bgs)	30	QC Sample type: <u>Duplicate</u> ID <u>MW-Dup</u> Time <u>12:00</u>	<input type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	W Garcia
Purge Rate (L/min)	1	Weather Conditions	Sunny, 97 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
14:15	19.03	23.89	3.34	0.850	7.07	-73	34.4		
14:18	19.03	22.58	6.58	0.848	7.08	-83	30.4		
14:21	19.03	21.72	6.14	0.847	7.07	-85	28.6		
14:24	19.03	21.80	5.89	0.848	7.06	-85	27.6		
14:27	19.03	21.53	5.94	0.847	7.04	-85	27.2		
14:30	19.03	21.22	6.33	0.842	7.00	-87	22.8		
14:33	19.03	21.25	6.30	0.841	6.99	-88	22.1		
14:36	19.03	21.29	6.29	0.840	6.99	-88	21.9		

Total Volume Purged

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



**PBS Engineering and Environmental Inc.**

**GROUNDWATER SAMPLING FORM (YSI Pro)**

**Project No:** 41392.000

**Project Name/Location:** Coleman Oil Yakima Bulk Fuel Plant

**Date:** 7/21/2022

**Monitoring Well ID** MW-14

<b>Initial DTW (feet bgs)</b>	19.22	<b>Sample ID (if not well ID)</b>	
<b>Screen Interval (feet bgs)</b>	15-30	<b>Sample Time</b>	14:09
<b>Well depth (feet bgs)</b>	30	<b>QC Sample type:</b> _____ ID _____ Time _____	<input checked="" type="checkbox"/> Not collected
<b>Depth of pump/tubing inlet (feet bgs)</b>			
<b>Sampling method (describe pump or sampler)</b>	Low Flow/Peristaltic Pump	<b>Field Personnel</b>	<b>W Garcia</b>
<b>Purge Rate (L/min)</b>	1	<b>Weather Conditions</b>	<b>Sunny, 94 °F</b>

**WELL PURGING INFORMATION**

<input type="checkbox"/> Time elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
13:50	19.23	23.99	0.47	0.458	7.19				
13:53	19.23	22.70	0.31	0.452	7.09				
13:56	19.23	22.52	0.28	0.449	7.05				
13:59	19.23	22.47	0.28	0.447	7.00				
14:02	19.23	22.18	0.30	0.444	7.01				
14:03	19.23	22.11	0.29	0.446	7.00				
14:06	19.23	22.07	0.28	0.445	6.99				
14:09	19.23	22.03	0.28	0.444	6.98				

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
Date: 7/21/2022

Monitoring Well ID: MW-15

Initial DTW (feet bgs)	18.74	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	13:18
Well depth (feet bgs)	30	QC Sample type: _____ ID_____ Time_____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	W Garcia
Purge Rate (L/min)	1	Weather Conditions	Sunny, 94 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity <input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> µS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged <input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
13:00	18.73	21.58	0.66	1.05	6.95	-26			
13:03	18.74	21.06	0.98	1.06	6.92	-32			
13:06	18.75	20.66	1.19	1.06	6.87	-35			
13:09	18.75	20.62	0.98	1.06	6.86	-36			
13:12	18.75	20.49	0.73	1.07	6.84	-38			
13:15	18.75	20.27	0.71	1.06	6.82	-39			
13:18	18.75	20.25	0.72	1.07	6.82	-39			

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)  
**Turbidity not included due to erroneous readings.**

Signature of Field Personnel: WG





PBS Engineering and Environmental Inc.

### GROUNDWATER SAMPLING FORM (YSI Pro)

Project No: 41392.000  
Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
Date: 7/21/2022

Monitoring Well ID: MW-16

Initial DTW (feet bgs)	19.32	Sample ID (if not well ID)	
Screen Interval (feet bgs)	15-30	Sample Time	12:37
Well depth (feet bgs)	30	QC Sample type: _____ ID_____ Time_____	<input checked="" type="checkbox"/> Not collected
Depth of pump/tubing inlet (feet bgs)			
Sampling method (describe pump or sampler)	Low Flow/Peristaltic Pump	Field Personnel	W Garcia
Purge Rate (L/min)		Weather Conditions	Sunny, 93 °F

#### WELL PURGING INFORMATION

Time <input type="checkbox"/> elapsed <input checked="" type="checkbox"/> actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged
				<input checked="" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm					<input checked="" type="checkbox"/> ltr <input type="checkbox"/> gal
12:10	19.46	21.98	3.72	0.903	8.00	70	17.8		
12:13	19.52	21.09	3.08	0.912	7.68	89	9.1		
12:16	19.55	20.05	3.09	0.921	7.40	98	7.2		
12:19	19.55	20.03	4.51	0.943	7.23	103	6.5		
12:22	19.55	19.40	5.60	0.950	7.14	106	6.1		
12:25	19.56	19.84	6.16	0.934	7.04	108	5.4		
12:28	19.56	19.74	6.04	0.934	7.02	109	5.7		
12:31	19.56	19.78	5.98	0.930	7.00	110	5.5		
12:34	19.56	19.75	5.98	0.931	6.97	111	5.3		
12:37	19.56	19.77	5.99	0.938	6.95	111	4.8		

Total Volume Purged

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: WG



PBS Engineering and Environmental Inc.

**GROUNDWATER SAMPLING FORM (YSI Pro)**

Project No: 41392.000  
 Project Name/ Location: Coleman Oil Yakima Bulk Fuel Plant  
 Date: 7/24/2022

Monitoring Well ID MWBNSF1

Initial DTW (feet bgs) 21.66

Sample ID (if not well ID)

Screen Interval (feet bgs) Sample Time 15:35

Well depth (feet bgs) QC Sample  Not collected

Depth of pump/tubing inlet (feet bgs) type: \_\_\_\_\_ ID \_\_\_\_\_ Time \_\_\_\_\_

Sampling method (describe pump or sampler) Low Flow/Peristaltic Pump Field Personnel W Garcia

Purge Rate (L/min) 1 Weather Conditions Sunny, 97 °F

**WELL PURGING INFORMATION**

Time <input type="checkbox"/> elapsed <input checked="checked" type="checkbox"/> actual	DTW (feet)	Temp. ( C )	Dissolved oxygen (mg/L)	Specific conductivity <input checked="checked" type="checkbox"/> mS/cm <input type="checkbox"/> μS/cm	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged	
									<input checked="checked" type="checkbox"/> ltr	<input type="checkbox"/> gal
15:20	21.69	24.02	0.47	0.715	6.90	-20	27.0			
15:23	21.69	23.50	0.41	0.713	6.89	-14	24.9			
15:26	21.69	23.88	0.28	0.693	6.85	-6	20.9			
15:29	21.70	23.68	0.32	0.701	6.84	-3	19.7			
15:32	21.70	23.43	0.31	0.705	6.83	-1	19.3			
15:35	21.70	23.40	0.30	0.708	6.82	-1	19.2			

**Total Volume Purged**

**FIELD OBSERVATIONS / NOTES** (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Signature of Field Personnel: PMB

**Field Form – Summa Canister Sampling**

**Sub-Slab or Soil Vapor Sampling**

**Remember to allow sample point to equilibrate 20-30 minutes before sampling**

PBS Project No.: 41392.000 Sample ID: VB1-2020-11-04

Site Name: Yakima Bulk Fuel Plant Date: 11/4/20

Canister ID: SN: 3344 Concrete Slab Thickness (in): 3

Flow Controller ID: TS-08 Gauge ID: 241

Tracer Gas Used: Helium Helium Meter Type: Dielectric MGD 2002

Sample Point Diameter (in): 1/4 "Seat" Diameter (in): 5

Tubing Length (ft): 8 PRT or Vapor Pin Used (circle if applicable)

**Canister Pressure**

**Sampling Time**

**Purge Volume**

Initial: 29 mm Hg Begin: 1256 78 mL

Final: 6.5 in Hg End: 1301  
circle one

**Shut-in Test Performed**  Yes  No

Pressure Held: 15 mm Hg How long (min): 3  
in Hg  
circle one

**Helium Concentration in Shroud**

Prior to Sampling (%): 81 Mid Sample (%): 80

After Sampling (%): 78

**Real-Time Leak Test – Not performed**

Helium at Sample Point (ppmv): (before sampling) \_\_\_\_\_ (after sampling) \_\_\_\_\_

PID at Sample Point (ppm) \_\_\_\_\_  
(optional)

**Comments/Observations (if soil gas was sampled indicate depth at which sample was collected here):**

Sample line checked with Helium detector immediately after sample collection (after Suma was closed). 0ppm He measured in sample line.

# Appendix C

## Survey Reports

YAKIMA PLANT FUEL RELEASE - WELL LOCATION SURVEY REPORT  
 COLEMAN OIL COMPANY  
 JOB #4365

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	467104.96	1636980.19	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	467054.80	1636869.03	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
1000	467174.09	1636965.91	1089.65	MW3 NORTH EDGE OF EXTERNAL CASING
1001	467173.89	1636965.90	1089.15	MW3 NORTH EDGE OF 2IN PVC WELL PIPE
1002	467194.51	1636962.68	1090.05	MW1 NORTH EDGE OF EXTERNAL CASING
1003	467194.30	1636962.63	1089.54	MW1 NORTH EDGE OF 4IN PVC WELL PIPE
1004	467211.57	1636953.36	1090.21	MW1 NORTH EDGE OF EXTERNAL CASING
1005	467211.29	1636953.38	1089.54	MW1 NORTH EDGE OF 2IN PVC WELL PIPE
1006	467209.98	1636986.28	1089.73	MW2 NORTH EDGE OF EXTERNAL CASING
1007	467209.69	1636986.34	1089.44	MW2 NORTH EDGE OF 2IN PVC WELL PIPE
1009	467246.11	1636952.13	1089.50	MW6 NORTH EDGE OF EXTERNAL CASING
1010	467245.86	1636952.17	1089.21	MW6 NORTH EDGE OF 2IN PVC WELL PIPE
1011	467235.90	1637036.33	1089.20	MW4 NORTH EDGE OF EXTERNAL CASING
1012	467235.59	1637036.33	1088.85	MW4 NORTH EDGE OF 2IN PVC WELL PIPE
1013	467176.87	1636900.68	1090.25	MW5 NORTH EDGE OF EXTERNAL CASING
1014	467176.60	1636900.74	1090.01	MW5 NORTH EDGE OF 2IN PVC WELL PIPE

POINT	LATITUDE (NORTH)	LONGITUDE (WEST)	ELEVATION	DESCRIPTION
1	46°36'51.3018"	120°30'49.2301"	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	46°36'50.8065"	120°30'50.8224"	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
1001	46°36'51.9823"	120°30'49.4350"	1089.15	MW3 NORTH EDGE OF 2IN PVC WELL PIPE
1003	46°36'52.1837"	120°30'49.4819"	1089.54	MW1 NORTH EDGE OF 4IN PVC WELL PIPE
1005	46°36'52.3515"	120°30'49.6144"	1089.54	MW1 NORTH EDGE OF 2IN PVC WELL PIPE
1007	46°36'52.3357"	120°30'49.1423"	1089.44	MW2 NORTH EDGE OF 2IN PVC WELL PIPE
1010	46°36'52.6927"	120°30'49.6319"	1089.21	MW6 NORTH EDGE OF 2IN PVC WELL PIPE
1012	46°36'52.5915"	120°30'48.4261"	1088.85	MW4 NORTH EDGE OF 2IN PVC WELL PIPE
1014	46°36'52.0089"	120°30'50.3685"	1090.01	MW5 NORTH EDGE OF 2IN PVC WELL PIPE

**DATUM NOTES:**

HORIZONTAL DATUM IS NAD83-2011 (EPOCH 2010.00) PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM IS NAVD88 PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

COORDINATES LISTED ARE WASHINGTON STATE PLANE SOUTH ZONE GRID



7-7-2017

YAKIMA PLANT FUEL RELEASE - WELL LOCATION SURVEY REPORT  
 COLEMAN OIL COMPANY  
 JOB #41392 (REPORT BY ROP)  
 REFERENCE JOB #4365  
 11/24/2020

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	467104.96	1636980.19	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	467054.80	1636869.03	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
2001	466986.98	1637036.18	1087.50	GROUND ELEVATION AT MONITORING WELL 14
2002	466986.59	1637036.35	1086.98	TOP OF NORTH EDGE OF PVC PIPE @ WELL 14
2003	467066.83	1637006.17	1087.42	TOP OF NORTH EDGE OF PVC PIPE @ WELL 13
2004	467067.14	1637006.18	1088.04	GROUND ELEVATION AT MONITORING WELL 13
2005	467097.30	1636988.57	1088.44	TOP OF NORTH EDGE OF PVC PIPE @ WELL 12
2006	467097.78	1636988.45	1088.58	GROUND ELEVATION AT MONITORING WELL 12
2007	467099.62	1636950.24	1088.99	TOP OF NORTH EDGE OF PVC PIPE @ WELL 11
2008	467100.08	1636950.12	1089.26	GROUND ELEVATION AT MONITORING WELL 11
2009	467191.49	1637079.16	1087.75	TOP OF NORTH EDGE OF PVC PIPE @ WELL 10
2010	467191.85	1637079.14	1088.28	GROUND ELEVATION AT MONITORING WELL 10
2011	467313.85	1637101.55	1089.07	TOP OF NORTH EDGE OF PVC PIPE @ WELL 9
2012	467314.19	1637101.48	1089.35	GROUND ELEVATION AT MONITORING WELL 9
2013	467289.03	1637032.28	1089.47	TOP OF NORTH EDGE OF PVC PIPE @ WELL 8
2014	467289.44	1637032.21	1089.77	GROUND ELEVATION AT MONITORING WELL 8
2015	467316.57	1636854.27	1090.40	TOP OF NORTH EDGE OF PVC PIPE @ WELL 7
2016	467317.03	1636854.24	1090.63	GROUND ELEVATION AT MONITORING WELL 7

POINT	LATITUDE (NORTH)	LONGITUDE (WEST)	ELEVATION	DESCRIPTION
1	46°36'51.3018"	120°30'49.2301"	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	46°36'50.8065"	120°30'50.8224"	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
22001	46°36'50.13723"	120°30'48.42767"	1087.50	GROUND ELEVATION AT MONITORING WELL 14
22002	46°36'50.13345"	120°30'48.42527"	1086.98	TOP OF NORTH EDGE OF PVC PIPE @ WELL 14
22003	46°36'50.92551"	120°30'48.85784"	1087.42	TOP OF NORTH EDGE OF PVC PIPE @ WELL 13
22004	46°36'50.92856"	120°30'48.85768"	1088.04	GROUND ELEVATION AT MONITORING WELL 13
22005	46°36'51.2262"	120°30'49.11006"	1088.44	TOP OF NORTH EDGE OF PVC PIPE @ WELL 12
22006	46°36'51.23097"	120°30'49.11178"	1088.58	GROUND ELEVATION AT MONITORING WELL 12
22007	46°36'51.24905"	120°30'49.65918"	1088.99	TOP OF NORTH EDGE OF PVC PIPE @ WELL 11
22008	46°36'51.25361"	120°30'49.66082"	1089.26	GROUND ELEVATION AT MONITORING WELL 11
22009	46°36'52.15618"	120°30'47.81245"	1087.75	TOP OF NORTH EDGE OF PVC PIPE @ WELL 10
22010	46°36'52.15980"	120°30'47.81278"	1088.28	GROUND ELEVATION AT MONITORING WELL 10
22011	46°36'53.36414"	120°30'47.49200"	1089.07	TOP OF NORTH EDGE OF PVC PIPE @ WELL 9
22012	46°36'53.36755"	120°30'47.49304"	1089.35	GROUND ELEVATION AT MONITORING WELL 9
22013	46°36'53.11901"	120°30'48.48427"	1089.47	TOP OF NORTH EDGE OF PVC PIPE @ WELL 8
22014	46°36'53.12308"	120°30'48.48539"	1089.77	GROUND ELEVATION AT MONITORING WELL 8
22015	46°36'53.39055"	120°30'51.03459"	1090.40	TOP OF NORTH EDGE OF PVC PIPE @ WELL 7
22016	46°36'53.39514"	120°30'51.03493"	1090.63	GROUND ELEVATION AT MONITORING WELL 7

**DATUM NOTES:**

HORIZONTAL DATUM IS NAD83-2011 (EPOCH 2010.00) PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM IS NAVD88 PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

COORDINATES LISTED ARE WASHINGTON STATE PLANE SOUTH ZONE GRID





YAKIMA PLANT FUEL RELEASE - WELL LOCATION SURVEY REPORT  
 COLEMAN OIL COMPANY  
 JOB #4365 (REPORT BY ROP)

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	467104.96	1636980.19	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	467054.80	1636869.03	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
1000	467174.09	1636965.91	1089.65	MW3 NORTH EDGE OF EXTERNAL CASING
1001	467173.89	1636965.90	1089.15	MW3 NORTH EDGE OF 2IN PVC WELL PIPE
1002	467194.51	1636962.68	1090.05	MW1 NORTH EDGE OF EXTERNAL CASING
1003	467194.30	1636962.63	1089.54	MW1 NORTH EDGE OF 4IN PVC WELL PIPE
1004	467211.57	1636953.36	1090.21	MW1 NORTH EDGE OF EXTERNAL CASING
1005	467211.29	1636953.38	1089.54	MW1 NORTH EDGE OF 2IN PVC WELL PIPE
1006	467209.98	1636986.28	1089.73	MW2 NORTH EDGE OF EXTERNAL CASING
1007	467209.69	1636986.34	1089.44	MW2 NORTH EDGE OF 2IN PVC WELL PIPE

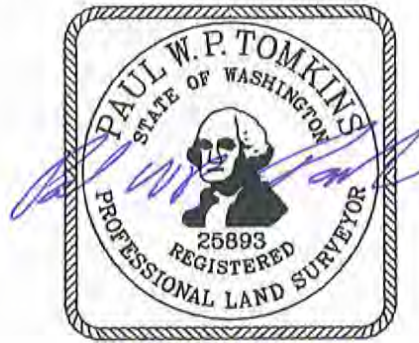
POINT	LATITUDE (NORTH)	LONGITUDE (WEST)	ELEVATION	DESCRIPTION
1	46°36'51.3018"	120°30'49.2301"	1088.59	CONTROL POINT 1, SET REBAR & HDJ RED CAP
2	46°36'50.8065"	120°30'50.8224"	1089.82	CONTROL POINT 2, SET REBAR & HDJ RED CAP
1000	46°36'51.9842"	120°30'49.4348"	1089.65	MW3 NORTH EDGE OF EXTERNAL CASING
1001	46°36'51.9823"	120°30'49.4350"	1089.15	MW3 NORTH EDGE OF 2IN PVC WELL PIPE
1002	46°36'52.1858"	120°30'49.4811"	1090.05	MW1 NORTH EDGE OF EXTERNAL CASING
1003	46°36'52.1837"	120°30'49.4819"	1089.54	MW1 NORTH EDGE OF 4IN PVC WELL PIPE
1004	46°36'52.3543"	120°30'49.6147"	1090.21	MW1 NORTH EDGE OF EXTERNAL CASING
1005	46°36'52.3515"	120°30'49.6144"	1089.54	MW1 NORTH EDGE OF 2IN PVC WELL PIPE
1006	46°36'52.3386"	120°30'49.1432"	1089.73	MW2 NORTH EDGE OF EXTERNAL CASING
1007	46°36'52.3357"	120°30'49.1423"	1089.44	MW2 NORTH EDGE OF 2IN PVC WELL PIPE

**DATUM NOTES:**

HORIZONTAL DATUM IS NAD83-2011 (EPOCH 2010.00) PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM IS NAVD88 PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

COORDINATES LISTED ARE WASHINGTON STATE PLANE SOUTH ZONE GRID



*May 12, 2016*

# **Appendix D**

## **Terrestrial Ecological Evaluation Exclusion Form**





## **TECHNICAL MEMORANDUM**

**DATE:** January 5, 2021

**TO:** Washington State Department of Ecology

**FROM:** James Welles, LG

**FACILITY NO:** 4233

**VCP Project NO:** NA

**PBS PROJECT NO:** 41392

**RE:** Terrestrial Ecological Evaluation – Exclusion Documentation

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To Whom It May Concern:

This technical memorandum is intended to document an exclusion from further evaluation in relation to conducting a Terrestrial Ecological Evaluation (TEE) for the Coleman Oil Yakima Bulk Fuel Plant Site. The exclusion is based on Barriers to Exposure: WAC 173-340-7491(1)(b) and Undeveloped Land: WAC 173-340-7491(1)(c).

### **Background**

PBS has conducted site characterization and remedial investigation work at the site since June 2015, in relation to releases of gasoline and diesel in the vicinity of the fueling canopy. Subsurface investigation work has included soil borings and the installation of fourteen groundwater monitoring wells. The site is considered to be mostly characterized at this time.

### **Basis for Exclusion**

All contaminated soil is or will be covered by physical barriers (buildings and pavement) that prevent exposure to plants and wildlife. Additionally, there is less than 1.5 acres of contiguous undeveloped land on or within 500 feet of any area of the Site, and none of the following chemicals are present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlore, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol or phentachlorobenzene.

Please refer to the Data Summary Report dated July 2018 and the Remedial Investigation Report dated January 2020 for further details.

Please let me know if you need any additional information or clarification.

Thank you.

*PBS Engineering and Environmental*

### **Attachments**

TEE Form

Site Plans

Analytical Results Tables



# Voluntary Cleanup Program

## Washington State Department of Ecology Toxics Cleanup Program

### TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

**Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.**

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Terrestrial-ecological-evaluation>.

#### Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.

Facility/Site Name: Coleman Oil Yakima Bulk Fuel Plant

Facility/Site Address: 1 East I Street, Yakima, Washington 98901

Facility/Site No: 4233

VCP Project No.: N/A – Agreed Order: DE 15639

#### Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.

Name: James Welles, LG

Title: Project Geologist

Organization: PBS Engineering and Environmental

Mailing address: 214 E Galer Street suite 300

City: Seattle

State: WA

Zip code: 98102

Phone: 206.233.9639

Fax: 866.727.0140

E-mail: [james.welles@pbsusa.com](mailto:james.welles@pbsusa.com)

### Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

#### A. Exclusion from further evaluation.

##### 1. Does the Site qualify for an exclusion from further evaluation?

- Yes *If you answered "YES," then answer **Question 2**.*
- No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3B** of this form.*

##### 2. What is the basis for the exclusion? Check all that apply. Then skip to **Step 4** of this form.

Point of Compliance: WAC 173-340-7491(1)(a)

- All soil contamination is, or will be,\* at least 15 feet below the surface.
- All soil contamination is, or will be,\* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

- All contaminated soil, is or will be,\* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

- There is less than 0.25 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.
- For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site.
- It is noted that while the property to the west of the railroad tracks is currently vacant, it was formerly developed as the Valley Evaporating Company plant and later by Nakano Foods, a former VCP Cleanup Site. As such, the property is not considered undeveloped.*

Background Concentrations: WAC 173-340-7491(1)(d)

- Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

\* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

± "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

# "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

## B. Simplified evaluation.

### 1. Does the Site qualify for a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 2** below.*
- No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3C** of this form.*

### 2. Did you conduct a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 3** below.*
- No *If you answered "NO," then skip to **Step 3C** of this form.*

### 3. Was further evaluation necessary?

- Yes *If you answered "YES," then answer **Question 4** below.*
- No *If you answered "NO," then answer **Question 5** below.*

### 4. If further evaluation was necessary, what did you do?

- Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*
- Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

### 5. If no further evaluation was necessary, what was the reason? Check all that apply. Then skip to **Step 4** of this form.

#### Exposure Analysis: WAC 173-340-7492(2)(a)

- Area of soil contamination at the Site is not more than 350 square feet.
- Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

#### Pathway Analysis: WAC 173-340-7492(2)(b)

- No potential exposure pathways from soil contamination to ecological receptors.

#### Contaminant Analysis: WAC 173-340-7492(2)(c)

- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

**C. Site-specific evaluation.** A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. See WAC 173-340-7493(1)(c).

**1. Was there a problem?** See WAC 173-340-7493(2).

- Yes    *If you answered “YES,” then answer **Question 2** below.*
- No    *If you answered “NO,” then identify the reason here and then skip to **Question 5** below:*
- No issues were identified during the problem formulation step.
  - While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

**2. What did you do to resolve the problem?** See WAC 173-340-7493(3).

- Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

**3. If you conducted further site-specific evaluations, what methods did you use?**

*Check all that apply. See WAC 173-340-7493(3).*

- Literature surveys.
- Soil bioassays.
- Wildlife exposure model.
- Biomarkers.
- Site-specific field studies.
- Weight of evidence.
- Other methods approved by Ecology. If so, please specify:

**4. What was the result of those evaluations?**

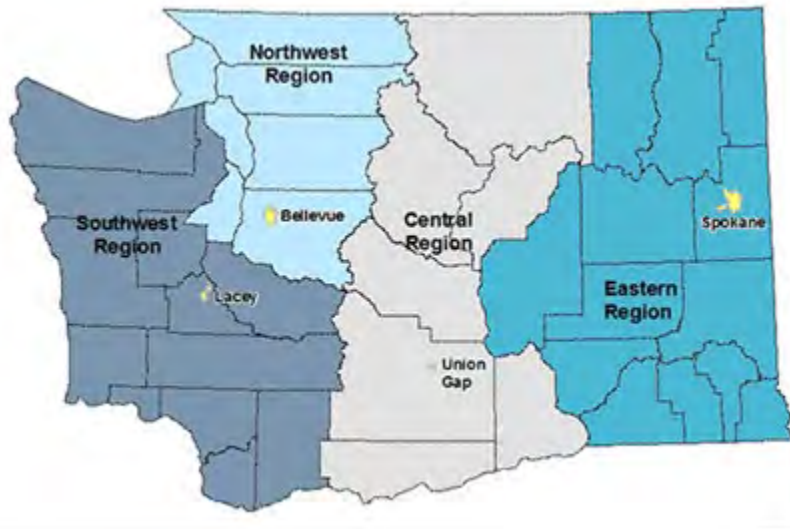
- Confirmed there was no problem.
- Confirmed there was a problem and established site-specific cleanup levels.

**5. Have you already obtained Ecology’s approval of both your problem formulation and problem resolution steps?**

- Yes    If so, please identify the Ecology staff who approved those steps:
- No

## Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



<b>Northwest Region:</b> Attn: VCP Coordinator 3190 160 <sup>th</sup> Ave. SE Bellevue, WA 98008-5452	<b>Central Region:</b> Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
<b>Southwest Region:</b> Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	<b>Eastern Region:</b> Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call 877-833-6341.

# **Appendix E**

## **Laboratory Analytical Reports**

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

June 22, 2015

Dana Ertel, Project Manager  
PBS Engineering and Environmental, Inc.  
400 Bradley Blvd, Suite 300  
Richland, WA 99352

Dear Mr. Ertel:

Included is the amended report from the testing of material submitted on April 17, 2015 from the 64116 Yakima, F&BI 504328 project. Per your request, the methylnaphthalenes have been added to the report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBR0507R.DOC



FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

May 7, 2015

Dana Ertel, Project Manager  
PBS Engineering and Environmental, Inc.  
400 Bradley Blvd, Suite 300  
Richland, WA 99352

Dear Mr. Ertel:

Included are the results from the testing of material submitted on April 17, 2015 from the 64116 Yakima, F&BI 504328 project. There are 17 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBR0507R.DOC

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 17, 2015 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 64116 Yakima, F&BI 504328 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
504328 -01	S26
504328 -02	S27
504328 -03	S28
504328 -04	S29
504328 -05	S30
504328 -06	S31
504328 -07	S32
504328 -08	S33
504328 -09	S34
504328 -10	S35
504328 -11	S36
504328 -12	S37
504328 -13	S38
504328 -14	S39
504328 -15	S40
504328 -16	S41
504328 -17	S42
504328 -18	S43
504328 -19	S44

The 8082A aroclor 1016 matrix spike failed below the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results are likely due to matrix effect.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15  
 Date Received: 04/17/15  
 Project: 64116 Yakima, F&BI 504328  
 Date Extracted: 04/20/15  
 Date Analyzed: 04/20/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID  
 Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE  
 WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION  
 WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
S26 504328-01	ND	D	D	ip
S27 504328-02	ND	160 e	ND	89
S28 504328-03	ND	10,000 e	1,500 e	ip
S29 504328-04	ND	7,300 e	7,400 e	78
S30 504328-05	ND	D	D	82
S31 504328-06	ND	3,300 e	2,100 e	87
S32 504328-07	ND	2,400 e	1,200 e	95
S33 504328-08	ND	2,100 e	510 e	87
S34 504328-09	ND	320 e	ND	99
S35 504328-10	ND	90 e	ND	88

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15  
 Date Received: 04/17/15  
 Project: 64116 Yakima, F&BI 504328  
 Date Extracted: 04/20/15  
 Date Analyzed: 04/20/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID  
 Results Reported as Not Detected (ND) or Detected (D)**

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
S36 504328-11	ND	D	D	ip
S37 504328-12	ND	D	ND	103
S38 504328-13	ND	ND	310 e	89
S40 504328-15	D	ND	ND	94
S41 504328-16	D	ND	ND	97
S42 504328-17	ND	290 e	ND	90
S43 504328-18	ND	99 e	ND	91
S44 504328-19	ND	1,300 e	330 e	91
Method Blank 05-808 MB	ND	ND	ND	89

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15  
Date Received: 04/17/15  
Project: 64116 Yakima, F&BI 504328  
Date Extracted: 04/27/15  
Date Analyzed: 04/27/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
S40 504328-15	<0.02	<0.02	<0.02	<0.06	<2	89
Method Blank 05-0821 MB	<0.02	<0.02	<0.02	<0.06	<2	79

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15  
Date Received: 04/17/15  
Project: 64116 Yakima, F&BI 504328  
Date Extracted: 04/27/15  
Date Analyzed: 04/27/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
S26 504328-01	15,000	980	69
S30 504328-05 1/10	3,200	5,000	100
S36 504328-11 1/10	52,000	5,300	ip
S37 504328-12	530	<250	96
S39 504328-14 1/10	15,000	31,000	79
S42 504328-17	660	310	91
Method Blank 05-851 MB	<50	<250	106

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	S29	Client:	PBS Engineering and Environmental
Date Received:	04/17/15	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	504328-04
Date Analyzed:	04/27/15	Data File:	504328-04.065
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	84	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.00
Cadmium	2.35
Chromium	5.91
Lead	332
Mercury	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	I5-252 mb
Date Analyzed:	04/27/15	Data File:	I5-252 mb.045
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	72	60	125
Indium	78	60	125
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID: S30	Client: PBS Engineering and Environmental
Date Received: 04/17/15	Project: 64116 Yakima, F&BI 504328
Date Extracted: 04/27/15	Lab ID: 504328-05 1/50
Date Analyzed: 05/01/15	Data File: 050110.D
Matrix: Soil	Instrument: GCMS6
Units: mg/kg (ppm) Dry Weight	Operator: VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88 d	31	163
Benzo(a)anthracene-d12	103 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.12
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.14
Anthracene	0.16
Fluoranthene	0.11
Pyrene	0.23
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	0.10
Benzo(b)fluoranthene	0.11
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.34
2-Methylnaphthalene	0.26
1-Methylnaphthalene	0.13

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	05-853 mb 1/5
Date Analyzed:	04/28/15	Data File:	042805.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	163
Benzo(a)anthracene-d12	82	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For PCBs By EPA Method 8082A

Client Sample ID:	S30	Client:	PBS Engineering and Environmental
Date Received:	04/17/15	Project:	64116 Yakima, F&BI 504328
Date Extracted:	05/04/15	Lab ID:	504328-05 1/50
Date Analyzed:	05/04/15	Data File:	09.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	40 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	0.37
Aroclor 1268	<0.2

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	64116 Yakima, F&BI 504328
Date Extracted:	05/04/15	Lab ID:	05-895 mb 1/5
Date Analyzed:	05/04/15	Data File:	07.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 504462-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	81	69-120
Toluene	mg/kg (ppm)	0.5	92	70-117
Ethylbenzene	mg/kg (ppm)	0.5	92	65-123
Xylenes	mg/kg (ppm)	1.5	91	66-120
Gasoline	mg/kg (ppm)	20	100	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 504328-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	14,000	123 b	138 b	63-146	11 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	110	79-144

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 504442-41 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	10.3	83 b	102 b	67-121	21 b
Cadmium	mg/kg (ppm)	10	<1	97	102	88-121	5
Chromium	mg/kg (ppm)	50	5.43	79	83	57-128	5
Lead	mg/kg (ppm)	50	68.8	114	122	59-148	7
Mercury	mg/kg (ppm)	10	<1	88	95	50-150	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	84	83-113
Cadmium	mg/kg (ppm)	10	100	85-114
Chromium	mg/kg (ppm)	50	88	78-121
Lead	mg/kg (ppm)	50	105	80-120
Mercury	mg/kg (ppm)	10	96	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM**

Laboratory Code: 504416-03 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	44-129
2-Methylnaphthalene	mg/kg (ppm)	0.17	<0.01	89	45-135
1-Methylnaphthalene	mg/kg (ppm)	0.17	<0.01	89	40-141
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	86	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	90	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	84	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	85	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	86	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	79	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	87	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	89	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	94	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	96	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	89	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	99	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	100	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	98	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	89	90	58-121	1
2-Methylnaphthalene	mg/kg (ppm)	0.17	88	89	58-123	1
1-Methylnaphthalene	mg/kg (ppm)	0.17	89	89	60-124	0
Acenaphthylene	mg/kg (ppm)	0.17	85	86	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	87	87	54-123	0
Fluorene	mg/kg (ppm)	0.17	91	91	56-127	0
Phenanthrene	mg/kg (ppm)	0.17	89	91	55-122	2
Anthracene	mg/kg (ppm)	0.17	83	85	50-120	2
Fluoranthene	mg/kg (ppm)	0.17	87	88	54-129	1
Pyrene	mg/kg (ppm)	0.17	77	83	53-127	7
Benz(a)anthracene	mg/kg (ppm)	0.17	82	84	51-115	2
Chrysene	mg/kg (ppm)	0.17	88	92	55-129	4
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	98	56-123	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	101	105	54-131	4
Benzo(a)pyrene	mg/kg (ppm)	0.17	90	90	51-118	0
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	98	93	49-148	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	101	95	50-141	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	98	95	52-131	3



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES FOR  
POLYCHLORINATED BIPHENYLS AS  
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: 504328-05 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	29 vo	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	74	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	82	81	55-130	1
Aroclor 1260	mg/kg (ppm)	0.8	99	89	58-133	11

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504328

SAMPLE CHAIN OF CUSTODY ME 04/17/15

153/2

Send Report To Dave Erle  
 Company PBS Environmental  
 Address 400 Bradley Blvd Suite 300  
 City, State, ZIP Richland, WA 99352  
 Phone # (509) 727-0873 Fax # \_\_\_\_\_

SAMPLERS (signature) Dave Erle  
 PROJECT NAME/NO. 64116  
Yakima  
 REMARKS

Page # 1 of 2  
 TURNAROUND TIME  
 Standard (2 Weeks)  
 RUSH  
 Rush charges authorized by \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Return samples  
 Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED										Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	HClD	MTCA 5	PCBs	PAHs	
S26	01A	4/14/15		Soil	3	X										X-PO D2
S27	02				3											4/24/15
S28	03				3											M.C.
S29	04				3							X				
S30	05	AD			4	X							X			
S31	06	AK			3								X			
S32	07				3											
S33	08				3											
S34	09				3											
S35	10				3											

Friedman & Bryna, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282  
 Fax (206) 283-5044  
 FORMS\COC\COC.DOC

SIGNATURE		PRINT NAME		COMPANY		DATE	TIME
Reinquished by: <u>Dave Erle</u>		<u>Dave Erle</u>		<u>PBS</u>		<u>4/15/15</u>	
Received by: <u>M. Phan</u>		<u>M. Phan</u>		<u>FBI</u>		<u>4/16/15</u>	<u>1415</u>
Reinquished by:							
Received by:							

504325

SAMPLE CHAIN OF CUSTODY

ME 09/13/15

US3/2013

Send Report To Dana Ertel

Company PRS Environmental

Address 400 Bradley Blvd Suite 300

City, State, ZIP Richland, WA 99352

Phone # (509) 727-0873 Fax #

SAMPLERS (signature)

PROJECT NAME/NO.

64116 Yalima

PO#

REMARKS

Page # 2 of 2

TURNAROUND TIME  
 Standard (2 Weeks)  
 RUSH

Rush charges authorized by

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Return samples  
 Will call with instructions

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED					Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS	HClD
S36	DA 24/11/15			Soil	3	X							
S37				↓		X							
S38				↓		X							
S39				Soil/Knowledge	4	X							Analyte per DC
S40				Soil			X	X					Porter Analyze
S41													Insight Environment
S42				↓		X							
S43				↓									
S44				↓									

SIGNATURE

Relinquished by:

Received by:

Relinquished by:

Received by:

PRINT NAME

COMPANY

DATE

TIME

Alison Phelan

FEBI

9/13/15

1418

Friedman & Bruya, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029  
Ph. (206) 285-8282  
Fax (206) 283-5044  
FORMSICOCOCOC.DOC

Relinquished by:	PRINT NAME	COMPANY	DATE	TIME
Received by:				
Relinquished by:				
Received by:				

Samples received at 6 °C

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 31, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr. Nogeire:

Included are the results from the testing of material submitted on March 23, 2016 from the Coleman Yakima, 64116 PO, F&BI 603413 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0331R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 23, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima, 64116 PO, F&BI 603413 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
603413 -01	NSW1-4
603413 -02	WSW1-4
603413 -03	B1-5.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/31/16

Date Received: 03/23/16

Project: Coleman Yakima, 64116 PO, F&BI 603413

Date Extracted: 03/24/16

Date Analyzed: 03/24/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
B1-5.5 603413-03 1/10	0.79	14	20	110	5,100	ip
Method Blank 06-556 MB	<0.02	<0.02	<0.02	<0.06	<2	89



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/31/16

Date Received: 03/23/16

Project: Coleman Yakima, 64116 PO, F&BI 603413

Date Extracted: 03/24/16

Date Analyzed: 03/24/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
NSW1-4 603413-01	11,000	270 x	91
WSW1-4 603413-02	26,000	570 x	72
B1-5.5 603413-03	34,000	770 x	103
Method Blank 06-567 MB	<50	<250	99

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	B1-5.5	Client:	PBS Engineering and Environmental
Date Received:	03/23/16	Project:	Coleman Yakima, 64116 PO, F&BI 603413
Date Extracted:	03/24/16	Lab ID:	603413-03 1/250
Date Analyzed:	03/24/16	Data File:	032418.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	3 d	31	163
Benzo(a)anthracene-d12	163 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	8.1
Acenaphthylene	<0.5
Acenaphthene	1.4
Fluorene	3.4
Phenanthrene	5.0
Anthracene	<0.5
Fluoranthene	<0.5
Pyrene	2.4
Benz(a)anthracene	<0.5
Chrysene	<0.5
Benzo(a)pyrene	<0.5
Benzo(b)fluoranthene	<0.5
Benzo(k)fluoranthene	<0.5
Indeno(1,2,3-cd)pyrene	<0.5
Dibenz(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Yakima, 64116 PO, F&BI 603413
Date Extracted:	03/24/16	Lab ID:	06-569 mb 1/5
Date Analyzed:	03/28/16	Data File:	032803.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	31	163
Benzo(a)anthracene-d12	102	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/31/16

Date Received: 03/23/16

Project: Coleman Yakima, 64116 PO, F&BI 603413

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
AND XYLENES  
USING EPA METHOD 8021B**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	mg/kg (ppm)	0.5	94	91	69-120	3
Toluene	mg/kg (ppm)	0.5	100	96	70-117	4
Ethylbenzene	mg/kg (ppm)	0.5	101	98	65-123	3
Xylenes	mg/kg (ppm)	1.5	99	99	66-120	0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/31/16

Date Received: 03/23/16

Project: Coleman Yakima, 64116 PO, F&BI 603413

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 603420-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	95	97	63-146	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	104	79-144

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/31/16

Date Received: 03/23/16

Project: Coleman Yakima, 64116 PO, F&BI 603413

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	93	91	58-121	2
Acenaphthylene	mg/kg (ppm)	0.17	96	93	54-121	3
Acenaphthene	mg/kg (ppm)	0.17	93	92	54-123	1
Fluorene	mg/kg (ppm)	0.17	94	91	56-127	3
Phenanthrene	mg/kg (ppm)	0.17	94	92	55-122	2
Anthracene	mg/kg (ppm)	0.17	90	86	50-120	5
Fluoranthene	mg/kg (ppm)	0.17	93	87	54-129	7
Pyrene	mg/kg (ppm)	0.17	92	97	53-127	5
Benz(a)anthracene	mg/kg (ppm)	0.17	95	94	51-115	1
Chrysene	mg/kg (ppm)	0.17	92	95	55-129	3
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	99	96	56-123	3
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	100	99	54-131	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	93	89	51-118	4
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	91	87	49-148	4
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	86	83	50-141	4
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	86	84	52-131	2

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

603413

SAMPLE CHAIN OF CUSTODY

HE 03/23/16

522/051

Report To: Ken Noyce  
 Company: PBS Engineering  
 Address: Seattle, WA  
 City, State, ZIP: \_\_\_\_\_  
 Phone: 504512.4163 Email: KenNoyce@pbsenv.com

SAMPLERS (signature) K. Noyce  
 PROJECT NAME: Coburn Yukon  
 PO #: 64116  
 REMARKS: \_\_\_\_\_  
 INVOICE TO: \_\_\_\_\_

Page # \_\_\_\_\_ of \_\_\_\_\_  
 TURNAROUND TIME  
 Standard Turnaround  
 RUSH 24 hrs  
 Rush charges authorized by: Ken Noyce  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM			
NSWJ-4	01	3.23.16	1140	So.1	1	X									
WSWJ-4	02	3.23.16	1200	Si.1	1	X	X								24 for diesel
B1-S.S	03-A-F	3.23.16	1240	Si.1	6	X	X					X			48 for 6x BTEX PAHs

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>K. Noyce</u>	Ken Noyce	PBS	3.23.16	1640
Relinquished by: <u>[Signature]</u>	[Signature]	[Signature]	3/23/16	1640
Received by: _____				
Relinquished by: _____				

Samples received at 4 °C



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 4, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr. Nogeire:

Included are the results from the testing of material submitted on March 30, 2016 from the 41392, F&BI 603529 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0404R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 30, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 41392, F&BI 603529 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
603529 -01	T1-WSW
603529 -02	T1-ESW
603529 -03	T1-B

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/16  
Date Received: 03/30/16  
Project: 41392, F&BI 603529  
Date Extracted: 03/30/16  
Date Analyzed: 03/30/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
T1-B 603529-03	<0.02	0.063	0.18	2.3	340	85
Method Blank 06-608 MB	<0.02	<0.02	<0.02	<0.06	<2	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/16  
Date Received: 03/30/16  
Project: 41392, F&BI 603529  
Date Extracted: 03/30/16  
Date Analyzed: 03/30/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
T1-WSW 603529-01	9,500	<250	79
T1-ESW 603529-02	920	<250	84
T1-B 603529-03	190	<250	83
Method Blank 06-604 MB2	<50	<250	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/16

Date Received: 03/30/16

Project: 41392, F&BI 603529

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 603520-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	90	69-120
Toluene	mg/kg (ppm)	0.5	95	70-117
Ethylbenzene	mg/kg (ppm)	0.5	96	65-123
Xylenes	mg/kg (ppm)	1.5	94	66-120
Gasoline	mg/kg (ppm)	20	95	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/16

Date Received: 03/30/16

Project: 41392, F&BI 603529

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 603504-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	116	124	73-135	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	118	74-139

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

603529

SAMPLE CHAIN OF CUSTODY

ME 03/30/16

CT

Send Report To Ken Nogueire

Company PBS Engineering

Address Seattle, WA

City, State, ZIP \_\_\_\_\_

Phone # 509.512.8163 Fax # \_\_\_\_\_

Email Address Ken.nogueire@pbsenv.com

SAMPLERS (signature) Ken Nogueire

PROJECT NAME/NO. 411392

PO # 41392

PROJECT ADDRESS Yakima, WA

ELECTRONIC DATA REQUESTED

Page # 1 of 1

TURNAROUND TIME

- Standard Turnaround
- RUSH \_\_\_\_\_
- Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

- Dispose after 30 days
- Return samples
- Will call with instructions
- Samples Received at \_\_\_\_\_ °C

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED					Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS
TL-WSW	01	3.28.16	930	So.1	1	X						
F1-ESW	02	3.28.16	935	So.1	1	X						
T1-B	03A-D	3.28.16	940	So.1	4	X	X	X				

Samples received at 5 °C

Friedman & Bruya, Inc.

3012 16th Avenue West  
Seattle, WA 98119-2029

Ph. (206) 285-8282  
Fax (206) 283-5044

FORMS\COC\COC.DOC

Relinquished by: [Signature]

PRINT NAME K. Nogueire

COMPANY PBS

DATE 3.29.16 TIME 1645

Received by: [Signature]

PRINT NAME Jean Wils

COMPANY Fed Ex SOC

DATE 3/30/16 TIME 11:59am

Relinquished by: [Signature]

PRINT NAME Ellen Roberts Rodford

COMPANY F&B

DATE 3/30/16 TIME 11:45



FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 22, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr. Nogeire:

Included are the results from the testing of material submitted on April 1, 2016 from the 41392, F&BI 604013 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0422R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 1, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 41392, F&BI 604013 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
604013 -01	NSW2-17
604013 -02	ESW1-17
604013 -03	SSW1-17
604013 -04	WSW2-11
604013 -05	B2-18
604013 -06	Trip Blank

Samples WSW2-11 and B2-18 was sent to Fremont Analytical for EPH and VPH analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16  
 Date Received: 04/01/16  
 Project: 41392, F&BI 604013  
 Date Extracted: 04/01/16  
 Date Analyzed: 04/01/16 and 04/05/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
NSW2-17 604013-01	<0.02	<0.02	<0.02	<0.06	<2	81
ESW1-17 604013-02	<0.02	<0.02	<0.02	<0.06	3.1	84
SSW1-17 604013-03	<0.02	0.039	0.024	0.14	5.5	76
WSW2-11 604013-04	<0.02	3.1	7.5	62	3,400	ip
B2-18 604013-05	0.65	5.1	7.3	44	1,600	ip
Method Blank 06-612 MB	<0.02	<0.02	<0.02	<0.06	<2	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16  
Date Received: 04/01/16  
Project: 41392, F&BI 604013  
Date Extracted: 04/01/16  
Date Analyzed: 04/01/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Trip Blank 604013-06	<1	<1	<1	<3	84
Method Blank 06-613 MB	<1	<1	<1	<3	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16  
 Date Received: 04/01/16  
 Project: 41392, F&BI 604013  
 Date Extracted: 04/04/16  
 Date Analyzed: 04/04/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR TOTAL PETROLEUM HYDROCARBONS AS  
 DIESEL AND MOTOR OIL  
 USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 48-168)
NSW2-17 604013-01	<50	<250	93
ESW1-17 604013-02	<50	<250	105
SSW1-17 604013-03	<50	<250	91
WSW2-11 604013-04	9,900	330 x	93
B2-18 604013-05	25,000	570 x	73
Method Blank 06-660 MB	<50	<250	105

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	B2-18	Client:	PBS Engineering and Environmental
Date Received:	04/01/16	Project:	41392, F&BI 604013
Date Extracted:	04/01/16	Lab ID:	604013-05
Date Analyzed:	04/01/16	Data File:	604013-05.065
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Analyte:	Concentration mg/kg (ppm)
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Lead	4.94
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FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	41392, F&BI 604013
Date Extracted:	04/01/16	Lab ID:	I6-186 mb
Date Analyzed:	04/01/16	Data File:	I6-186 mb.019
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Analyte:	Concentration mg/kg (ppm)
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Lead	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	B2-18	Client:	PBS Engineering and Environmental
Date Received:	04/01/16	Project:	41392, F&BI 604013
Date Extracted:	04/04/16	Lab ID:	604013-05 1/250
Date Analyzed:	04/04/16	Data File:	040415.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	45	31	163
Benzo(a)anthracene-d12	160	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	7.2
Acenaphthylene	<0.5
Acenaphthene	0.86
Fluorene	2.1
Phenanthrene	2.5
Anthracene	<0.5
Fluoranthene	<0.5
Pyrene	1.6
Benz(a)anthracene	<0.5
Chrysene	<0.5
Benzo(a)pyrene	<0.5
Benzo(b)fluoranthene	<0.5
Benzo(k)fluoranthene	<0.5
Indeno(1,2,3-cd)pyrene	<0.5
Dibenz(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	41392, F&BI 604013
Date Extracted:	04/04/16	Lab ID:	06-657 mb 1/5
Date Analyzed:	04/04/16	Data File:	040404.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	31	163
Benzo(a)anthracene-d12	90	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16

Date Received: 04/01/16

Project: 41392, F&BI 604013

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 603575-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	81	69-120
Toluene	mg/kg (ppm)	0.5	91	70-117
Ethylbenzene	mg/kg (ppm)	0.5	93	65-123
Xylenes	mg/kg (ppm)	1.5	94	66-120
Gasoline	mg/kg (ppm)	20	95	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16

Date Received: 04/01/16

Project: 41392, F&BI 604013

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
AND XYLENES  
USING EPA METHOD 8021B**

Laboratory Code: 604014-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	100	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	89	74-118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16

Date Received: 04/01/16

Project: 41392, F&BI 604013

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 604013-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	128	120	73-135	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	122	74-139

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16

Date Received: 04/01/16

Project: 41392, F&BI 604013

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 603575-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	30.1	96	111	70-130	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	106	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/22/16

Date Received: 04/01/16

Project: 41392, F&BI 604013

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: 604023-02 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	<0.01	87	87	44-129	0
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	85	86	52-121	1
Acenaphthene	mg/kg (ppm)	0.17	<0.01	86	87	51-123	1
Fluorene	mg/kg (ppm)	0.17	<0.01	82	83	37-137	1
Phenanthrene	mg/kg (ppm)	0.17	<0.01	87	87	34-141	0
Anthracene	mg/kg (ppm)	0.17	<0.01	81	85	32-124	5
Fluoranthene	mg/kg (ppm)	0.17	<0.01	82	80	16-160	2
Pyrene	mg/kg (ppm)	0.17	<0.01	90	91	10-180	1
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	87	87	23-144	0
Chrysene	mg/kg (ppm)	0.17	<0.01	90	90	32-149	0
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	89	89	23-176	0
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	89	89	42-139	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	83	88	21-163	6
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	95	90	23-170	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	91	89	31-146	2
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	93	89	37-133	4

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	90	58-121
Acenaphthylene	mg/kg (ppm)	0.17	90	54-121
Acenaphthene	mg/kg (ppm)	0.17	89	54-123
Fluorene	mg/kg (ppm)	0.17	90	56-127
Phenanthrene	mg/kg (ppm)	0.17	91	55-122
Anthracene	mg/kg (ppm)	0.17	85	50-120
Fluoranthene	mg/kg (ppm)	0.17	91	54-129
Pyrene	mg/kg (ppm)	0.17	84	53-127
Benz(a)anthracene	mg/kg (ppm)	0.17	88	51-115
Chrysene	mg/kg (ppm)	0.17	91	55-129
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	96	56-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	91	54-131
Benzo(a)pyrene	mg/kg (ppm)	0.17	85	51-118
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	91	49-148
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	90	50-141
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	90	52-131

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



3600 Fremont Ave. N.

Seattle, WA 98103

T: (206) 352-3790

F: (206) 352-7178

[info@fremontanalytical.com](mailto:info@fremontanalytical.com)

**Friedman & Bruya**

Michael Erdahl  
3012 16th Ave. W.  
Seattle, WA 98119

**RE: 604013**

**Lab ID: 1604015**

April 21, 2016

**Attention Michael Erdahl:**

Fremont Analytical, Inc. received 2 sample(s) on 4/1/2016 for the analyses presented in the following report.

***Extractable Petroleum Hydrocarbons by NWEPH***

***Sample Moisture (Percent Moisture)***

***Volatile Petroleum Hydrocarbons by NWVPH***

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,

Mike Ridgeway  
President

DoD/ELAP Certification #L2371, ISO/ICC 17025:2005  
ORELAP Certification: WA 100009-007 (NELAP Recognized)





Date: 04/21/2016

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**CLIENT:** Friedman & Bruya  
**Project:** 604013  
**Lab Order:** 1604015

## Work Order Sample Summary

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Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1604015-001	WSW2-11	03/30/2016 12:00 AM	04/01/2016 3:54 PM
1604015-002	B1-18	03/30/2016 12:00 AM	04/01/2016 3:54 PM

**CLIENT:** Friedman & Bruya**Project:** 604013

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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 (<20%RSD, <20% Drift or minimum RRF)
- 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
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



# Analytical Report

WO#: 1604015  
Date Reported: 4/21/2016

**Client:** Friedman & Bruya

**Collection Date:** 3/30/2016

**Project:** 604013

**Lab ID:** 1604015-001

**Matrix:** Soil

**Client Sample ID:** WSW2-11

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>Extractable Petroleum Hydrocarbons by NWEPH</b>						
				Batch ID: 13403	Analyst: CM	
Aliphatic Hydrocarbon (C8-C10)	52.4	4.86	*	mg/Kg-dry	1	4/20/2016 12:26:00 AM
Aliphatic Hydrocarbon (C10-C12)	271	4.86	*	mg/Kg-dry	1	4/20/2016 12:26:00 AM
Aliphatic Hydrocarbon (C12-C16)	715	4.86	*	mg/Kg-dry	1	4/20/2016 12:26:00 AM
Aliphatic Hydrocarbon (C16-C21)	711	4.86	Q	mg/Kg-dry	1	4/20/2016 12:26:00 AM
Aliphatic Hydrocarbon (C21-C34)	176	4.86	*	mg/Kg-dry	1	4/20/2016 12:26:00 AM
Aromatic Hydrocarbon (C8-C10)	31.2	4.86	*	mg/Kg-dry	1	4/20/2016 9:30:00 AM
Aromatic Hydrocarbon (C10-C12)	160	4.86	*	mg/Kg-dry	1	4/20/2016 9:30:00 AM
Aromatic Hydrocarbon (C12-C16)	531	4.86	*	mg/Kg-dry	1	4/20/2016 9:30:00 AM
Aromatic Hydrocarbon (C16-C21)	820	4.86		mg/Kg-dry	1	4/20/2016 9:30:00 AM
Aromatic Hydrocarbon (C21-C34)	659	4.86		mg/Kg-dry	1	4/20/2016 9:30:00 AM
Surr: 1-Chlorooctadecane	64.3	60-140		%Rec	1	4/20/2016 12:26:00 AM
Surr: o-Terphenyl	104	60-140		%Rec	1	4/20/2016 9:30:00 AM

**NOTES:**

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.

<b>Volatile Petroleum Hydrocarbons by NWVPH</b>						
				Batch ID: 13409	Analyst: BC	
Aliphatic Hydrocarbon (C5-C6)	ND	2.23		mg/Kg-dry	1	4/7/2016 12:32:08 PM
Aliphatic Hydrocarbon (C6-C8)	16.6	2.23		mg/Kg-dry	1	4/7/2016 12:32:08 PM
Aliphatic Hydrocarbon (C8-C10)	122	44.7	D	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Aliphatic Hydrocarbon (C10-C12)	509	44.7	D	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Aromatic Hydrocarbon (C8-C10)	173	44.7	D	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Aromatic Hydrocarbon (C10-C12)	2,960	44.7	DE	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Aromatic Hydrocarbon (C12-C13)	4,630	44.7	DE	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Benzene	ND	0.558		mg/Kg-dry	1	4/7/2016 12:32:08 PM
Toluene	1.82	0.558		mg/Kg-dry	1	4/7/2016 12:32:08 PM
Ethylbenzene	4.23	0.558	Q	mg/Kg-dry	1	4/7/2016 12:32:08 PM
m,p-Xylene	18.1	0.558		mg/Kg-dry	1	4/7/2016 12:32:08 PM
o-Xylene	11.1	0.558		mg/Kg-dry	1	4/7/2016 12:32:08 PM
Naphthalene	274	11.2	D	mg/Kg-dry	20	4/7/2016 4:13:09 AM
Methyl tert-butyl ether (MTBE)	ND	0.558	*	mg/Kg-dry	1	4/7/2016 12:32:08 PM
Surr: 1,4-Difluorobenzene	113	65-140		%Rec	1	4/7/2016 12:32:08 PM
Surr: Bromofluorobenzene	71.7	65-140	D	%Rec	20	4/7/2016 4:13:09 AM

**NOTES:**

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.



# Analytical Report

WO#: 1604015  
Date Reported: 4/21/2016

**Client:** Friedman & Bruya

**Collection Date:** 3/30/2016

**Project:** 604013

**Lab ID:** 1604015-001

**Matrix:** Soil

**Client Sample ID:** WSW2-11

<b>Analyses</b>	<b>Result</b>	<b>RL</b>	<b>Qual</b>	<b>Units</b>	<b>DF</b>	<b>Date Analyzed</b>
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**Sample Moisture (Percent Moisture)**

Batch ID: R28628      Analyst: CG

Percent Moisture	7.71	0.500		wt%	1	4/6/2016 1:16:13 PM
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# Analytical Report

WO#: 1604015  
Date Reported: 4/21/2016

**Client:** Friedman & Bruya

**Collection Date:** 3/30/2016

**Project:** 604013

**Lab ID:** 1604015-002

**Matrix:** Soil

**Client Sample ID:** B1-18

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>Extractable Petroleum Hydrocarbons by NWEPH</b>						
				Batch ID: 13403	Analyst: CM	
Aliphatic Hydrocarbon (C8-C10)	196	5.30	*	mg/Kg-dry	1	4/20/2016 2:58:00 AM
Aliphatic Hydrocarbon (C10-C12)	761	5.30	*	mg/Kg-dry	1	4/20/2016 2:58:00 AM
Aliphatic Hydrocarbon (C12-C16)	1,870	53.0	D	mg/Kg-dry	10	4/20/2016 6:35:00 PM
Aliphatic Hydrocarbon (C16-C21)	630	53.0	DQ	mg/Kg-dry	10	4/20/2016 6:35:00 PM
Aliphatic Hydrocarbon (C21-C34)	338	5.30	*	mg/Kg-dry	1	4/20/2016 2:58:00 AM
Aromatic Hydrocarbon (C8-C10)	100	5.30	*	mg/Kg-dry	1	4/20/2016 11:56:00 AM
Aromatic Hydrocarbon (C10-C12)	323	5.30	*	mg/Kg-dry	1	4/20/2016 11:56:00 AM
Aromatic Hydrocarbon (C12-C16)	989	5.30	*	mg/Kg-dry	1	4/20/2016 11:56:00 AM
Aromatic Hydrocarbon (C16-C21)	830	53.0	D	mg/Kg-dry	10	4/20/2016 7:29:00 PM
Aromatic Hydrocarbon (C21-C34)	1,100	53.0	D	mg/Kg-dry	10	4/20/2016 7:29:00 PM
Surr: 1-Chlorooctadecane	110	60-140		%Rec	1	4/20/2016 2:58:00 AM
Surr: o-Terphenyl	130	60-140		%Rec	1	4/20/2016 11:56:00 AM

**NOTES:**

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.

<b>Volatile Petroleum Hydrocarbons by NWVPH</b>						
				Batch ID: 13409	Analyst: BC	
Aliphatic Hydrocarbon (C5-C6)	ND	1.86		mg/Kg-dry	1	4/7/2016 1:43:06 PM
Aliphatic Hydrocarbon (C6-C8)	27.5	1.86		mg/Kg-dry	1	4/7/2016 1:43:06 PM
Aliphatic Hydrocarbon (C8-C10)	ND	93.0	D	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Aliphatic Hydrocarbon (C10-C12)	389	93.0	D	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Aromatic Hydrocarbon (C8-C10)	159	93.0	D	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Aromatic Hydrocarbon (C10-C12)	4,170	93.0	DE	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Aromatic Hydrocarbon (C12-C13)	6,850	93.0	DE	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Benzene	0.519	0.465		mg/Kg-dry	1	4/7/2016 1:43:06 PM
Toluene	7.80	0.465		mg/Kg-dry	1	4/7/2016 1:43:06 PM
Ethylbenzene	9.59	0.465	Q	mg/Kg-dry	1	4/7/2016 1:43:06 PM
m,p-Xylene	28.7	0.465		mg/Kg-dry	1	4/7/2016 1:43:06 PM
o-Xylene	14.7	0.465		mg/Kg-dry	1	4/7/2016 1:43:06 PM
Naphthalene	364	23.2	D	mg/Kg-dry	50	4/7/2016 4:48:40 AM
Methyl tert-butyl ether (MTBE)	ND	0.465	*	mg/Kg-dry	1	4/7/2016 1:43:06 PM
Surr: 1,4-Difluorobenzene	113	65-140		%Rec	1	4/7/2016 1:43:06 PM
Surr: Bromofluorobenzene	73.8	65-140	D	%Rec	50	4/7/2016 4:48:40 AM

**NOTES:**

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.



# Analytical Report

WO#: 1604015  
Date Reported: 4/21/2016

**Client:** Friedman & Bruya  
**Project:** 604013  
**Lab ID:** 1604015-002  
**Client Sample ID:** B1-18

**Collection Date:** 3/30/2016  
**Matrix:** Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b><u>Sample Moisture (Percent Moisture)</u></b>				Batch ID: R28628		Analyst: CG
Percent Moisture	12.9	0.500		wt%	1	4/6/2016 1:16:13 PM

Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>MB-13403</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/19/2016</b>	SeqNo: <b>542942</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	ND	5.00									
Aliphatic Hydrocarbon (C10-C12)	ND	5.00									
Aliphatic Hydrocarbon (C12-C16)	ND	5.00									
Aliphatic Hydrocarbon (C16-C21)	ND	5.00									
Aliphatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: 1-Chlorooctadecane	13.4		20.00		66.8	60	140				

Sample ID: <b>LCS-13403</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/19/2016</b>	SeqNo: <b>542941</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	155	5.00	100.0	0	155	70	130				S
Aliphatic Hydrocarbon (C10-C12)	123	5.00	50.00	0	245	70	130				S
Aliphatic Hydrocarbon (C12-C16)	136	5.00	50.00	0	272	70	130				S
Aliphatic Hydrocarbon (C16-C21)	41.7	5.00	50.00	0	83.3	70	130				Q
Aliphatic Hydrocarbon (C21-C34)	121	5.00	50.00	0	241	70	130				S
Surr: 1-Chlorooctadecane	12.4		20.00		62.1	60	140				

**NOTES:**

S - Outlying spike recovery observed (high bias). Detections will be qualified with a \*.

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

Sample ID: <b>MB-13403</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/19/2016</b>	SeqNo: <b>542976</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	ND	5.00									
Aromatic Hydrocarbon (C10-C12)	ND	5.00									
Aromatic Hydrocarbon (C12-C16)	ND	5.00									
Aromatic Hydrocarbon (C16-C21)	ND	5.00									
Aromatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: o-Terphenyl	21.5		20.00		108	60	140				



**Work Order:** 1604015  
**CLIENT:** Friedman & Bruya  
**Project:** 604013

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>MB-13403</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/19/2016</b>	SeqNo: <b>542976</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: <b>LCS-13403</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/19/2016</b>	SeqNo: <b>542975</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aromatic Hydrocarbon (C8-C10)	143	5.00	50.00	0	285	70	130				S
Aromatic Hydrocarbon (C10-C12)	166	5.00	50.00	0	332	70	130				S
Aromatic Hydrocarbon (C12-C16)	173	5.00	50.00	0	347	70	130				S
Aromatic Hydrocarbon (C16-C21)	62.6	5.00	50.00	0	125	70	130				
Aromatic Hydrocarbon (C21-C34)	48.8	5.00	50.00	0	97.7	70	130				
Surr: o-Terphenyl	19.3		20.00		96.3	60	140				

**NOTES:**

S - Outlying spike recovery observed (high bias). Detections will be qualified with a \*.

Sample ID: <b>1604015-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>WSW2-11</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543026</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C8-C10)	192	5.33	106.5	52.43	131	70	130				S
Aliphatic Hydrocarbon (C10-C12)	378	5.33	106.5	270.9	100	70	130				
Aliphatic Hydrocarbon (C12-C16)	821	5.33	106.5	714.7	99.3	70	130				
Aliphatic Hydrocarbon (C16-C21)	664	5.33	106.5	711.0	-43.9	70	130				SQ
Aliphatic Hydrocarbon (C21-C34)	288	5.33	106.5	176.4	105	70	130				
Surr: 1-Chlorooctadecane	12.9		21.31		60.6	60	140				

**NOTES:**

S - Outlying spike recoveries were associated with this sample.

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>1604015-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>				Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>				
Client ID: <b>WSW2-11</b>	Batch ID: <b>13403</b>					Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543027</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	212	4.74	94.80	52.43	168	70	130	191.5	10.2	30	S
Aliphatic Hydrocarbon (C10-C12)	427	4.74	94.80	270.9	164	70	130	377.7	12.2	30	S
Aliphatic Hydrocarbon (C12-C16)	756	4.74	94.80	714.7	43.6	70	130	820.5	8.18	30	S
Aliphatic Hydrocarbon (C16-C21)	731	4.74	94.80	711.0	21.4	70	130	664.2	9.62	30	SQ
Aliphatic Hydrocarbon (C21-C34)	326	4.74	94.80	176.4	158	70	130	287.9	12.4	30	S
Surr: 1-Chlorooctadecane	13.5		18.96		71.3	60	140		0		

**NOTES:**

S - Outlying spike recoveries were associated with this sample.

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

Sample ID: <b>1604015-002ADUP</b>	SampType: <b>DUP</b>	Units: <b>mg/Kg-dry</b>				Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>				
Client ID: <b>B1-18</b>	Batch ID: <b>13403</b>					Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543023</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	404	5.23						196.4	69.2	30	R*
Aliphatic Hydrocarbon (C10-C12)	693	5.23						760.7	9.32	30	*
Aliphatic Hydrocarbon (C12-C16)	1,630	5.23						1,506	7.85	30	E*
Aliphatic Hydrocarbon (C16-C21)	1,500	5.23						1,211	21.1	30	EQ
Aliphatic Hydrocarbon (C21-C34)	334	5.23						338.4	1.31	30	*
Surr: 1-Chlorooctadecane	19.3		4.184		460	60	140		0		S

**NOTES:**

R - High RPD observed.

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.

Sample ID: <b>1604015-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>				Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>				
Client ID: <b>WSW2-11</b>	Batch ID: <b>13403</b>					Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543038</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	188	5.33	106.5	0	177	70	130				S
Aromatic Hydrocarbon (C10-C12)	342	5.33	106.5	0	321	70	130				S
Aromatic Hydrocarbon (C12-C16)	679	5.33	106.5	0	637	70	130				S



Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Extractable Petroleum Hydrocarbons by NWEPH**

Sample ID: <b>1604015-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>WSW2-11</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543038</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aromatic Hydrocarbon (C16-C21)	986	5.33	106.5	0	925	70	130				S
Aromatic Hydrocarbon (C21-C34)	416	5.33	106.5	0	390	70	130				S
Surr: o-Terphenyl	23.6		21.31		111	60	140				

**NOTES:**

S - Outlying spike recoveries were associated with this sample.

Sample ID: <b>1604015-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>WSW2-11</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543034</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aromatic Hydrocarbon (C8-C10)	217	4.74	94.80	0	229	70	130	0	200	30	S
Aromatic Hydrocarbon (C10-C12)	413	4.74	94.80	0	435	70	130	0	200	30	S
Aromatic Hydrocarbon (C12-C16)	815	4.74	94.80	0	860	70	130	0	200	30	S
Aromatic Hydrocarbon (C16-C21)	1,420	4.74	94.80	0	1,490	70	130	0	200	30	S
Aromatic Hydrocarbon (C21-C34)	831	4.74	94.80	0	877	70	130	0	200	30	S
Surr: o-Terphenyl	26.1		18.96		138	60	140		0		

**NOTES:**

S - Outlying spike recoveries were associated with this sample.

Sample ID: <b>1604015-002ADUP</b>	SampType: <b>DUP</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28874</b>							
Client ID: <b>B1-18</b>	Batch ID: <b>13403</b>		Analysis Date: <b>4/20/2016</b>	SeqNo: <b>543031</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aromatic Hydrocarbon (C8-C10)	84.1	5.23						0	200	30	*
Aromatic Hydrocarbon (C10-C12)	278	5.23						0	200	30	*
Aromatic Hydrocarbon (C12-C16)	853	5.23						0	200	30	*
Aromatic Hydrocarbon (C16-C21)	1,730	5.23						0	200	30	E
Aromatic Hydrocarbon (C21-C34)	1,120	5.23						0	200	30	E
Surr: o-Terphenyl	27.3		20.92		131	60	140		0		

**NOTES:**

\* - Flagged value is not within established control limits.

Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: <b>LCS-13409</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539441</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C5-C6)	21.2	2.00	30.00	0	70.7	70	130				
Aliphatic Hydrocarbon (C6-C8)	8.35	2.00	10.00	0	83.5	70	130				
Aliphatic Hydrocarbon (C8-C10)	9.26	2.00	10.00	0	92.6	70	130				
Aliphatic Hydrocarbon (C10-C12)	8.58	2.00	10.00	0	85.8	70	130				
Aromatic Hydrocarbon (C8-C10)	37.2	2.00	40.00	0	93.0	70	130				
Aromatic Hydrocarbon (C10-C12)	9.07	2.00	10.00	0	90.7	70	130				
Aromatic Hydrocarbon (C12-C13)	7.36	2.00	10.00	0	73.6	70	130				
Benzene	8.17	0.500	10.00	0	81.7	70	130				
Toluene	8.13	0.500	10.00	0	81.3	70	130				
Ethylbenzene	8.51	0.500	10.00	0	85.1	70	130				
m,p-Xylene	17.4	0.500	20.00	0	86.8	70	130				
o-Xylene	8.84	0.500	10.00	0	88.4	70	130				
Naphthalene	7.43	0.500	10.00	0	74.3	70	130				
Methyl tert-butyl ether (MTBE)	ND	0.500	10.00	0	0	70	130				SQ
Surr: 1,4-Difluorobenzene	2.57		2.500		103	65	140				
Surr: Bromofluorobenzene	2.57		2.500		103	65	140				

**NOTES:**

S - Outlying spike recovery observed (low bias). Samples will be qualified with a \*.

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

Sample ID: <b>MB-13409</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539319</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C5-C6)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C6-C8)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C8-C10)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C10-C12)	ND	2.00		0	0						
Aromatic Hydrocarbon (C8-C10)	ND	2.00		0	0						
Aromatic Hydrocarbon (C10-C12)	ND	2.00		0	0						
Aromatic Hydrocarbon (C12-C13)	ND	2.00		0	0						



Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: <b>MB-13409</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539319</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	ND	0.500		0	0						
Toluene	ND	0.500		0	0						
Ethylbenzene	ND	0.500		0	0						
m,p-Xylene	ND	0.500		0	0						
o-Xylene	ND	0.500		0	0						
Naphthalene	ND	0.500		0	0						
Methyl tert-butyl ether (MTBE)	ND	0.500		0	0						*
Surr: 1,4-Difluorobenzene	2.55		2.500		102	65	140				
Surr: Bromofluorobenzene	1.91		2.500		76.4	65	140				

**NOTES:**

\* - Flagged value is not within established control limits.

Sample ID: <b>1604014-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539305</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C5-C6)	ND	1.65		0	0			0		25	
Aliphatic Hydrocarbon (C6-C8)	6.01	1.65		0	0			4.209	35.2	25	R
Aliphatic Hydrocarbon (C8-C10)	7.10	1.65		0	0			3.721	62.4	25	R
Aliphatic Hydrocarbon (C10-C12)	20.6	1.65		0	0			19.61	5.04	25	
Aromatic Hydrocarbon (C8-C10)	11.8	1.65		0	0			8.624	30.8	25	R
Aromatic Hydrocarbon (C10-C12)	89.9	1.65		0	0			80.54	11.0	25	E
Aromatic Hydrocarbon (C12-C13)	64.5	1.65		0	0			62.40	3.25	25	
Benzene	ND	0.413		0	0			0		25	
Toluene	ND	0.413		0	0			0		25	
Ethylbenzene	ND	0.413		0	0			0		25	
m,p-Xylene	ND	0.413		0	0			0		25	
o-Xylene	ND	0.413		0	0			0		25	
Naphthalene	6.81	0.413		0	0			6.449	5.40	25	
Methyl tert-butyl ether (MTBE)	ND	0.413		0	0			0		25	*
Surr: 1,4-Difluorobenzene	2.10		2.064		102	65	140		0		

Work Order: 1604015  
 CLIENT: Friedman & Bruya  
 Project: 604013

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Sample ID: <b>1604014-001BDUP</b>	SampType: <b>DUP</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539305</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Bromofluorobenzene	2.06		2.064		99.7	65	140		0	0	
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**NOTES:**

R - High RPD observed. The method is in control as indicated by the Laboratory Control Sample (LCS).  
 \* - Flagged value is not within established control limits.

Sample ID: <b>1604015-002BMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28673</b>							
Client ID: <b>B1-18</b>	Batch ID: <b>13409</b>		Analysis Date: <b>4/7/2016</b>	SeqNo: <b>539310</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C5-C6)	22.2	1.86	27.90	1.398	74.7	70	130				
Aliphatic Hydrocarbon (C6-C8)	41.4	1.86	9.299	27.47	149	70	130				S
Aliphatic Hydrocarbon (C8-C10)	81.4	1.86	9.299	66.78	157	70	130				SE
Aliphatic Hydrocarbon (C10-C12)	414	1.86	9.299	329.4	913	70	130				SE
Aromatic Hydrocarbon (C8-C10)	313	1.86	37.20	245.5	180	70	130				SE
Aromatic Hydrocarbon (C10-C12)	613	1.86	9.299	589.6	253	70	130				SQE
Aromatic Hydrocarbon (C12-C13)	554	1.86	9.299	813.4	-2,790	70	130				SQE
Benzene	12.8	0.465	9.299	0.5190	132	70	130				S
Toluene	17.9	0.465	9.299	7.797	108	70	130				
Ethylbenzene	17.9	0.465	9.299	9.588	89.3	70	130				Q
m,p-Xylene	44.2	0.465	18.60	28.70	83.6	70	130				
o-Xylene	22.8	0.465	9.299	14.67	87.5	70	130				
Naphthalene	152	0.465	9.299	100.5	551	70	130				S
Methyl tert-butyl ether (MTBE)	ND	0.465	9.299	0	0	70	130				S*
Surr: 1,4-Difluorobenzene	3.10		2.325		133	65	140				
Surr: Bromofluorobenzene	4.47		2.325		192	65	140				S

**NOTES:**

S - Outlying surrogate recovery attributed to TPH interference. The method is in control as indicated by the Method Blank (MB) & Laboratory Control Sample (LCS).  
 Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.  
 \* - Flagged value is not within established control limits.

**Work Order:** 1604015  
**CLIENT:** Friedman & Bruya  
**Project:** 604013

**QC SUMMARY REPORT**  
**Volatile Petroleum Hydrocarbons by NWVPH**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	23.5	1.86	27.90	1.398	79.4	70	130	22.24	5.70	30	
Aliphatic Hydrocarbon (C6-C8)	41.6	1.86	9.299	27.47	152	70	130	41.37	0.498	30	S
Aliphatic Hydrocarbon (C8-C10)	79.6	1.86	9.299	66.78	138	70	130	81.39	2.27	30	SE
Aliphatic Hydrocarbon (C10-C12)	458	1.86	9.299	329.4	1,390	70	130	414.3	10.1	30	SE
Aromatic Hydrocarbon (C8-C10)	330	1.86	37.20	245.5	227	70	130	312.6	5.44	30	SE
Aromatic Hydrocarbon (C10-C12)	593	1.86	9.299	589.6	40.2	70	130	613.1	3.29	30	SQE
Aromatic Hydrocarbon (C12-C13)	688	1.86	9.299	813.4	-1,350	70	130	554.2	21.5	30	SQE
Benzene	13.1	0.465	9.299	0.5190	135	70	130	12.80	2.14	30	S
Toluene	19.1	0.465	9.299	7.797	122	70	130	17.85	6.73	30	
Ethylbenzene	20.2	0.465	9.299	9.588	114	70	130	17.89	12.1	30	Q
m,p-Xylene	49.2	0.465	18.60	28.70	110	70	130	44.24	10.7	30	
o-Xylene	25.2	0.465	9.299	14.67	113	70	130	22.80	9.90	30	
Naphthalene	167	0.465	9.299	100.5	720	70	130	151.7	9.85	30	SE
Methyl tert-butyl ether (MTBE)	ND	0.465	9.299	0	0	70	130	0		30	S*
Surr: 1,4-Difluorobenzene	3.52		2.325		151	65	140		0		S
Surr: Bromofluorobenzene	4.89		2.325		210	65	140		0	0	S

**NOTES:**

S - Outlying surrogate recovery attributed to TPH interference. The method is in control as indicated by the Method Blank (MB) & Laboratory Control Sample (LCS).

Q - Indicates an analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF); high bias.

\* - Flagged value is not within established control limits.



Date: 4/21/2016

**Work Order:** 1604015  
**CLIENT:** Friedman & Bruya  
**Project:** 604013

**QC SUMMARY REPORT**  
**Sample Moisture (Percent Moisture)**

Sample ID: <b>1604002-001ADUP</b>	SampType: <b>DUP</b>	Units: <b>wt%</b>	Prep Date: <b>4/6/2016</b>	RunNo: <b>28628</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>R28628</b>		Analysis Date: <b>4/6/2016</b>	SeqNo: <b>538346</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	19.5	0.500						16.74	15.4	20	



Client Name: <b>FB</b>	Work Order Number: <b>1604015</b>
Logged by: <b>Erica Silva</b>	Date Received: <b>4/1/2016 3:54:00 PM</b>

**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   
No cooler present
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 Required
6. Was an attempt made to cool the samples? Yes  No  NA
7. Were all items received at a temperature of >0°C to 10.0°C \* Yes  No  NA   
Please refer to Item Information
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
Cooler	10.1
Sample	10.3

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

**SUBCONTRACT SAMPLE CHAIN OF CUSTODY**

Send Report To Michael Erdahl  
 Company Friedman and Bruya, Inc.  
 Address 3012 16th Ave W  
 City, State, ZIP Seattle, WA 98119  
 Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTOR <u>Fremont</u>	
PROJECT NAME/NO. <u>604013</u>	PO # <u>D-906</u>
REMARKS Please Email Results	

Pages # 1 of 1

TURNOAROUND TIME  
 Standard (2 Weeks)  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Return samples  
 Will call with instructions

1604015

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED								Notes	
						Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M			
WSW2-11 R1-18		3/30/16		Soil	2		X	X							
SIGNATURE															
Received by: <i>[Signature]</i>						Michael Erdahl						DATE		TIME	
Relinquished by: <i>[Signature]</i>						Eric Silva						DATE		TIME	
Friedman & Bruya, Inc.						Friedman and Bruya						DATE		TIME	
3012 16th Avenue West						Friedman and Bruya						DATE		TIME	
Seattle, WA 98119-2029						Friedman and Bruya						DATE		TIME	
Ph. (206) 285-8282						Friedman and Bruya						DATE		TIME	
Fax (206) 283-5044						Friedman and Bruya						DATE		TIME	

604013

SAMPLE CHAIN OF CUSTODY

ME 04-01-16

11/13/16  
1/1/16

Send Report To Ken Noyire  
 Company PBS Engineering  
 Address 2517 East  
 City, State, ZIP Seattle, WA  
 Phone # 206.572.8163 Fax # \_\_\_\_\_  
 Email Address Ken.noyire@pbsenv.com

SAMPLERS (signature) <u>Diana S. Eddy</u>	PROJECT NAME/NO. <u>41392</u>	PO # <u>41392</u>
PROJECT ADDRESS	PROJECT ADDRESS	
• ELECTRONIC DATA REQUESTED		

Page # \_\_\_\_\_ of \_\_\_\_\_

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Return samples  
 Will call with instructions  
 Samples Received at \_\_\_\_\_ °C

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED										Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HPS	VPH / EPH	lead	PAHs			
NSW2-17	01A-D	3.30.16		Soil	4	X	X	X									
ESW1-17	02				"	X	X	X									
SSW1-17	03				"	X	X	X									
MSW2-11	04				"	X	X	X									
B1-18	05				"	X	X	X				X	X	X			
Trip Blank	06				1												

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282  
 Fax (206) 283-5044  
 FORMS\COC\COC.DOC

SIGNATURE		PRINT NAME		COMPANY		DATE	TIME
<u>Diana S. Eddy</u>		<u>Diana S. Eddy</u>		<u>PBS</u>		<u>3/1/16</u>	
<u>Ken Noyire</u>		<u>Ken Noyire</u>		<u>PBS</u>		<u>4/1/16</u>	<u>10:00</u>
Received by:		Received by:		Received by:			

Samples received at 2 °C

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

May 5, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr. Nogeire:

Included are the results from the testing of material submitted on April 29, 2016 from the 41392, F&BI 604521 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0505R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 29, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 41392, F&BI 604521 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
604521 -01	MW1
604521 -02	MW2
604521 -03	MW3

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/05/16  
Date Received: 04/29/16  
Project: 41392, F&BI 604521  
Date Extracted: 04/29/16  
Date Analyzed: 04/29/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
MW1 604521-01	5,800	<250	113
MW2 604521-02	<50	<250	103
MW3 604521-03	15,000	390 x	147
Method Blank 06-856 MB	<50	<250	118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/05/16

Date Received: 04/29/16

Project: 41392, F&BI 604521

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 604510-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	110	112	63-146	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	111	79-144

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



604521

SAMPLE CHAIN OF CUSTODY

ME 04-29-16

B01

Send Report To Ken Nguyen

Company PBS

Address Seattle

City, State, ZIP \_\_\_\_\_

Phone # 206.572.8163 Fax # \_\_\_\_\_

Email Address Ken.Nguyen@pbsenv.com

SAMPLERS (Signature)	
PROJECT NAME/NO.	PO #
<u>41392</u>	<u>41392</u>
PROJECT ADDRESS	
• ELECTRONIC DATA REQUESTED	

Page # \_\_\_\_\_ of \_\_\_\_\_

TURNAROUND TIME

Standard Turnaround

RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

Dispose after 30 days



Return samples

Will call with instructions

Samples Received at \_\_\_\_\_ °C

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED					Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS
NW1	01	4/28/16	10:00am	Soil	1	X						
NW2	02	4/28/16	10:00am		1	X						
NW3	03	4/28/16	11:00		1	X						

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282  
 Fax (206) 283-5044  
 FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	Ken Nguyen	PBS	4/21/16	1200
	Eric Chan	EPB	4/21/16	12
Received by:				
Retinquished by:				

Samples received at 21 °C

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

May 19, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr. Nogeire:

Included are the results from the testing of material submitted on May 11, 2016 from the 41392, F&BI 605193 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Megan Nogeire  
PBS0519R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 11, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 41392, F&BI 605193 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
605193 -01	MW1
605193 -02	MW2
605193 -03	Trip blank

The 8270D laboratory control sample and laboratory control sample duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16  
Date Received: 05/11/16  
Project: 41392, F&BI 605193  
Date Extracted: 05/12/16  
Date Analyzed: 05/12/16 and 05/13/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW1 605193-01	49	78	89	440	4,300	118
MW2 605193-02	<1	<1	1.1	<3	420	101
Method Blank 06-943 MB	<1	<1	<1	<3	<100	96

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16  
Date Received: 05/11/16  
Project: 41392, F&BI 605193  
Date Extracted: 05/12/16  
Date Analyzed: 05/12/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Trip blank 605193-03	<1	<1	<1	<3	98
Method Blank 06-943 MB	<1	<1	<1	<3	96

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16  
Date Received: 05/11/16  
Project: 41392, F&BI 605193  
Date Extracted: 05/12/16  
Date Analyzed: 05/12/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW1 605193-01	12,000	1,100 x	72
MW2 605193-02	1,300	250 x	112
Method Blank 06-959 MB	<50	<250	97

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW1	Client:	PBS Engineering and Environmental
Date Received:	05/11/16	Project:	41392, F&BI 605193
Date Extracted:	05/12/16	Lab ID:	605193-01 1/2
Date Analyzed:	05/12/16	Data File:	051222.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	31	160
Benzo(a)anthracene-d12	67	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	38 ve
Acenaphthylene	<0.06
Acenaphthene	0.16
Fluorene	0.19
Phenanthrene	0.18
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW1	Client:	PBS Engineering and Environmental
Date Received:	05/11/16	Project:	41392, F&BI 605193
Date Extracted:	05/12/16	Lab ID:	605193-01 1/40
Date Analyzed:	05/13/16	Data File:	051304.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111 d	31	160
Benzo(a)anthracene-d12	76 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	56
Acenaphthylene	<1.2
Acenaphthene	<1.2
Fluorene	<1.2
Phenanthrene	<1.2
Anthracene	<1.2
Fluoranthene	<1.2
Pyrene	<1.2
Benz(a)anthracene	<1.2
Chrysene	<1.2
Benzo(a)pyrene	<1.2
Benzo(b)fluoranthene	<1.2
Benzo(k)fluoranthene	<1.2
Indeno(1,2,3-cd)pyrene	<1.2
Dibenz(a,h)anthracene	<1.2
Benzo(g,h,i)perylene	<1.2



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW2	Client:	PBS Engineering and Environmental
Date Received:	05/11/16	Project:	41392, F&BI 605193
Date Extracted:	05/12/16	Lab ID:	605193-02 1/2
Date Analyzed:	05/12/16	Data File:	051223.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	31	160
Benzo(a)anthracene-d12	94	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	3.9
Acenaphthylene	<0.06
Acenaphthene	0.23
Fluorene	0.25
Phenanthrene	0.42
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	0.11
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	41392, F&BI 605193
Date Extracted:	05/12/16	Lab ID:	06-934 mb
Date Analyzed:	05/12/16	Data File:	051217.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	31	160
Benzo(a)anthracene-d12	92	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16

Date Received: 05/11/16

Project: 41392, F&BI 605193

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 605188-05 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	97	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	93	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16

Date Received: 05/11/16

Project: 41392, F&BI 605193

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	97	96	63-142	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/16

Date Received: 05/11/16

Project: 41392, F&BI 605193

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	98	89	67-116	10
Acenaphthylene	ug/L (ppb)	1	98	89	65-119	10
Acenaphthene	ug/L (ppb)	1	100	91	66-118	9
Fluorene	ug/L (ppb)	1	96	88	64-125	9
Phenanthrene	ug/L (ppb)	1	101	93	67-120	8
Anthracene	ug/L (ppb)	1	98	90	65-122	9
Fluoranthene	ug/L (ppb)	1	89	83	65-127	7
Pyrene	ug/L (ppb)	1	109	95	62-130	14
Benz(a)anthracene	ug/L (ppb)	1	112	98	60-118	13
Chrysene	ug/L (ppb)	1	109	96	66-125	13
Benzo(b)fluoranthene	ug/L (ppb)	1	107	91	55-135	16
Benzo(k)fluoranthene	ug/L (ppb)	1	100	93	62-125	7
Benzo(a)pyrene	ug/L (ppb)	1	102	89	58-127	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	102	77	36-142	28 vo
Dibenz(a,h)anthracene	ug/L (ppb)	1	94	69	37-133	31 vo
Benzo(g,h,i)perylene	ug/L (ppb)	1	96	74	34-135	26 vo

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

605193

SAMPLE CHAIN OF CUSTODY

ME 05-11-16

DOV/v1

Send Report To K. Nogueira

Company PBS

Address 2517 Eastlake Ave. E

City, State, ZIP Seattle, WA

Phone # 509.572.8163 Fax #

SAMPLERS (signature)

Megan Nogueira

PROJECT NAME/NO.

41392

PO #

41392

REMARKS

GEMS Y / N

Page # 1 of 1

TURNAROUND TIME

Standard (2 weeks)

RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Return samples

Will call with instructions

ANALYSES REQUESTED

NWTPH-Dx  
NWTPH-Ox  
BTEX by 8021B  
VOC's by 8260  
SVOC's by 8270  
RCRA-8 Metals

PAHs

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Ox	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	Notes
MW1			01A-F	10/4/16	5:00 AM	water	5	X	X	X				
MW2			02	11/3/16	5:00 AM	water	5	X	X	X				
trip blank			03A-B			water	2			X				

Friedman & Bruya, Inc  
3012 16th Avenue West

Seattle, WA 98119

Ph (206) 285-8282

Fax (206) 283-5044

FORMS\COC\SESGEMSR1.DOC (Revision 1)

SIGNATURE

Received by: Ken Nogueira

Relinquished by: [Signature]

PRINT NAME

Ken Nogueira

D. Barnes

COMPANY

PBS

Federal SDC

DATE

5/11/16

5/11/16

TIME

1:00

2:34

Samples received at 5 °C

Received by: [Signature]

Elizabeth Rodford

F&B

5/11

3:00

Samples received at 5 °C

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

November 21, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on November 9, 2016 from the Coleman Oil PO 41392.000, F&BI 611160 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Mike Bagley  
PBS1121R.DOC



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 9, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil PO 41392.000, F&BI 611160 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
611160 -01	MW-5
611160 -02	MW-5a
611160 -03	MW-4
611160 -04	MW-6

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/21/16

Date Received: 11/09/16

Project: Coleman Oil PO 41392.000, F&BI 611160

Date Extracted: 11/15/16

Date Analyzed: 11/15/16 and 11/16/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
MW-5a 611160-02	<0.02	<0.02	0.27	1.1	140	92
MW-4 611160-03	<0.02	<0.02	<0.02	<0.06	<2	80
MW-6 611160-04	<0.02	<0.02	<0.02	<0.06	<2	79
Method Blank	<0.02	<0.02	<0.02	<0.06	<2	82

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/21/16  
Date Received: 11/09/16  
Project: Coleman Oil PO 41392.000, F&BI 611160  
Date Extracted: 11/09/16  
Date Analyzed: 11/10/16

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 56-165)
MW-5 611160-01	<50	<250	115
MW-5a 611160-02	1,100	<250	103
MW-4 611160-03	<50	<250	99
MW-6 611160-04	<50	<250	100
Method Blank 06-2339 MB	<50	<250	108

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/21/16

Date Received: 11/09/16

Project: Coleman Oil PO 41392.000, F&BI 611160

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 611184-06 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	91	69-120
Toluene	mg/kg (ppm)	0.5	90	70-117
Ethylbenzene	mg/kg (ppm)	0.5	89	65-123
Xylenes	mg/kg (ppm)	1.5	88	66-120
Gasoline	mg/kg (ppm)	20	80	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/21/16

Date Received: 11/09/16

Project: Coleman Oil PO 41392.000, F&BI 611160

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 611159-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	92	94	64-133	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	92	58-147

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

611160

SAMPLE CHAIN OF CUSTODY

ME 11-09-16

Page # 1 of 1 CR

Report To K. Nogueira, M. Bagley  
 Company PBS  
 Address 2517 Eastlake Ave. E. Seattle WA  
 City, State, ZIP Seattle, WA 98102  
 Phone 360 830 8384 Email \_\_\_\_\_

SAMPLERS (signature) <u>[Signature]</u>	PROJECT NAME <u>Colman Dil</u>	PO # <u>41392.000</u>
REMARKS	INVOICE TO	

TURNAROUND TIME \_\_\_\_\_  
 Standard Turnaround  
 RUSH \_\_\_\_\_  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM			
MW-5	01	11/8	11:45	S	1	X									
MW-5a	02 A-C	11/8	12:00	S	3	X	X	X							
MW-4	03	11/8	2:00	S	3	X	X	X							
MW-6	04	11/9	9:30	S	3	X	X	X							

Samples received at 4 °C

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	Mike Bagley	PBS	11/9	1:30 PM
<u>[Signature]</u>	Khan Phan	FERT	11/9/16	1:30
Received by:				
Reinquired by:				
Reinquired by:				
Received by:				

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 20, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on December 14, 2016 from the Coleman Oil PO 41392.000, F&BI 612215 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS1220R.DOC



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 14, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil PO 41392.000, F&BI 612215 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
612215 -01	VS-1
612215 -02	VS-2
612215 -03	VS-3

The MA-APH concentration in sample VS-2 exceeded the calibration range of the instrument. The data were flagged accordingly.

Naphthalene was reported below the standard reporting limit. The data were flagged accordingly.

Naphthalene was detected in the TO-15 method blank. Samples with naphthalene below ten times that of the method blank were flagged.

All other quality control requirements were acceptable.

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	VS-1	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-01 1/1.5
Date Analyzed:	12/16/16	Data File:	121522.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	170
APH EC9-12 aliphatics	160
APH EC9-10 aromatics	<75

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	VS-2	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-02 1/1.5
Date Analyzed:	12/16/16	Data File:	121523.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	340
APH EC9-12 aliphatics	7,700 ve
APH EC9-10 aromatics	<75

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	VS-3	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-03 1/1.5
Date Analyzed:	12/16/16	Data File:	121524.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	130
APH EC9-12 aliphatics	<110
APH EC9-10 aromatics	<75

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/15/16	Lab ID:	06-2582 mb/20550
Date Analyzed:	12/15/16	Data File:	121509.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	<46
APH EC9-12 aliphatics	<70
APH EC9-10 aromatics	<50

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	VS-1	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-01 1/1.5
Date Analyzed:	12/16/16	Data File:	121522.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	1.7	0.52
Toluene	7.7	2.1
Ethylbenzene	2.1	0.49
m,p-Xylene	8.6	2.0
o-Xylene	3.4	0.79
1,2,4-Trimethylbenzene	6.9	1.4
Naphthalene	0.91	0.17

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	VS-2	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-02 1/1.5
Date Analyzed:	12/16/16	Data File:	121523.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	2.2	0.70
Toluene	19	5.0
Ethylbenzene	11	2.4
m,p-Xylene	38	8.7
o-Xylene	11	2.5
1,2,4-Trimethylbenzene	<3.7	<0.75
Naphthalene	0.28 j fb	0.054 j fb

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	VS-3	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/13/16	Lab ID:	612215-03 1/1.5
Date Analyzed:	12/16/16	Data File:	121524.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	1.6	0.49
Toluene	9.1	2.4
Ethylbenzene	2.6	0.60
m,p-Xylene	11	2.6
o-Xylene	4.1	0.95
1,2,4-Trimethylbenzene	4.0	0.82
Naphthalene	0.31 j fb	0.060 j fb



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Oil PO 41392.000, F&BI 612215
Date Collected:	12/15/16	Lab ID:	06-2582 mb/20550
Date Analyzed:	12/15/16	Data File:	121509.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.29	<0.1
Toluene	<2.9	<1
Ethylbenzene	<0.77	<0.1
m,p-Xylene	<0.36	<0.1
o-Xylene	<7	<2
1,2,4-Trimethylbenzene	<0.49	<0.1
Naphthalene	0.089 j	0.017 j

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/20/16

Date Received: 12/14/16

Project: Coleman Oil PO 41392.000, F&BI 612215

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES  
FOR VOLATILES BY METHOD APH**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
APH EC5-8 aliphatics	ug/m3	230	105	70-130
APH EC9-12 aliphatics	ug/m3	350	109	70-130
APH EC9-10 aromatics	ug/m3	251	118	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/20/16

Date Received: 12/14/16

Project: Coleman Oil PO 41392.000, F&BI 612215

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES  
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ppbv	10	111	70-130
Toluene	ppbv	10	108	70-130
Ethylbenzene	ppbv	10	108	70-130
m,p-Xylene	ppbv	20	105	70-130
o-Xylene	ppbv	10	104	70-130
1,2,4-Trimethylbenzene	ppbv	10	100	70-130
Naphthalene	ppbv	10	80	70-130

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

612215

SAMPLE CHAIN OF CUSTODY

ME 12/14/16

Report To K. Negreir

Company PBS

Address 2517 Eastlake Ave #100

City, State, ZIP Seattle, WA 98103

Phone 206.233.9639 Email \_\_\_\_\_

Page # \_\_\_\_\_ of \_\_\_\_\_

TURNAROUND TIME

Standard  
 RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

Dispose after 30 days  
 Archive Samples  
 Other

PROJECT NAME

Coleman Oil

PO #

413922005

REMARKS

INVOICE TO

ANALYSIS REQUESTED

TO-15 Full Scan  
TO-15 BTEXN  
TO-15 cVOCs

APIs and select VOCs per 12.8.16 email  
BTEXN - 12.4 TMB  
Notes



Sample Name	Lab ID	Canister ID	Flow Contr. ID	Date Sampled	Field Initial Press. (Hg)	Field Initial Time	Field Final Press. (Hg)	Field Final Time	TO-15 Full Scan	TO-15 BTEXN	TO-15 cVOCs	Notes
VS-1	01	SN 18512	07850	11/30/16	-30	919	-14	1419			X	
VS-2	02	SN 18580	07851	12/16/16	-29	928	-13	1422			X	
VS-3	03	SN 20645	07848	12/13/16	-29	925	-14	1423			X	

Samples received at 18 °C

Friedman & Bruya, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029

Ph. (206) 285-8282  
Fax (206) 283-5044

FORMS.DOC \COCTO-16.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	M. NOELLE	PBS	12/14/16	1320
Received by: 	M. Noelle	FERT	12/14/16	1415
Relinquished by: _____	_____	_____	_____	_____
Received by: _____	_____	_____	_____	_____

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 22, 2016

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on December 14, 2016 from the Coleman Oil PO 41392, F&BI 612214 project. There are 13 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS1222R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 14, 2016 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil PO 41392, F&BI 612214 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
612214 -01	MW3
612214 -02	MW2
612214 -03	MW5
612214 -04	MW4
612214 -05	MW6
612214 -06	Trip Blank

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16  
Date Received: 12/14/16  
Project: Coleman Oil PO 41392, F&BI 612214  
Date Extracted: 12/15/16  
Date Analyzed: 12/15/16

**RESULTS FROM THE ANALYSIS OF SOIL/PRODUCT SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported as Not Detected (ND) or Detected (D)

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE  
WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION  
WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
MW3 612214-01 1/1000	D	D	ND	156
MW2 612214-02 1/1000	D	D	ND	116
MW5 612214-03 1/1000	ND	D	ND	ip
Method Blank 06-2575 MB2	ND	ND	ND	103

ND - Material not detected at or above 20,000 mg/kg gas, 50,000 mg/kg diesel and 250,000 mg/kg heavy oil.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16  
Date Received: 12/14/16  
Project: Coleman Oil PO 41392, F&BI 612214  
Date Extracted: 12/15/16  
Date Analyzed: 12/15/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW4 612214-04 1/100	500	<100	130	<300	12,000	87
MW6 612214-05 1/100	110	<100	130	<300	13,000	88
Method Blank 06-2560 MB	<1	<1	<1	<3	<100	90

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16  
Date Received: 12/14/16  
Project: Coleman Oil PO 41392, F&BI 612214  
Date Extracted: 12/15/16  
Date Analyzed: 12/15/16

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW4 612214-04	3,200 x	460 x	108
MW6 612214-05	3,100 x	<250	99
Method Blank 06-2576 MB2	<50	<250	96

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID: MW4	Client: PBS Engineering and Environmental
Date Received: 12/14/16	Project: Coleman Oil PO 41392, F&BI 612214
Date Extracted: 12/19/16	Lab ID: 612214-04 1/2
Date Analyzed: 12/19/16	Data File: 121911.D
Matrix: Water	Instrument: GCMS6
Units: ug/L (ppb)	Operator: ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	31	160
Benzo(a)anthracene-d12	91	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	150 ve
Acenaphthylene	<0.06
Acenaphthene	1.1
Fluorene	3.4
Phenanthrene	2.2
Anthracene	0.086
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW4	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392, F&BI 612214
Date Extracted:	12/19/16	Lab ID:	612214-04 1/200
Date Analyzed:	12/19/16	Data File:	121925.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	268 d	31	160
Benzo(a)anthracene-d12	125 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	160
Acenaphthylene	<6
Acenaphthene	<6
Fluor ene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392, F&BI 612214
Date Extracted:	12/19/16	Lab ID:	612214-05 1/2
Date Analyzed:	12/19/16	Data File:	121912.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	310 ve
Acenaphthylene	<0.06
Acenaphthene	0.24
Fluorene	0.25
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	12/14/16	Project:	Coleman Oil PO 41392, F&BI 612214
Date Extracted:	12/19/16	Lab ID:	612214-05 1/200
Date Analyzed:	12/19/16	Data File:	121926.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	295 d	31	160
Benzo(a)anthracene-d12	124 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	310
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Oil PO 41392, F&BI 612214
Date Extracted:	12/19/16	Lab ID:	06-2598 mb
Date Analyzed:	12/19/16	Data File:	121905.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16

Date Received: 12/14/16

Project: Coleman Oil PO 41392, F&BI 612214

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 612173-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	104	65-118
Toluene	ug/L (ppb)	50	105	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	108	69-134



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16

Date Received: 12/14/16

Project: Coleman Oil PO 41392, F&BI 612214

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	93	103	63-142	10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/16

Date Received: 12/14/16

Project: Coleman Oil PO 41392, F&BI 612214

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	85	67-116	7
Acenaphthylene	ug/L (ppb)	1	91	86	65-119	6
Acenaphthene	ug/L (ppb)	1	89	85	66-118	5
Fluorene	ug/L (ppb)	1	92	88	64-125	4
Phenanthrene	ug/L (ppb)	1	90	88	67-120	2
Anthracene	ug/L (ppb)	1	93	89	65-122	4
Fluoranthene	ug/L (ppb)	1	92	88	65-127	4
Pyrene	ug/L (ppb)	1	84	83	62-130	1
Benz(a)anthracene	ug/L (ppb)	1	95	91	60-118	4
Chrysene	ug/L (ppb)	1	94	89	66-125	5
Benzo(b)fluoranthene	ug/L (ppb)	1	84	81	55-135	4
Benzo(k)fluoranthene	ug/L (ppb)	1	90	88	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	86	82	58-127	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	89	83	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	81	78	37-133	4
Benzo(g,h,i)perylene	ug/L (ppb)	1	87	78	34-135	11

# FRIEDMAN & BRUYA, INC.

---

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

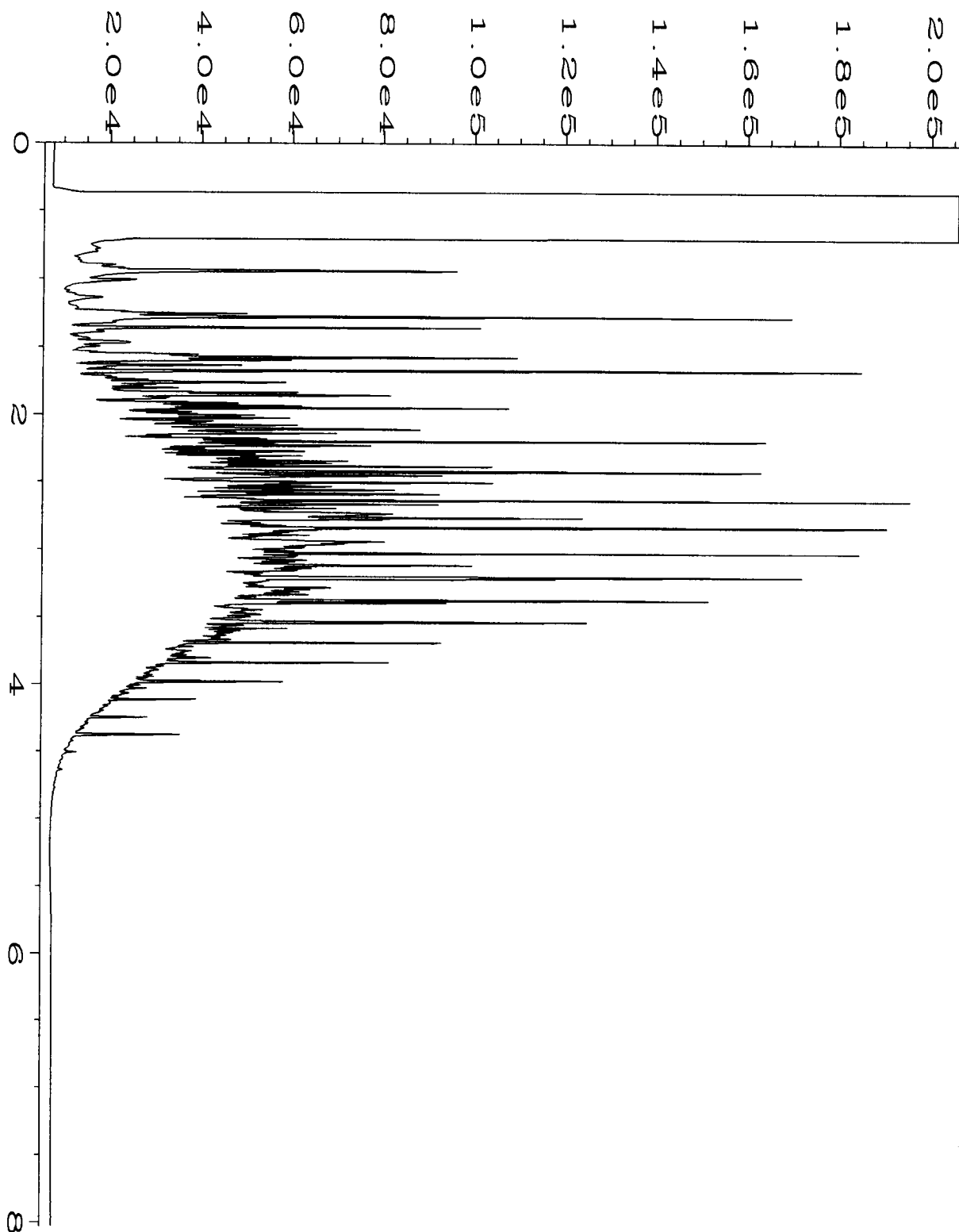
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

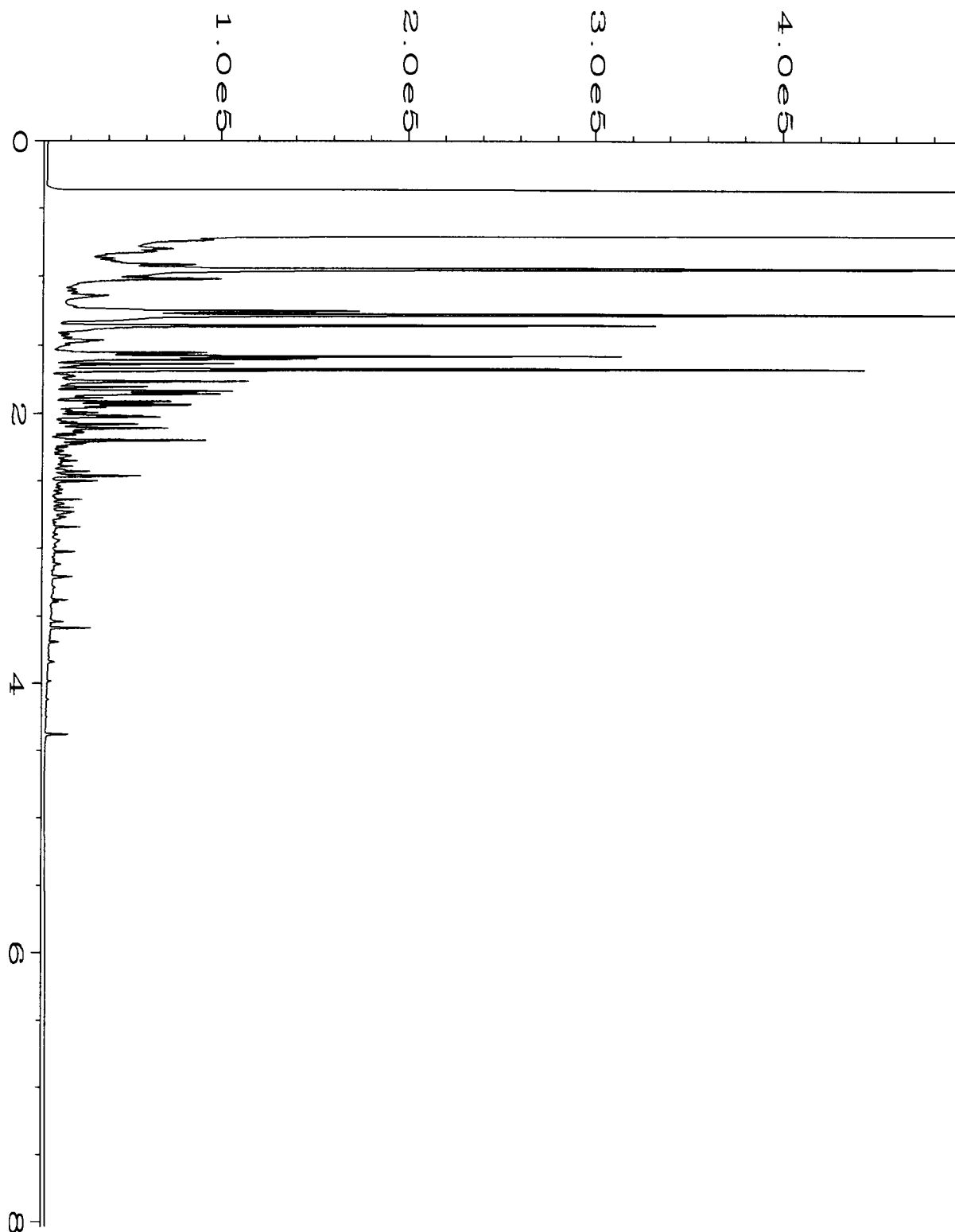
ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

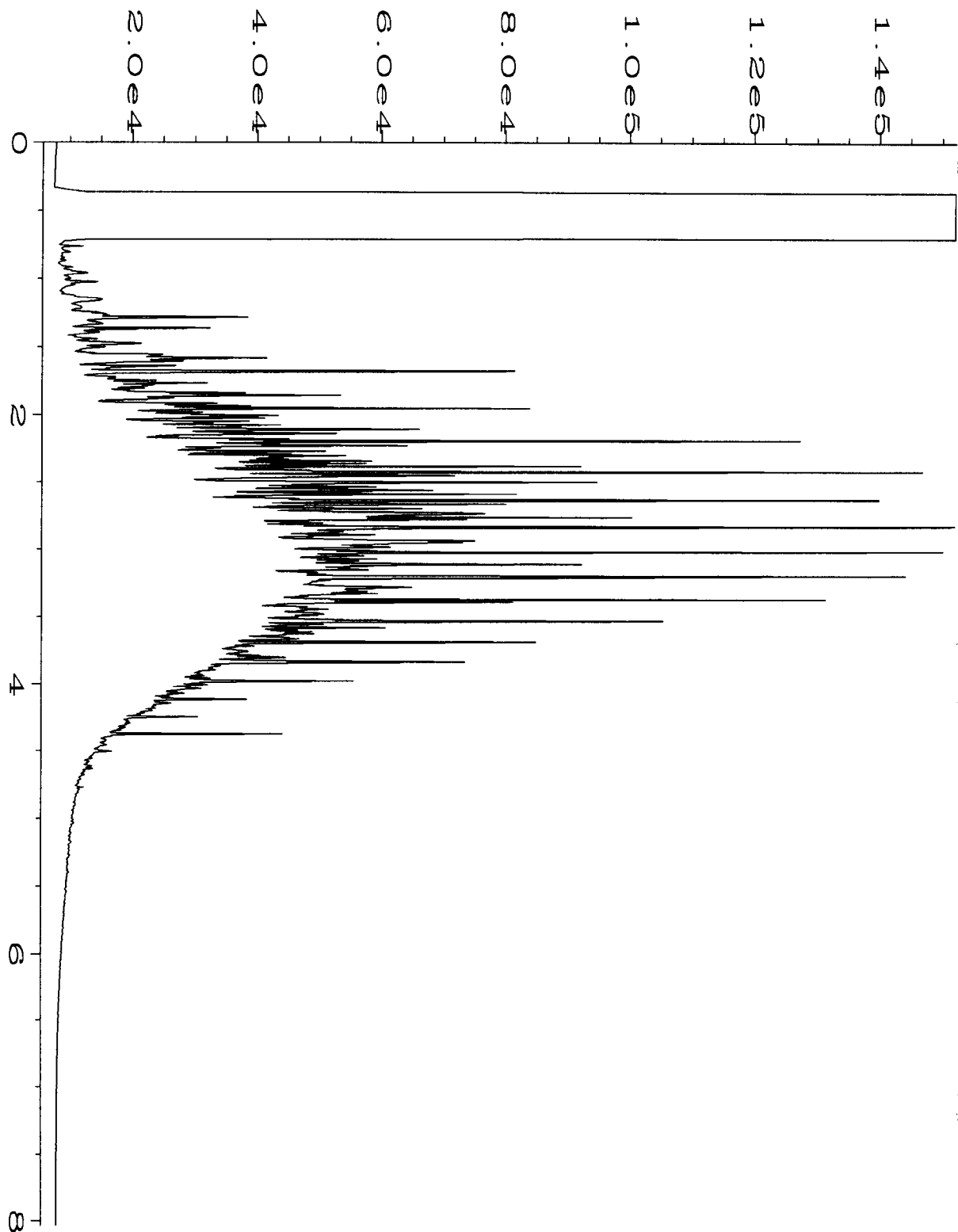
x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



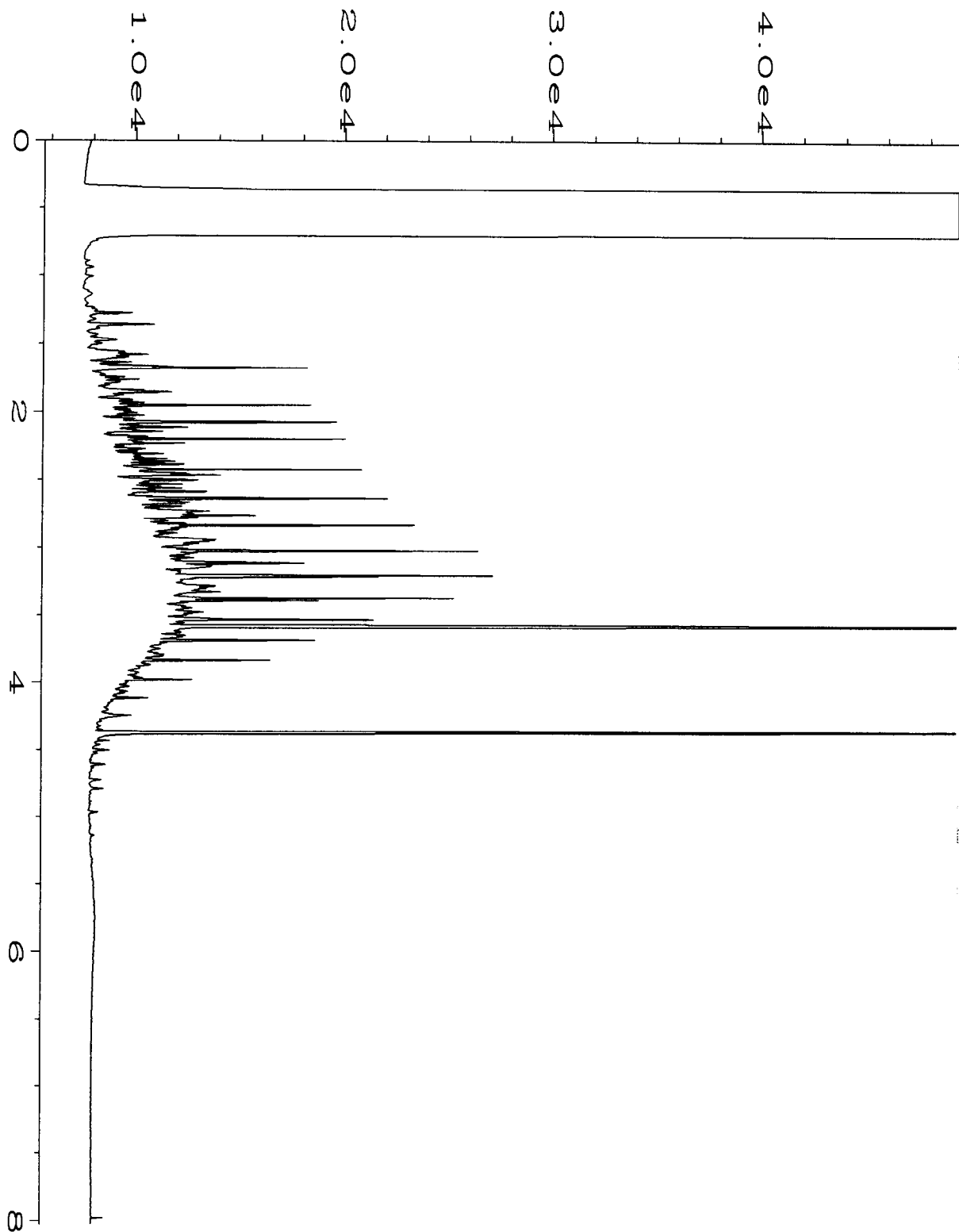
Data File Name	: C:\HPCHEM\1\DATA\12-15-16\048F1201.D	Page Number	: 1
Operator	: mwd1	Vial Number	: 48
Instrument	: GC1	Injection Number	: 1
Sample Name	: 612214-01 1/10	Sequence Line	: 12
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Dec 16 09:50 PM	Analysis Method	: DX.MTH
Report Created on:	16 Dec 16 09:15 AM		



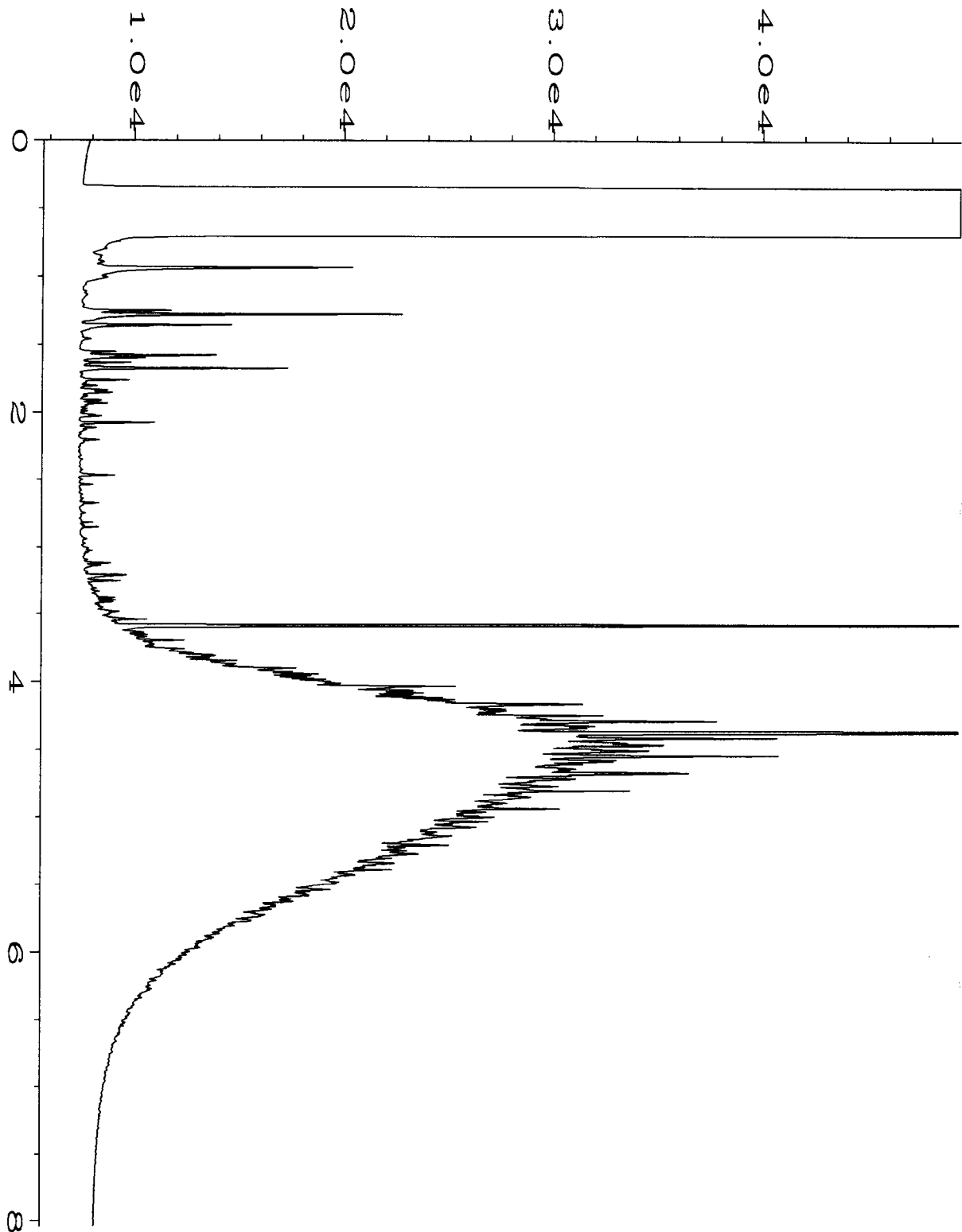
Data File Name	: C:\HPCHEM\1\DATA\12-15-16\049F1201.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 49
Instrument	: GC1	Injection Number	: 1
Sample Name	: 612214-02 1/10	Sequence Line	: 12
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Dec 16 10:02 PM	Analysis Method	: DX.MTH
Report Created on:	16 Dec 16 09:15 AM		



Data File Name	: C:\HPCHEM\1\DATA\12-15-16\050F1201.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 50
Instrument	: GC1	Injection Number	: 1
Sample Name	: 612214-03 1/10	Sequence Line	: 12
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Dec 16 10:14 PM	Analysis Method	: DX.MTH
Report Created on:	16 Dec 16 09:15 AM		



Data File Name	: C:\HPCHEM\1\DATA\12-15-16\097F1101.D	Page Number	: 1
Operator	: mwd1	Vial Number	: 97
Instrument	: GC1	Injection Number	: 1
Sample Name	: HCIDs Dx 47-110C	Sequence Line	: 11
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Dec 16 09:27 PM	Analysis Method	: DX.MTH
Report Created on:	16 Dec 16 09:15 AM		



Data File Name	: C:\HPCHEM\1\DATA\12-15-16\096F1101.D	Page Number	: 1
Operator	: mwdl	Vial Number	: 96
Instrument	: GC1	Injection Number	: 1
Sample Name	: HCIDs G/M 48-05A	Sequence Line	: 11
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 15 Dec 16 09:15 PM	Analysis Method	: DX.MTH
Report Created on:	16 Dec 16 09:15 AM		



612214

SAMPLE CHAIN OF CUSTODY

ME 12/14/16

W09/405

Report To R. Noeire

Company PBS

Address 2517 EAST 106th AVE ET100

City, State, ZIP Seattle, WA 98102

Phone 206.2339635 Email \_\_\_\_\_

SAMPLERS (Signature) [Signature]

PROJECT NAME Coleman 04

PO # 41392

REMARKS

INVOICE TO

Page # \_\_\_\_\_ of \_\_\_\_\_

TURNAROUND TIME

Standard Turnaround  
 RUSH  
Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes				
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		Product ID			
MW3	01	12/13/16	540	Product	1												
MW2	02		1215	Product	1												
MW5	03		1315	Product	1												
MW4	04 A-E		1240	GW	5	X	X	X	X			X					
MW6	05 V		1103	GW	5	X	X	X	X			X					
Trips Blank	06 A-B		-	water	2												

Samples received at 3 °C

\* Added at lab (TP) 12/14/16

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: R. Noeire

MEGAN NOEIRE

PBS

12/14/16 1320

Received by: [Signature]

Nolan Aran

FEBI

12/14/16 1415

Seattle, WA 98119-2029

Ph. (206) 285-8282

Friedman & Bruya, Inc.

3012 16th Avenue West

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

June 21, 2017

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
2517 Eastlake Ave E, Suite 100  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on June 13, 2017 from the Coleman Yakima PO 41392, F&BI 706207 project. There are 22 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0621R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 13, 2017 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima PO 41392, F&BI 706207 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
706207 -01	MW2
706207 -02	MW4
706207 -03	MW6
706207 -04	DUP_6.9.17

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

Date Extracted: 06/16/17

Date Analyzed: 06/16/17 and 06/19/17

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW2 706207-01 1/100	2,900	9,900	1,000	5,900	83,000	84
MW4 706207-02 1/10	240	12	120	<30	3,300	87
MW6 706207-03 1/10	140	100	110	69	7,600	92
Method Blank 07-1259 MB	<1	<1	<1	<3	<100	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

Date Extracted: 06/16/17

Date Analyzed: 06/19/17

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
DUP_6.9.17 706207-04 1/10	240	12	120	<30	86
Method Blank 07-1259 MB	<1	<1	<1	<3	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

Date Extracted: 06/13/17

Date Analyzed: 06/13/17

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW4 706207-02	4,300 x	870 x	97
MW6 706207-03 1/1.6	3,700 x	<400	97
Method Blank 07-1250 MB	<50	<250	88

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	MW4	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/14/17	Lab ID:	706207-02
Date Analyzed:	06/14/17	Data File:	706207-02.030
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/14/17	Lab ID:	706207-03
Date Analyzed:	06/14/17	Data File:	706207-03.031
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	Coleman Yakima PO 41392
Date Extracted:	06/14/17	Lab ID:	I7-324 mb2
Date Analyzed:	06/14/17	Data File:	I7-324 mb2.029
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Lead	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW4	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-02 1/2
Date Analyzed:	06/14/17	Data File:	061412.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	160
Benzo(a)anthracene-d12	86	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	160 ve
Acenaphthylene	<0.06
Acenaphthene	1.5
Fluorene	4.3
Phenanthrene	2.2
Anthracene	0.095
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW4	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-02 1/200
Date Analyzed:	06/15/17	Data File:	061521.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	146 d	31	160
Benzo(a)anthracene-d12	94 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	150
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-03 1/2
Date Analyzed:	06/14/17	Data File:	061413.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	250 ve
Acenaphthylene	<0.06
Acenaphthene	0.30
Fluorene	0.29
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-03 1/200
Date Analyzed:	06/15/17	Data File:	061522.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	157 d	31	160
Benzo(a)anthracene-d12	83 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	340
Acenaphthylene	<6
Acenaphthene	<6
Fluorene	<6
Phenanthrene	<6
Anthracene	<6
Fluoranthene	<6
Pyrene	<6
Benz(a)anthracene	<6
Chrysene	<6
Benzo(a)pyrene	<6
Benzo(b)fluoranthene	<6
Benzo(k)fluoranthene	<6
Indeno(1,2,3-cd)pyrene	<6
Dibenz(a,h)anthracene	<6
Benzo(g,h,i)perylene	<6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	07-1249 mb2
Date Analyzed:	06/14/17	Data File:	061406.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	31	160
Benzo(a)anthracene-d12	99	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW2	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-01
Date Analyzed:	06/13/17	Data File:	061309.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)
Hexane	140
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW4	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-02
Date Analyzed:	06/13/17	Data File:	061314A.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Hexane	12
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW6	Client:	PBS Engineering and Environmental
Date Received:	06/13/17	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	706207-03
Date Analyzed:	06/13/17	Data File:	061312.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)
Hexane	49
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Yakima PO 41392
Date Extracted:	06/13/17	Lab ID:	07-1227 mb
Date Analyzed:	06/13/17	Data File:	061307.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Hexane	<1
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 706226-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	105	65-118
Toluene	ug/L (ppb)	50	103	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	103	74-118
Gasoline	ug/L (ppb)	1,000	96	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	111	103	63-142	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020A**

Laboratory Code: 706161-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<5	98	96	75-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR PAHS BY EPA METHOD 8270D SIM**

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.25	89	90	67-116	1
Acenaphthylene	ug/L (ppb)	0.25	92	95	65-119	3
Acenaphthene	ug/L (ppb)	0.25	92	94	66-118	2
Fluorene	ug/L (ppb)	0.25	92	96	64-125	4
Phenanthrene	ug/L (ppb)	0.25	91	98	67-120	7
Anthracene	ug/L (ppb)	0.25	94	96	65-122	2
Fluoranthene	ug/L (ppb)	0.25	94	100	65-127	6
Pyrene	ug/L (ppb)	0.25	92	101	62-130	9
Benz(a)anthracene	ug/L (ppb)	0.25	97	109	60-118	12
Chrysene	ug/L (ppb)	0.25	94	105	66-125	11
Benzo(b)fluoranthene	ug/L (ppb)	0.25	96	107	55-135	11
Benzo(k)fluoranthene	ug/L (ppb)	0.25	94	112	62-125	17
Benzo(a)pyrene	ug/L (ppb)	0.25	93	107	58-127	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.25	101	117	36-142	15
Dibenz(a,h)anthracene	ug/L (ppb)	0.25	97	106	37-133	9
Benzo(g,h,i)perylene	ug/L (ppb)	0.25	101	115	34-135	13

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/21/17

Date Received: 06/13/17

Project: Coleman Yakima PO 41392, F&BI 706207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Hexane	ug/L (ppb)	50	105	103	57-137	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	107	100	64-147	7
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	111	107	73-132	4
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	106	102	82-125	4

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



706207

**SAMPLE CHAIN OF CUSTODY**

NE 06/13/17 1033 / 413  
 Page # 1 of 1

Report To Ken Nagire

Company PBS

Address Seattle

City, State, ZIP \_\_\_\_\_

Phone 206.572.8163 Email ken.nagire@pbsusa.com

SAMPLERS (signature) <u>Ken Nagire</u>	
PROJECT NAME <u>Columb Yukon</u>	PO # <u>41392</u>
REMARKS	INVOICE TO <u>Ken</u>

TURNAROUND TIME <input checked="" type="checkbox"/> Standard Turnaround <input type="checkbox"/> RUSH Rush charges authorized by: _____	SAMPLE DISPOSAL <input checked="" type="checkbox"/> Dispose after 30 days <input type="checkbox"/> Archive Samples <input type="checkbox"/> Other _____
--	--

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead	Extended: MTBE EDC, EDC	Mercur			
MW2	01A-C	6.9.17	1215	liquid	3				X	X								
MW4	02A-G	6.9.17	1230	↓	7		X	X	X		X	X						
MW6	03A-G	6.9.17	1135	↓	7		X	X	X		X	X						
DWP-6.9.17	04A-B	6.9.17	—	↓	—				X									

Relinquished by: <u>Ken Nagire</u>	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>Ken Nagire</u>		Ken Nagire	PBS	6/12/17	1600
Relinquished by: <u>Ken Nagire</u>		Ken Nagire	PBS	6/13/17	1030
Received by: _____					

Friedman & Bruya, Inc.  
 3012 16<sup>th</sup> Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

June 26, 2017



Ken Nogeire  
PBS Engineering  
2517 Eastlake Ave  
Suite 100  
Seattle, WA 88102

RE: Coleman Kakima  
Project Number: 41392

Pace Analytical received 4 samples on June 13, 2017 for analysis labeled MW3, and MW5. Per client request, the following analyses were performed:

1. C8-C40 Qualitative Molecular Characterization by GC/MS – full scan mode

The samples labeled as MW1 and MW2 have been placed on hold.

The sample was performed in house under laboratory number **22995**.

Please call the lab at 412-826-5245, or you may email any questions or concerns to [ruth.welsh@pacelabs.com](mailto:ruth.welsh@pacelabs.com) regarding any analytical data reports.

Respectfully submitted,

*Ruth Welsh*

Ruth Welsh  
Project Manager



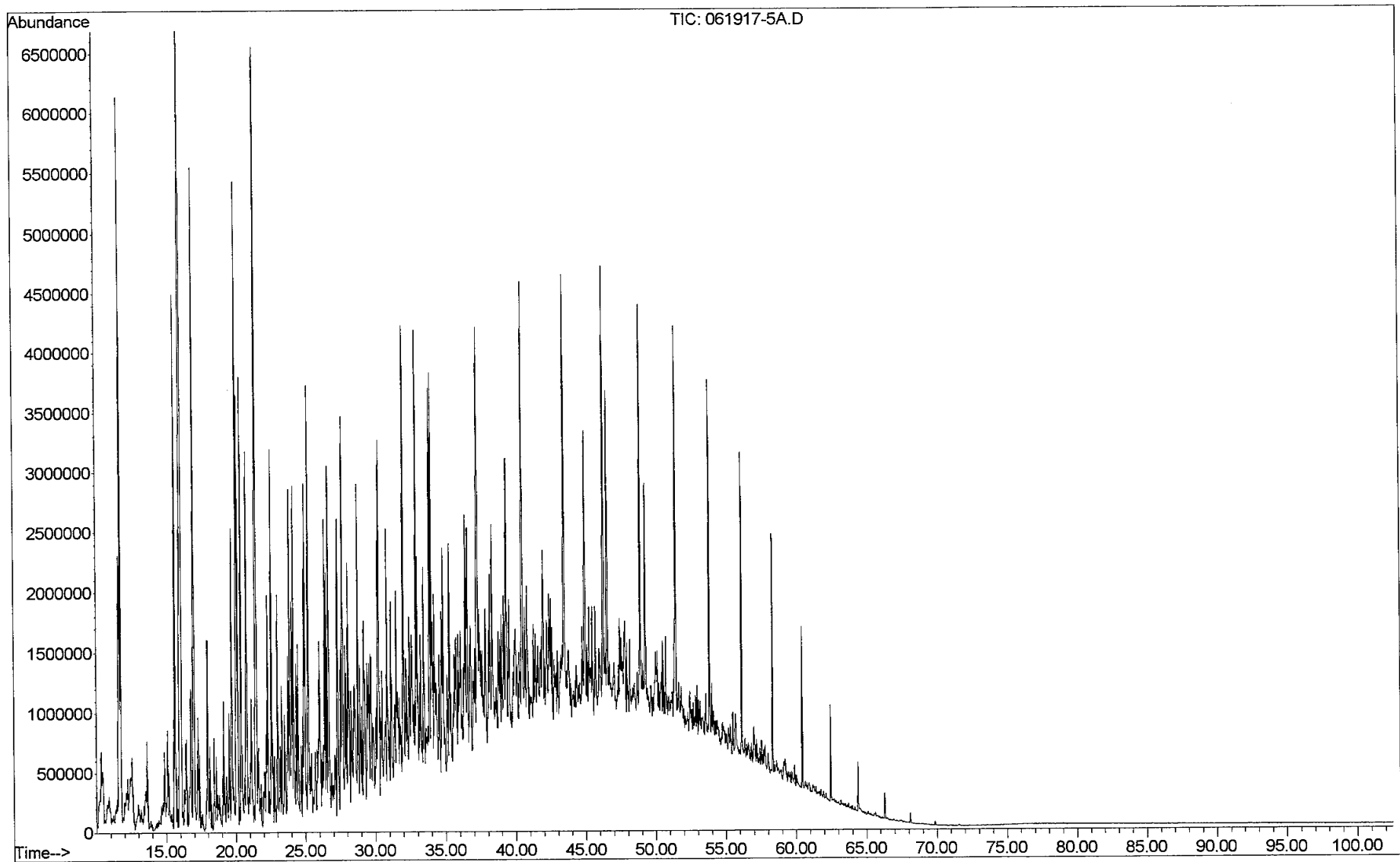
**C8-C40 - Qualitative Hydrocarbons Characterization  
by GC/MS - full scan mode**

<b>ION (m/z)</b>	<b>Mass Chromatograms</b>	<b>COMPOUND CLASS</b>
TIC		All Compounds
85		n-Alkanes (Paraffins)
113		Iso-Alkanes (Isoparaffins) & Isoprenoids
83		Alkylcyclohexanes
134		C <sub>4</sub> -benzenes (monoaromatics)
123		Bicyclanes
191		Terpanes
217		Steranes
Bar Diagram		Monoaromatic and Polyaromatic Hydrocarbon Distribution

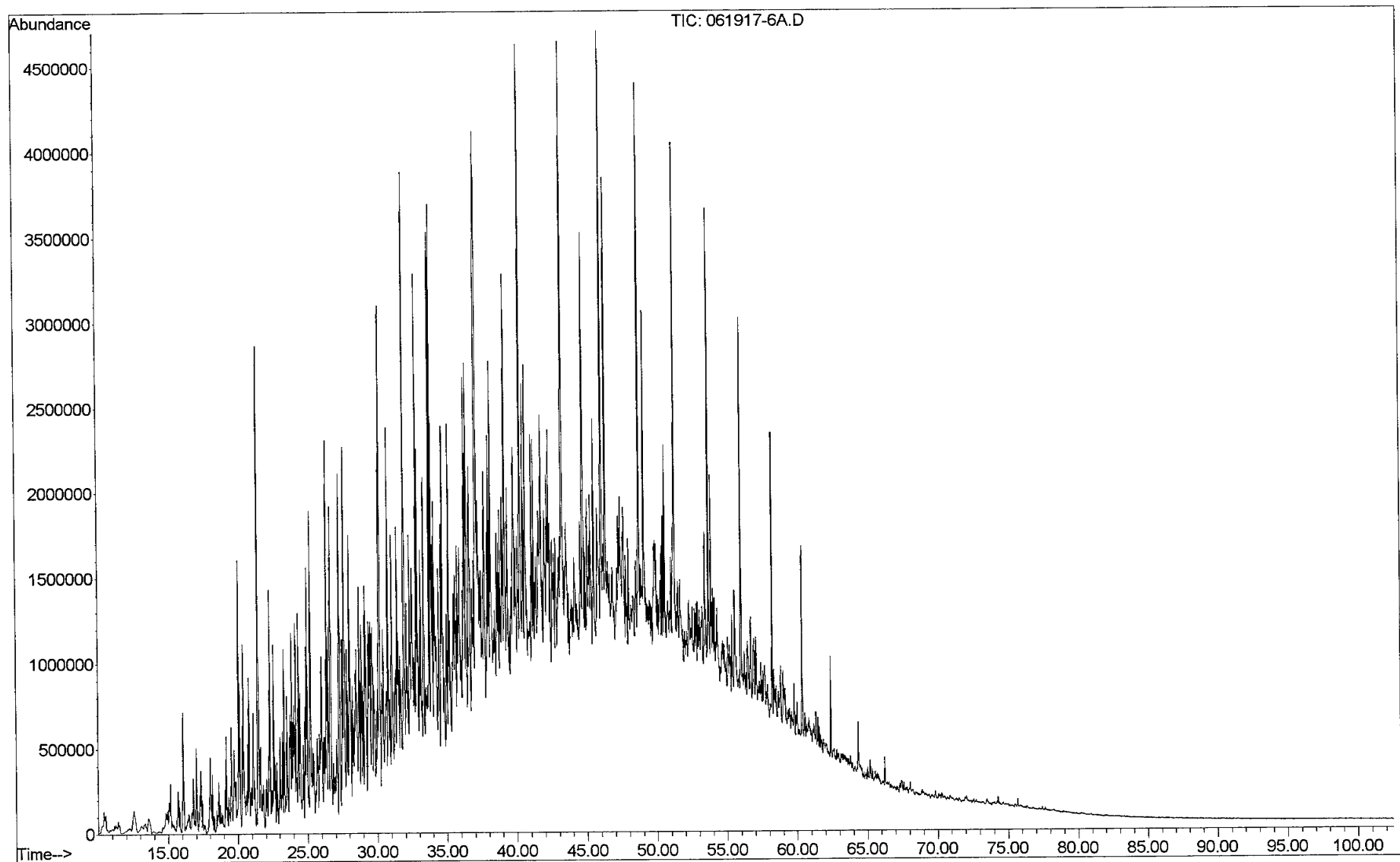
**note: Chromatograms and data follow this cover page.**

**Submitted by,  
Pace Analytical Energy Services**

Sample Name: 22995-1 [MW-3] 1/5DILUTION  
Misc Info :



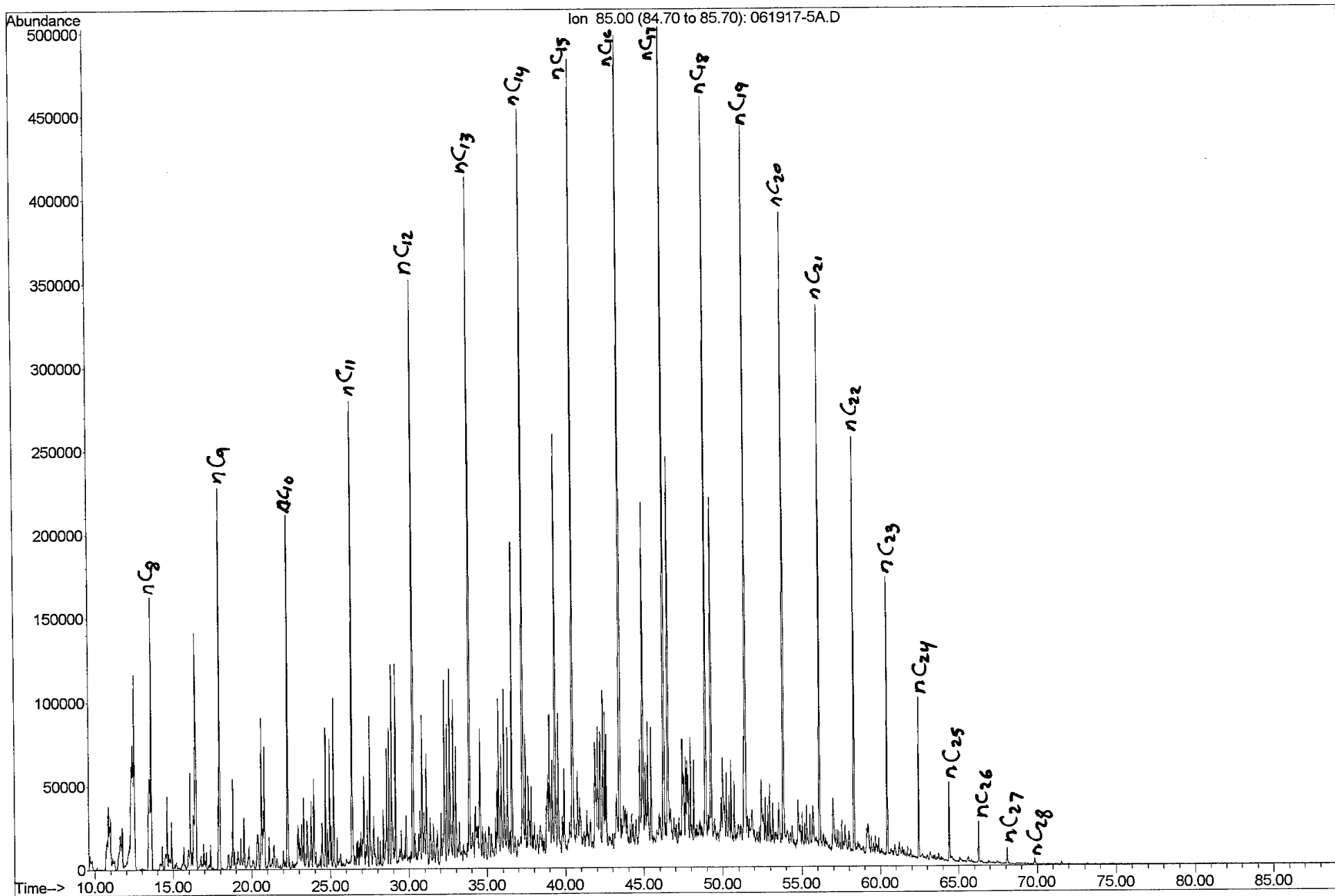
Sample Name: 22995-2 [MW-5] 1/5 DILUTION  
Misc Info :

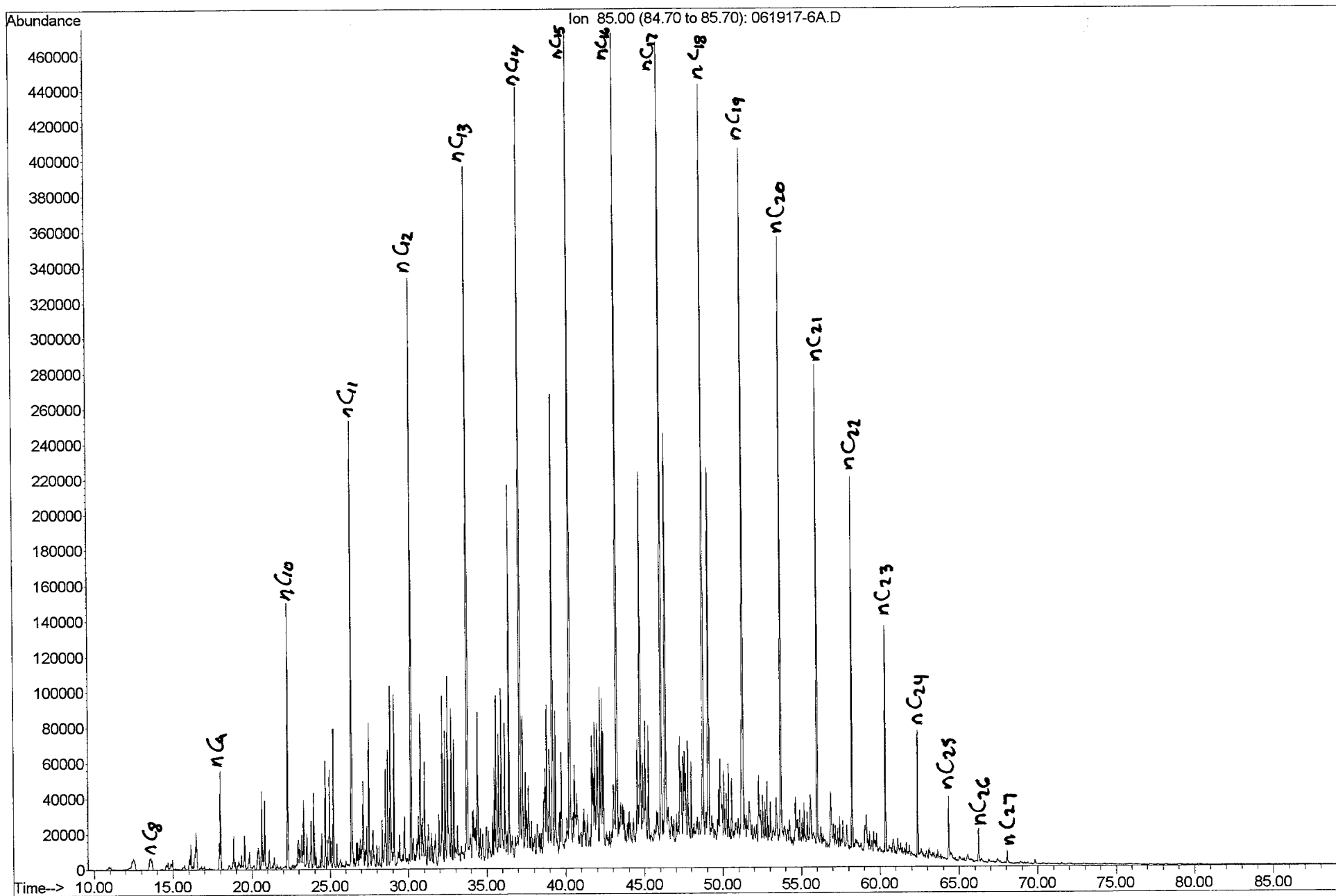


## Key to Chromatogram Symbol Identification

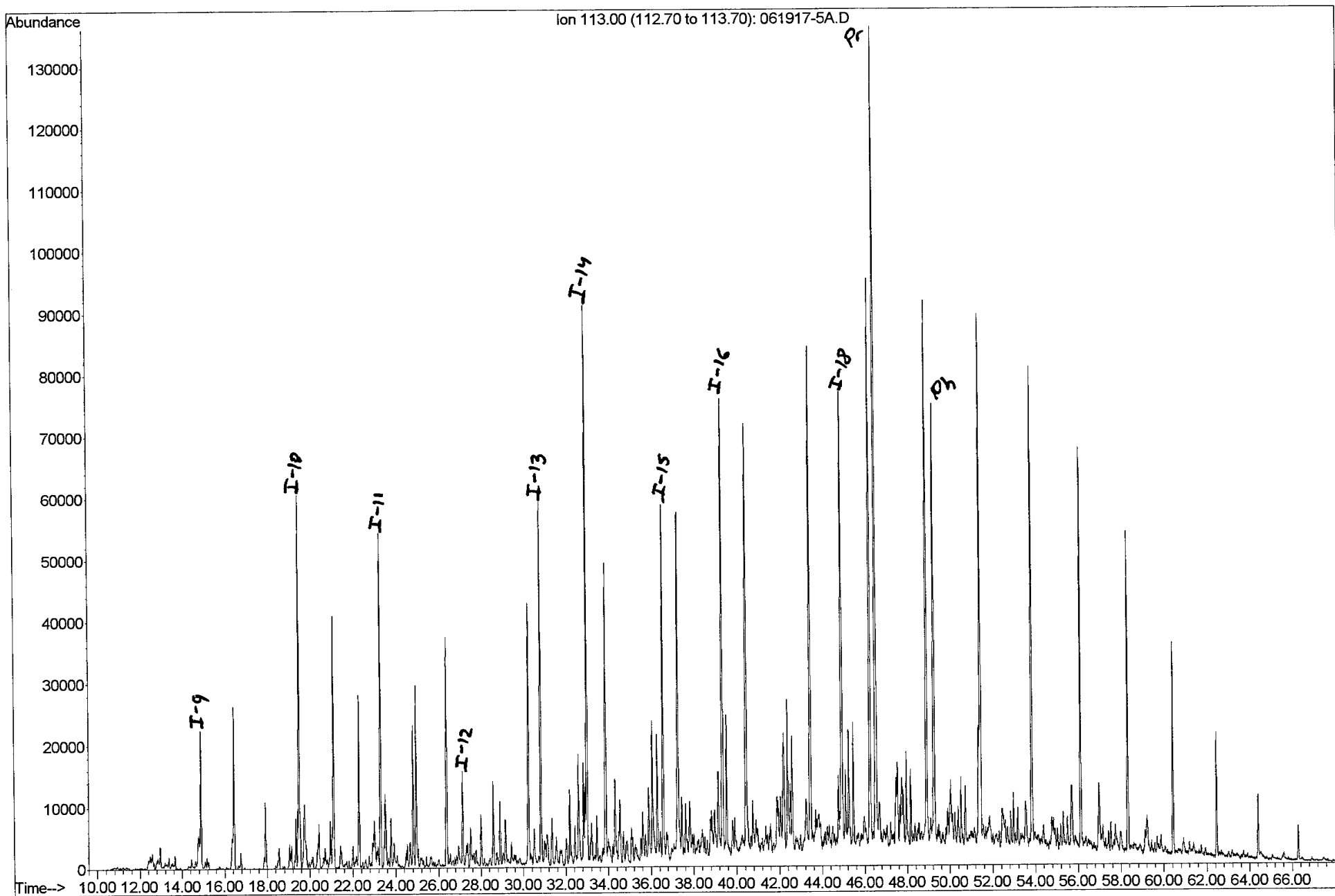
### For m/z 85 and m/z 113 Paraffins and Isoparaffins

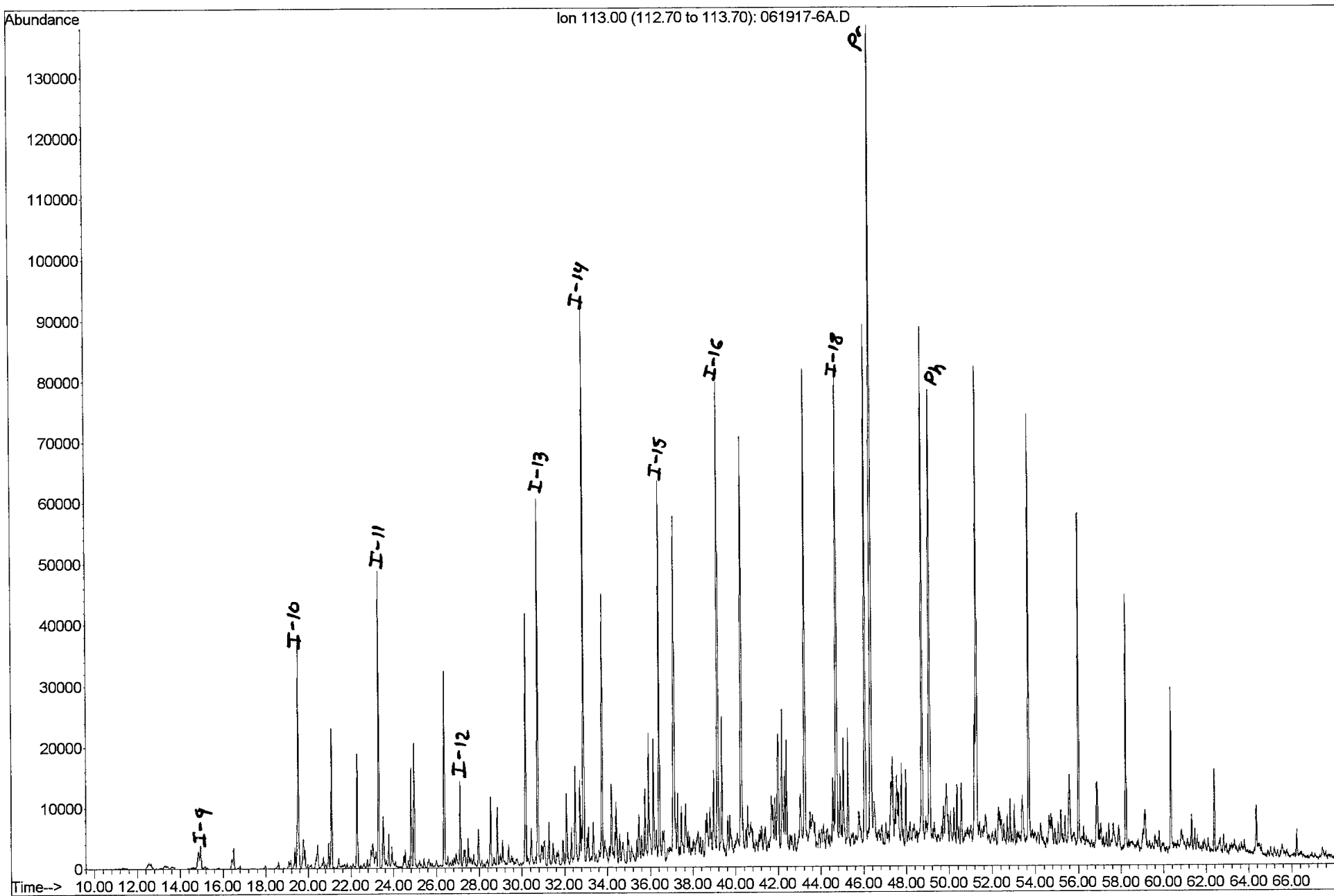
Symbol	Detail
i-10	Iso-alkane with 10 carbon atoms
i-15	Farnesane (isoprenoid with 15 carbon atoms)
i-16	Isoprenoid with 16 carbon atoms
Pr	Pristane (isoprenoid with 19 carbon atoms)
Ph	Phytane (isoprenoid with 20 carbon atoms)
nC <sub>8</sub>	n-C <sub>8</sub> normal Alkane
nC <sub>15</sub>	n-C <sub>15</sub> normal Alkane
i-8	2,5-(2,4)-Dimethylhexane
i-8'	2,3,4-Trimethylpentane
i-8 <sup>n</sup>	2-3-Dimethylhexane
CH-n	Alkylcyclohexane (where n indicates the number of carbon atoms in the side chain)





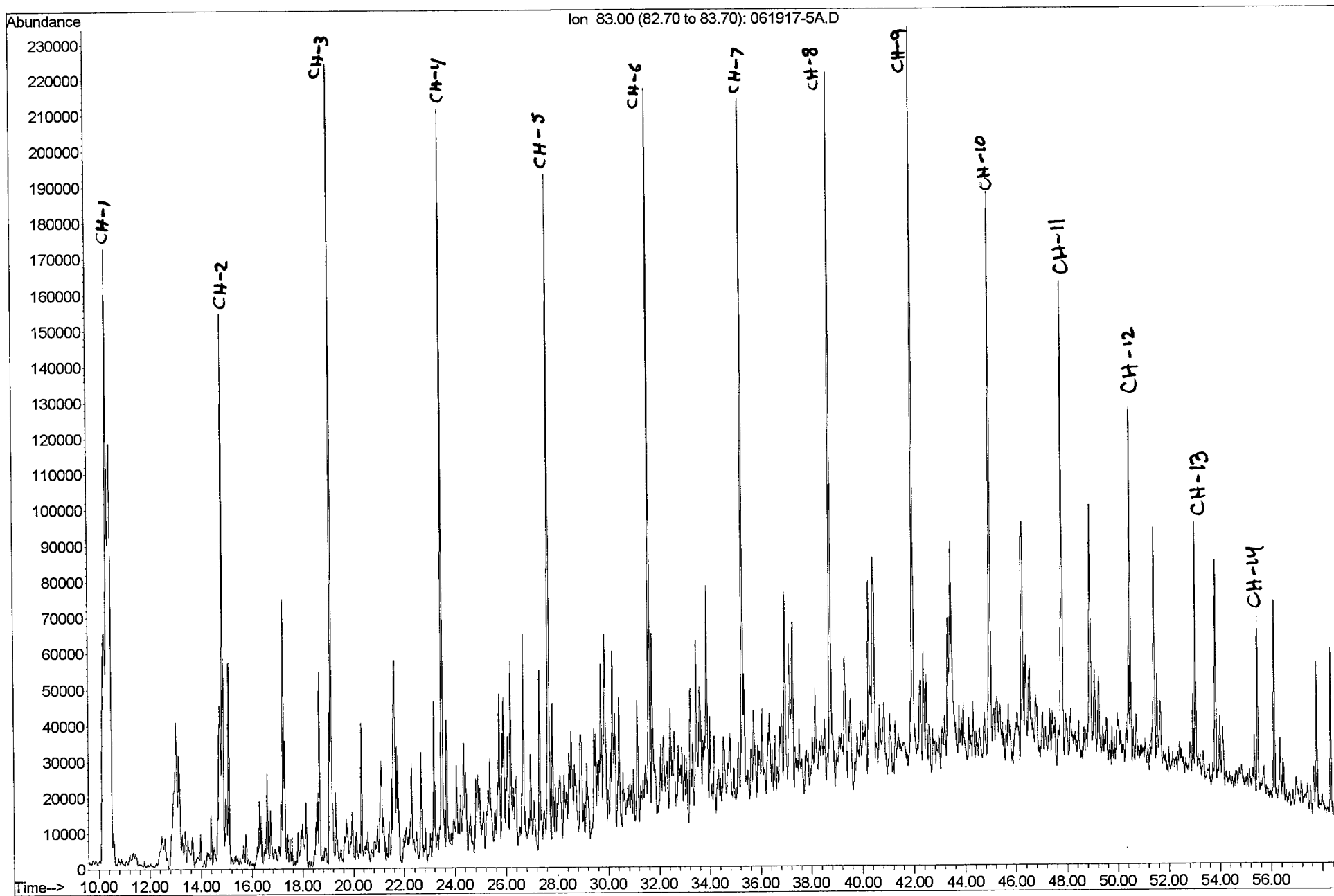


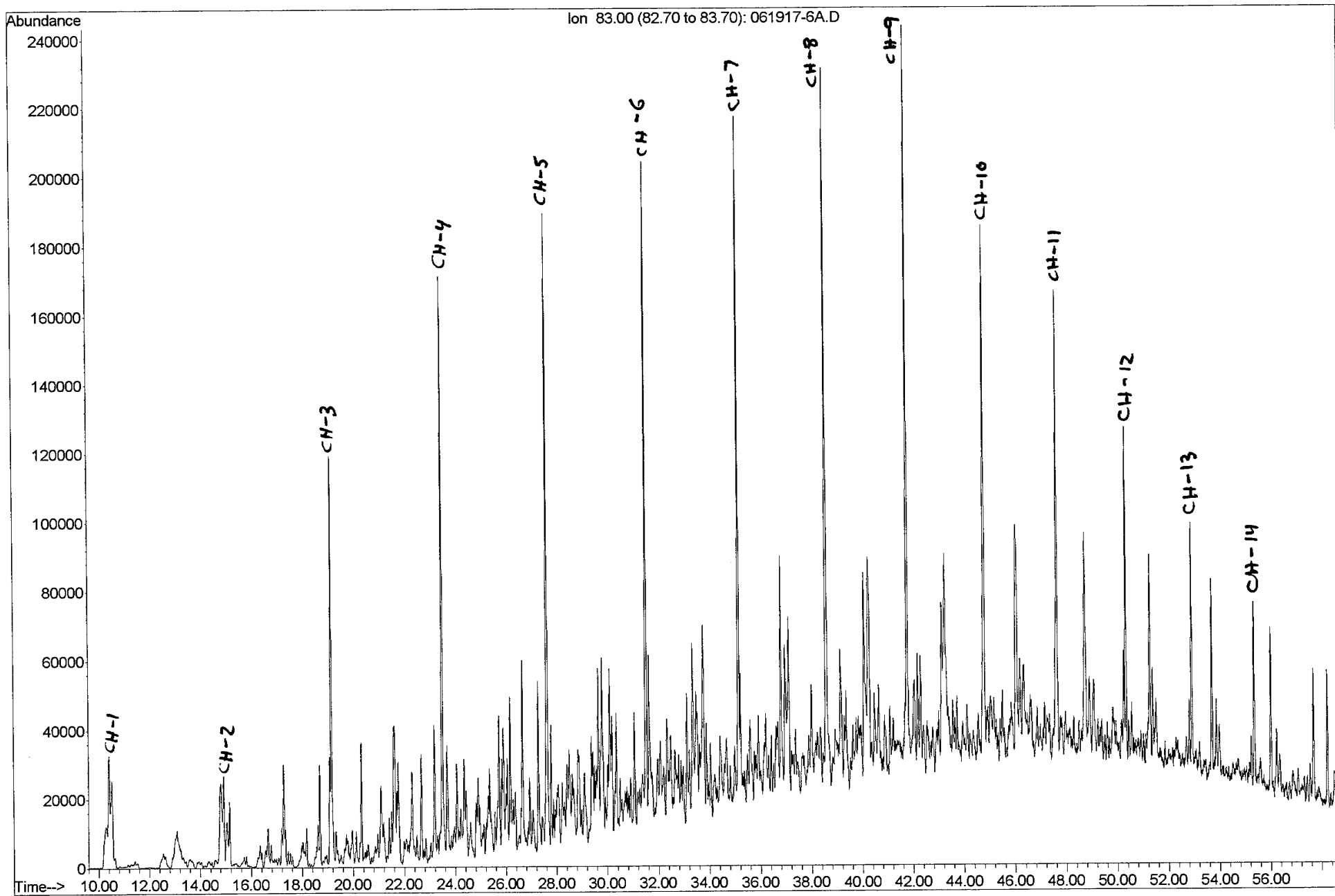




## Key for Alkylcyclohexanes at m/z 83

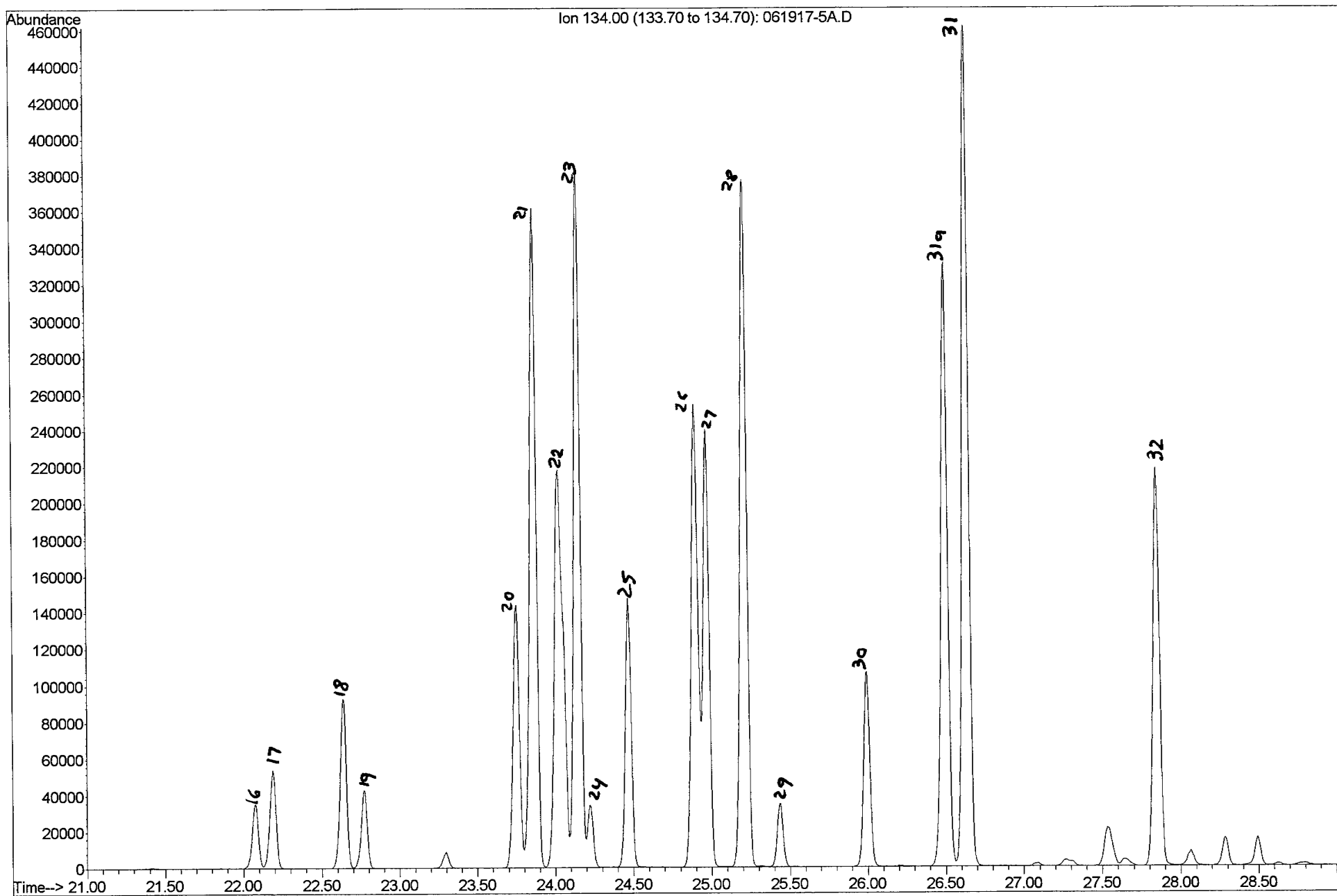
Symbol	Detail
CH-1	Methylcyclohexane
CH-2	Ethylcyclohexane
CH-3	Propylcyclohexane
CH-4	Butylcyclohexane
CH-5	Pentylcyclohexane
CH-6	Hexylcyclohexane
CH-7	Heptylcyclohexane
CH-8	Octylcyclohexane
CH-9	Nonylcyclohexane
CH-10	Decylcyclohexane
CH-11	Undecylcyclohexane
CH-12	Dodecylcyclohexane
CH-13	Tridecylcyclohexane
CH-14	Tetradecylcyclohexane

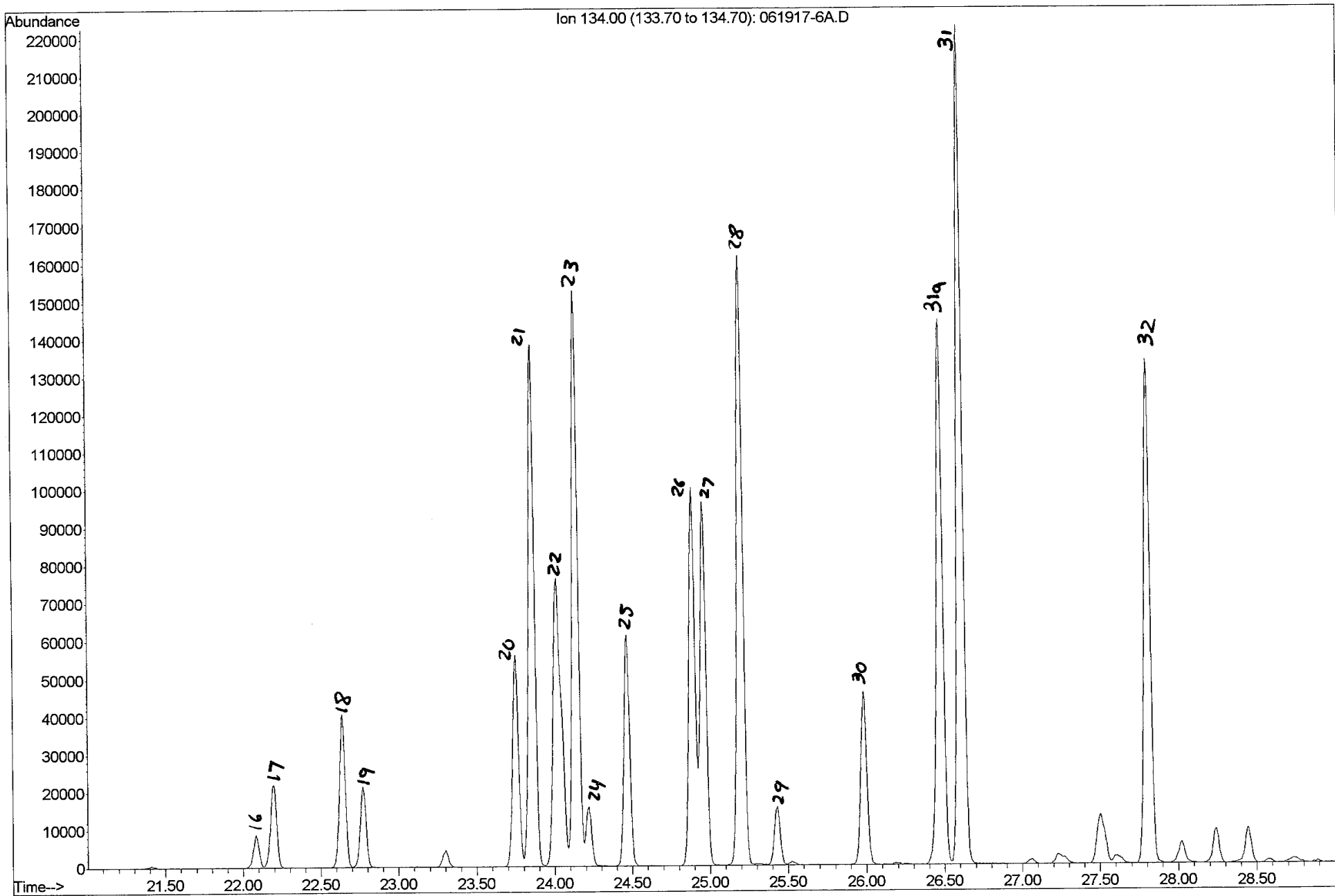




### Key for C<sub>4</sub>-Alkylbenzenes (m/z 134)

Symbol	Detail
16	Sec-Butylbenzene
17	1-Methyl-3-Isopropylbenzene
18	1-Methyl-4-Isopropylbenzene
19	1-Methyl-2-Isopropylbenzene
20	1,3-Diethylbenzene
21	1-Methyl-3-Propylbenzene
22	Butylbenzene
23	1,3-Diethyl-5-Ethylbenzene
24	1,2-Diethylbenzene
25	1-Methyl-2-Propylbenzene
26	1,4-Dimethyl-2-Ethylbenzene
27	1,3-Dimethyl-4-Ethylbenzene
28	1,2-Dimethyl-4-Ethylbenzene
29	1,3-Dimethyl-2-Ethylbenzene
30	1,2-Dimethyl-3-Ethylbenzene
31a	1,2,4,5-Tetramethylbenzene
31	1,2,3,5-Tetramethylbenzene
32	1,2,3,4-Tetramethylbenzene

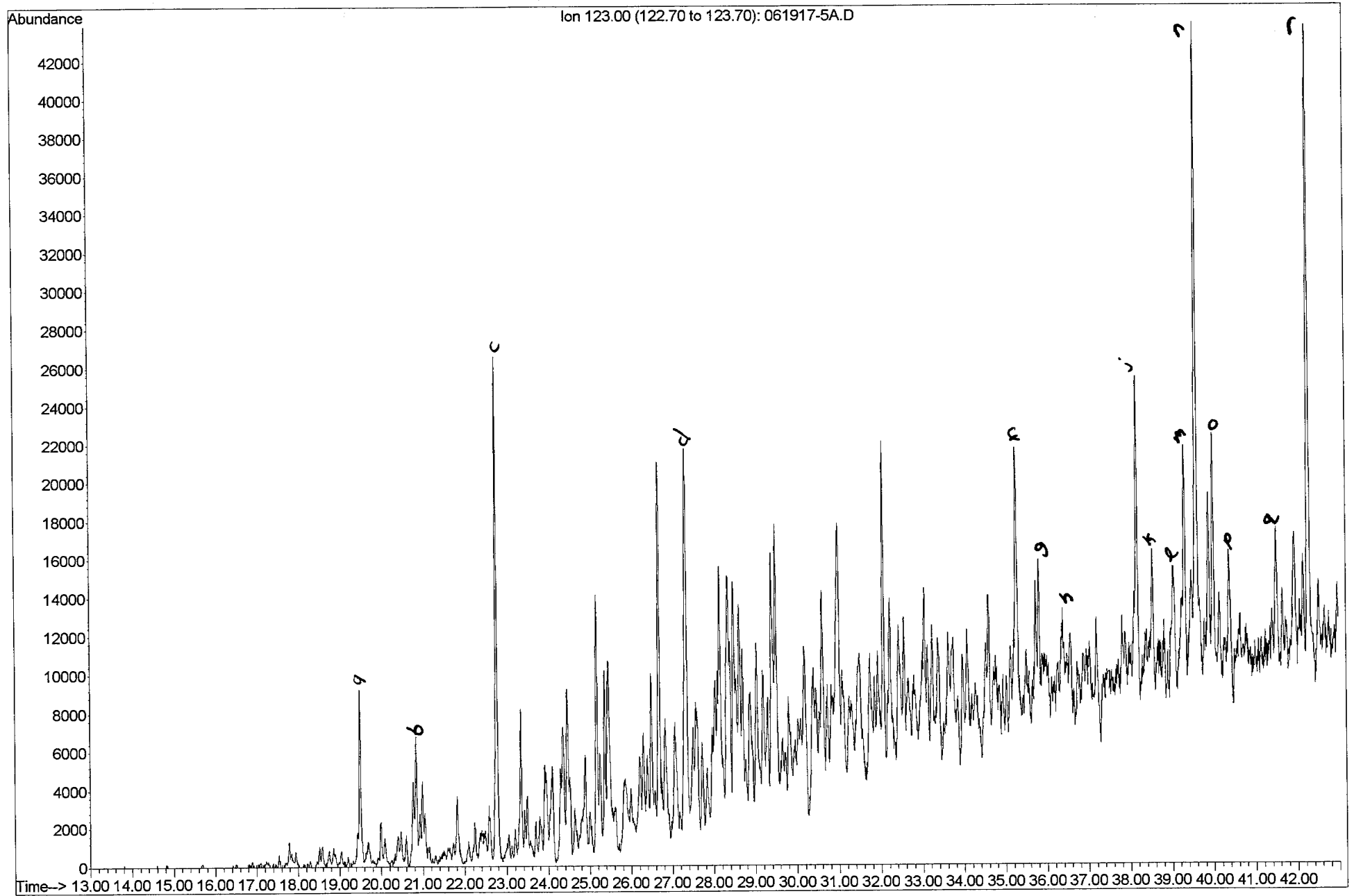


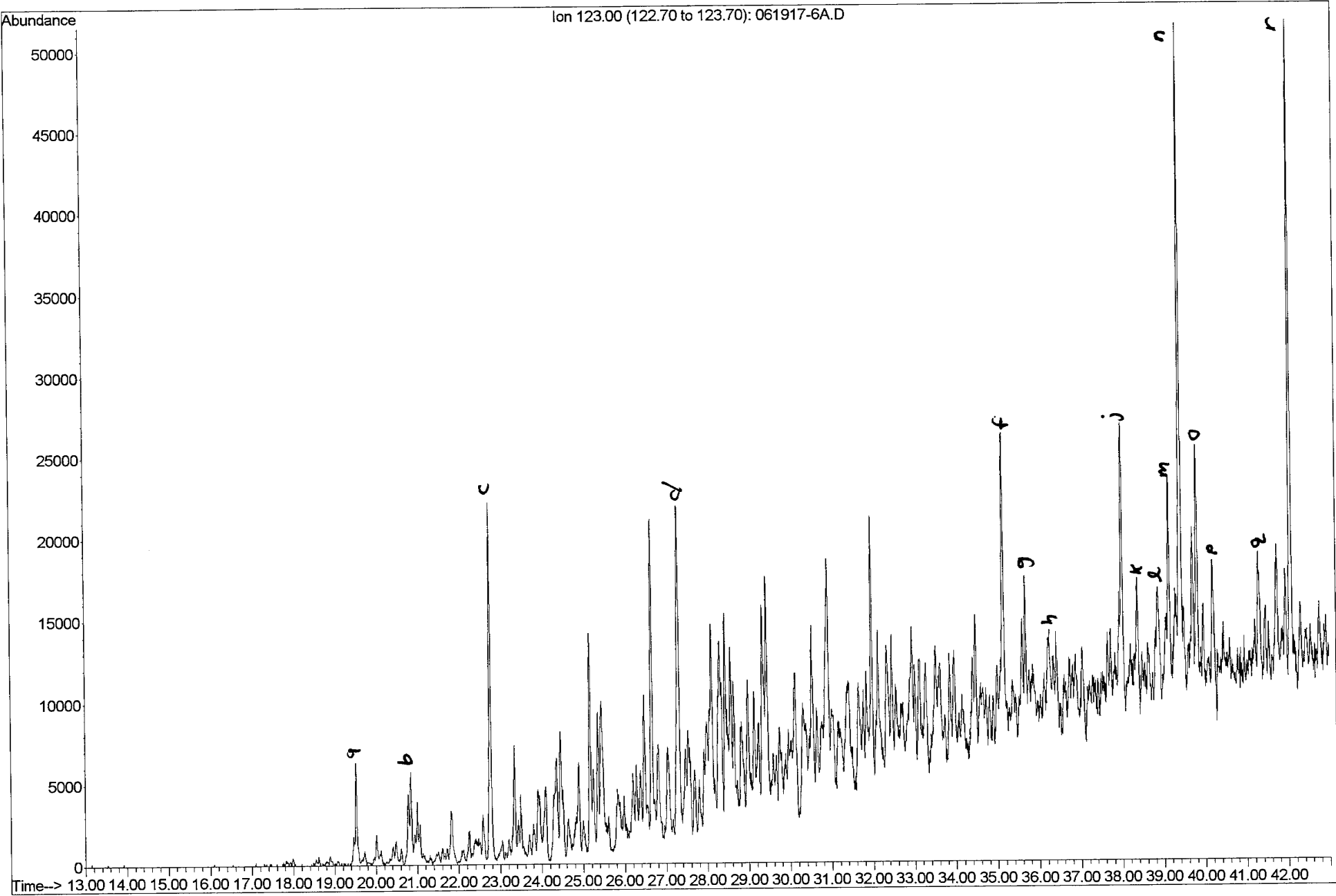




### Key for Identification of the Bicyclanes (m/z 123)

Peak No.	Identity	Formula	M.W.
a	2,2,3-Trimethylbicycloheptane	C <sub>10</sub> H <sub>18</sub>	138
b	C <sub>10</sub> bicycloalkane	C <sub>10</sub> H <sub>18</sub>	138
c	3,3,7-Trimethylbicycloheptane	C <sub>10</sub> H <sub>18</sub>	138
d	C <sub>11</sub> Decalin	C <sub>11</sub> H <sub>20</sub>	152
f	Nordrimane	C <sub>14</sub> H <sub>26</sub>	194
g	Nordrimane	C <sub>14</sub> H <sub>26</sub>	194
h	Rearranged drimane	C <sub>15</sub> H <sub>28</sub>	208
j	Rearranged drimane	C <sub>15</sub> H <sub>28</sub>	208
k	Isomer of Eudesmane	C <sub>15</sub> H <sub>28</sub>	208
l	4β (H) Eudesmane	C <sub>15</sub> H <sub>28</sub>	208
m	C <sub>15</sub> Bicyclic Sesquiterpane	C <sub>15</sub> H <sub>28</sub>	208
n	8β (H) Drimane	C <sub>15</sub> H <sub>28</sub>	208
o	C <sub>15</sub> Bicyclic Sesquiterpane	C <sub>15</sub> H <sub>28</sub>	208
p	C <sub>16</sub> Bicyclic Sesquiterpane	C <sub>16</sub> H <sub>30</sub>	222
q	C <sub>16</sub> Bicyclic Sesquiterpane	C <sub>16</sub> H <sub>30</sub>	222
r	8β (H) Homodrimane	C <sub>16</sub> H <sub>30</sub>	222



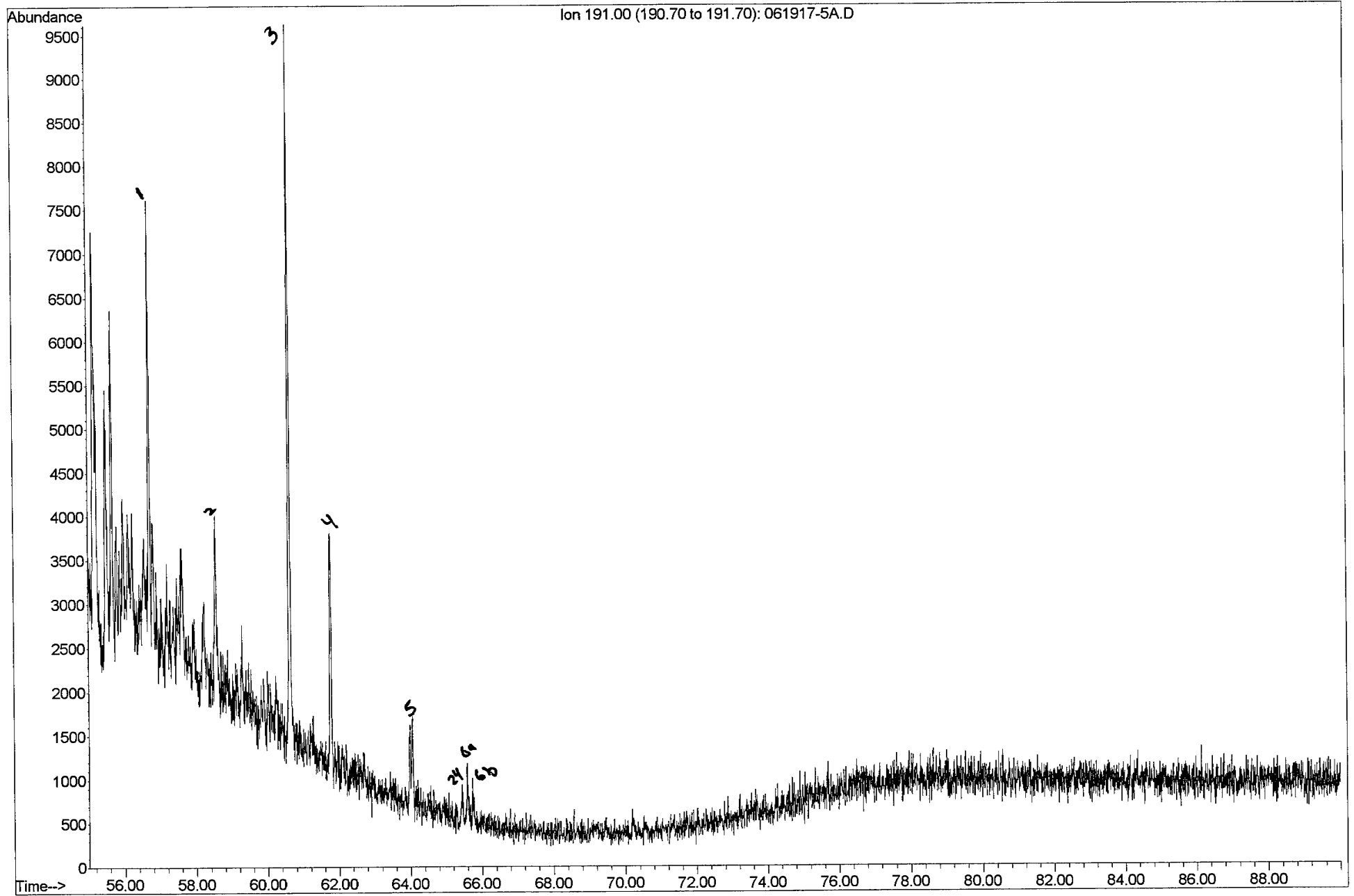


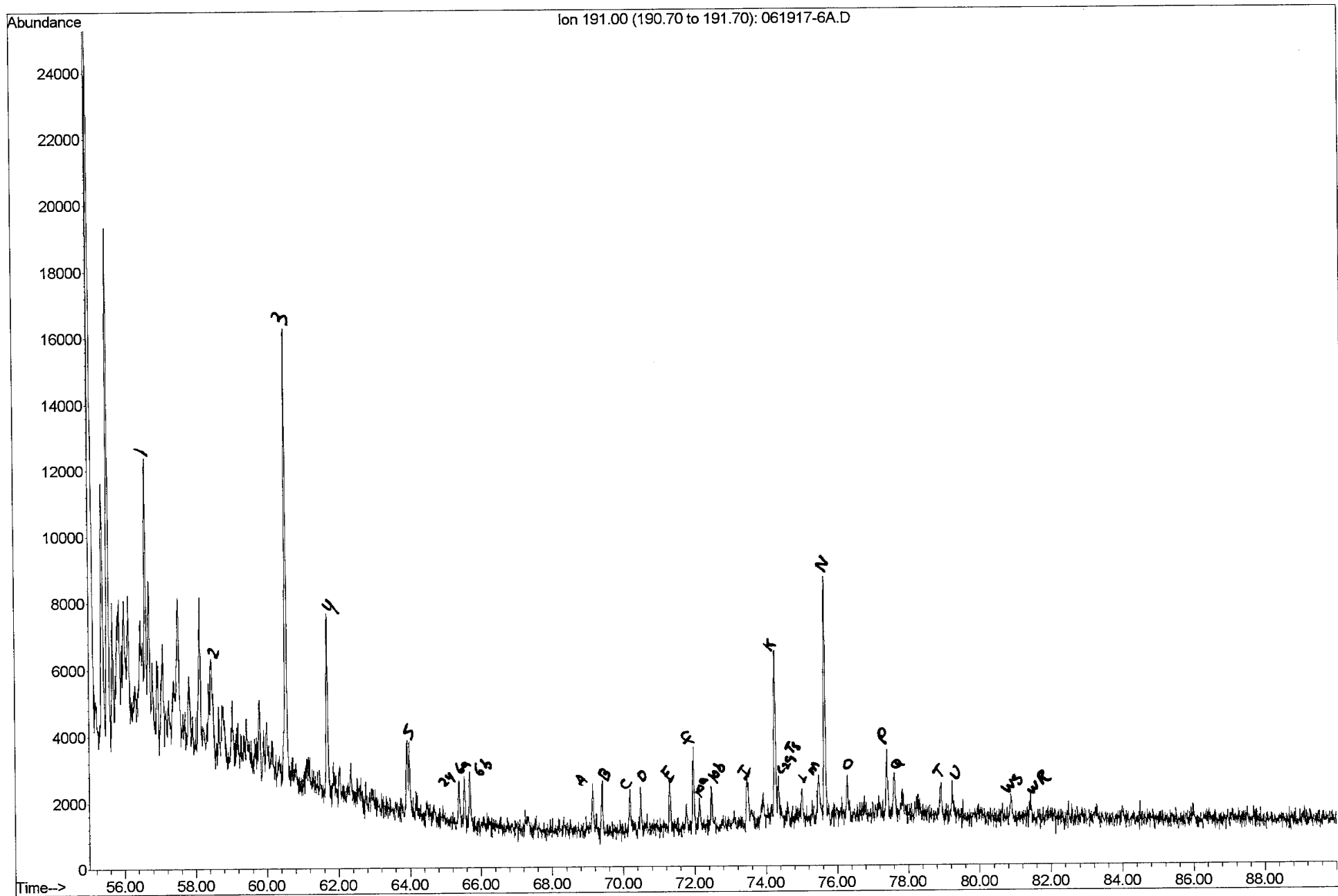
**Key for Tricyclic, Tetracyclic, and Pentacyclic Terpanes  
Identification (m/z 191 Mass chromatograms)**

Code	Identity	Carbon #
0	C <sub>20</sub> -Tricyclic Terpane	20
1	C <sub>21</sub> -Tricyclic Terpane	21
2	C <sub>22</sub> -Tricyclic Terpane	22
3	C <sub>23</sub> -Tricyclic Terpane	23
4	C <sub>24</sub> -Tricyclic Terpane	24
5	C <sub>25</sub> -Tricyclic Terpane	25
Z4	C <sub>24</sub> -Tetracyclic Terpane	24
6a	C <sub>26</sub> -Tricyclic Terpane	26
6b	C <sub>26</sub> -Tricyclic Terpane	26
7	C <sub>27</sub> -Tricyclic Terpane	27
A	C <sub>28</sub> -Tricyclic Terpane #1	28
B	C <sub>28</sub> -Tricyclic Terpane #2	28
C	C <sub>29</sub> -Tricyclic Terpane #1	29
D	C <sub>29</sub> -Tricyclic Terpane #2	29
E	18 $\alpha$ -22,29,30-Trisnorneohopane (Ts)	27
F	17 $\alpha$ -22,29,30-Trisnorhopane (Tm)	27
G	17 $\beta$ -22,29,30-Trisnorhopane	27
H	17 $\alpha$ -23,28-Bisnorlupane	28
10a	C <sub>30</sub> -Tricyclic Terpane #1	30
10b	C <sub>30</sub> -Tricyclic Terpane #2	30
I	17 $\alpha$ -28,30 Bisnorhopane	28
11a	C <sub>31</sub> -Tricyclic Terpane #1	31
J	17 $\alpha$ -25-Norhopane	29
11b	C <sub>31</sub> -Tricyclic Terpane #2	31
K	17 $\alpha$ ,21 $\beta$ -30-Norhopane	29
C <sub>29</sub> Ts	18 $\alpha$ -30-Norneohopane	29
C <sub>30</sub> *	17 $\alpha$ -Diahopane	30
L	17 $\beta$ -21 $\alpha$ -30-Normoretane	29
Ma	18 $\alpha$ -Oleanane	30
Mb	18 $\beta$ -Oleanane	30
N	17 $\alpha$ -21 $\beta$ -Hopane	30
O	17 $\beta$ -21 $\alpha$ -Moretane	30
13a	C <sub>33</sub> -Tricyclic Terpane #1	33
13b	C <sub>33</sub> -Tricyclic Terpane #2	33

**Key for Tricyclic, Tetracyclic, and Pentacyclic Terpanes  
Identification (m/z 191 Mass chromatograms) – Cont.**

Code	Identity	Carbon #
P	22S-17 $\alpha$ ,21 $\beta$ -30-Homohopane	31
Q	22R-17 $\alpha$ ,21 $\beta$ -30-Homohopane	31
R	Gammacerane	30
14a	C <sub>34</sub> -Tricyclic Terpene #1	34
S	17 $\beta$ ,21 $\alpha$ -Homomoretane	31
14b	C <sub>34</sub> -Tricyclic Terpene #2	34
T	22S-17 $\alpha$ ,21 $\beta$ -30-Bishomohopane	32
U	22R-17 $\alpha$ ,21 $\beta$ -30-Bishomohopane	32
15a	C <sub>35</sub> -Tricyclic Terpene #1	35
15b	C <sub>34</sub> -Tricyclic Terpene #2	35
V	17 $\beta$ ,21 $\alpha$ -C <sub>32</sub> -Bishomomoretane	32
WS	22S-17 $\alpha$ ,21 $\beta$ -30-Bishomohopane	33
WR	22R-17 $\alpha$ ,21 $\beta$ -30,31,32-Trishomohopane	33
16a	C <sub>36</sub> -Tricyclic Terpene #1	36
16b	C <sub>36</sub> -Tricyclic Terpene #2	36
XS	22S-17 $\alpha$ ,21 $\beta$ -30,31,32,33-Tetrahomohopane	34
XR	22R-17 $\alpha$ ,21 $\beta$ -30,31,32,33-Tetrahomohopane	34
YS	22S-17 $\alpha$ ,21 $\beta$ -30,31,32,33,34-Pentahomohopane	35
YR	22R-17 $\alpha$ ,21 $\beta$ -30,31,32,33,34-Pentahomohopane	35



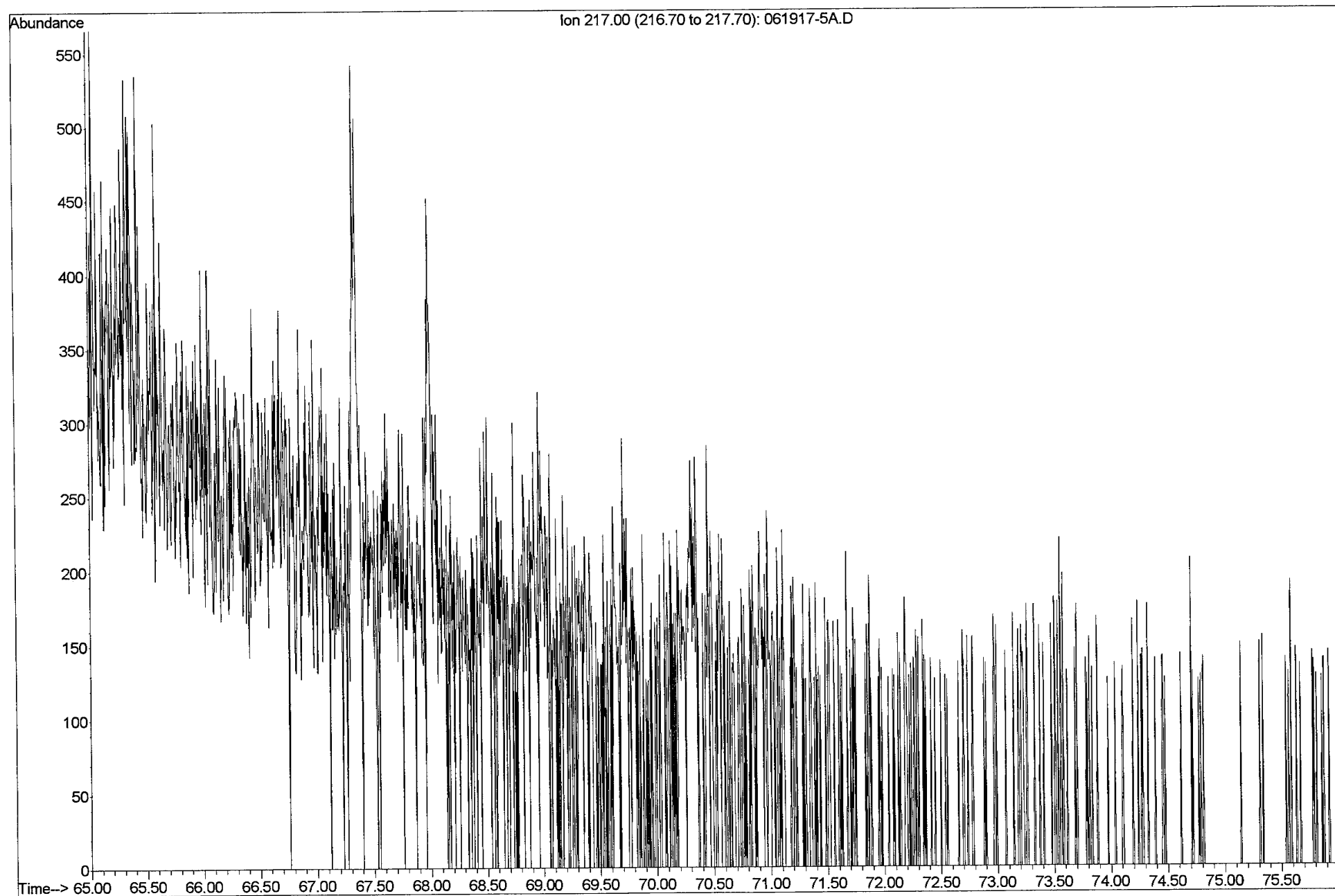


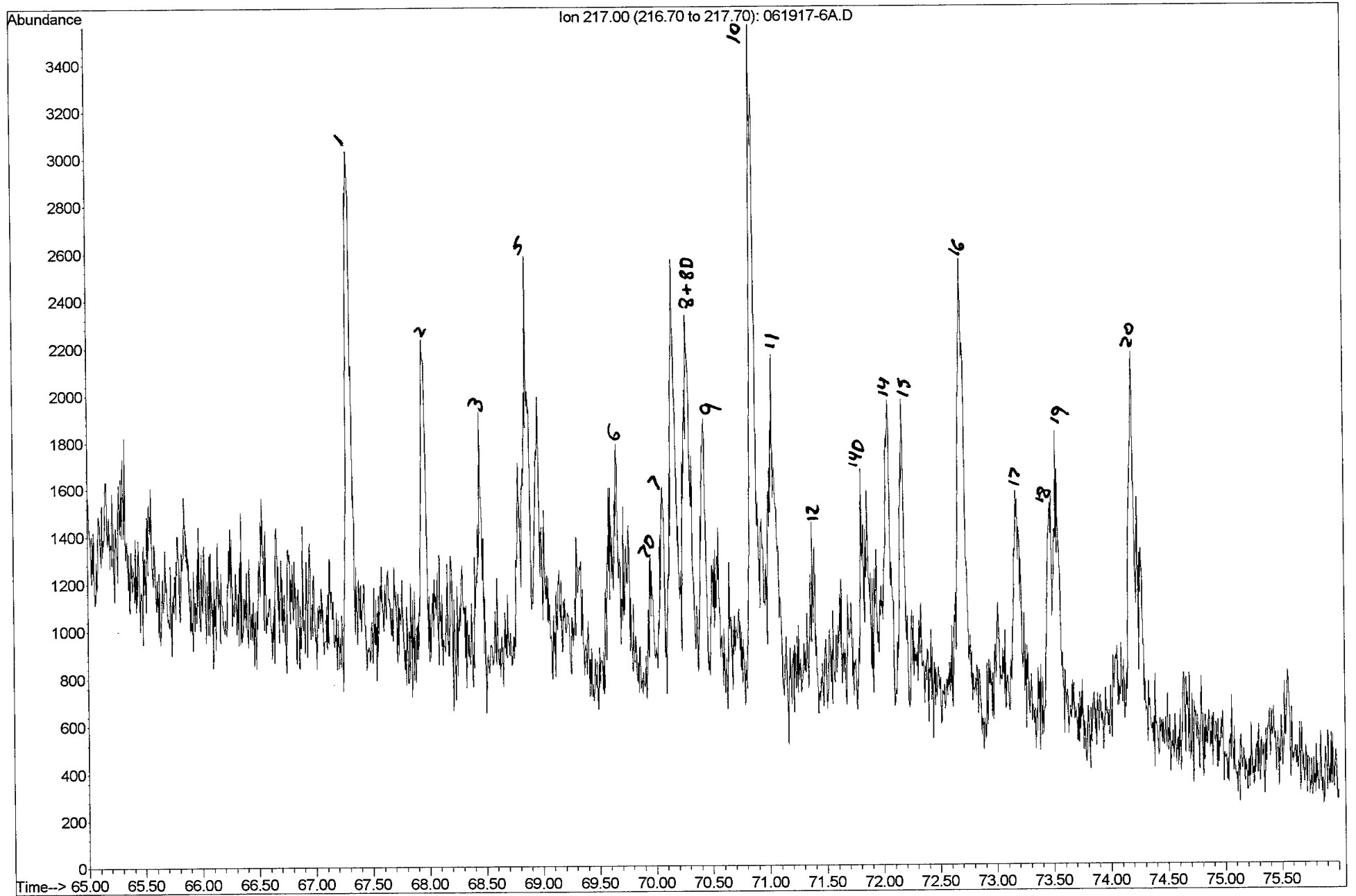


Key for Steranes Identification (m/z 217 Mass Chromatogram)

Code	Identity	Carbon #
1	13 $\beta$ , 17 $\alpha$ -Diacholestane (20S)	27
2	13 $\beta$ , 17 $\alpha$ -Diacholestane (20R)	27
3	13 $\alpha$ , 17 $\beta$ -Diacholestane (20S)	27
4	13 $\alpha$ , 17 $\beta$ -Diacholestane (20R)	27
5	24-methyl-13 $\beta$ ,17 $\alpha$ -Diacholestane (20S)	28
6	24-methyl-13 $\beta$ ,17 $\alpha$ -Diacholestane (20S)	28
7D	24-methyl-13 $\alpha$ ,17 $\beta$ -Diacholestane (20S)	28
7	14 $\alpha$ ,17 $\alpha$ -Cholestane (20S)	27
8D	24-ethyl-13 $\beta$ , 17 $\alpha$ -Diacholestane (20S)	29
8	14 $\beta$ ,17 $\beta$ -Cholestane (20R)	27
9	14 $\beta$ ,17 $\beta$ -Cholestane (20S)	27
9D	24-methyl-13 $\alpha$ ,17 $\beta$ -Diacholestane (20R)	28
10	14 $\alpha$ ,17 $\alpha$ -Cholestane (20R)	27
11	24-ethyl-13 $\beta$ , 17 $\alpha$ -Diacholestane (20R)	29
12	24-ethyl-13 $\alpha$ , 17 $\beta$ -Diacholestane (20S)	29
13	24-ethyl-13 $\alpha$ , 17 $\alpha$ -Diacholestane (20S)	28
14D	24-ethyl-13 $\alpha$ , 17 $\beta$ -Diacholestane (20R)	29
14	24-methyl-14 $\beta$ , 17 $\beta$ -Cholestane (20R)	28
15	24-methyl-14 $\beta$ , 17 $\beta$ -Cholestane (20S)	28
16	24-methyl-14 $\alpha$ , 17 $\alpha$ -Cholestane (20R)	28
17	24-ethyl-14 $\alpha$ -Cholestane (20S)	29
18	24-ethyl-14 $\beta$ , 17 $\beta$ -Cholestane (20R)	29
19	24-ethyl-14 $\beta$ , 17 $\beta$ -Cholestane (20S)	29
20	24-ethyl-14 $\alpha$ , 17 $\alpha$ -Cholestane (20R)	29
21A	24-n-Propylcholestane (20S)	30
21B	4-methyl-24-ethylcholestane (20S)	30
22A	4 $\alpha$ -methyl-24-ethyl-14 $\beta$ ,17 $\beta$ -cholestane (20S)	30
22B	24-n-Propyl-14 $\beta$ ,17 $\beta$ -cholestane (20S)	30
23A	4 $\alpha$ -methyl-24-ethyl-14 $\beta$ ,17 $\beta$ -cholestane (20R)	30
23B	24-n-propyl-14 $\beta$ ,17 $\beta$ -cholestane (20R)	30
24A	4 $\alpha$ -methyl-24-ethylcholestane (20R)	30
24B	24-n-propylcholestane (20R)	30



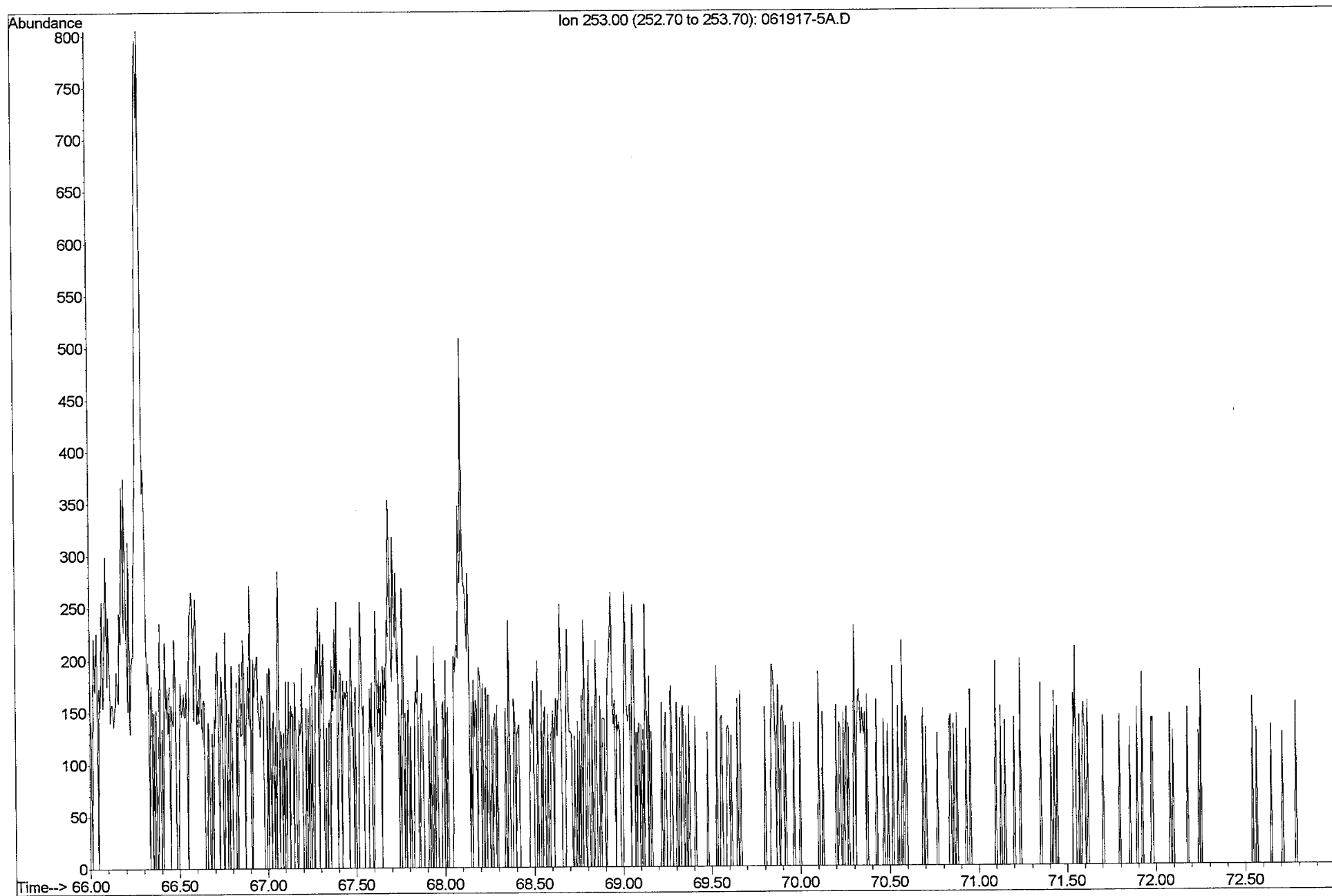


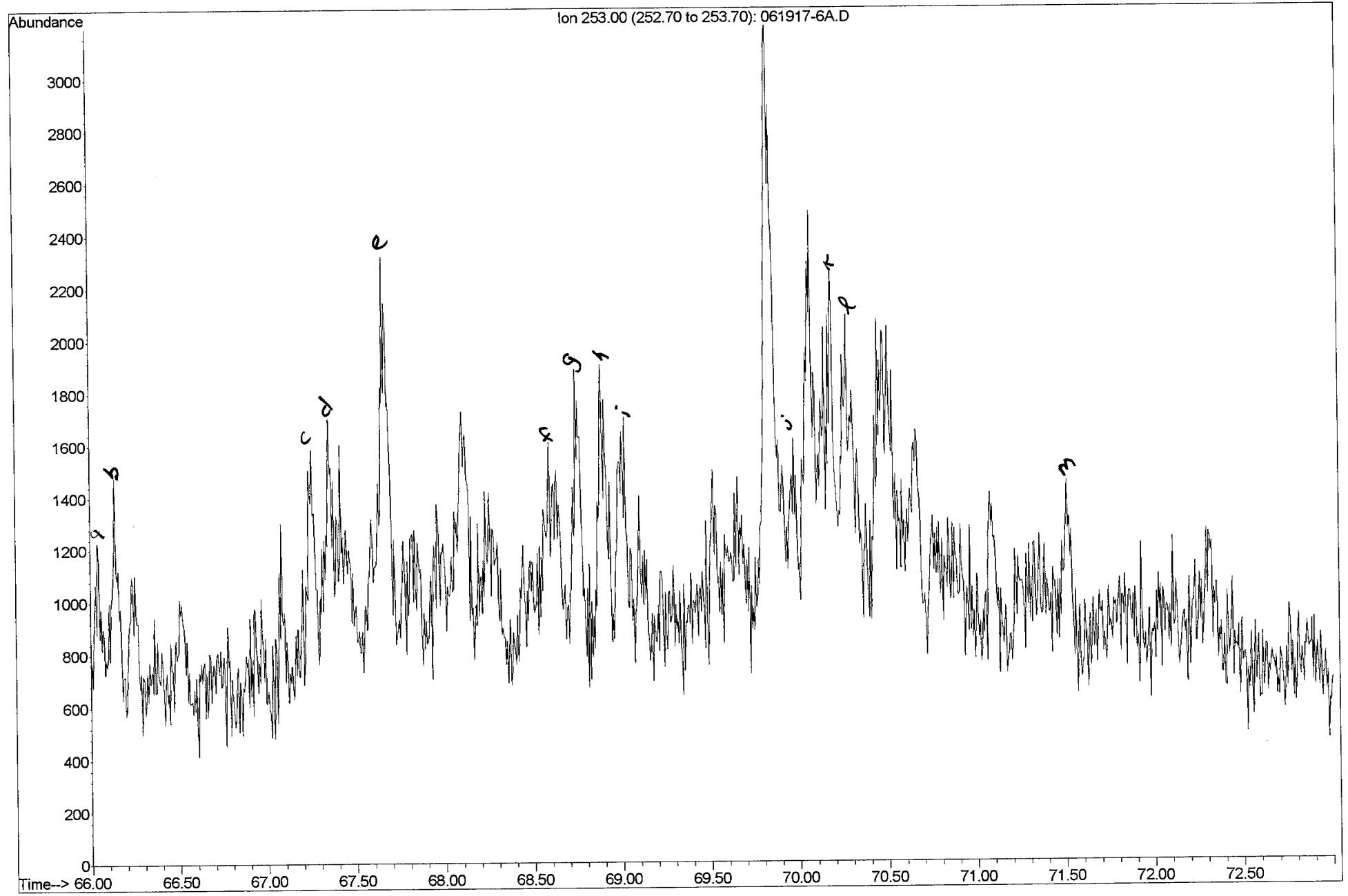




Key for Monoaromatic Steranes Identification (m/z 253 Mass Chromatogram)

Code	Identity	Elemental Composition
a	20S, 5 $\beta$ C <sub>27</sub> -Monoaromatic Sterane	C <sub>27</sub> H <sub>42</sub>
b	20S, dia C <sub>27</sub> -Monoaromatic Sterane	C <sub>27</sub> H <sub>42</sub>
c	20R, 5 $\beta$ C <sub>27</sub> -Monoaromatic Sterane + 20R C <sub>27</sub> dia MAS	C <sub>27</sub> H <sub>42</sub>
d	20S, 5 $\alpha$ C <sub>27</sub> -Monoaromatic Sterane	C <sub>27</sub> H <sub>42</sub>
e	20R, 5 $\beta$ C <sub>28</sub> -Monoaromatic Sterane + 20S C <sub>28</sub> dia MAS	C <sub>28</sub> H <sub>44</sub>
f	20R, 5 $\alpha$ C <sub>27</sub> -Monoaromatic Sterane	C <sub>27</sub> H <sub>42</sub>
g	20S, 5 $\alpha$ C <sub>28</sub> -Monoaromatic Sterane	C <sub>28</sub> H <sub>44</sub>
h	20R, 5 $\beta$ C <sub>28</sub> -Monoaromatic Sterane + 20R C <sub>28</sub> dia MAS	C <sub>28</sub> H <sub>44</sub>
i	20S, 5 $\beta$ C <sub>29</sub> -Monoaromatic Sterane + 20S C <sub>29</sub> dia MAS	C <sub>29</sub> H <sub>46</sub>
j	20S, 5 $\alpha$ C <sub>29</sub> -Monoaromatic Sterane	C <sub>29</sub> H <sub>46</sub>
k	20R, 5 $\alpha$ C <sub>28</sub> -Monoaromatic Sterane	C <sub>28</sub> H <sub>44</sub>
l	20R, 5 $\beta$ C <sub>29</sub> -Monoaromatic Sterane + 20R C <sub>29</sub> dia MAS	C <sub>29</sub> H <sub>46</sub>
m	20R, 5 $\alpha$ C <sub>29</sub> -Monoaromatic Sterane	C <sub>29</sub> H <sub>46</sub>

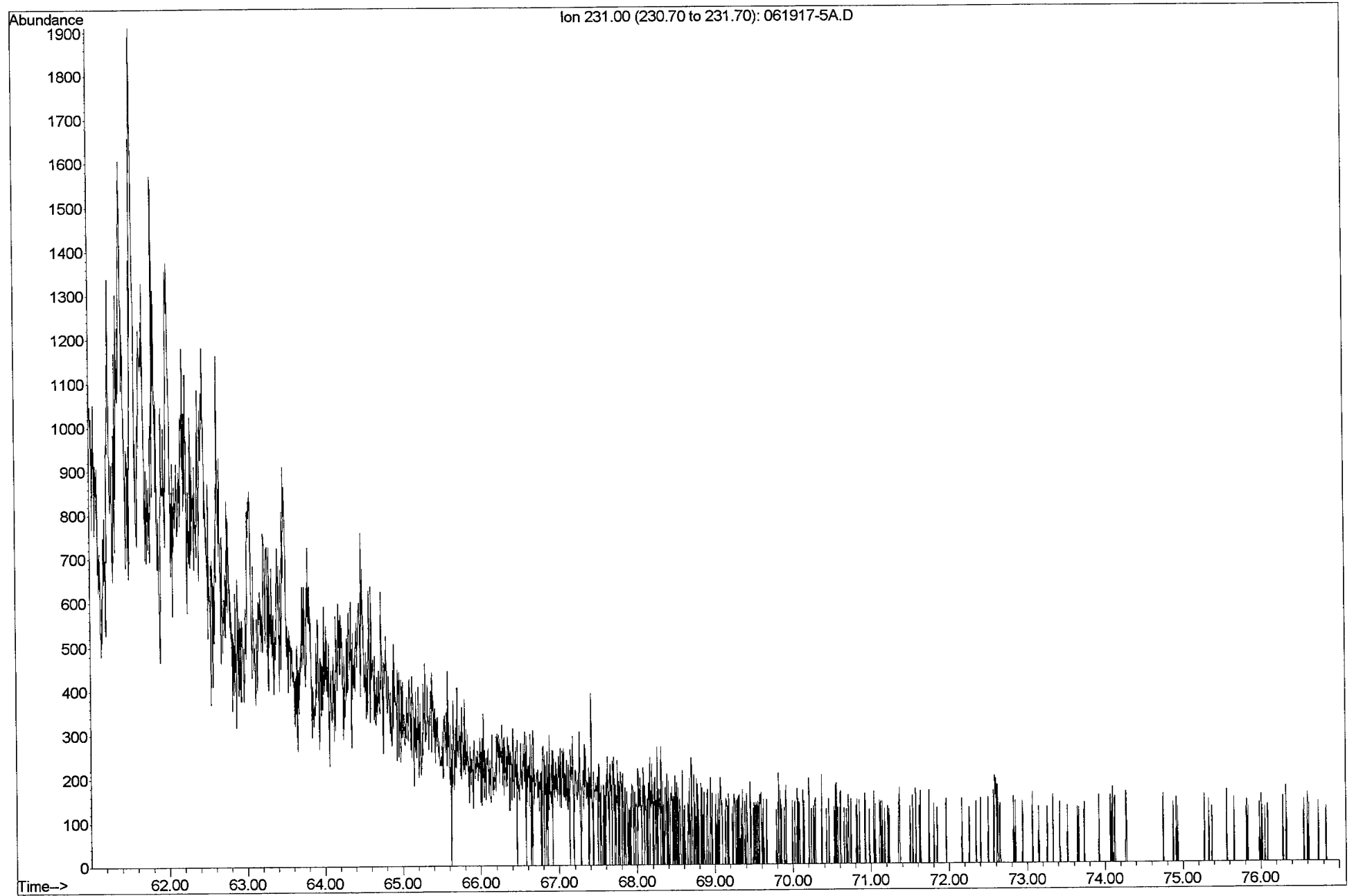


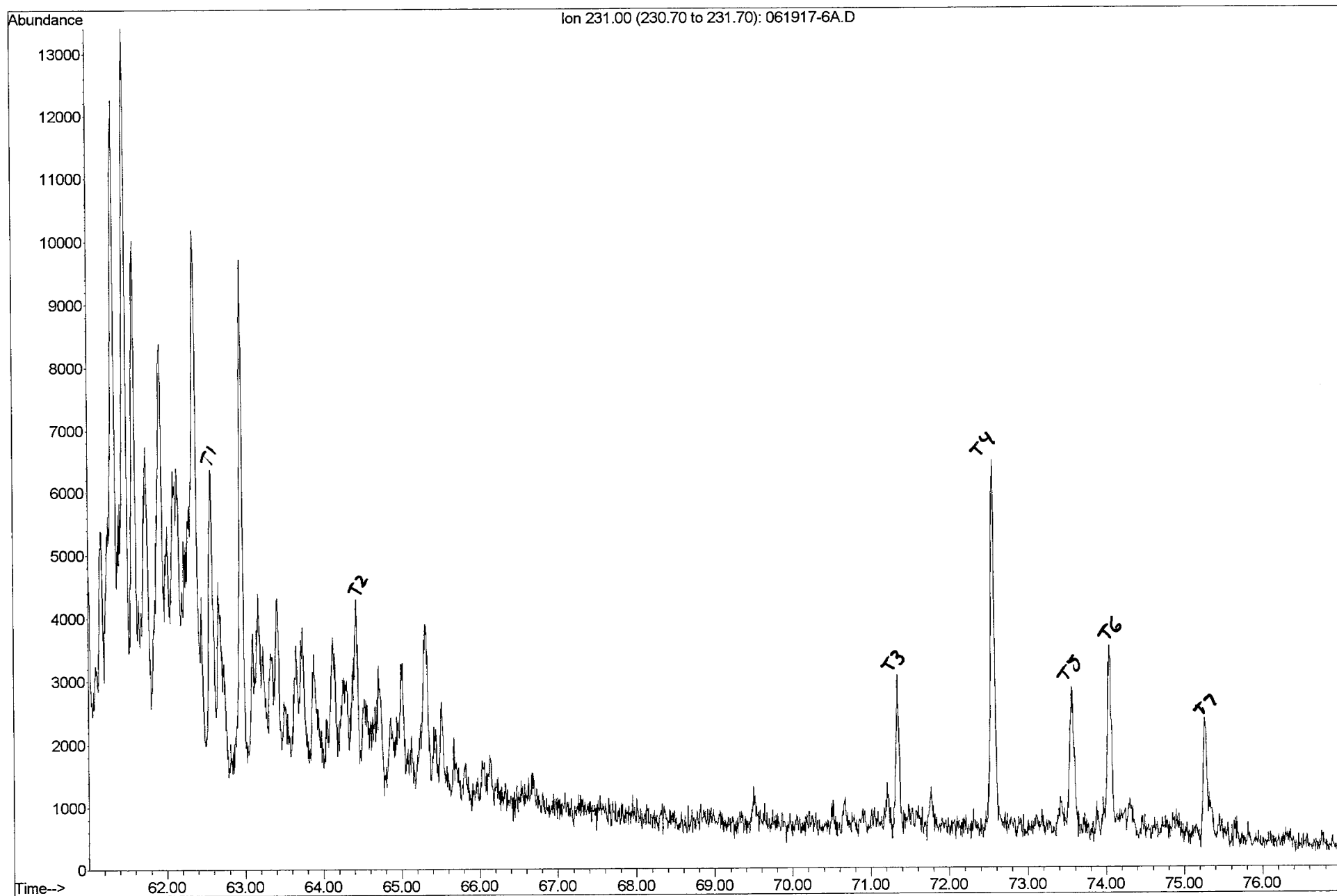




Key for Triaromatic Steranes Identification (m/z 231 Mass Chromatogram)

Code	Identity	Elemental Composition
T1	C <sub>20</sub> Triaromatic Sterane	C <sub>20</sub> H <sub>20</sub>
T2	C <sub>21</sub> Triaromatic Sterane	C <sub>21</sub> H <sub>22</sub>
T3	20S C <sub>26</sub> Triaromatic Sterane	C <sub>26</sub> H <sub>32</sub>
T4	20R C <sub>26</sub> + 20S C <sub>27</sub> Triaromatic Steranes	C <sub>26</sub> H <sub>32</sub> + C <sub>27</sub> H <sub>34</sub>
T5	20S C <sub>28</sub> Triaromatic Sterane	C <sub>28</sub> H <sub>36</sub>
T6	20R C <sub>27</sub> Triaromatic Sterane	C <sub>27</sub> H <sub>34</sub>
T7	20R C <sub>28</sub> Triaromatic Sterane	C <sub>28</sub> H <sub>36</sub>







Key for Identifying Aromatic Hydrocarbons

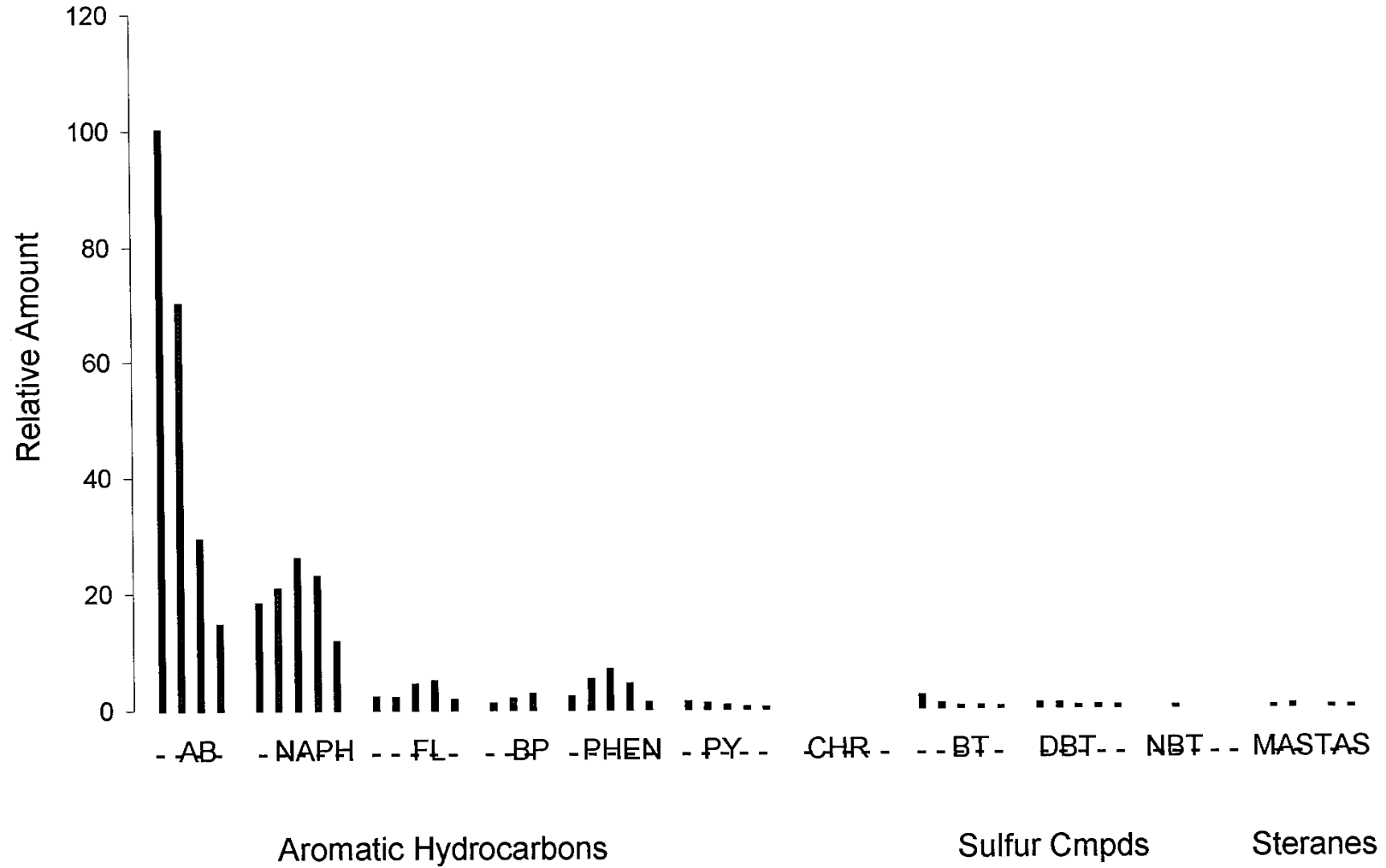
No	m/z	Abbreviation	Compound
1	120	AB	C <sub>3</sub> -alkylbenzenes
2	134		C <sub>4</sub> -alkylbenzenes
3	148		C <sub>5</sub> -alkylbenzenes
4	162		C <sub>6</sub> -alkylbenzenes
5	128	NAPH	C <sub>0</sub> -naphthalene
6	142		C <sub>1</sub> -naphthalenes
7	156		C <sub>2</sub> -naphthalenes
8	170		C <sub>3</sub> -naphthalenes
9	184		C <sub>4</sub> -naphthalenes
10	166	FL	C <sub>0</sub> -fluorene
11	180		C <sub>1</sub> -fluorenes
12	194		C <sub>2</sub> -fluorenes
13	208		C <sub>3</sub> -fluorenes
14	222		C <sub>4</sub> -fluorenes
15	154	BP	C <sub>0</sub> -biphenyl
16	168		C <sub>1</sub> -biphenyls + dibenzofuran
17	182		C <sub>2</sub> -biphenyls + C1 Dibenzofuran
18	178	PHEN	C <sub>0</sub> -phenanthrene
19	192		C <sub>1</sub> -phenanthrenes
20	206		C <sub>2</sub> -phenanthrenes
21	220		C <sub>3</sub> -phenanthrenes
22	234		C <sub>4</sub> -phenanthrenes
23	202	PY	C <sub>0</sub> -pyrene/fluoranthene
24	216		C <sub>1</sub> -pyrenes/fluoranthenes
25	230		C <sub>2</sub> -pyrenes/fluoranthenes
26	244		C <sub>3</sub> -pyrenes/fluoranthenes
27	258		C <sub>4</sub> -pyrenes/fluoranthenes
28	228	CHR	C <sub>0</sub> -chrysene
29	242		C <sub>1</sub> -chrysenes
30	256		C <sub>2</sub> -chrysenes
31	270		C <sub>3</sub> -chrysenes
32	284		C <sub>4</sub> -chrysenes
33	148	BT	C <sub>1</sub> -benzothiophenes
34	162		C <sub>2</sub> -benzothiophenes
35	176		C <sub>3</sub> -benzothiophenes
36	190		C <sub>4</sub> -benzothiophenes
37	204		C <sub>5</sub> -benzothiophenes

Key for Identifying Aromatic Hydrocarbons – Cont.

No	m/z	Abbreviation	Compound
38	184	DBT	C <sub>0</sub> -dibenzothiophene
39	198		C <sub>1</sub> -dibenzothiophenes
40	212		C <sub>2</sub> -dibenzothiophenes
41	226		C <sub>3</sub> -dibenzothiophenes
42	240		C <sub>4</sub> -dibenzothiophenes
43	234	NBT	C <sub>0</sub> -naphthobenzthiophene
44	248		C <sub>1</sub> -naphthobenzthiophenes
45	262		C <sub>2</sub> -naphthobenzthiophenes
46	276		C <sub>3</sub> -naphthobenzthiophenes
47	290		C <sub>4</sub> -naphthobenzthiophenes
48	253	MAS	Monoaromatic steranes
49	267		Monoaromatic steranes
50	239		Monoaromatic steranes
51	231	TAS	Triaromatic steranes
52	245		Triaromatic steranes

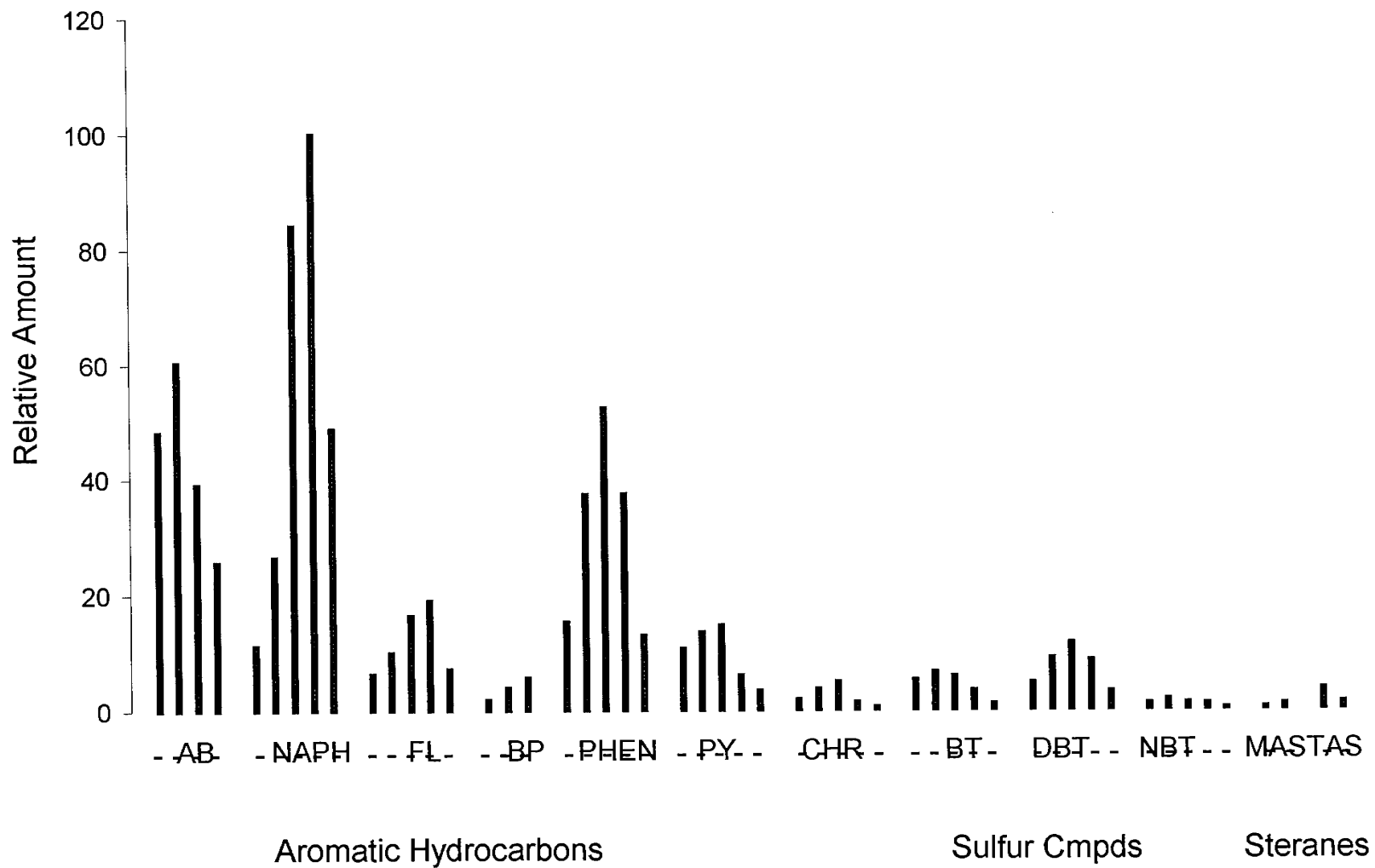
# Aromatic Hydrocarbon Distribution

22995-1 [MW-3] 1/5DILUTION



# Aromatic Hydrocarbon Distribution

22995-2 [MW-5] 1/5 DILUTION





# Cooler Receipt Form

Client Name: PR55 Engineering Project: 601820301 Lab Work Order: S 24925

**A. Shipping/Container Information (circle appropriate response)**

Courier: FedEx  UPS  USPS  Client Other: \_\_\_\_\_ Air bill Present: Yes  No

Tracking Number: 1Z9X96571160885565

Custody Seal on Cooler/Box Present: Yes  No  Seals Intact: Yes  No

Cooler/Box Packing Material: Bubble Wrap  Absorbent Foam  Other:  \_\_\_\_\_

Type of Ice: Wet  Blue  None  Ice Intact: Yes  Melted

Cooler Temperature: 40 Radiation Screened: Yes  No  Chain of Custody Present: Yes  No

Comments: \_\_\_\_\_

**B. Laboratory Assignment/Log-in (check appropriate response)**

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	<input checked="" type="checkbox"/>			
Chain of Custody relinquished	<input checked="" type="checkbox"/>			
Sampler Name & Signature on CDC	<input checked="" type="checkbox"/>			
Containers intact	<input checked="" type="checkbox"/>			
Were samples in separate bags	<input checked="" type="checkbox"/>			
Sample container labels match CDC Sample name/date and time collected		<input checked="" type="checkbox"/>		
Sufficient volume provided	<input checked="" type="checkbox"/>			
PAES containers used			<input checked="" type="checkbox"/>	
Are containers properly preserved for the requested testing? (as labeled)			<input checked="" type="checkbox"/>	
If an unknown preservation state, were containers checked? Exception: VDA's coliform			<input checked="" type="checkbox"/>	If yes, see pH form
Was volume for dissolved testing field filtered, as noted on the CDC? Was volume received in a preserved container?			<input checked="" type="checkbox"/>	

Comments: \_\_\_\_\_

Cooler contents examined/received by: LO Date: 6/13/17

Project Manager Review: [Signature] Date: 6/15/17

NON-CONFORMANCE FORM

PAES Work Order #: 22995

Date: 6/15/17 Time of Receipt: 13:00 Receiver: 13

Client: FBS Engineering

REASON FOR NON-CONFORMANCE:

MW1 & MW2 - 2: untested  
MW3 & MW4 - 2: product  
Assemble by customer on container  
Time taken from LCC

ACTION TAKEN:

Client name: FBS Engineering Date: 6/15/17 Time: 14:00

Client decided to analyze MW3+MW5  
for full scan.

Customer Service Initials: JM Date: 6/15/17

**Lauren McGrath - RE: Coleman Petroleum Project**

---

**From:** Ken Nogeire <Ken.Nogeire@pbsusa.com>  
**To:** Lauren McGrath <Lauren.McGrath@pacelabs.com>  
**Date:** 6/15/2017 1:30 PM  
**Subject:** RE: Coleman Petroleum Project

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22495

Hi Lauren. Please proceed with the C8-C40 Full Scan on samples MW3 and MW5. Thank you,

Ken Nogeire, LHG | Senior Hydrogeologist | PBS Seattle | [509.572.8163](tel:509.572.8163) (cell)

---

**From:** Lauren McGrath [[Lauren.McGrath@pacelabs.com](mailto:Lauren.McGrath@pacelabs.com)]  
**Sent:** Thursday, June 15, 2017 6:28 AM  
**To:** Ken Nogeire  
**Subject:** RE: Coleman Petroleum Project

Good morning Ken,

Since you are not concerned about MW2, we can do a Whole Oil analyses on MW1, MW3, and MW5 to verify that they are the same. The only reason Full Scan was chosen was due to the MW2 being a water. Would that be sufficient for you and your client?

**Lauren McGrath**

Project Coordinator

Pace Analytical Energy Services, LLC

220 William Pitt Way

Pittsburgh, PA 15238

[412-826-5245](tel:412-826-5245)

[Lauren.McGrath@pacelabs.com](mailto:Lauren.McGrath@pacelabs.com)



[www.pacelabs.com](http://www.pacelabs.com)

2017/15

>>> Ken Nogeire <[Ken.Nogeire@pbsusa.com](mailto:Ken.Nogeire@pbsusa.com)> 6/14/2017 5:22 PM >>>

Hi Lauren. The analysis your chemist recommended would be almost \$4000, which is too much for my client. I'm not worried about gasoline and MW1 and MW3 products should be the same. So I'm leaning toward doing the C8-C40 full scan on MW3 and MW5. What do you think? We can discuss on the phone if you're around. Thank you for your patience.

**Ken Nogeire, LHG**

Senior Hydrogeologist

**PBS**

2517 Eastlake Ave. East, Suite 100, Seattle, WA 98102

office: [206.233.9639](tel:206.233.9639) | cell: [509.572.8163](tel:509.572.8163)

[ken.nogeire@pbsusa.com](mailto:ken.nogeire@pbsusa.com)

[pbsusa.com](http://pbsusa.com)



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**From:** Lauren McGrath [<mailto:Lauren.McGrath@pacelabs.com>]

**Sent:** Tuesday, June 13, 2017 11:03 AM

**To:** Ken Nogeire

**Subject:** Coleman Petroleum Project

Dear Ken,

We received your samples for the Coleman project. Unfortunately, there is not enough product in MW2 to run a whole oil analyses. I spoke with our petroleum expert and he advised to run a PIANO and Full Scan on all four samples in order to compare all of them accurately. Please let me know if you approve to proceed. Thank you.

**Lauren McGrath**

Project Coordinator

Pace Analytical Energy Services, LLC

220 William Pitt Way

Pittsburgh, PA 15238

412-826-5245

Lauren.McGrath@pacelabs.com

www.pacelabs.com

22995

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FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 27, 2018

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on December 20, 2018 from the Coleman Yakima 41392, F&BI 812291 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS1227R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 20, 2018 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima 41392, F&BI 812291 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
812291 -01	MW9-1.5
812291 -02	MW9-2.2
812291 -03	MW9-2.5
812291 -04	MW8-3
812291 -05	MW8-11
812291 -06	MW10-2
812291 -07	MW10-14
812291 -08	BH4-2
812291 -09	BH4-12
812291 -10	BH4-W

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18  
Date Received: 12/20/18  
Project: Coleman Yakima 41392, F&BI 812291  
Date Extracted: 12/26/18  
Date Analyzed: 12/26/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
BH4-W 812291-10 1/20	200	<20	<20	<60	3,900	98
Method Blank 08-2903 MB	<1	<1	<1	<3	<100	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18  
 Date Received: 12/20/18  
 Project: Coleman Yakima 41392, F&BI 812291  
 Date Extracted: 12/20/18  
 Date Analyzed: 12/21/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
MW9-1.5 812291-01	<0.02	<0.02	<0.02	<0.06	<5	82
MW9-2.5 812291-03	<0.02	<0.02	<0.02	<0.06	<5	81
MW8-3 812291-04	<0.02	<0.02	<0.02	<0.06	<5	80
MW8-11 812291-05	<0.02	<0.02	<0.02	<0.06	<5	81
MW10-2 812291-06	<0.02	<0.02	<0.02	<0.06	<5	80
MW10-14 812291-07	<0.02	<0.02	<0.02	<0.06	<5	83
BH4-2 812291-08	<0.02	<0.02	<0.02	<0.06	<5	81
BH4-12 812291-09	<0.02	<0.02	<0.02	<0.06	<5	84
Method Blank 08-2827 MB	<0.02	<0.02	<0.02	<0.06	<5	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18  
Date Received: 12/20/18  
Project: Coleman Yakima 41392, F&BI 812291  
Date Extracted: 12/26/18  
Date Analyzed: 12/26/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 47-140)
BH4-W 812291-10 1/60	97,000	<15,000	ip
Method Blank 08-2915 MB	<50	<250	100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18  
 Date Received: 12/20/18  
 Project: Coleman Yakima 41392, F&BI 812291  
 Date Extracted: 12/21/18  
 Date Analyzed: 12/21/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR TOTAL PETROLEUM HYDROCARBONS AS  
 DIESEL AND MOTOR OIL  
 USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
MW9-1.5 812291-01	<50	<250	85
MW9-2.5 812291-03	<50	<250	86
MW8-3 812291-04	<50	<250	83
MW8-11 812291-05	<50	<250	85
MW10-2 812291-06	<50	<250	88
MW10-14 812291-07	<50	<250	91
BH4-2 812291-08	<50	<250	90
BH4-12 812291-09	<50	<250	90
Method Blank 08-2892 MB	<50	<250	84



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18

Date Received: 12/20/18

Project: Coleman Yakima 41392, F&BI 812291

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 812308-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	113	65-118
Toluene	ug/L (ppb)	50	110	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	106	74-118
Gasoline	ug/L (ppb)	1,000	88	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18

Date Received: 12/20/18

Project: Coleman Yakima 41392, F&BI 812291

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 812291-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	97	69-120
Toluene	mg/kg (ppm)	0.5	96	70-117
Ethylbenzene	mg/kg (ppm)	0.5	97	65-123
Xylenes	mg/kg (ppm)	1.5	96	66-120
Gasoline	mg/kg (ppm)	20	85	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18

Date Received: 12/20/18

Project: Coleman Yakima 41392, F&BI 812291

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	80	61-133	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/27/18

Date Received: 12/20/18

Project: Coleman Yakima 41392, F&BI 812291

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 812291-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	84	84	73-135	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	80	74-139

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

812291  
 Report To Ken Nogueira@pbususa.com  
 Company PBS Engineering  
 Address 214 E Galer St. Seattle  
 City, State, ZIP WA, 98102  
 Phone 509.572.8163 Email above

**SAMPLE CHAIN OF CUSTODY**

SAMPLERS (signature) <i>Ken Nogueira</i>	PROJECT NAME <u>Coleman Yakima</u>	PO # <u>41392</u>
REMARKS <u>Will likely be adding secondary analysis</u>	INVOICE TO <u>Ken</u>	

Page # 1 of 1

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM			
MW9-15	01 A-E	12/18/18	1200	Soil	5	X	X	X	X						4-15
MW9-02	02	12/18/18	1230	Soil	5	X	X	X	X						
MW9-0.5	03	12/18/18	1055	Soil	5	X	X	X	X						
MW8-3	04	12/18/18	1400	Soil	5	X	X	X	X						
MW8-11	05	12/18/18	1450	Soil	5	X	X	X	X						
MW10-2	06	12/19/18	0835	Soil	5	X	X	X	X						
MW10-14	07	12/19/18	0910	Soil	5	X	X	X	X						
BH4-2	08	12/19/18	1150	Soil	5	X	X	X	X						
BH4-12	09	12/19/18	1230	Soil	5	X	X	X	X						
BH4-W	10	12/19/18	1312	Water	5	X	X	X	X						likely high concentration

SIGNATURE		PRINT NAME		COMPANY		DATE	TIME
Relinquished by: <i>Ken Nogueira</i>	<i>Ken Nogueira</i>	Patrick Brice		PBS		12/19/18	1350
Received by: <i>Ken Nogueira</i>	<i>Ken Nogueira</i>	Ken Nogueira		PBS		12/19/18	1330
Relinquished by: <i>Ken Nogueira</i>	<i>Ken Nogueira</i>	Ken Nogueira		PBS		12/20/18	1120
Received by: <i>Ken Nogueira</i>	<i>Ken Nogueira</i>	VIVA		EBI		12/20/18	1120

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

January 2, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on December 27, 2018 from the Coleman Yakima 41392, F&BI 812355 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0102R.DOC

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 27, 2018 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima 41392, F&BI 812355 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
812355 -01	BH1-2
812355 -02	BH1-12
812355 -03	BH1
812355 -04	BH2-2
812355 -05	BH2-14
812355 -06	BH2
812355 -07	BH5-2
812355 -08	BH5-13
812355 -09	BH5
812355 -10	Trip Blank 1

The NWTPH-Dx waters BH1 and BH2 were received outside of the holding time. The data were flagged accordingly.

All other quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812355  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Trip Blank 1 812355-10	<1	<1	<1	<3	89
Method Blank 08-2904 MB	<1	<1	<1	<3	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812355  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18 and 12/28/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
BH1 812355-03	18	18	54	97	7,300	ip
BH2 812355-06 1/20	240	<20	160	170	8,600	107
BH5 812355-09 1/40	1,300	730	1,200	4,400	27,000	107
Method Blank 08-2904 MB	<1	<1	<1	<3	<100	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
 Date Received: 12/27/18  
 Project: Coleman Yakima 41392, F&BI 812355  
 Date Extracted: 12/27/18  
 Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
BH1-2 812355-01	<0.02	0.12	0.053	0.44	27	81
BH1-12 812355-02	<0.02	<0.02	<0.02	<0.06	<5	82
BH2-2 812355-04	<0.02	<0.02	<0.02	<0.06	<5	84
BH2-14 812355-05	<0.02	<0.02	<0.02	<0.06	<5	80
BH5-2 812355-07	<0.02	<0.02	<0.02	<0.06	<5	82
BH5-13 812355-08	<0.02	<0.02	<0.02	<0.06	<5	84
Method Blank 08-2891 MB2	<0.02	<0.02	<0.02	<0.06	<5	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812355  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18 and 12/28/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u>	<u>Diesel Range</u>	<u>Motor Oil Range</u>	<u>Surrogate</u>
Laboratory ID	(C <sub>10</sub> -C <sub>25</sub> )	(C <sub>25</sub> -C <sub>36</sub> )	(% Recovery)
			(Limit 41-152)
BH1 ht 812355-03 1/10	87,000	<2,500	80
BH2 ht 812355-06 1/1.6	3,200 x	<400	73
BH5 812355-09 1/1.3	4,200 x	<320	95
Method Blank 08-2915 MB2	<50	<250	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812355  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
BH1-2 812355-01	630	<250	76
BH1-12 812355-02	<50	<250	77
BH2-2 812355-04	<50	<250	78
BH2-14 812355-05	<50	<250	90
BH5-2 812355-07	<50	<250	79
BH5-13 812355-08	<50	<250	77
Method Blank 08-2919 MB	<50	<250	78

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812355

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 812347-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	116	65-118
Toluene	ug/L (ppb)	50	114	72-122
Ethylbenzene	ug/L (ppb)	50	110	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812355

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 811494-08 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	0.071	0.062	13
Xylenes	mg/kg (ppm)	0.34	0.32	7
Gasoline	mg/kg (ppm)	110	110	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	99	69-120
Toluene	mg/kg (ppm)	0.5	98	70-117
Ethylbenzene	mg/kg (ppm)	0.5	99	65-123
Xylenes	mg/kg (ppm)	1.5	100	66-120
Gasoline	mg/kg (ppm)	20	90	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812355

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	80	61-133	5



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812355

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 812303-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	760	91	85	63-146	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	90	79-144

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

812355

SAMPLE CHAIN OF CUSTODY ME 12/27/18

WA / GA / E04

Report To Ken Mogeire

Company PBS Engineering & Environmental

Address 214 E. Galer St., Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-9143 Email Ken.Mogeire@PBSusa.com

SAMPLERS (signature) Pat Brice

PROJECT NAME Coleman Yakima

PO # 41392

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME

Standard Turnaround

RUSH  
Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
BH1-2	01A-E	12/19/18	1415	Soil	5	X	X	X	X					
BH1-12	02	12/19/18	1455	soil	5	X	X	X	X					
BH1	03A-D	12/19/18	1500	water	5	X	X	X	X					
BH2-2	04 A-E	12/19/18	1600	soil	5	X	X	X	X					
BH2-14	05	12/19/18	1623	soil	5	X	X	X	X					
BH2	06	12/19/18	1630	water	5	X	X	X	X					
BH5-2	02	12/20/18	0850	soil	5	X	X	X	X					
BH5-13	08	12/20/18	1000	soil	5	X	X	X	X					
BH5	09	12/20/18	0938	water	5	X	X	X	X					
Trip Blank 1	10													

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: Pat Brice

Patrick Brice

PBS Engineering

12/20/18

1600

Received by: Ken Mogeire

Ken Mogeire

Samples received at

3

00

Relinquished by:

Received by: Ken Mogeire

Ken Mogeire

FBT

12/27/18

0830

Friedman & Bryya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
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3012 16th Avenue West  
Seattle, WA 98119-2029  
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fbi@isomedia.com  
www.friedmanandbruya.com

January 2, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on December 27, 2018 from the Coleman Yakima 41392, F&BI 812356 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0102R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 27, 2018 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima 41392, F&BI 812356 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
812356 -01	BH6-2
812356 -02	BH6-14
812356 -03	BH6
812356 -04	BH7-2
812356 -05	BH7-13
812356 -06	BH7
812356 -07	BH3-2
812356 -08	BH3-14
812356 -09	BH3
812356 -10	Trip Blank 2

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812356  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Trip Blank 2 812356-10	<1	<1	<1	<3	88
Method Blank 08-2904 MB	<1	<1	<1	<3	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
 Date Received: 12/27/18  
 Project: Coleman Yakima 41392, F&BI 812356  
 Date Extracted: 12/27/18  
 Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
BH6 812356-03 1/5	<5	10	58	78	5,100	116
BH7 812356-06 1/5	38	17	95	81	4,300	110
BH3 812356-09 1/5	89	47	180	130	8,900	119
Method Blank 08-2904 MB	<1	<1	<1	<3	<100	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
 Date Received: 12/27/18  
 Project: Coleman Yakima 41392, F&BI 812356  
 Date Extracted: 12/27/18  
 Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
BH6-2 812356-01	<0.02	<0.02	<0.02	0.074	<5	81
BH6-14 812356-02	<0.02	<0.02	<0.02	<0.06	<5	82
BH7-2 812356-04	<0.02	<0.02	<0.02	<0.06	<5	81
BH7-13 812356-05	<0.02	<0.02	<0.02	<0.06	<5	83
BH3-2 812356-07	<0.02	<0.02	<0.02	<0.06	<5	81
BH3-14 812356-08	<0.02	<0.02	<0.02	<0.06	<5	84
Method Blank 08-2891 MB2	<0.02	<0.02	<0.02	<0.06	<5	83



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812356  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18 and 12/28/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
BH6 812356-03	19,000	390 x	ip
BH7 812356-06	34,000	1,400 x	96
BH3 812356-09 1/10	100,000	2,800 x	57
Method Blank 08-2915 MB2	<50	<250	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19  
Date Received: 12/27/18  
Project: Coleman Yakima 41392, F&BI 812356  
Date Extracted: 12/27/18  
Date Analyzed: 12/27/18

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 48-168)
BH6-2 812356-01	<50	<250	87
BH6-14 812356-02	<50	<250	89
BH7-2 812356-04	<50	<250	89
BH7-13 812356-05	<50	<250	99
BH3-2 812356-07	<50	<250	94
BH3-14 812356-08	<50	<250	99
Method Blank 08-2917 MB	<50	<250	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812356

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 812347-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	116	65-118
Toluene	ug/L (ppb)	50	114	72-122
Ethylbenzene	ug/L (ppb)	50	110	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812356

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 811494-08 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	0.071	0.062	13
Xylenes	mg/kg (ppm)	0.34	0.32	7
Gasoline	mg/kg (ppm)	110	110	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	99	69-120
Toluene	mg/kg (ppm)	0.5	98	70-117
Ethylbenzene	mg/kg (ppm)	0.5	99	65-123
Xylenes	mg/kg (ppm)	1.5	100	66-120
Gasoline	mg/kg (ppm)	20	90	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812356

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	80	61-133	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/02/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812356

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 812356-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	84	86	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	94	74-139

**Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

812356

SAMPLE CHAIN OF CUSTODY

ME 12/27/18

WAF/EGY/CT2

Report To Ken Nogeire

Company PBS Engineering & Environmental

Address 214 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-8163 Email Ken.Nogeire@PBSUSA.com

SAMPLERS (signature) Patrick Brice

PROJECT NAME

Coleman Yakima

PO #

41399

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME

Standard Turnaround

RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	
BH6-2	01 A-E	12/20/18	1100	Soil	5	X	X	X	X				
BH6-14	02	12/20/18	1130	Soil	5	X	X	X	X				
BH6	03	12/20/18	1145	Water	5	X	X	X	X				
BH7-2	04	12/20/18	1420	Soil	5	X	X	X	X				
BH7-13	05	12/20/18	1450	Soil	5	X	X	X	X				
BH7	06	12/20/18	1505	Water	5	X	X	X	X				
BH3-2	07	12/20/18	1603	Soil	5	X	X	X	X				
BH3-14	08	12/20/18	1625	soil	5	X	X	X	X				
BH3	09	12/20/18	1640	Water	5	X	X	X	X				
Trip Blank 2	10												

Samples received at 4 °C

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: Patrick Brice

Patrick Brice

PBS Engineering

12/20/18

1600

Received by:

Felix: 7740 6309 7627

Relinquished by:

Received by: Michael Amis

Michael Amis

FBI

12/27/18

0830

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282



FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

January 14, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the additional results from the testing of material submitted on December 27, 2018 from the Coleman Yakima 41392, F&BI 812355 project. There are 5 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0114R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 27, 2018 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima 41392, F&BI 812355 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
812355 -01	BH1-2
812355 -02	BH1-12
812355 -03	BH1
812355 -04	BH2-2
812355 -05	BH2-14
812355 -06	BH2
812355 -07	BH5-2
812355 -08	BH5-13
812355 -09	BH5
812355 -10	Trip Blank 1

The MTBE, EDC, and EDB concentrations for sample BH5 were reported below the lowest calibration standard. The data were flagged accordingly.

The 8260C samples were requested to be analyzed outside of the holding time. The data were flagged accordingly.

All other quality control requirements were acceptable.

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	BH5	Client:	PBS Engineering and Environmental
Date Received:	12/27/18	Project:	Coleman Yakima 41392, F&BI 812355
Date Extracted:	01/09/19	Lab ID:	812355-09 1/5
Date Analyzed:	01/09/19	Data File:	010909.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1 j
1,2-Dichloroethane (EDC)	<1 j
1,2-Dibromoethane (EDB)	<1 j

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Yakima 41392, F&BI 812355
Date Extracted:	01/09/19	Lab ID:	09-0017 mb
Date Analyzed:	01/09/19	Data File:	010907.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812355

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: 901080-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	69-133
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	98	69-134

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	97	99	64-147	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	101	73-132	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	98	100	82-125	2

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

January 14, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the additional results from the testing of material submitted on December 27, 2018 from the Coleman Yakima 41392, F&BI 812356 project. There are 6 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0114R.DOC



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 27, 2018 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Yakima 41392 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
812356 -01	BH6-2
812356 -02	BH6-14
812356 -03	BH6
812356 -04	BH7-2
812356 -05	BH7-13
812356 -06	BH7
812356 -07	BH3-2
812356 -08	BH3-14
812356 -09	BH3
812356 -10	Trip Blank 2

The 8260C samples were requested to be analyzed outside of the holding time. The data were flagged accordingly.

All other quality control requirements were acceptable.

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	BH7 ht	Client:	PBS Engineering and Environmental
Date Received:	12/27/18	Project:	Coleman Yakima 41392, F&BI 812356
Date Extracted:	01/09/19	Lab ID:	812356-06
Date Analyzed:	01/09/19	Data File:	010907.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	109	50	150

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	BH3 ht	Client:	PBS Engineering and Environmental
Date Received:	12/27/18	Project:	Coleman Yakima 41392, F&BI 812356
Date Extracted:	01/09/19	Lab ID:	812356-09
Date Analyzed:	01/09/19	Data File:	010908.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	104	50	150
4-Bromofluorobenzene	113	50	150

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Yakima 41392, F&BI 812356
Date Extracted:	01/09/19	Lab ID:	09-0017 mb
Date Analyzed:	01/09/19	Data File:	010907.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/19

Date Received: 12/27/18

Project: Coleman Yakima 41392, F&BI 812356

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: 901080-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	69-133
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	98	69-134

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	97	99	64-147	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	101	73-132	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	98	100	82-125	2

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

812356

SAMPLE CHAIN OF CUSTODY

ME 12/27/18

Waf Eay/CTA

Report To Ken Nozice

Company PBS Engineering & Environmental

Address 214 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-8163 Email KenNozice@PBSusa.com

SAMPLERS (Signature) <u>Patrick Brice</u>	
PROJECT NAME <u>Coburn Parkina</u>	PO # <u>41399</u>
REMARKS	INVOICE TO

Page # 1 of 1

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		ED, EDC, MTBE	
BH6-2	01 A-E	12/20/18	11:00	Soil	5	X	X	X	X						◆ - per LN
BH6-14	02	12/20/18	11:30	Soil	5	X	X	X	X						1/6/19 MC
BH6	03	12/20/18	11:45	Water	5	X	X	X	X						
BH7-2	04	12/20/18	14:20	Soil	5	X	X	X	X						
BH7-13	05	12/20/18	14:50	Soil	5	X	X	X	X						
BH7	06	12/20/18	15:05	Water	5	X	X	X	X						
BH3-2	07	12/20/18	16:03	Soil	5	X	X	X	X						
BH3-14	08	12/20/18	16:25	Soil	5	X	X	X	X						
BH3	09	12/20/18	16:40	Water	5	X	X	X	X						
Trip Blank 2	10														

Samples received at 4 °C

Relinquished by: <u>Ken Nozice</u>	SIGNATURE	PRINT NAME: <u>Patrick Brice</u>	COMPANY: <u>PBS Engineering</u>	DATE: <u>12/27/18</u>	TIME: <u>0830</u>
Received by: <u>Patrick Brice</u>					
Relinquished by:					
Received by: <u>Ngan Phan</u>					

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

---

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 3, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on March 21, 2019 from the Coleman Oil Yakima 41392.000.12.2, F&BI 903392 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0403R.doc



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 21, 2019 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392.000.12.2, F&BI 903392 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
903392 -01	MW-10
903392 -02	MW-9
903392 -03	Dup 1
903392 -04	RW-1P
903392 -05	MW-8P
903392 -06	MW-4P
903392 -07	MW-2P
903392 -08	MW-3P
903392 -09	MW-5P
903392 -10	Trip Blank

The samples RW-1P, MW-8P, and MW-3P were sent to Spectra Analytical for viscosity analysis. The report is enclosed.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

Date Extracted: 03/22/19

Date Analyzed: 03/22/19

**RESULTS FROM THE ANALYSIS OF SOIL/PRODUCT SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported as Not Detected (ND) or Detected (D)

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE  
WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION  
WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
RW-1P 903392-04 1/1,000	D	D	ND	68
MW-8P 903392-05 1/1,000	ND	D	ND	136
MW-4P 903392-06 1/1,000	ND	D	ND	120
MW-2P 903392-07 1/1,000	D	D	ND	75
MW-3P 903392-08 1/1,000	D	D	ND	64
MW-5P 903392-09 1/1,000	D	D	ND	108
Method Blank 09-648 MB	ND	ND	ND	108

ND - Material not detected at or above 20,000 mg/kg gas, 50,000 mg/kg diesel and 250,000 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

Date Extracted: 03/21/19

Date Analyzed: 03/21/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Dup 1 903392-03	<1	<1	<1	<3	84
Trip Blank 903392-10	<1	<1	<1	<3	84
Method Blank 09-496 MB	<1	<1	<1	<3	85

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

Date Extracted: 03/21/19

Date Analyzed: 03/21/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-10 903392-01	<1	<1	<1	<3	<100	84
MW-9 903392-02	<1	<1	<1	<3	<100	85
Method Blank 09-496 MB	<1	<1	<1	<3	<100	85

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

Date Extracted: 03/22/19

Date Analyzed: 03/22/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 47-140)
MW-10 903392-01	180 x	<250	105
MW-9 903392-02	440 x	<250	87
Method Blank 09-645 MB	<50	<250	104

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

Date Extracted: NA

Date Analyzed: 03/22/19

**RESULTS FROM THE ANALYSIS OF PRODUCT SAMPLES  
FOR SPECIFIC GRAVITY  
@ 15.56 °C**

<u>Sample ID</u> Laboratory ID	<u>Specific Gravity</u>
RW-1P 903392-04	0.817
MW-8P 903392-05	0.841
MW-4P 903392-06	0.830
MW-2P 903392-07	0.786
MW-3P 903392-08	0.810
MW-5P 903392-09	0.828

*Note: The third significant digit is an estimate*

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 903377-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	98	65-118
Toluene	ug/L (ppb)	50	101	72-122
Ethylbenzene	ug/L (ppb)	50	97	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	108	61-133	4



FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

Date of Report: 04/03/19

Date Received: 03/21/19

Project: Coleman Oil Yakima 41392.000.12.2, F&BI 903392

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF PRODUCT SAMPLES  
FOR SPECIFIC GRAVITY  
@ 15.56 °C**

Laboratory Code: 903392-04 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Specific Gravity	0.817	0.815	0	0-2

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The analyte is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits due to sample matrix effects.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



# SPECTRA Laboratories

...Where experience matters

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

03/29/2019

Friedman & Bruya, Inc  
3012 16th Ave West  
Seattle, WA 98119-2029  
Attn: Michael Erdahl

P.O.#: B-189  
Project: 903392  
Sample Matrix: Product  
Date Sampled: 03/19/2019  
Date Received: 03/22/2019  
Spectra Project: 2019030635

<u>Client ID</u>	<u>Spectra #</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Method</u>
RW-1P	1	Viscosity, Kin, @ 15 °C	2.28	cSt	ASTM D-445
MW-8P	2	Viscosity, Kin, @ 15 °C	3.82	cSt	ASTM D-445
MW-3P	3	Viscosity, Kin, @ 15 °C	2.21	cSt	ASTM D-445

SPECTRA LABORATORIES



Jeffrey Cooper, Laboratory Manager

a7/kth



4033 903392

**SAMPLE CHAIN OF CUSTODY** ME 03-21-19

A02 / A13 / MW2

Report To: Ken Nogeire  
 Company: PBS Engineering (Environment)  
 Address: 214 E. Galer St Ste 300  
 City, State, ZIP: Seattle, WA 98109  
 Phone: 509-572-8163 Email: Ken.Nogeire@PBSUSA.com

SAMPLERS (signature) <i>Ken Nogeire</i>	
PROJECT NAME <u>Coleman Oil Yelmu</u>	PO # <u>41392, 000, 12.3</u>
REMARKS	INVOICE TO

Page # \_\_\_\_\_ of \_\_\_\_\_

TURNAROUND TIME

Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		Density	Viscosity
MW-10	01A-E	3/19/19	1155	Water	5		X	X	X						Hold Pb samples
MW-9	02 T	3/19/19	1349	Water	5		X	X	X						pending analysis
Dup 1	03 A-D	3/19/19	1200	Water	4				X						
RW-1P	04 A-C	3/19/19	1235	Product	3	X									
MW-8P	05 T	3/19/19	1500	Product	3	X									
MW-4P	06	3/19/19	1515	Product	1	X									
MW-2P	07	3/19/19	1540	Product	1	X									
MW-3P	08 A-C	3/19/19	1545	Product	3	X									
MW-5P	09 A-B	3/19/19	1620	Product	2	X									Samples received at 1000
Tip Blank	10	3/19/19	0800	Water	1				X						

Friedman & Bruva, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

Relinquished by: <i>[Signature]</i>	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Received by: <i>[Signature]</i>		Patrick Brice	PBS Engineering	3/20/19	1600
Relinquished by: <i>[Signature]</i>					
Received by: <i>[Signature]</i>					
Relinquished by: <i>[Signature]</i>					
Received by: <i>[Signature]</i>					
Relinquished by: <i>[Signature]</i>					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

June 12, 2019

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on June 6, 2019 from the Coleman Oil Yakima 41392, F&BI 906083 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0612R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 6, 2019 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392, F&BI 906083 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
906083 -01	BH8-4
906083 -02	BH8-12
906083 -03	BH9-4
906083 -04	BH9-8
906083 -05	BH10-4
906083 -06	BH10-6
906083 -07	BH11-4
906083 -08	BH11-8
906083 -09	BH12-3
906083 -10	BH12-8
906083 -11	BH13-4
906083 -12	BH13-9

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19  
 Date Received: 06/06/19  
 Project: Coleman Oil Yakima 41392, F&BI 906083  
 Date Extracted: 06/06/19  
 Date Analyzed: 06/06/19 and 06/07/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-132)
BH8-4 906083-01	<0.02	<0.02	<0.02	<0.06	<5	89
BH8-12 906083-02	<0.02	<0.02	<0.02	<0.06	<5	90
BH9-4 906083-03	<0.02	<0.02	<0.02	<0.06	<5	89
BH9-8 906083-04	<0.02	<0.02	<0.02	<0.06	<5	88
BH10-4 906083-05	<0.02	<0.02	<0.02	<0.06	<5	88
BH10-6 906083-06	<0.02	<0.02	<0.02	<0.06	<5	89
BH11-4 906083-07	<0.02	<0.02	<0.02	<0.06	<5	88
BH11-8 906083-08	<0.02	<0.02	<0.02	<0.06	<5	88
BH12-3 906083-09	<0.02	<0.02	<0.02	<0.06	<5	88
BH12-8 906083-10	<0.02	<0.02	<0.02	<0.06	<5	88



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19

Date Received: 06/06/19

Project: Coleman Oil Yakima 41392, F&BI 906083

Date Extracted: 06/06/19

Date Analyzed: 06/06/19 and 06/07/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-132)
BH13-4 906083-11	<0.02	<0.02	<0.02	<0.06	<5	88
BH13-9 906083-12	<0.02	<0.02	<0.02	<0.06	<5	89
Method Blank 09-1283 MB	<0.02	<0.02	<0.02	<0.06	<5	90

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19

Date Received: 06/06/19

Project: Coleman Oil Yakima 41392, F&BI 906083

Date Extracted: 06/07/19

Date Analyzed: 06/07/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
BH8-4 906083-01	<50	<250	93
BH8-12 906083-02	<50	<250	107
BH9-4 906083-03	<50	<250	93
BH9-8 906083-04	<50	<250	92
BH10-4 906083-05	<50	<250	94
BH10-6 906083-06	<50	<250	94
BH11-4 906083-07	<50	<250	92
BH11-8 906083-08	<50	<250	92
BH12-3 906083-09	<50	<250	92
BH12-8 906083-10	<50	<250	92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19

Date Received: 06/06/19

Project: Coleman Oil Yakima 41392, F&BI 906083

Date Extracted: 06/07/19

Date Analyzed: 06/07/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
BH13-4 906083-11	<50	<250	94
BH13-9 906083-12	<50	<250	106
Method Blank 09-1351 MB	<50	<250	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19

Date Received: 06/06/19

Project: Coleman Oil Yakima 41392, F&BI 906083

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 906083-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	95	66-121
Toluene	mg/kg (ppm)	0.5	107	72-128
Ethylbenzene	mg/kg (ppm)	0.5	105	69-132
Xylenes	mg/kg (ppm)	1.5	105	69-131
Gasoline	mg/kg (ppm)	20	100	61-153

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/12/19

Date Received: 06/06/19

Project: Coleman Oil Yakima 41392, F&BI 906083

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 906083-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	91	93	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	92	74-139

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

906083

SAMPLE CHAIN OF CUSTODY

ME 06/06/19

Page # 1 of 2

Report To Ken Noyeire

Company PBS Engineering & Environmental

Address 214 E. Galer St., Suite 300

City, State, ZIP Seattle, WA 98102

Phone 509-572-2163 Email Ken.Noyeire@PBSUSA.com

SAMPLERS (signature) <u>Ken Noyeire</u>	
PROJECT NAME <u>Coleman Oil Ytkim</u>	PO # <u>41392</u>
REMARKS	INVOICE TO <u>Ken Noyeire</u>

TURNAROUND TIME <input checked="" type="checkbox"/> Standard Turnaround <input type="checkbox"/> RUSH Rush charges authorized by: _____	SAMPLE DISPOSAL <input checked="" type="checkbox"/> Dispose after 30 days <input type="checkbox"/> Archive Samples <input type="checkbox"/> Other
--	--

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
BH8-4	01 A-E	6/4/19	1138	Soil	5	X	X	X	X					
BH8-12	02		1150			X	X	X	X					
BH9-4	03		1210			X	X	X	X					
BH9-8	04		1220			X	X	X	X					
BH10-4	05		1235			X	X	X	X					
BH10-6	06		1248			X	X	X	X					
BH11-4	07		1312			X	X	X	X					
BH11-8	08		1325			X	X	X	X					
BH12-3	09		1340			X	X	X	X					
BH12-8	10		1350			X	X	X	X					

SIGNATURE		PRINT NAME		COMPANY		DATE		TIME	
<u>Ken Noyeire</u>		<u>Patrick Boice</u>		<u>PBS Eng. &amp; Env.</u>		<u>6/5/19</u>		<u>1600</u>	
Relinquished by:		Received by:		Relinquished by:		Received by:		Samples received at	
<u>Ken Noyeire</u>		<u>Patrick Boice</u>		<u>Ken Noyeire</u>		<u>6/6/19</u>		<u>850</u>	
Received by:		Tracking #:		Received by:		Received by:		Samples received at	
<u>Ken Noyeire</u>		<u>8015 6344 0137</u>		<u>Ken Noyeire</u>		<u>6/6/19</u>		<u>850</u>	
Relinquished by:		Tracking #:		Received by:		Received by:		Samples received at	
<u>Ken Noyeire</u>		<u>8015 6344 0137</u>		<u>Ken Noyeire</u>		<u>6/6/19</u>		<u>850</u>	

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282





DRAFT

Date of Report: 12/30/19  
Date Received: 12/20/19  
Project: Coleman Oil Yakima 41392, F&BI 912385  
Date Extracted: 12/27/19  
Date Analyzed: 12/27/19 and 12/30/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
BH14-water 912385-09	<1	<1	250	290	35,000	ip
Method Blank 09-3115 MB	<1	<1	<1	<3	<100	76

Date of Report: 12/30/19  
 Date Received: 12/20/19  
 Project: Coleman Oil Yakima 41392, F&BI 912385  
 Date Extracted: 12/26/19  
 Date Analyzed: 12/26/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-132)
MW-11-5.5 soil 912385-01	<0.02	<0.02	<0.02	<0.06	<5	79
MW-11-12 soil 912385-02	<0.02	0.023	<0.02	0.082	<5	78
MW-12-6 soil 912385-03	<0.02	<0.02	<0.02	<0.06	<5	78
MW-12-14 soil 912385-04	<0.02	<0.02	<0.02	<0.06	<5	78
MW-7-6.5 soil 912385-05	<0.02	<0.02	<0.02	<0.06	<5	78
MW-7-16 soil 912385-06	<0.02	<0.02	<0.02	<0.06	<5	79
BH14-6 912385-07	<0.02	<0.02	<0.02	<0.06	<5	77
BH14-16 912385-08	<0.02	<0.02	<0.02	<0.06	<5	77
BH15-6 912385-10	<0.02	<0.02	<0.02	<0.06	<5	79
BH15-16 912385-11	<0.02	0.078	<0.02	0.30	16	76
Method Blank 09-3114 MB	<0.02	<0.02	<0.02	<0.06	<5	78

Date of Report: 12/30/19  
 Date Received: 12/20/19  
 Project: Coleman Oil Yakima 41392, F&BI 912385  
 Date Extracted: 12/23/19  
 Date Analyzed: 12/23/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
 FOR TOTAL PETROLEUM HYDROCARBONS AS  
 DIESEL AND MOTOR OIL  
 USING METHOD NWTPH-Dx**

Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 53-144)
MW-11-5.5 soil 912385-01	<50	<250	84
MW-11-12 soil 912385-02	<50	<250	74
MW-12-6 soil 912385-03	<50	<250	73
MW-12-14 soil 912385-04	<50	<250	84
MW-7-6.5 soil 912385-05	<50	<250	75
MW-7-16 soil 912385-06	<50	<250	77
BH14-6 912385-07	110	<250	84
BH14-16 912385-08	59	<250	73
BH15-6 912385-10	<50	<250	74
BH15-16 912385-11	<50	<250	75
Method Blank 09-3106 MB	<50	<250	75

912385

SAMPLE CHAIN OF CUSTODY ME 12-20-19

Page # 023/101/033

Send Report To Ken Nogueira

Company PBS Engineering & Environmental

Address 214 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98109

Phone # 509-579-8163 Fax # \_\_\_\_\_

Email Address Ken.Nogueira@PBSUSA.com

SAMPLERS (signature) [Signature]

PROJECT NAME/NO. Coleman Oil Yalquina

PO # 41392

PROJECT ADDRESS 1 E I St. Yalquina, WA 98901

ELECTRONIC DATA REQUESTED

TURNAROUND TIME

Standard Turnaround

RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

• Dispose after 30 days

• Return samples

• Will call with instructions

Samples Received at \_\_\_\_\_ °C

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED					Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS
MW-11-5.5 soil	01A-E	12/16/19	1235	Soil	5	X	X	X				
MW-11-12 soil	02	12/16/19	1309	Soil	5	X	X	X				
MW-12-6 soil	03	12/17/19	0915	Soil	5	X	X	X				
MW-12-14 soil	04	12/17/19	0951	Soil	5	X	X	X				
MW-7-6.5 soil	05	12/18/19	0850	Soil	5	X	X	X				
MW-7-16 soil	06	12/18/19	0933	Soil	5	X	X	X				
BH14-6	07	12/18/19	1125	Soil	5	X	X	X				
BH14-16	08	12/18/19	1200	Soil	5	X	X	X				
BH14-water	09A-C	12/18/19	1225	Water	3	X	X	X				Samples received at <u>30°C</u>
BH15-6	10	12/18/19	1450	Soil	5	X	X	X				

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: [Signature]

Patrick Brice

PBS

12/19/19

1500

Received by: Fed Ex

Relinquished by:

Received by: [Signature]

Nhan Phan

FBI

12/20/19

1455

Friedman & Bruya, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

912385

**SAMPLE CHAIN OF CUSTODY**

**ME 12-20-19**

Page # 2 of 2 **DB3 / MW / G23**

Send Report To \_\_\_\_\_

Company PBS

Address \_\_\_\_\_

City, State, ZIP \_\_\_\_\_

Phone # \_\_\_\_\_ Fax # \_\_\_\_\_

Email Address \_\_\_\_\_

SAMPLERS (signature)		PO #
PROJECT NAME/NO.		
PROJECT ADDRESS		
• ELECTRONIC DATA REQUESTED		

TURNAROUND TIME
• Standard Turnaround
• RUSH
Rush charges authorized by: _____
SAMPLE DISPOSAL
• Dispose after 30 days
• Return samples
• Will call with instructions
Samples Received at _____ °C

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED						Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS			
BH15-16	LLA-E	12/18/19	1510	Soil	5	X	X	X						
BH15-20	127	12/18/19	1503	Soil	5	X	X	X						Held

**SIGNATURE**

**PRINT NAME**

**COMPANY**

**DATE**

**TIME**

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

Relinquished by: *Patricia Berne*

*Patricia Berne*

PBS

12/19/19 1500

Received by: FedEx

Relinquished by:

Received by: *mf / mw*

*Maia Phan*

FEBI

12/20/19 1455

Samples received at 3 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 6, 2020

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on February 27, 2020 from the Coleman Oil 41392, F&BI 002413 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0306R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 27, 2020 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil 41392, F&BI 002413 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
002413 -01	MW10-022520
002413 -02	MW9-022520
002413 -03	DUP1-022520
002413 -04	MW7-022520
002413 -05	MW12P-022520
002413 -06	MW11P-022520
002413 -07	Trip Blank

All quality control requirements were acceptable.

The NWTPH-Dx chromatograms from samples MW-8P, MW-4P, MW-2P, MW-3P and MW-5P were reviewed to determine the approximate ratio of products present, as well the approximate degree of weathering. The findings are provided in Table 1.

**Table 1**

<b>Sample ID</b>	<b>Approximate % Gas</b>	<b>Approximate % Diesel</b>	<b>Sample Color</b>	<b>Gas Degree of Weathering</b>	<b>Diesel Degree of Weathering</b>
MW12P	10	90	Black	Weathered	Mixed
MW11P	10	90	Black	Weathered	Mixed

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20  
Date Received: 02/27/20  
Project: Coleman Oil 41392, F&BI 002413  
Date Extracted: 02/27/20  
Date Analyzed: 02/27/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported on a Dry Weight Basis  
Results Reported as Not Detected (ND) or Detected (D)

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
MW12P-022520 002413-05 1/10	D	D	ND	121
MW11P-022520 002413-06 1/10	D	D	ND	127
Method Blank 00-504 MB	ND	ND	ND	82

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20  
Date Received: 02/27/20  
Project: Coleman Oil 41392, F&BI 002413  
Date Extracted: 03/05/20  
Date Analyzed: 03/05/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW10-022520 002413-01	<1	<1	<1	<3	<100	85
MW9-022520 002413-02	<1	<1	<1	<3	<100	84
DUP1-022520 002413-03	<1	<1	<1	<3	<100	85
MW7-022520 002413-04	<1	<1	<1	<3	<100	83
Method Blank 00-394 MB	<1	<1	<1	<3	<100	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20

Date Received: 02/27/20

Project: Coleman Oil 41392, F&BI 002413

Date Extracted: 03/05/20

Date Analyzed: 03/05/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
Trip Blank 002413-07	<1	<1	<1	<3	85
Method Blank 00-394 MB	<1	<1	<1	<3	86

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20

Date Received: 02/27/20

Project: Coleman Oil 41392, F&BI 002413

Date Extracted: 02/27/20

Date Analyzed: 02/27/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW10-022520 002413-01	160 x	<250	90
MW9-022520 002413-02	500 x	<250	94
DUP1-022520 002413-03	480 x	<250	97
MW7-022520 002413-04	540 x	<250	92
Method Blank 00-476 MB2	<50	<250	91

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20

Date Received: 02/27/20

Project: Coleman Oil 41392, F&BI 002413

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 002413-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	97	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	98	73-126
Xylenes	ug/L (ppb)	150	98	74-118
Gasoline	ug/L (ppb)	1,000	108	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/06/20

Date Received: 02/27/20

Project: Coleman Oil 41392, F&BI 002413

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	100	108	63-142	8

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

002413

SAMPLE CHAIN OF CUSTODY

ME 02/27/20 Day/wk 3

Report To Ken Nogueira

Company PBS Engineering: Environment

Address 214 E Galer St, Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-8163 Email ken.nogueira@pbsusa.com

SAMPLE PBS (signature) Ken Nogueira

PROJECT NAME Cedern Oil

PO # 41398

REMARKS

INVOICE TO Ken Nogueira

Page # 1 of 1  
TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
Rush charges authorized by:

SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM		
MW10-022520	01AD	2/25/20	1102	Water	4	X	X	X	X					
MW9-022520	02		1211		4	X	X	X	X					
DUP1-022520	03		1200		4	X	X	X	X					
MW7-022520	04		1307		4	X	X	X	X					
MW10P-022520	05AB		1440	Product	2	X								
MW11P-022520	06		1513	Product	1	X								
Trip Blank	07		0800	Water	1				X					

Samples received at 3 °C

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Reinquired by: Patricia Brice

Received by: Patricia Brice

Received by: Fed Ex: 7778 6719 1694

Reinquired by:

Received by: Michael Swann

Phan Phan

FBI

2/27/20

0955

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

September 14, 2020

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on September 9, 2020 from the Coleman Oil Yakima PO 41392, F&BI 009142 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0914R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 9, 2020 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima PO 41392 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
009142 -01	MW13-5
009142 -02	MW13-12
009142 -03	MW14-5
009142 -04	MW14-13.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/14/20

Date Received: 09/09/20

Project: Coleman Oil Yakima PO 41392, F&BI 009142

Date Extracted: 09/10/20

Date Analyzed: 09/10/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
MW13-5 009142-01	<0.02	<0.02	<0.02	<0.06	<5	89
MW13-12 009142-02	<0.02	<0.02	<0.02	<0.06	<5	89
MW14-5 009142-03	<0.02	<0.02	<0.02	<0.06	<5	89
MW14-13.5 009142-04	<0.02	<0.02	<0.02	<0.06	<5	90
Method Blank 00-1995 MB2	<0.02	<0.02	<0.02	<0.06	<5	92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/14/20

Date Received: 09/09/20

Project: Coleman Oil Yakima PO 41392, F&BI 009142

Date Extracted: 09/09/20

Date Analyzed: 09/09/20

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
MW13-5 009142-01	<50	<250	86
MW13-12 009142-02	<50	<250	87
MW14-5 009142-03	<50	<250	88
MW14-13.5 009142-04	<50	<250	87
Method Blank 00-2049 MB	<50	<250	90

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/14/20

Date Received: 09/09/20

Project: Coleman Oil Yakima PO 41392, F&BI 009142

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 009123-03 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	0.063	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	90	69-120
Toluene	mg/kg (ppm)	0.5	90	70-117
Ethylbenzene	mg/kg (ppm)	0.5	88	65-123
Xylenes	mg/kg (ppm)	1.5	93	66-120
Gasoline	mg/kg (ppm)	20	90	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/14/20

Date Received: 09/09/20

Project: Coleman Oil Yakima PO 41392, F&BI 009142

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 009136-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	98	98	73-135	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	98	74-139

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

December 14, 2020

James Welles, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Welles:

Included is the amended report from the testing of material submitted on November 6, 2020 from the Coleman Oil Yakima PO 41392.000, F&BI 011134 project. The NWTPH-Dx chromatograms from samples MW-5P and MW-12P were reviewed to determine the approximate ratio of products present, as well the approximate degree of weathering. The information is included in the case narrative.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Ken Nogeire  
PBS1116R.DOC



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

November 16, 2020

James Welles, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Welles:

Included are the results from the testing of material submitted on November 6, 2020 from the Coleman Oil Yakima PO 41392.000, F&BI 011134 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Ken Nogeire  
PBS1116R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 6, 2020 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima PO 41392.000, F&BI 011134 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
011134 -01	MW2-110520
011134 -02	MW3-P
011134 -03	MW5-P
011134 -04	MW7-110520
011134 -05	MW8-110520
011134 -06	MW9-110520
011134 -07	MW10-110520
011134 -08	MW12-P
011134 -09	MW13-110420
011134 -10	MW14-110420
011134 -11	TRIP BLANK
011134 -12	Temp Blank

All quality control requirements were acceptable.

The NWTPH-Dx chromatograms from samples MW-5P and MW-12P were reviewed to determine the approximate ratio of products present, as well the approximate degree of weathering. The findings are provided in Table 1.

**Table 1**

<b>Sample ID</b>	<b>Approximate % Gas</b>	<b>Approximate % Diesel</b>	<b>Sample Color</b>	<b>Gas Degree of Weathering</b>	<b>Diesel Degree of Weathering</b>
MW-5P	70	30	Black	Weathered	Weathered
MW-12P	NA	100	Black	NA	Not Weathered

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

Date Extracted: 11/10/20

Date Analyzed: 11/10/20

**RESULTS FROM THE ANALYSIS OF SOIL/PRODUCT SAMPLES  
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID**

Results Reported as Not Detected (ND) or Detected (D)

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
MW5-P 011134-03 1/1,000	D	D	ND	91
MW12-P 011134-08 1/1,000	D	D	ND	95
Method Blank 00-2497 MB	ND	ND	ND	82

ND - Material not detected at or above 20,000 mg/kg gas, 50,000 mg/kg diesel and 250,000 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

Date Extracted: 11/10/20

Date Analyzed: 11/10/20 and 11/12/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW2-110520 011134-01	59	5.9	94	310	2,300	99
MW7-110520 011134-04	<1	<1	<1	<3	<100	79
MW8-110520 011134-05	160	6.9	3.5	7.8	2,100	91
MW9-110520 011134-06	<1	1.6	<1	3.2	210	82
MW10-110520 011134-07	<1	<1	<1	<3	<100	79
MW13-110420 011134-09	<1	<1	<1	<3	<100	78
MW14-110420 011134-10	4.4	<1	4.8	12	270	81
Method Blank 00-2410 MB	<1	<1	<1	<3	<100	81

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

Date Extracted: 11/10/20

Date Analyzed: 11/10/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES  
USING METHOD 8021B**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Surrogate (% Recovery)</u> Limit (52-124)
TRIP BLANK 011134-11	<1	<1	<1	<3	78
Method Blank 00-2410 MB	<1	<1	<1	<3	81

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

Date Extracted: 11/09/20

Date Analyzed: 11/09/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW2-110520 011134-01	1,500 x	<250	104
MW7-110520 011134-04	150 x	<250	100
MW8-110520 011134-05	7,100 x	1,000 x	121
MW9-110520 011134-06	1,300 x	380 x	99
MW10-110520 011134-07	130 x	<250	105
MW13-110420 011134-09	520 x	<250	98
MW14-110420 011134-10	53 x	<250	108
Method Blank 00-2489 MB	<50	<250	97

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 011149-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	103	65-118
Toluene	ug/L (ppb)	50	98	72-122
Ethylbenzene	ug/L (ppb)	50	97	73-126
Xylenes	ug/L (ppb)	150	95	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/16/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011134

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	112	116	63-142	4



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

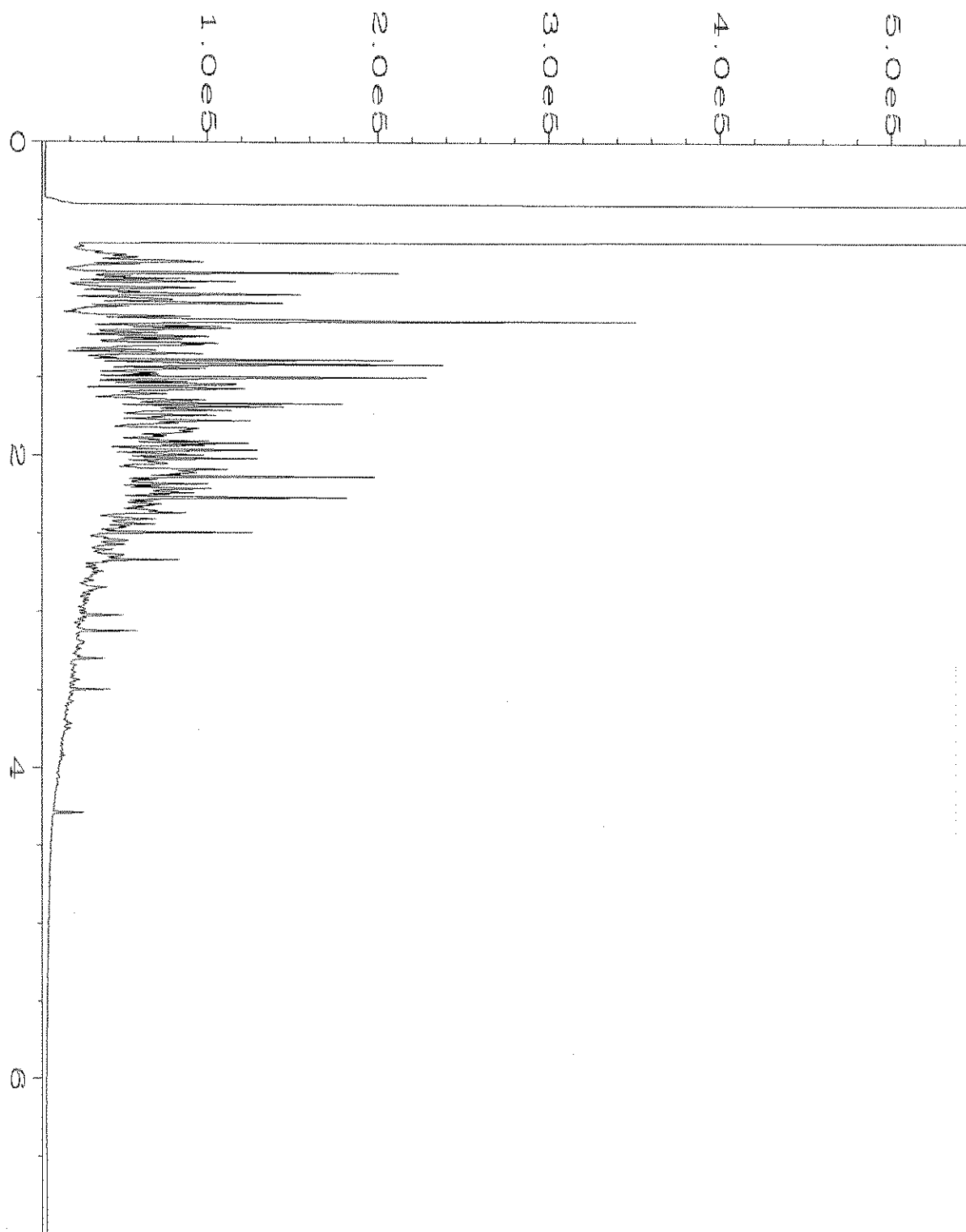
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



Data File Name	: C:\HPCHEM\6\DATA\11-10-20\033F0601.D	Page Number	: 1
Operator	: TL	Vial Number	: 33
Instrument	: GC6	Injection Number	: 1
Sample Name	: 011134-03 1/10	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 10 Nov 20 03:44 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	14 Dec 20 11:13 AM		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

November 18, 2020

James Welles, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Welles:

Included are the results from the testing of material submitted on November 6, 2020 from the Coleman Oil Yakima PO 41392.000, F&BI 011133 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Ken Nogeire  
PBS1118R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 6, 2020 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima PO 41392.000, F&BI 011133 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID  
011133 -01

PBS Engineering and Environmental  
VB1-2020-11-04

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZAnalysis For Volatile Compounds By Method MA-APH

Client Sample ID:	VB1-2020-11-04	Client:	PBS Engineering and Environmental
Date Received:	11/06/20	Project:	Coleman Oil Yakima PO 41392.000
Date Collected:	11/04/20	Lab ID:	011133-01 1/3.7
Date Analyzed:	11/12/20	Data File:	111132.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	<150
APH EC9-12 aliphatics	200
APH EC9-10 aromatics	<92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Oil Yakima PO 41392.000
Date Collected:	Not Applicable	Lab ID:	00-2678 MB
Date Analyzed:	11/11/20	Data File:	111111.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration
	ug/m3
APH EC5-8 aliphatics	<40
APH EC9-12 aliphatics	<50
APH EC9-10 aromatics	<25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

ZZZAnalysis For Volatile Compounds By Method TO-15

Client Sample ID:	VB1-2020-11-04	Client:	PBS Engineering and Environmental
Date Received:	11/06/20	Project:	Coleman Oil Yakima PO 41392.000
Date Collected:	11/04/20	Lab ID:	011133-01 1/3.7
Date Analyzed:	11/12/20	Data File:	111132.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	91	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<1.2	<0.37
Toluene	<70	<18
Ethylbenzene	<1.6	<0.37
m,p-Xylene	4.9	1.1
o-Xylene	<1.6	<0.37
Naphthalene	<0.97	<0.18

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Coleman Oil Yakima PO 41392.000
Date Collected:	Not Applicable	Lab ID:	00-2678 MB
Date Analyzed:	11/11/20	Data File:	111111.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.32	<0.1
Toluene	<19	<5
Ethylbenzene	<0.43	<0.1
m,p-Xylene	<0.87	<0.2
o-Xylene	<0.43	<0.1
Naphthalene	<0.26	<0.05



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/18/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011133

Date Extracted: 11/16/20

Date Analyzed: 11/16/20

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES  
FOR HELIUM USING METHOD ASTM D1946**

Results Reported as % Helium

<u>Sample ID</u>	<u>Helium</u>
Laboratory ID	
ZZZVB1-2020-11-04	<0.6
011133-01	
Method Blank	<0.6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/18/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011133

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES  
FOR VOLATILES BY METHOD MA-APH**

Laboratory Code: 011177-03 1/4.8 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
APH EC5-8 aliphatics	ug/m3	390	400	3
APH EC9-12 aliphatics	ug/m3	<240	<240	nm
APH EC9-10 aromatics	ug/m3	<120	<120	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
APH EC5-8 aliphatics	ug/m3	67	78	70-130
APH EC9-12 aliphatics	ug/m3	67	82	70-130
APH EC9-10 aromatics	ug/m3	67	97	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/18/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011133

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES  
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 011177-03 1/4.8 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	2.1	2.2	5
Toluene	ug/m3	<90	<90	nm
Ethylbenzene	ug/m3	6.3	6.6	5
m,p-Xylene	ug/m3	6.6	6.8	3
o-Xylene	ug/m3	2.5	2.6	4
Naphthalene	ug/m3	<1.3	<1.3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	89	70-130
Toluene	ug/m3	51	101	70-130
Ethylbenzene	ug/m3	59	102	70-130
m,p-Xylene	ug/m3	120	100	70-130
o-Xylene	ug/m3	59	100	70-130
Naphthalene	ug/m3	71	82	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/18/20

Date Received: 11/06/20

Project: Coleman Oil Yakima PO 41392.000, F&BI 011133

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES  
FOR HELIUM  
USING METHOD ASTM D1946**

Laboratory Code: 011232-03 (Duplicate)

Analyte	Sample Result (%)	Duplicate Result (%)	Relative Percent Difference	Acceptance Criteria
Helium	<0.6	<0.6	nm	0-20

Laboratory Code: 011136-07 (Duplicate)

Analyte	Sample Result (%)	Duplicate Result (%)	Relative Percent Difference	Acceptance Criteria
Helium	<0.6	<0.6	nm	0-20

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

011133

SAMPLE CHAIN OF CUSTODY

ME 11-06-20

Page # 1 of 1

Report To J. Welles & K. Nougere

Company PBS

Address \_\_\_\_\_

City, State, ZIP Seattle James.welles@pbsusa.com

Phone (206) 348-6317 Email ken.nougere@pbsusa.com

SAMPLERS (signature)		PO #
PROJECT NAME & ADDRESS		
NOTES: <u>Coleman Oil Refinery</u>		<u>41392.000</u> INVOICE TO

TURNAROUND TIME

Standard

RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

Default: Clean after 3 days

Archive (Fee may apply)

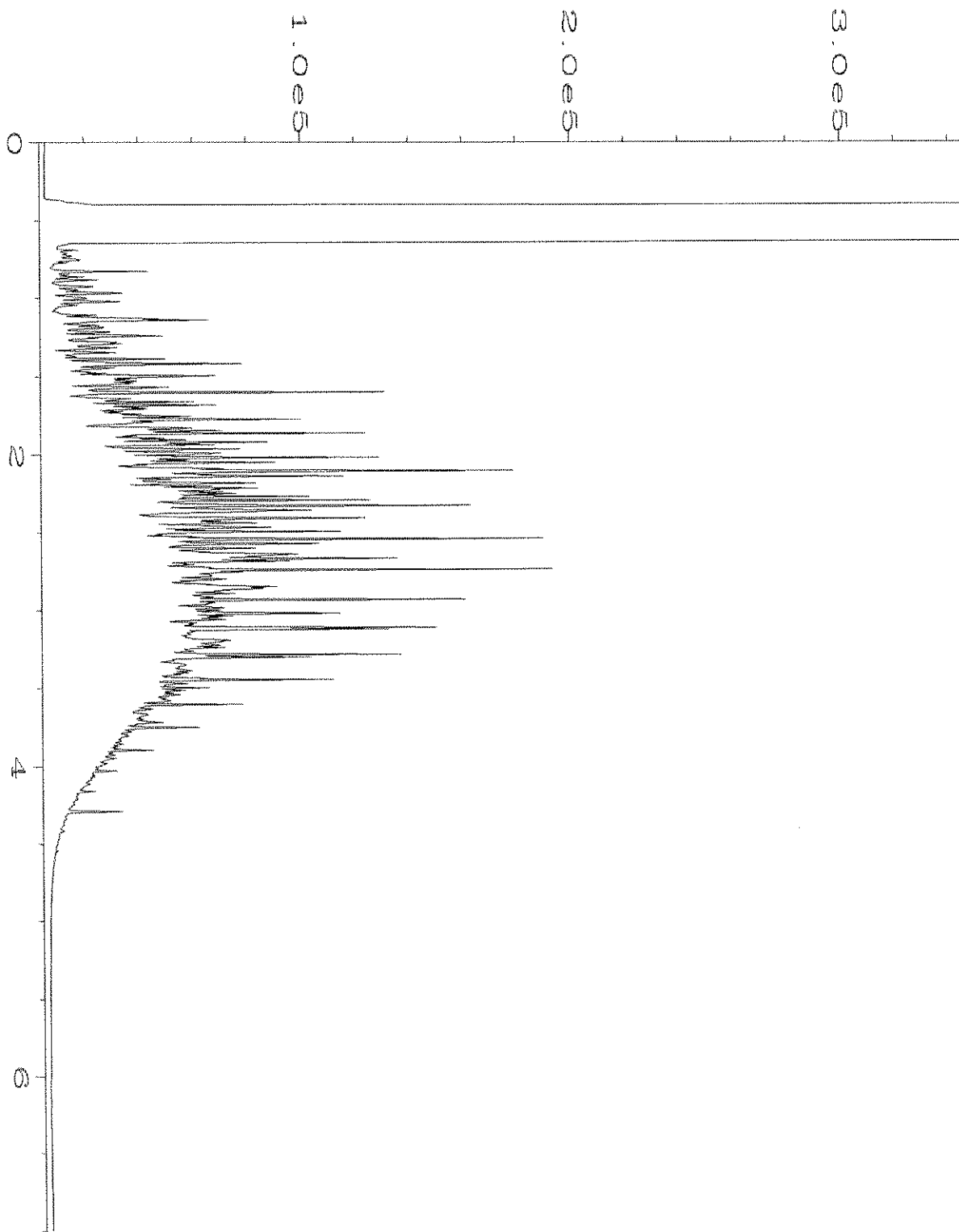
SAMPLE INFORMATION

Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. (uHg)	Field Initial Time	Final Vac. (uHg)	Field Final Time	ANALYSIS REQUESTED			Notes		
VB1 -2020-11-04	01	3344	TS-08	IA / <u>SG</u>	11/4/20	-29	12:56	-6.5	13:01	<input checked="" type="checkbox"/> TO15 Full Scan	<input checked="" type="checkbox"/> TO15 BTEXN	<input checked="" type="checkbox"/> TO15 cVOCs	<input checked="" type="checkbox"/> APH	<input checked="" type="checkbox"/> Helium	
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
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				IA / SG											

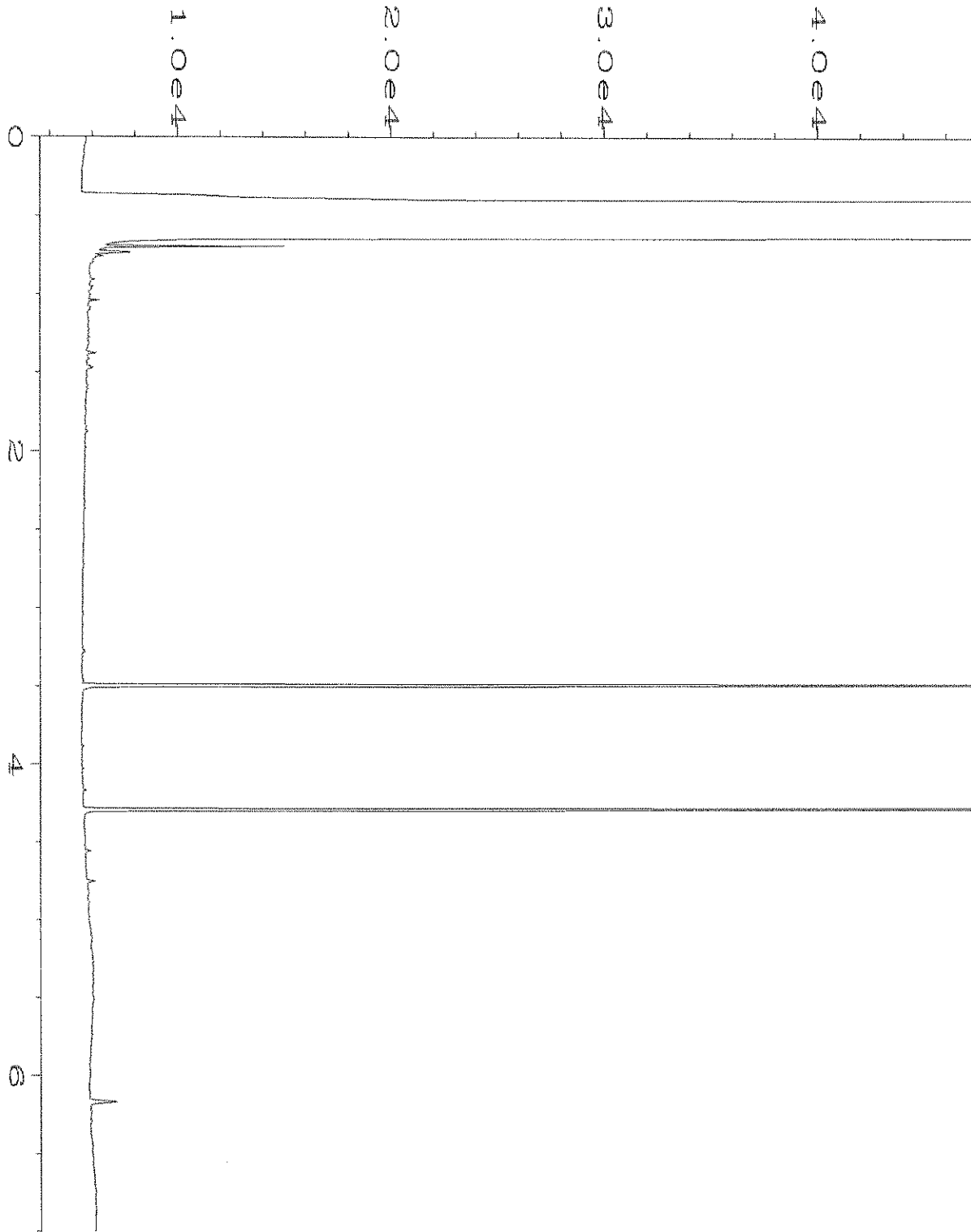
Samples received at 18 °C

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282  
 Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	J. Welles	PBS	11/6/20	1445
<u>[Signature]</u>	Ken Nougere	FCBI	11/6/20	1445
Received by:				

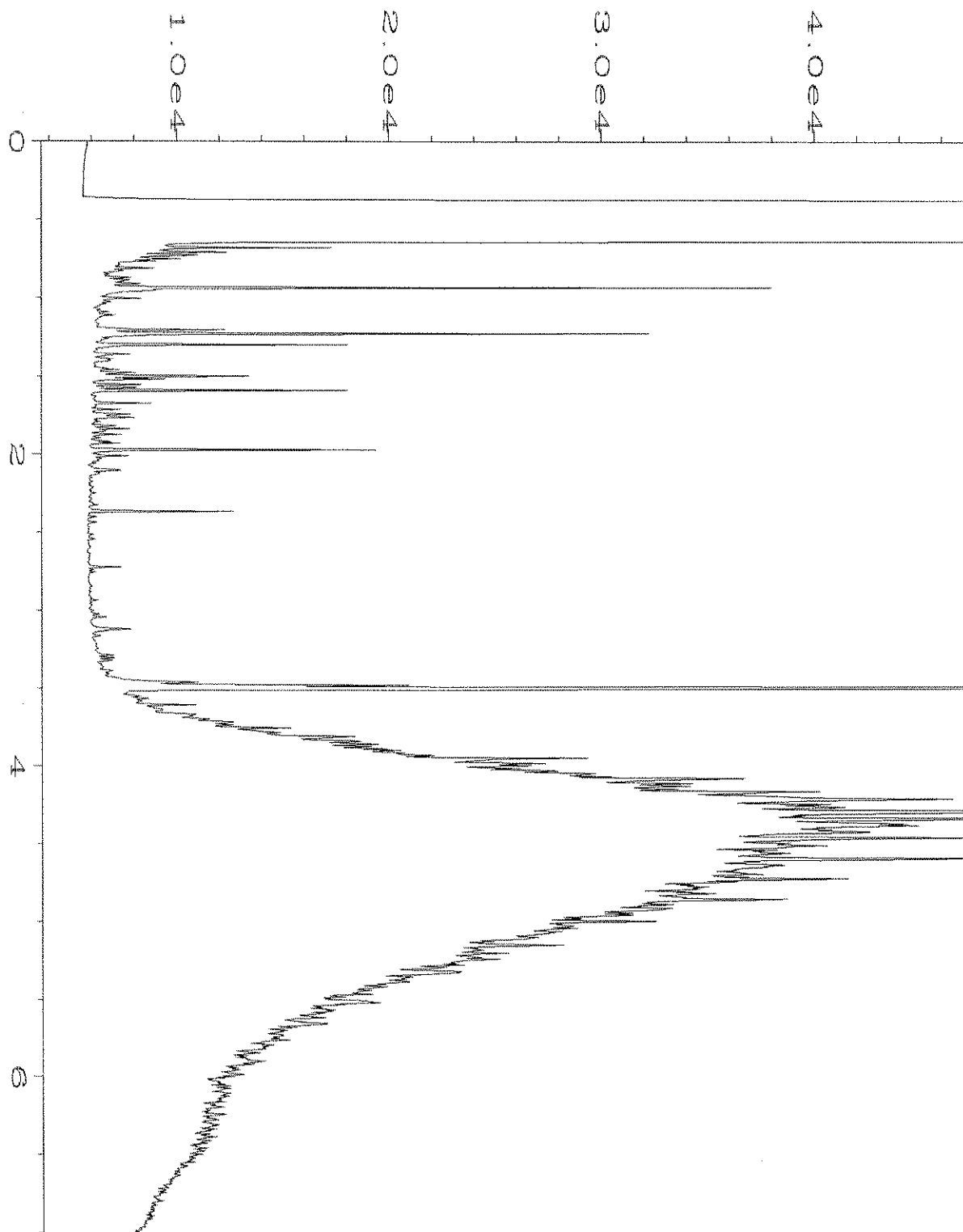


Data File Name	: C:\HPCHEM\6\DATA\11-10-20\034F0601.D	Page Number	: 1
Operator	: TL	Vial Number	: 34
Instrument	: GC6	Injection Number	: 1
Sample Name	: 011134-08 1/10	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 10 Nov 20 03:55 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	14 Dec 20 11:14 AM		

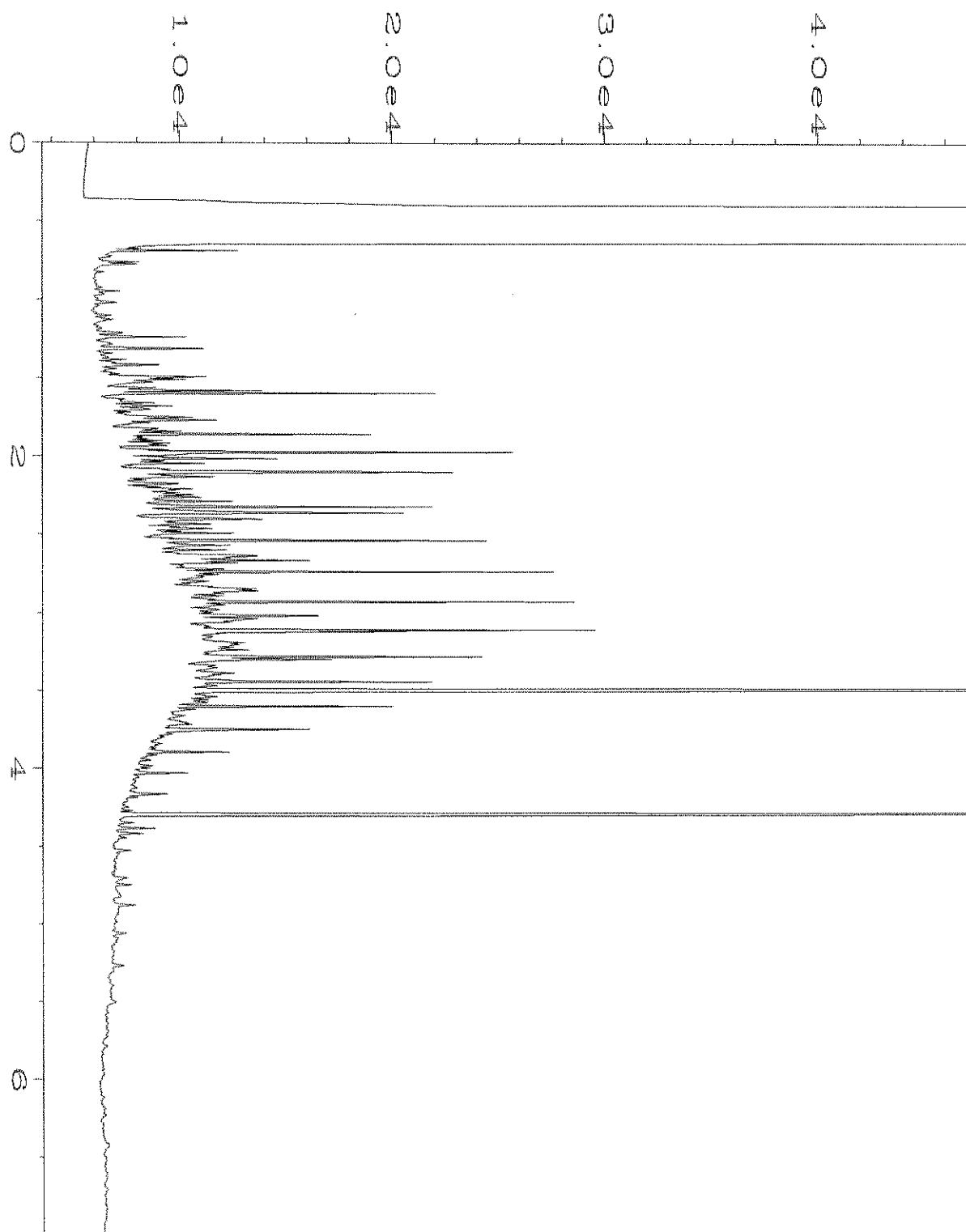


Data File Name	: C:\HPCHEM\6\DATA\11-10-20\028F0601.D	Page Number	: 1
Operator	: TL	Vial Number	: 28
Instrument	: GC6	Injection Number	: 1
Sample Name	: 00-2497 mb	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 10 Nov 20 02:49 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	14 Dec 20 11:14 AM		





Data File Name	: C:\HPCHEM\6\DATA\11-10-20\096F0501.D	Page Number	: 1
Operator	: TL	Vial Number	: 96
Instrument	: GC6	Injection Number	: 1
Sample Name	: HCIDS G/M 61-112	Sequence Line	: 5
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 10 Nov 20 02:30 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	14 Dec 20 11:15 AM		



Data File Name	: C:\HPCHEM\6\DATA\11-10-20\097F0501.D	Page Number	: 1
Operator	: TL	Vial Number	: 97
Instrument	: GC6	Injection Number	: 1
Sample Name	: HCIDS Dx 61-170I	Sequence Line	: 5
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 10 Nov 20 02:39 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	14 Dec 20 11:15 AM		





FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 20, 2021

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on April 9, 2021 from the Coleman Oil Yakima 41392, F&BI 104165 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0420R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 9, 2021 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392, F&BI 104165 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
104165 -01	MW15-5
104165 -02	MW15-12

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/20/21

Date Received: 04/09/21

Project: Coleman Oil Yakima 41392, F&BI 104165

Date Extracted: 04/16/21

Date Analyzed: 04/16/21

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-132)
MW15-5 104165-01	<0.02	<0.02	<0.02	<0.06	<5	78
MW15-12 104165-02	<0.02	<0.02	<0.02	<0.06	<5	79
Method Blank 01-900 MB2	<0.02	<0.02	<0.02	<0.06	<5	78

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/20/21

Date Received: 04/09/21

Project: Coleman Oil Yakima 41392, F&BI 104165

Date Extracted: 04/09/21

Date Analyzed: 04/09/21 and 04/12/21

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
MW15-5 104165-01	<50	<250	80
MW15-12 104165-02	<50	<250	80
Method Blank 01-883 MB	<50	<250	76



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/20/21

Date Received: 04/09/21

Project: Coleman Oil Yakima 41392, F&BI 104165

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 104076-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	0.025	nm
Toluene	mg/kg (ppm)	0.029	0.056	64 hr
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	22	43	65 hr

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	100	69-120
Toluene	mg/kg (ppm)	0.5	104	70-117
Ethylbenzene	mg/kg (ppm)	0.5	102	65-123
Xylenes	mg/kg (ppm)	1.5	107	66-120
Gasoline	mg/kg (ppm)	20	110	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/20/21

Date Received: 04/09/21

Project: Coleman Oil Yakima 41392, F&BI 104165

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 104164-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	6,500	97	103	73-135	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	80	74-139

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

104165

SAMPLE CHAIN OF CUSTODY

ME 04-09-21

Q2

Report To Ken Noyse

Company PBS Engineering & Environmental

Address 914 E Galer St. Suite 300

City, State, ZIP Seattle, WA 98102

Phone 206-572-8153 Email Ken.Noyse@PBSUSA.com

SAMPLERS (signature) <u>Patrick Bria</u>	
PROJECT NAME <u>Coleman Oil Yakiins</u>	PO # <u>41392</u>
REMARKS <u>Project Specific PIs - Yes / No</u>	INVOICE TO

TURNAROUND TIME Standard Turnaround RUSH Rush charges authorized by:	SAMPLE DISPOSAL Dispose after 30 days Archive Samples Other
---	--

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes					
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082							
MW15-5	01A-E	4/8/21	0930	Soil	5	X	X	X										
MW15-12	02	4/8/21	1005	Soil	5	X	X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	<u>Patrick Bria</u>	<u>PBS Engineering</u>	<u>4/8/21</u>	<u>1430</u>
Received by: <u>[Signature]</u>				
Relinquished by:				
Received by: <u>[Signature]</u>	<u>Chan Phan</u>	<u>FE BI</u>	<u>4/9/21</u>	<u>1000</u>

Friedman & Bryna, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-3029  
 Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

August 5, 2021

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on July 30, 2021 from the Coleman Oil Yakima 41392, F&BI 107508 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0805R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 30, 2021 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392, F&BI 107508 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
107508 -01	MW-1
107508 -02	MW-2
107508 -03	MW-4
107508 -04	MW-6
107508 -05	MW-7
107508 -06	MW-9
107508 -07	MW-10
107508 -08	MW-11
107508 -09	MW-13
107508 -10	MW-14
107508 -11	MW-15
107508 -12	MWBNSF1
107508 -13	MW-Dup

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21  
 Date Received: 07/30/21  
 Project: Coleman Oil Yakima 41392, F&BI 107508  
 Date Extracted: 08/02/21  
 Date Analyzed: 08/03/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-1 107508-01 1/40	620	<40	130	480	7,700	80
MW-2 107508-02 1/20	95	<20	28	<60	4,000	78
MW-4 107508-03 1/20	37	<20	95	<60	2,300	83
MW-6 107508-04 1/20	37	<20	51	74	4,200	87
MW-7 107508-05	<1	<1	<1	<3	<100	84
MW-9 107508-06	<1	<1	<1	<3	<100	87
MW-10 107508-07	<1	<1	<1	<3	<100	86
MW-11 107508-08 1/10	45	<10	38	100	2,200	81
MW-13 107508-09	3.5	<1	<1	<3	300	75
MW-14 107508-10	<1	<1	<1	<3	<100	85
MW-15 107508-11 1/20	1,200	300	830	1,700	14,000	89

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

Date Extracted: 08/02/21

Date Analyzed: 08/03/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MWBNSF1 107508-12	<1	<1	<1	<3	<100	82
MW-Dup 107508-13 1/40	620	<40	130	500	8,200	82
Method Blank 01-1667 MB	<1	<1	<1	<3	<100	80



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21  
 Date Received: 07/30/21  
 Project: Coleman Oil Yakima 41392, F&BI 107508  
 Date Extracted: 07/30/21  
 Date Analyzed: 07/30/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
 FOR TOTAL PETROLEUM HYDROCARBONS AS  
 DIESEL AND MOTOR OIL  
 USING METHOD NWTPH-D<sub>x</sub>**  
 Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW-1 107508-01	14,000 x	590 x	107
MW-2 107508-02	4,900 x	<250	99
MW-4 107508-03	1,700 x	280 x	99
MW-6 107508-04	3,900 x	370 x	102
MW-7 107508-05	410 x	<250	118
MW-9 107508-06	1,200 x	350 x	93
MW-10 107508-07	930 x	260 x	96
MW-11 107508-08	3,100 x	300 x	104
MW-13 107508-09	550 x	<250	107
MW-14 107508-10	<50	<250	101
MW-15 107508-11	1,900 x	<250	98
MWBNSF1 107508-12	<50	<250	90

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

Date Extracted: 07/30/21

Date Analyzed: 07/30/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152)
MW-Dup 107508-13	11,000 x	530 x	92
Method Blank 01-1759 MB	<50	<250	96

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 107535-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	101	73-126
Xylenes	ug/L (ppb)	150	94	74-118
Gasoline	ug/L (ppb)	1,000	89	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	80	80	63-142	0

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

167508

SAMPLE CHAIN OF CUSTODY

ME 7/30/01

Page # 1 of 2

Report To Ken Nogeire

Company PBS Engineering & Environmental

Address 914 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-8163 Email Ken.Nogeire@PBSWA.com

SAMPLERS (signature) [Signature]

PROJECT NAME Coleman Oil Refinery

PO # 41399

REMARKS

INVOICE TO

Protect specific RIs? - Yes / No

TURNAROUND TIME

Standard turnaround

RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

Archive samples

Other \_\_\_\_\_

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082		
MW-1	01 AD	7/28/01	1333	Water	4	X	X	X						
MW-2	02	7/28/01	1350		4	X	X	X						
MW-4	03	7/27/01	1610		4	X	X	X						
MW-6	04	7/27/01	1515		4	X	X	X						
MW-7	05	7/28/01	1448		4	X	X	X						
MW-9	06	7/27/01	1351		4	X	X	X						
MW-10	07	7/27/01	1335		4	X	X	X						
MW-11	08	7/28/01	1044		4	X	X	X						
MW-13	09	7/28/01	0816		4	X	X	X						
MW-14	10	7/28/01	0858		4	X	X	X						

Relinquished by: <u>[Signature]</u>	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>Pat Ex</u>	<u>7743 9780 7053</u>	<u>Patrick Brice</u>	<u>PBS</u>	<u>7/29/01</u>	<u>1600</u>
Relinquished by:					
Received by: <u>Will Radford</u>		<u>Will Radford</u>	<u>F&amp;BI</u>	<u>7/30/01</u>	<u>09:55</u>

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

107508

SAMPLE CHAIN OF CUSTODY

ME 7/30/01

EQ4 Page # 2 of 2

Report To Ken Noyeire

Company PBS Engineering & Environmental

Address 214 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98102

Phone 509-572-8163 Email Ken.Noyeire@pbsusa.com

SAMPLES (signature) [Signature]

PROJECT NAME Coleman Oil Yalama

PO # 41399

REMARKS INVOICE TO

Project specific RLS? - Yes / No

TURNAROUND TIME  
 Standard turnaround  
 RUSH  
Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
 Archive samples  
 Other \_\_\_\_\_  
Default: Dispose after 30 days

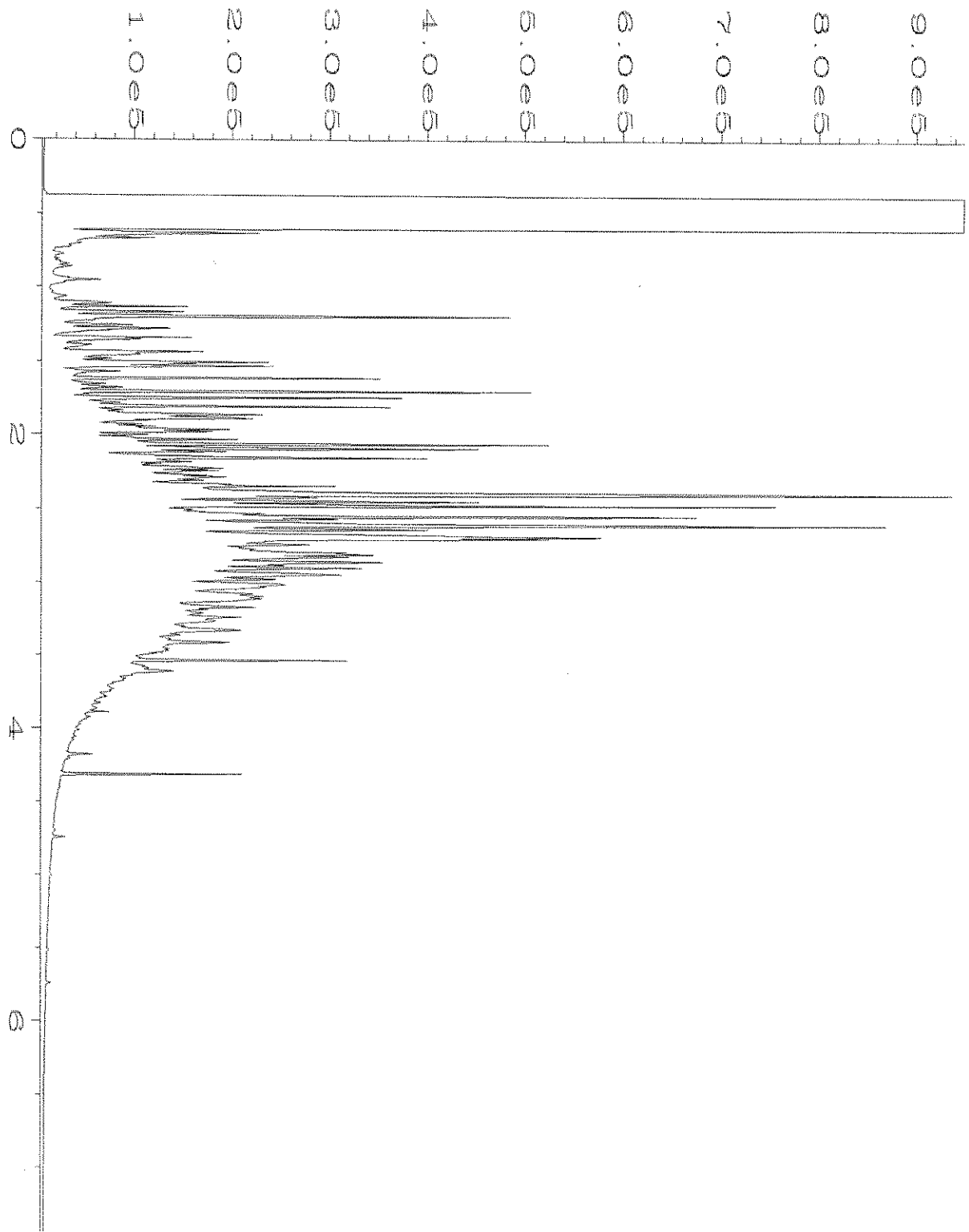
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082		
MW-15	11 A-D	7/28/01	1130	Water	4	X	X	X						
MWBV5F1	12 1	7/28/01	0941		4	X	X	X						
MW-DUP	13 ↓	7/28/01	1200	↓	4	X	X	X						

Relinquished by: [Signature] PRINT NAME Patricia Brice COMPANY PBS DATE 7/29/01 TIME 1600

Received by: [Signature] SIGNATURE [Signature] RECEIVED BY: Will Radford DATE 7/29/01 TIME 1600

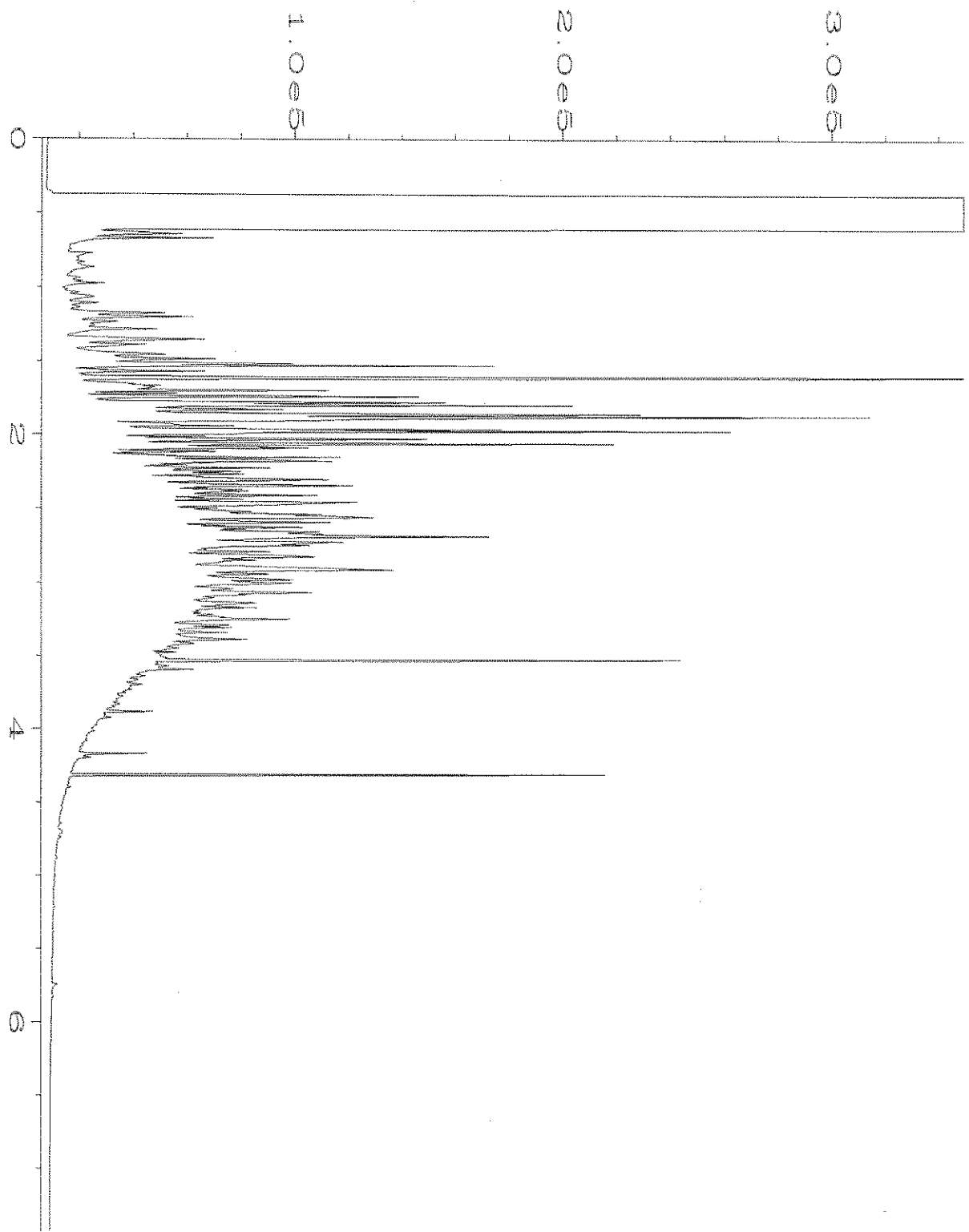
Relinquished by: [Signature] SIGNATURE [Signature] RECEIVED BY: Will Radford DATE 7/30/01 TIME 09:55

Friedman & Bruya, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029  
Ph. (206) 285-8282

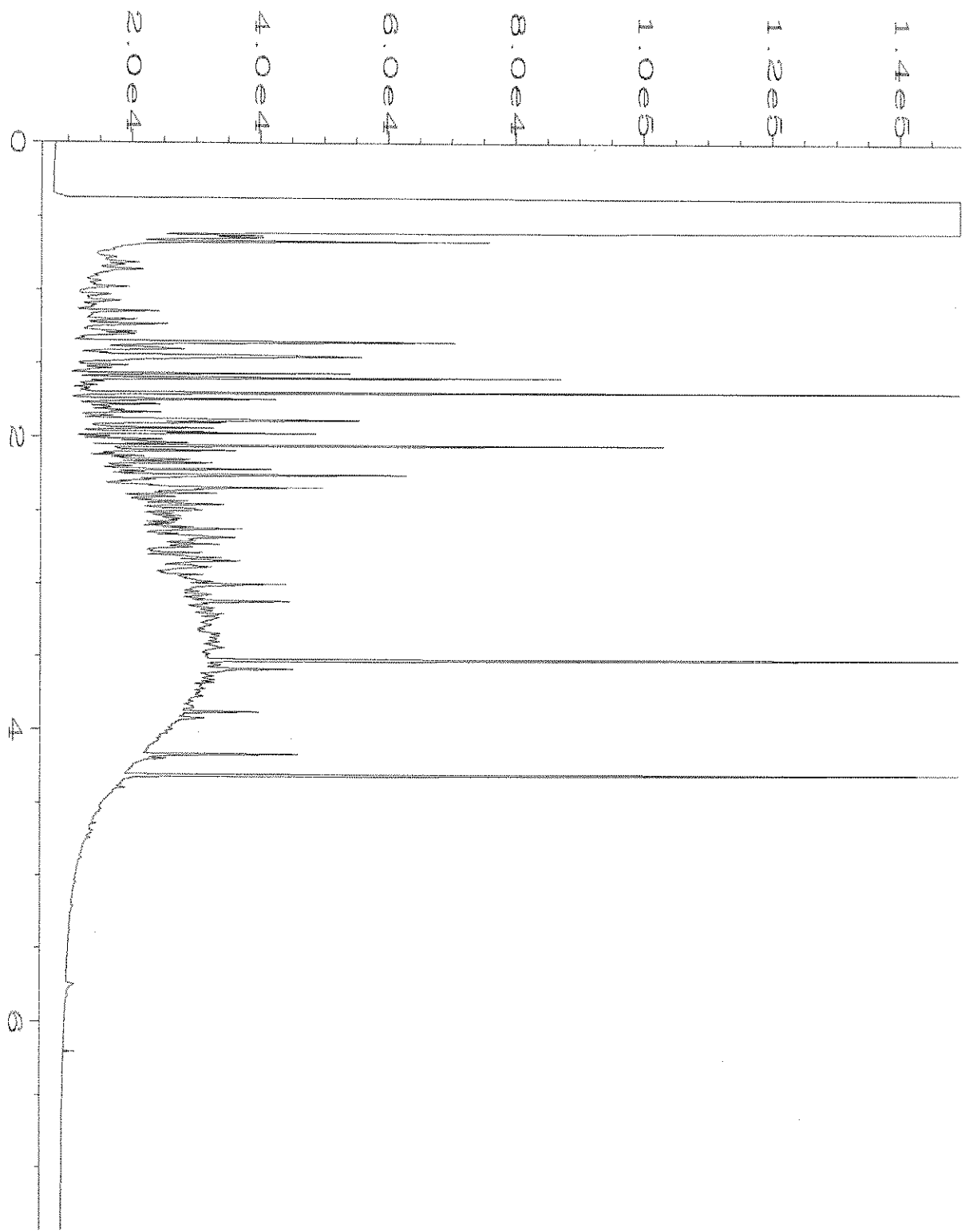


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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-01	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:33 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:32 AM		

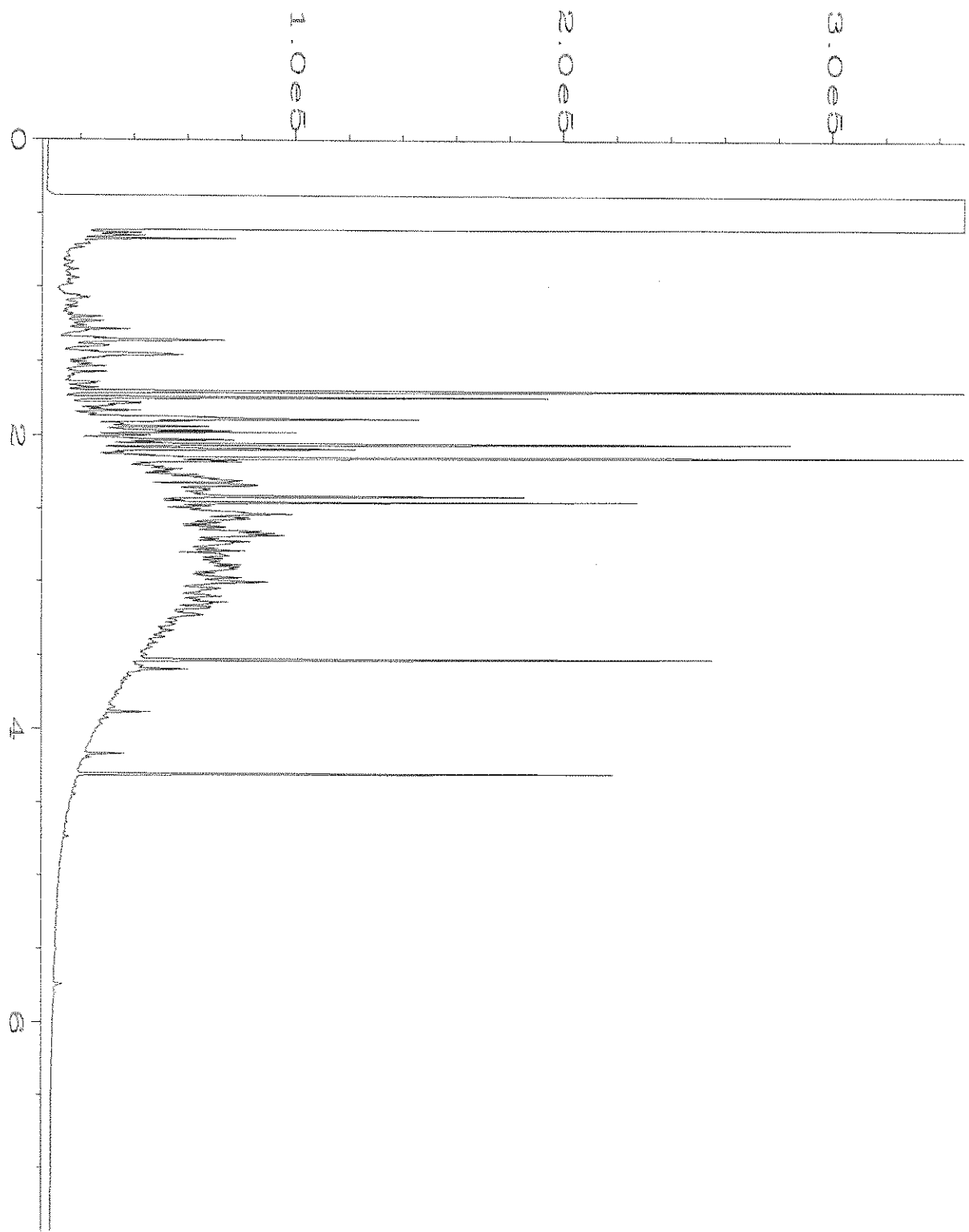




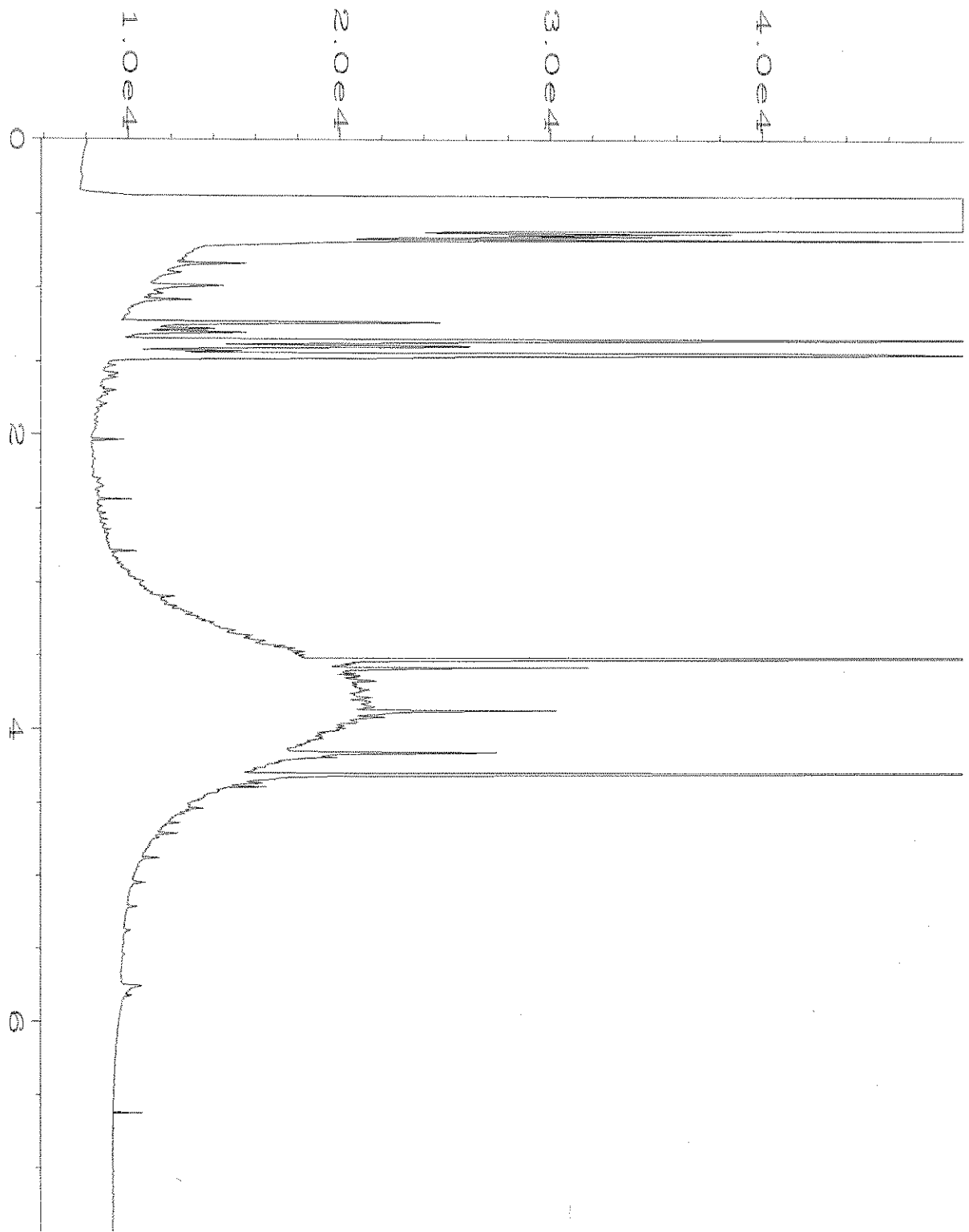
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-02	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:45 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:32 AM		



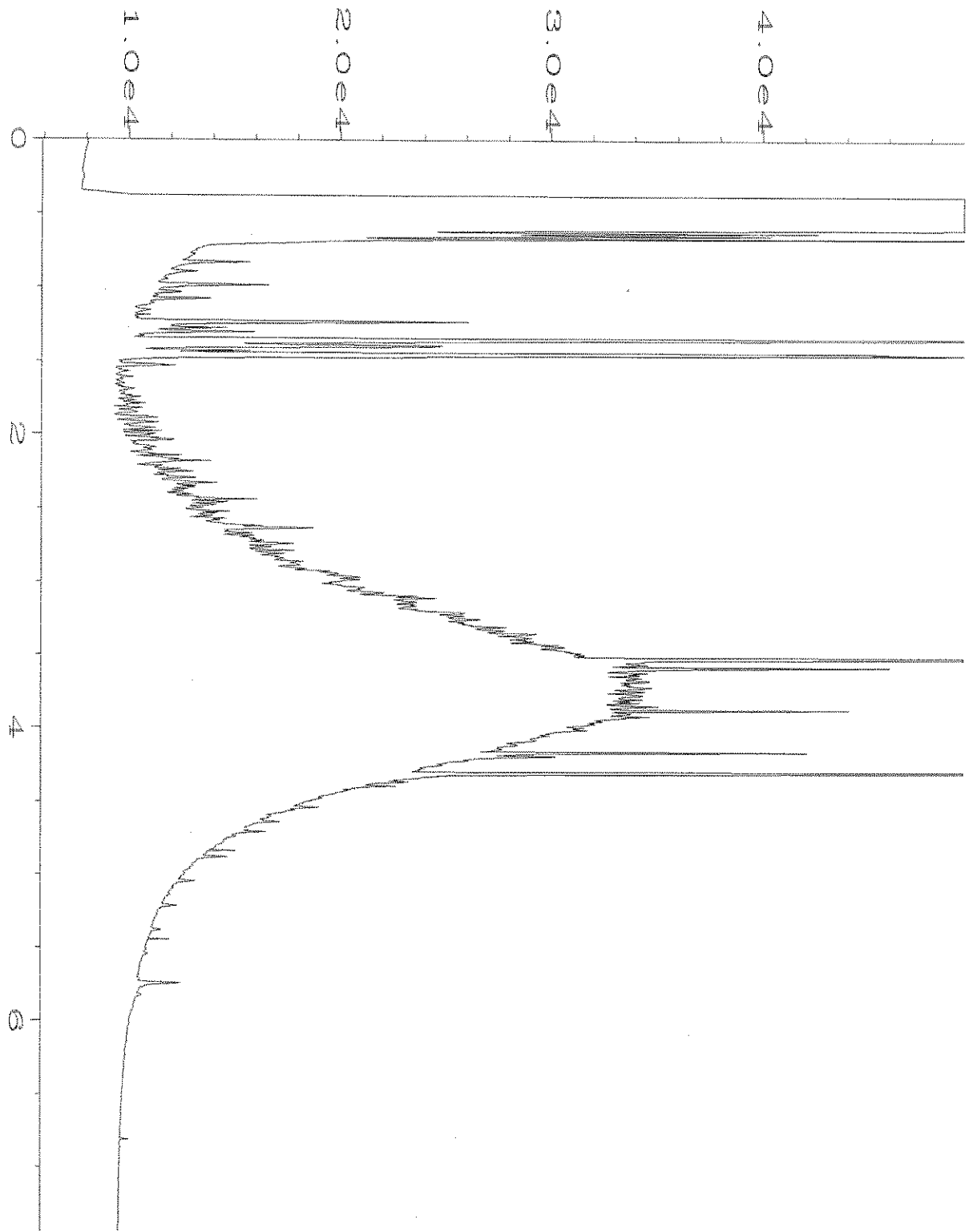
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Operator	: TL	Vial Number	: 33
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-03	Sequence Line	: 10
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Acquired on	: 30 Jul 21 04:57 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:40 AM		



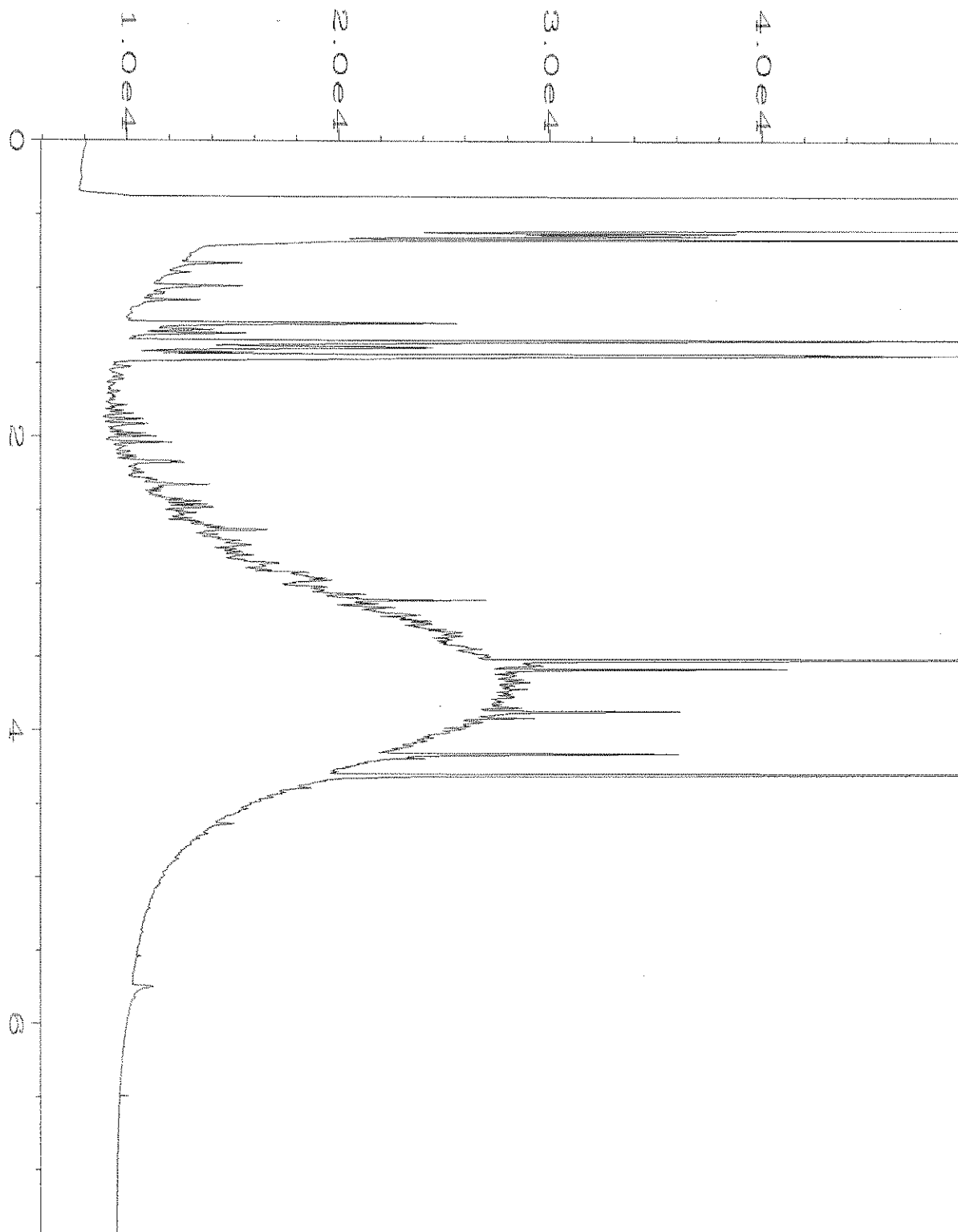
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Operator	: TL	Vial Number	: 34
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-04	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:09 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



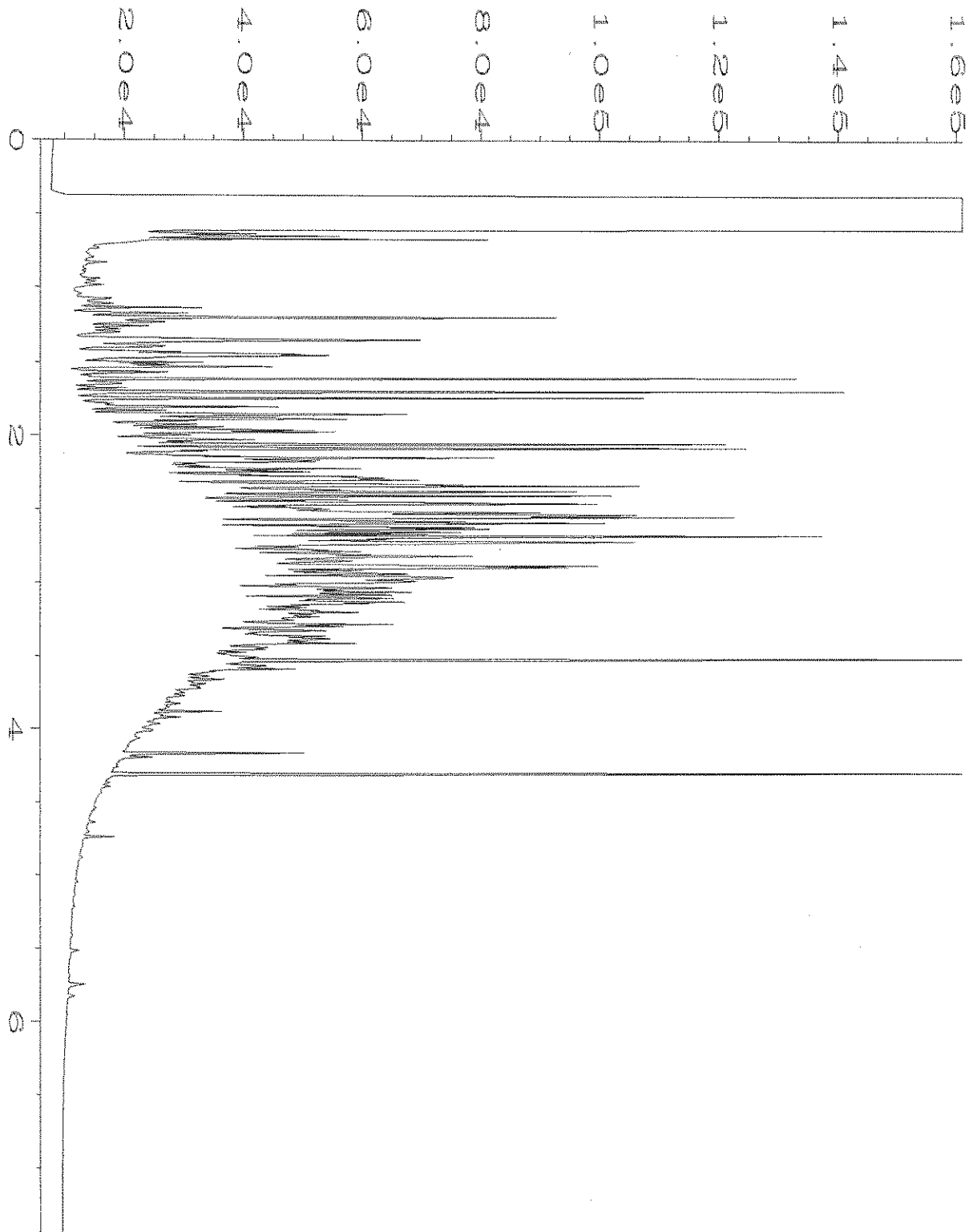
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Operator	: TL	Vial Number	: 35
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-05	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:21 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



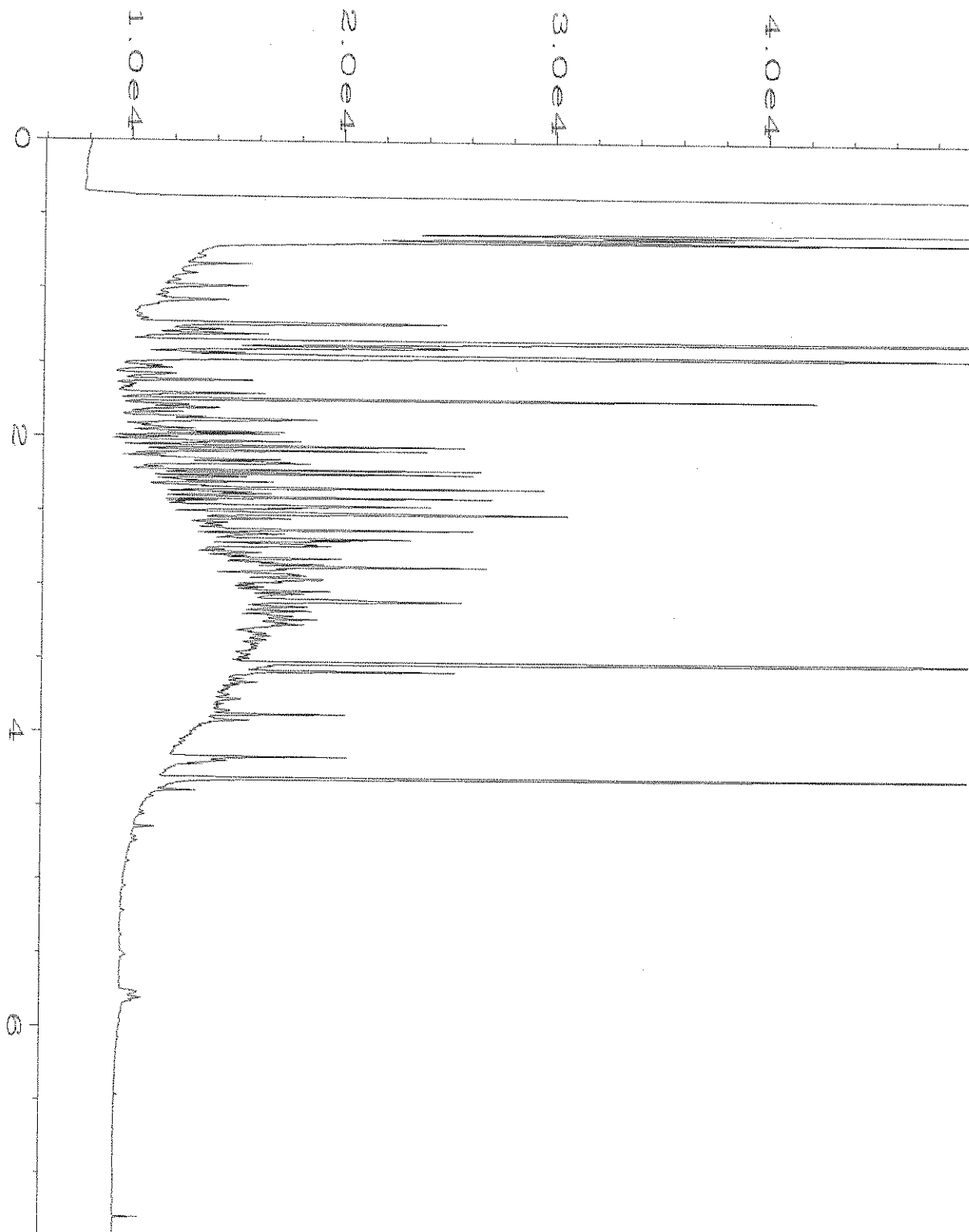
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Operator	: TL	Vial Number	: 36
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-06	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:32 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\037F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 37
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-07	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
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Report Created on:	02 Aug 21 09:42 AM		

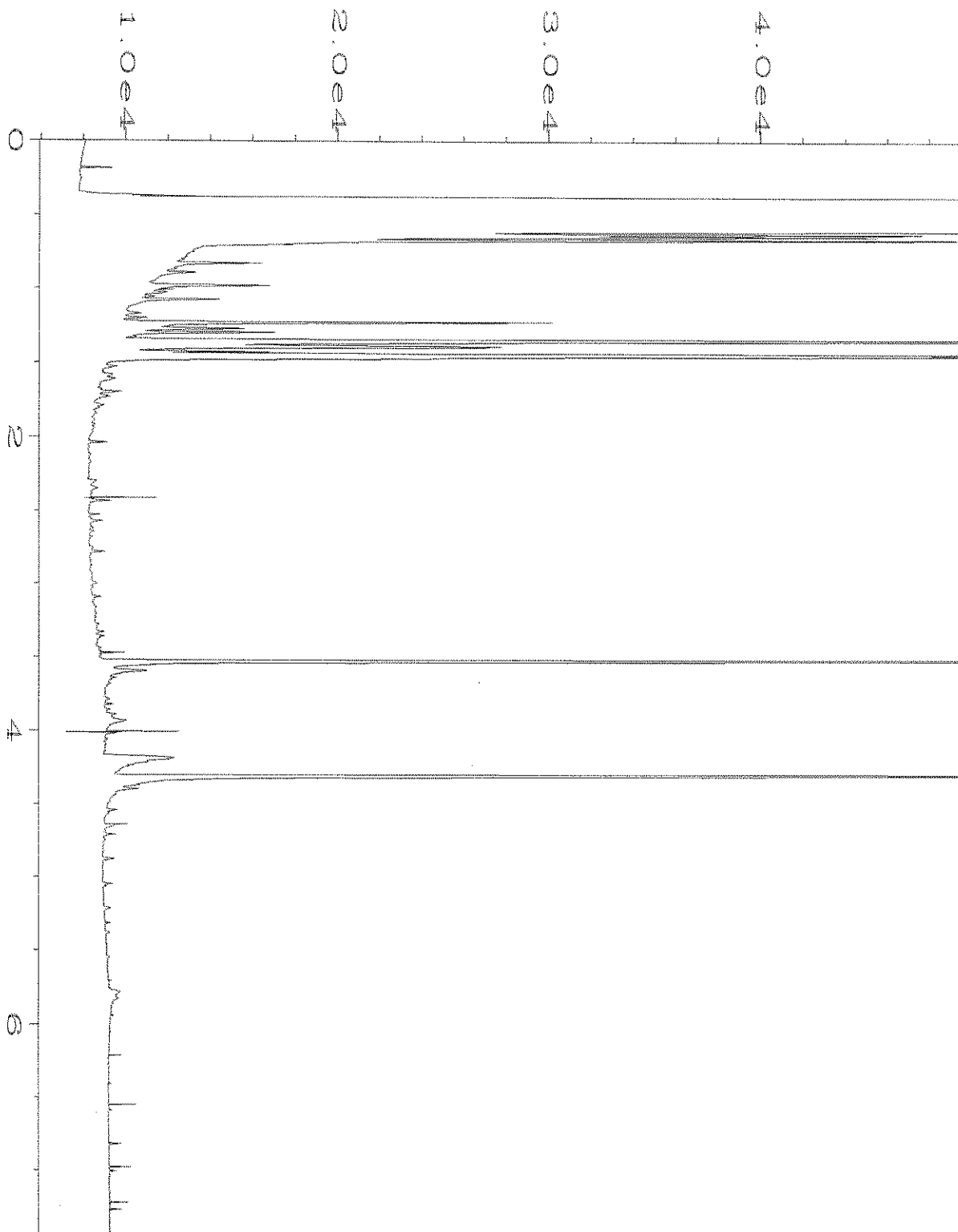


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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-08	Sequence Line	: 10
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Acquired on	: 30 Jul 21 05:56 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:44 AM		

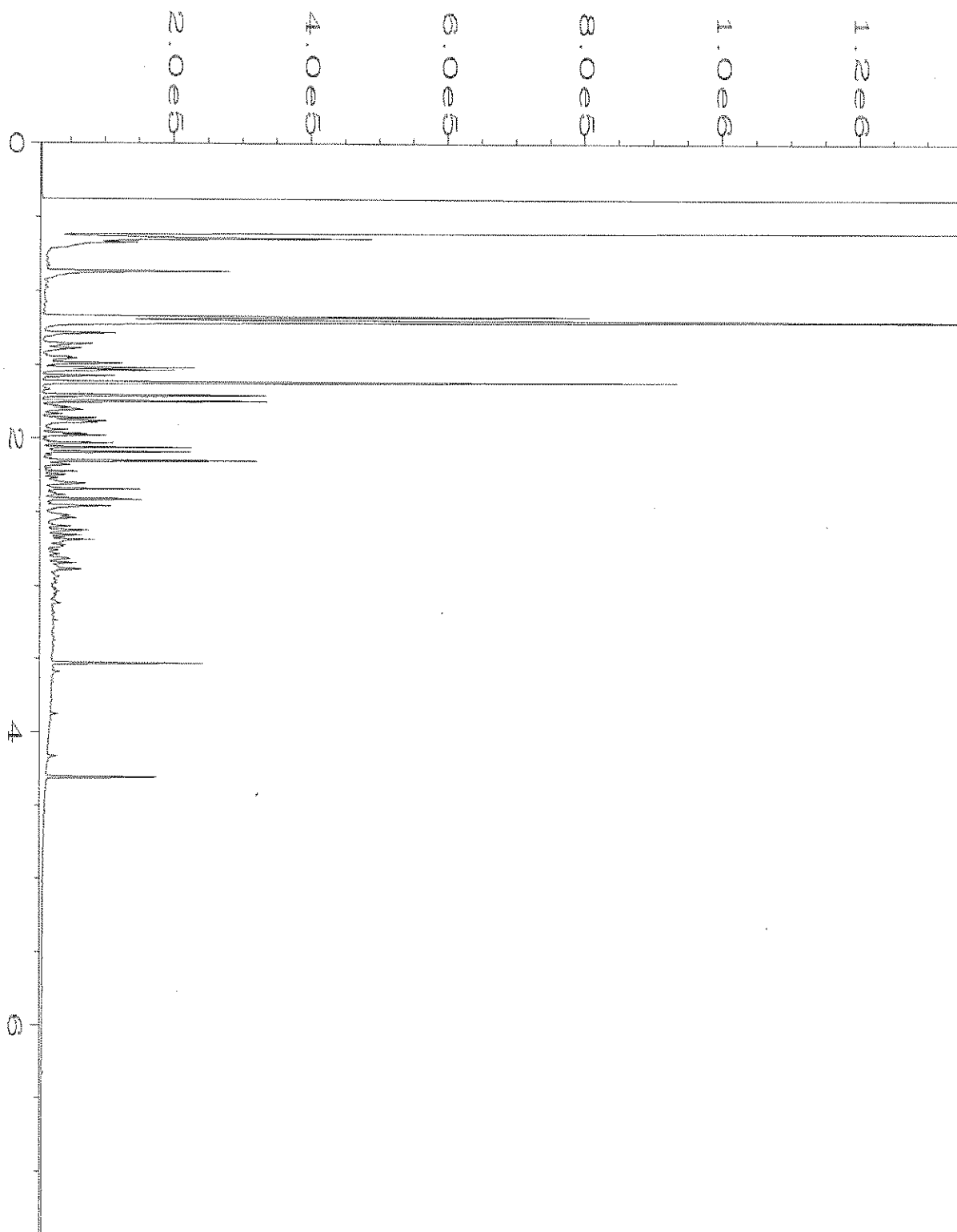


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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-09	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:08 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:45 AM		

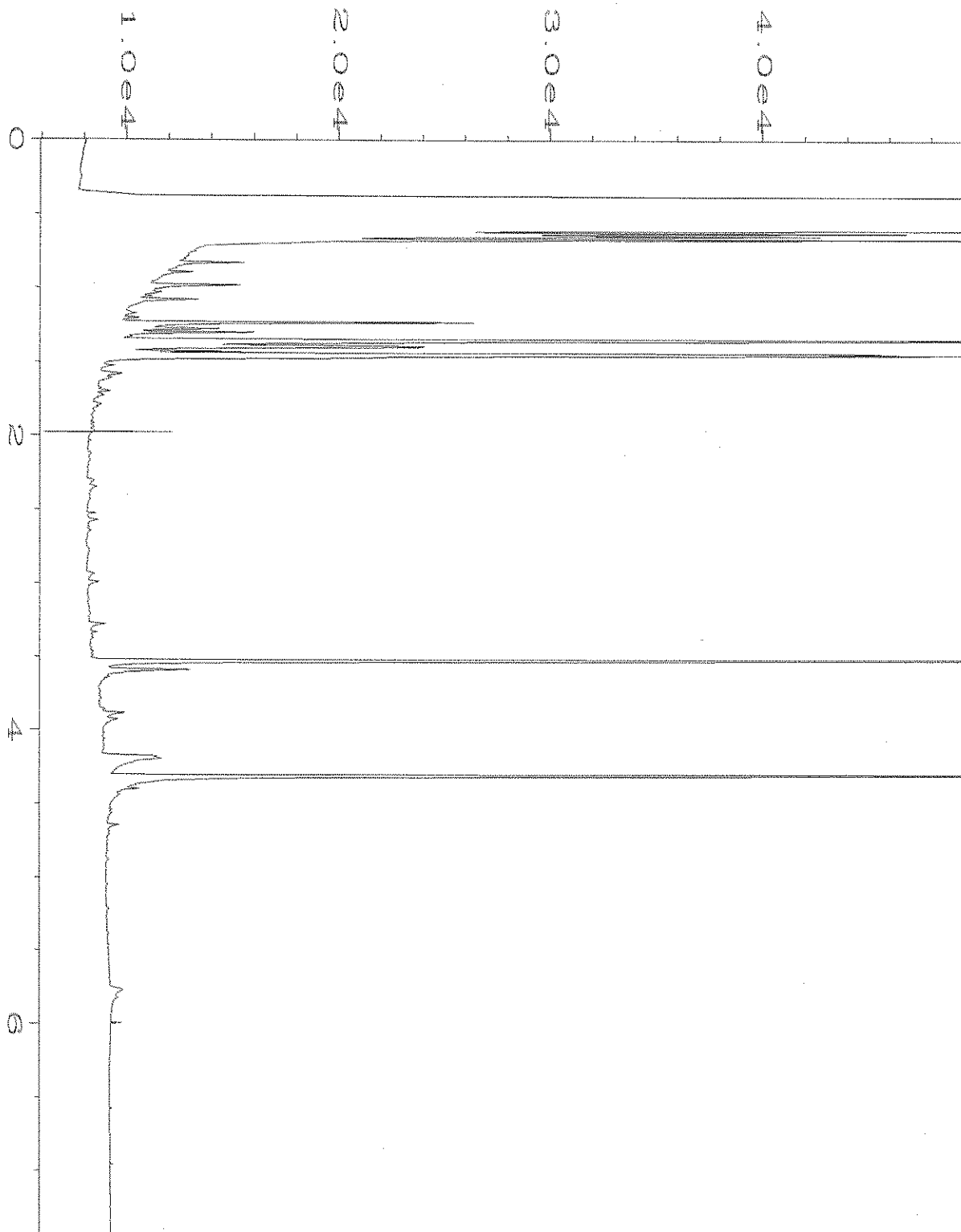




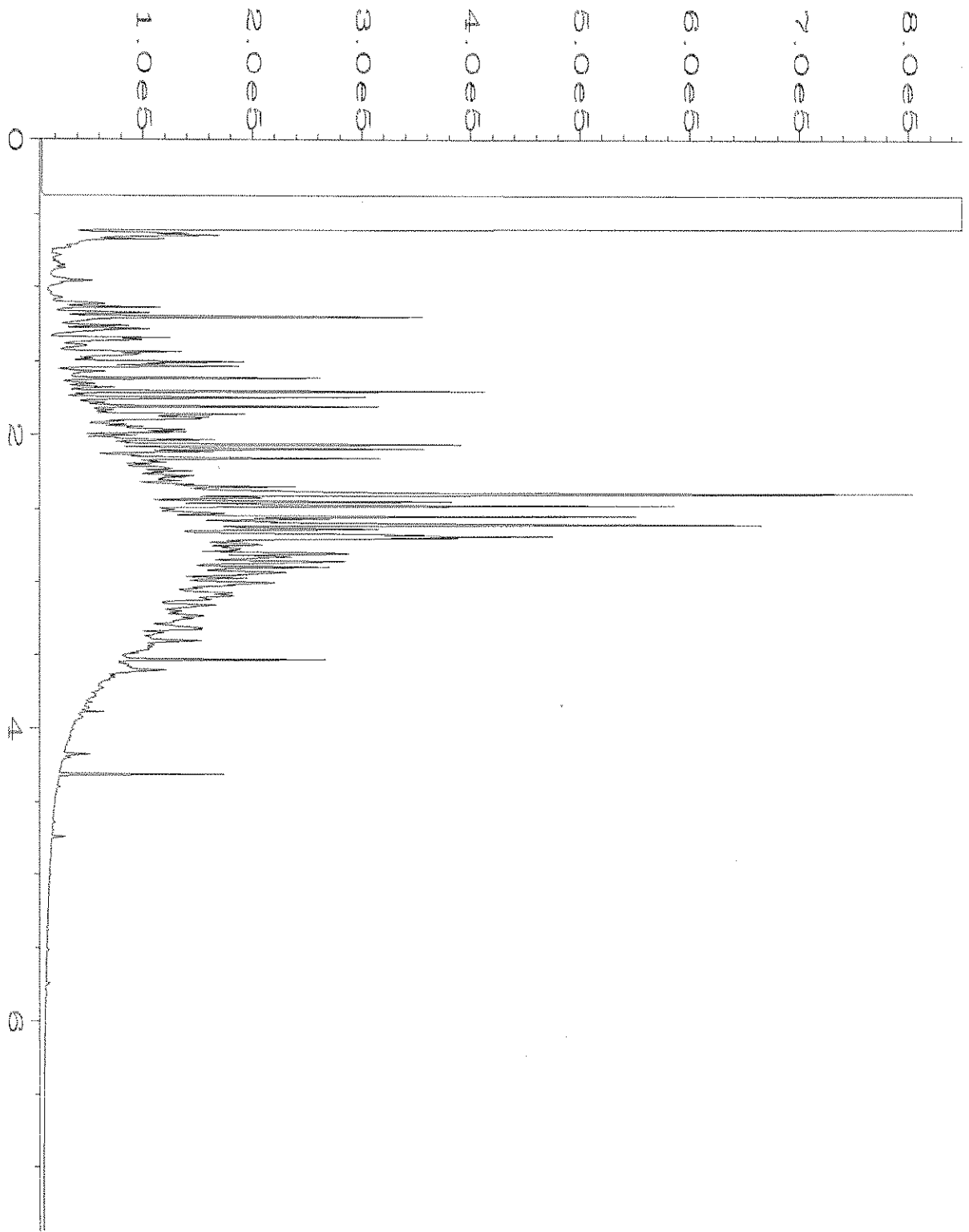
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-10	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:19 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:47 AM		



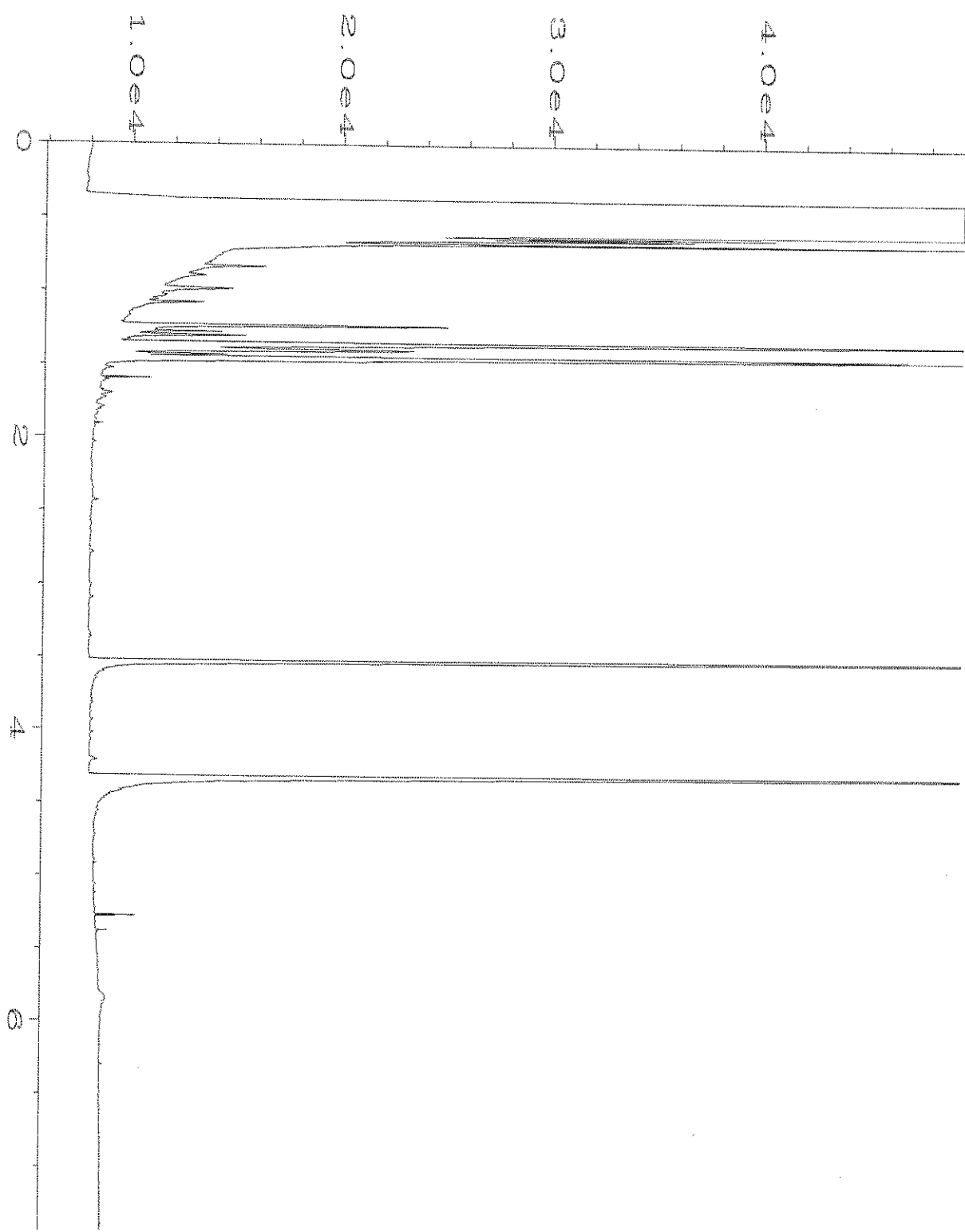
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-11	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:31 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:47 AM		



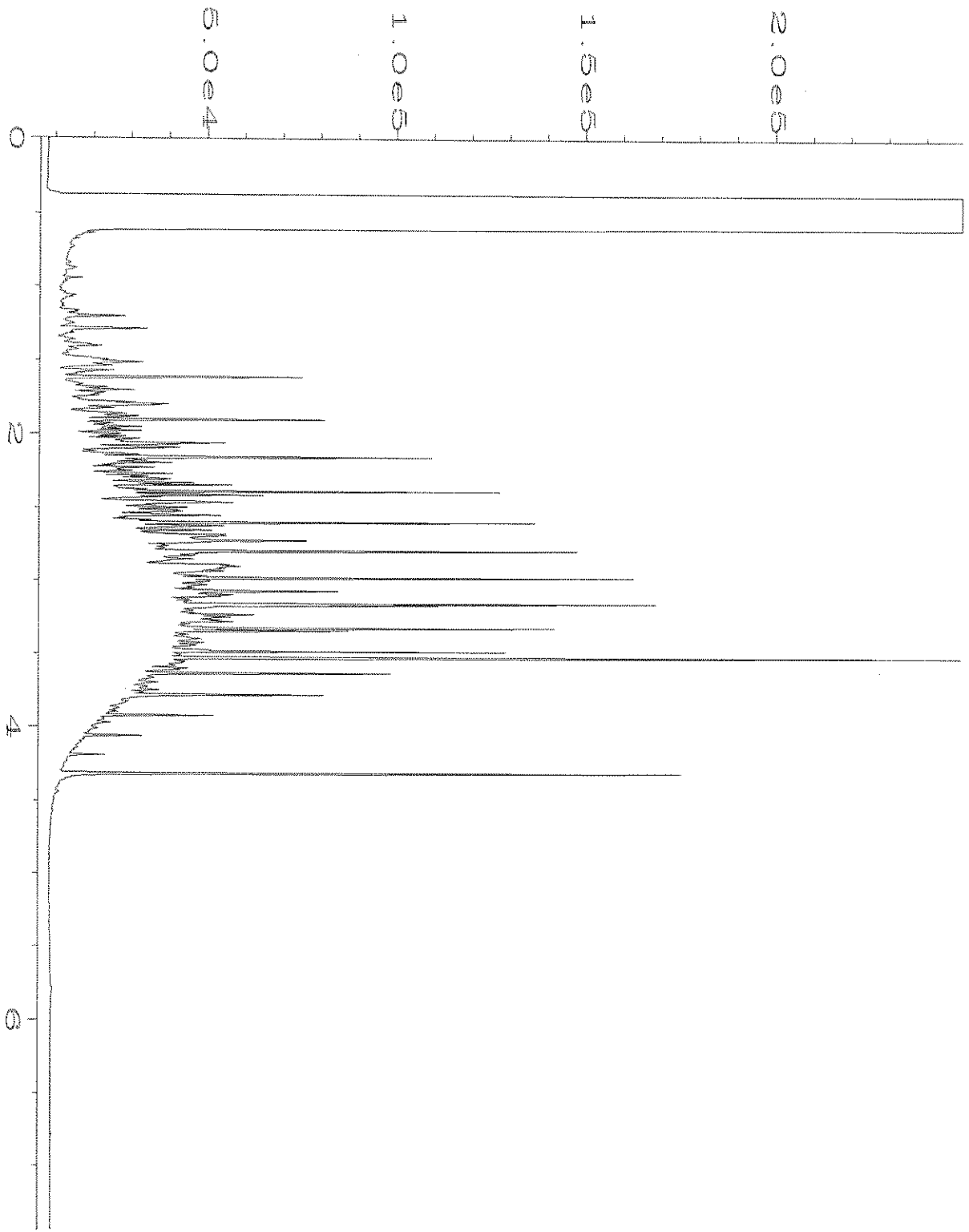
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-12	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:43 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\043F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 43
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-13	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:55 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\028F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 28
Instrument	: GC1	Injection Number	: 1
Sample Name	: 01-1759 mb	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:01 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\003F1101.D	Page Number	: 1
Operator	: TL	Vial Number	: 3
Instrument	: GC1	Injection Number	: 1
Sample Name	: 500 Dx 63-79C	Sequence Line	: 11
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 07:18 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:50 AM		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Arina Podnozova, B.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

August 9, 2021

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the additional results from the testing of material submitted on July 30, 2021 from the Coleman Oil Yakima 41392, F&BI 107508 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0809R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 30, 2021 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392, F&BI 107508 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
107508 -01	MW-1
107508 -02	MW-2
107508 -03	MW-4
107508 -04	MW-6
107508 -05	MW-7
107508 -06	MW-9
107508 -07	MW-10
107508 -08	MW-11
107508 -09	MW-13
107508 -10	MW-14
107508 -11	MW-15
107508 -12	MWBNSF1
107508 -13	MW-Dup

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/09/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

Date Extracted: 07/30/21

Date Analyzed: 08/05/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>  
Sample Extracts Passed Through a  
Silica Gel Column Prior to Analysis  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152)
MW-1 107508-01	4,400	<250	100
MW-2 107508-02	2,000	<250	103
MW-4 107508-03	230	<250	68
MW-6 107508-04	960 x	<250	102
MW-7 107508-05	<50	<250	118
MW-9 107508-06	<50	<250	97
MW-10 107508-07	<50	<250	97
MW-11 107508-08	860	<250	102
MW-13 107508-09	150	<250	101
MW-15 107508-11	800 x	<250	95
Method Blank 01-1759 MB	<50	<250	101

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/09/21

Date Received: 07/30/21

Project: Coleman Oil Yakima 41392, F&BI 107508

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	79	84	63-142	6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

**SAMPLE CHAIN OF CUSTODY**

ME 7/30/01

Page # 1 of 2

EW4 NW4

167508  
 Report To Ken Noyeire  
 Company PBS Engineering & Environment  
 Address 214 E. Galer St. Suite 300  
 City, State, ZIP Seattle, WA 98109  
 Phone 509-572-8163 Email Ken.Noyeire@PBSUSA.com

SAMPLERS (signature) <u>Ken Noyeire</u>	PROJECT NAME <u>Coleman Oil Yakima</u>
PO # <u>41399</u>	INVOICE TO
REMARKS	PROJECT specific PLS? - Yes / No

TURNAROUND TIME <input checked="" type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH Rush charges authorized by: _____	SAMPLE DISPOSAL <input type="checkbox"/> Archive samples <input type="checkbox"/> Other _____ Default: Dispose after 30 days
--	---

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	ANALYSES REQUESTED	Notes
MW-1	01 ASD	7/28/01	1933	Water	4	X	X	X					Dx/SG	● pu KN
MW-2	02	7/28/01	1350		4	X	X	X						8/5/01 ME
MW-4	03	7/27/01	1610		4	X	X	X						
MW-6	04	7/27/01	1515		4	X	X	X						
MW-7	05	7/28/01	1448		4	X	X	X						
MW-9	06	7/27/01	1351		4	X	X	X						
MW-10	07	7/27/01	1935		4	X	X	X						
MW-11	08	7/28/01	1044		4	X	X	X						
MW-13	09	7/28/01	0816		4	X	X	X						
MW-14	10	7/28/01	0858		4	X	X	X						

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-3029  
 Ph. (206) 285-8282

Requished by: <u>Patrick Brice</u>	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>Will Radford</u>				
Requished by:				
Received by:				

Received by: Will Radford FIBI 7/30/01 09:55

107508

SAMPLE CHAIN OF CUSTODY

ME 7/30/01

EQ4 Page # 2 of 2

Report To Ken Nogerre

Company PBS Engineering & Environmental

Address 914 E. Galer St. Suite 300

City, State, ZIP Seattle, WA 98109

Phone 509-572-8163 Email Ken.Nogerre@pbsusa.com

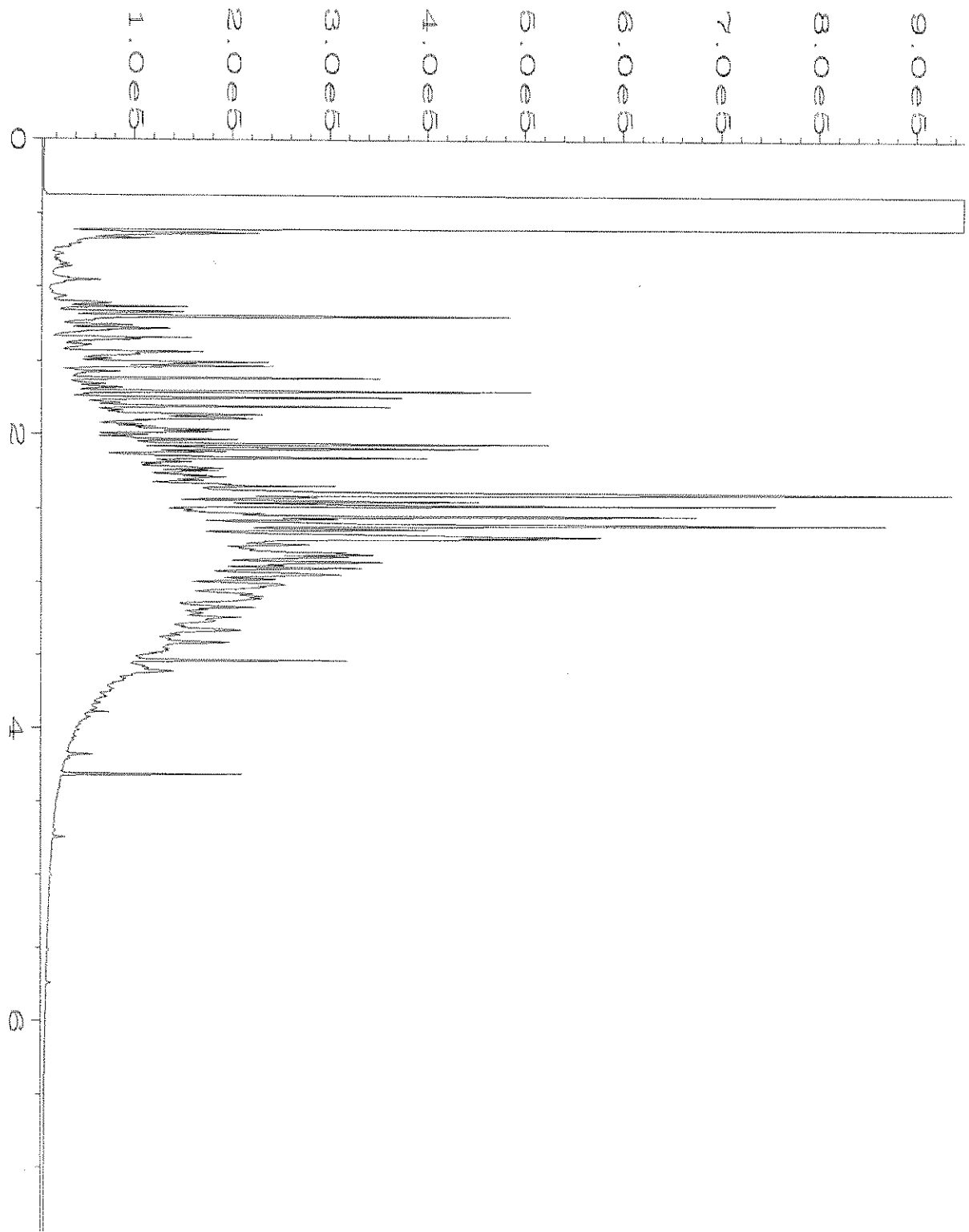
SAMPLES (signature) <u>[Signature]</u>	
PROJECT NAME <u>Coleman Oil Yalama</u>	PO # <u>41392</u>
REMARKS	INVOICE TO
Project specific RLS? - Yes / No	

TURNAROUND TIME <input checked="" type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH Rush charges authorized by: _____	SAMPLE DISPOSAL <input type="checkbox"/> Archive samples <input type="checkbox"/> Other _____
Default: Dispose after 30 days	

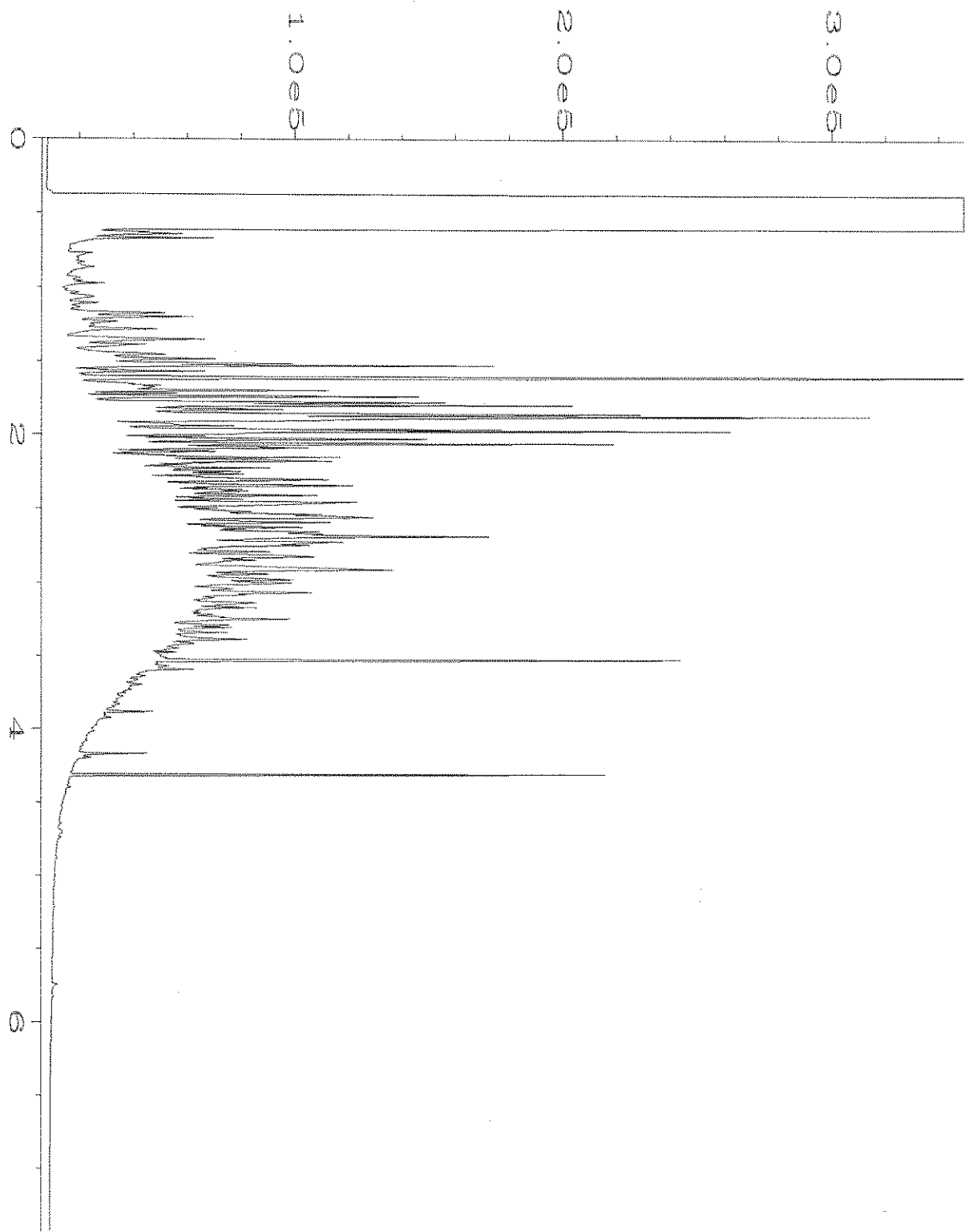
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED								Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082				
MW-15	11 A-D	7/28/01	1130	Coleman	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
MW/BVSE1	12 ↓	7/28/01	0941		4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
MW-DUP	13 ↓	7/28/01	1200		4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

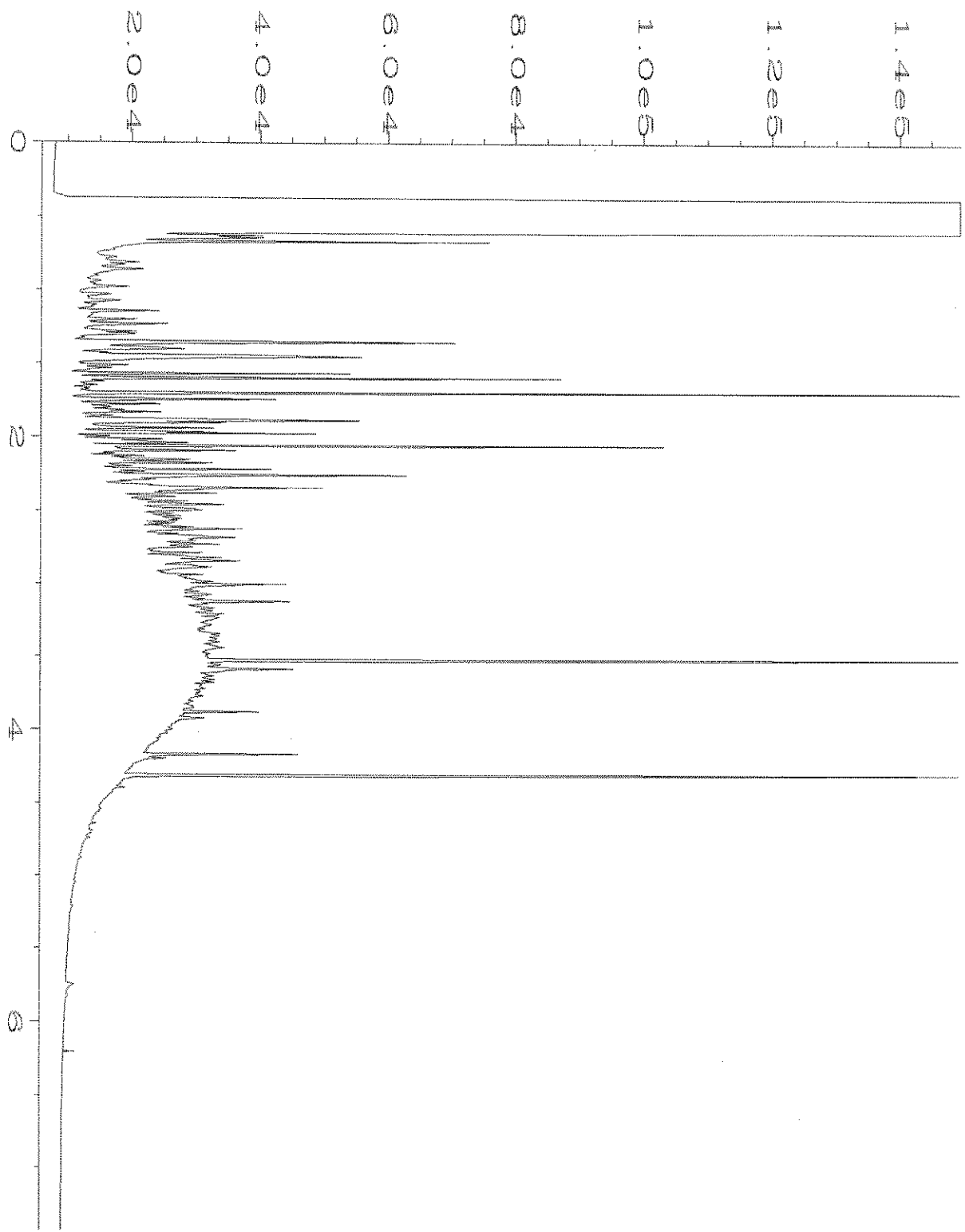
Relinquished by: <u>[Signature]</u>	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Received by: <u>[Signature]</u>		<u>Petrick Brice</u>	<u>PBS</u>	<u>7/29/01</u>	<u>1600</u>
Relinquished by:					
Received by: <u>[Signature]</u>		<u>Will Rodford</u>	<u>F&amp;BI</u>	<u>7/30/01</u>	<u>09:55</u>



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\031F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 31
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-01	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:33 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:32 AM		

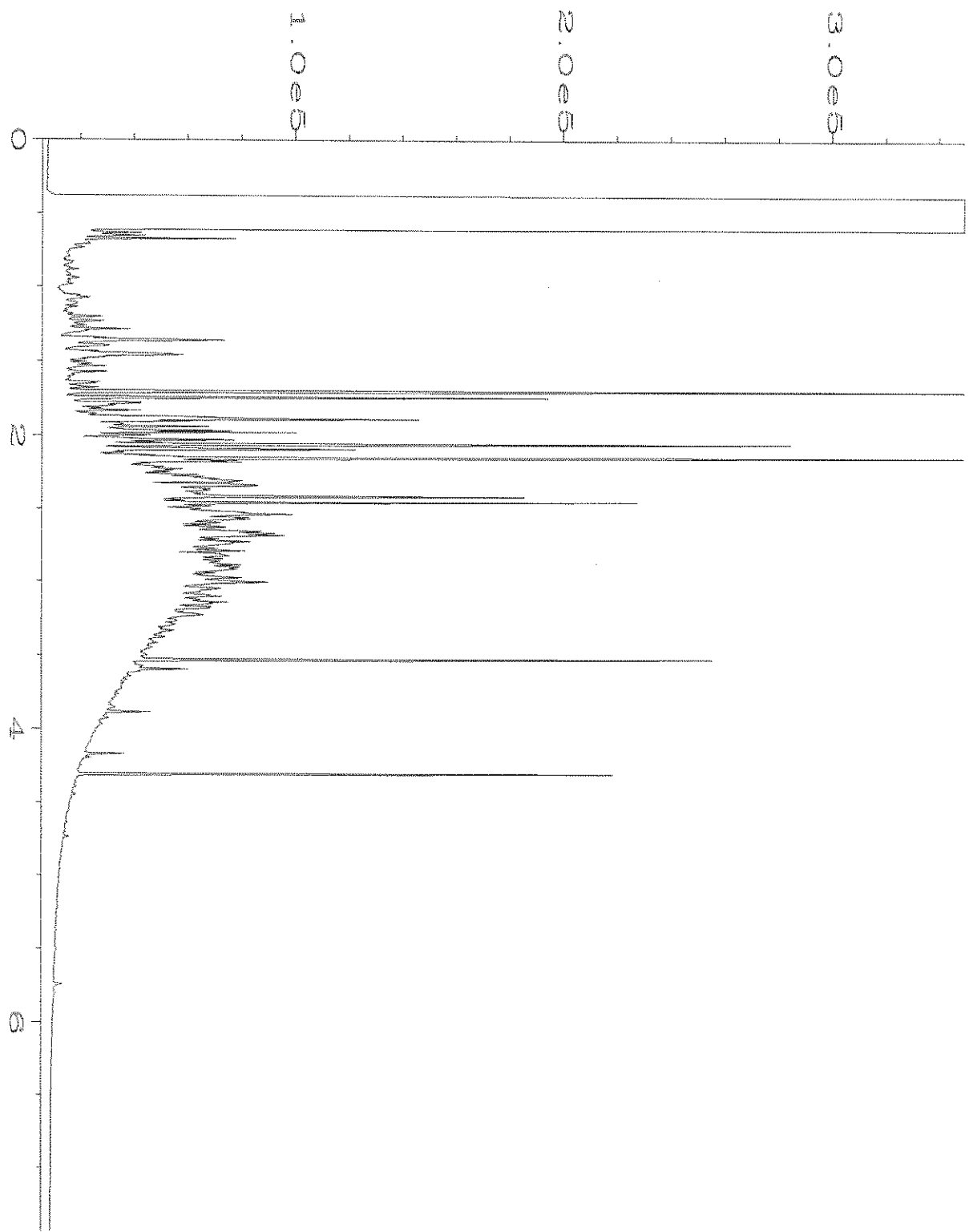


Data File Name	: C:\HPCHEM\1\DATA\07-30-21\032F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 32
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-02	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:45 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:32 AM		

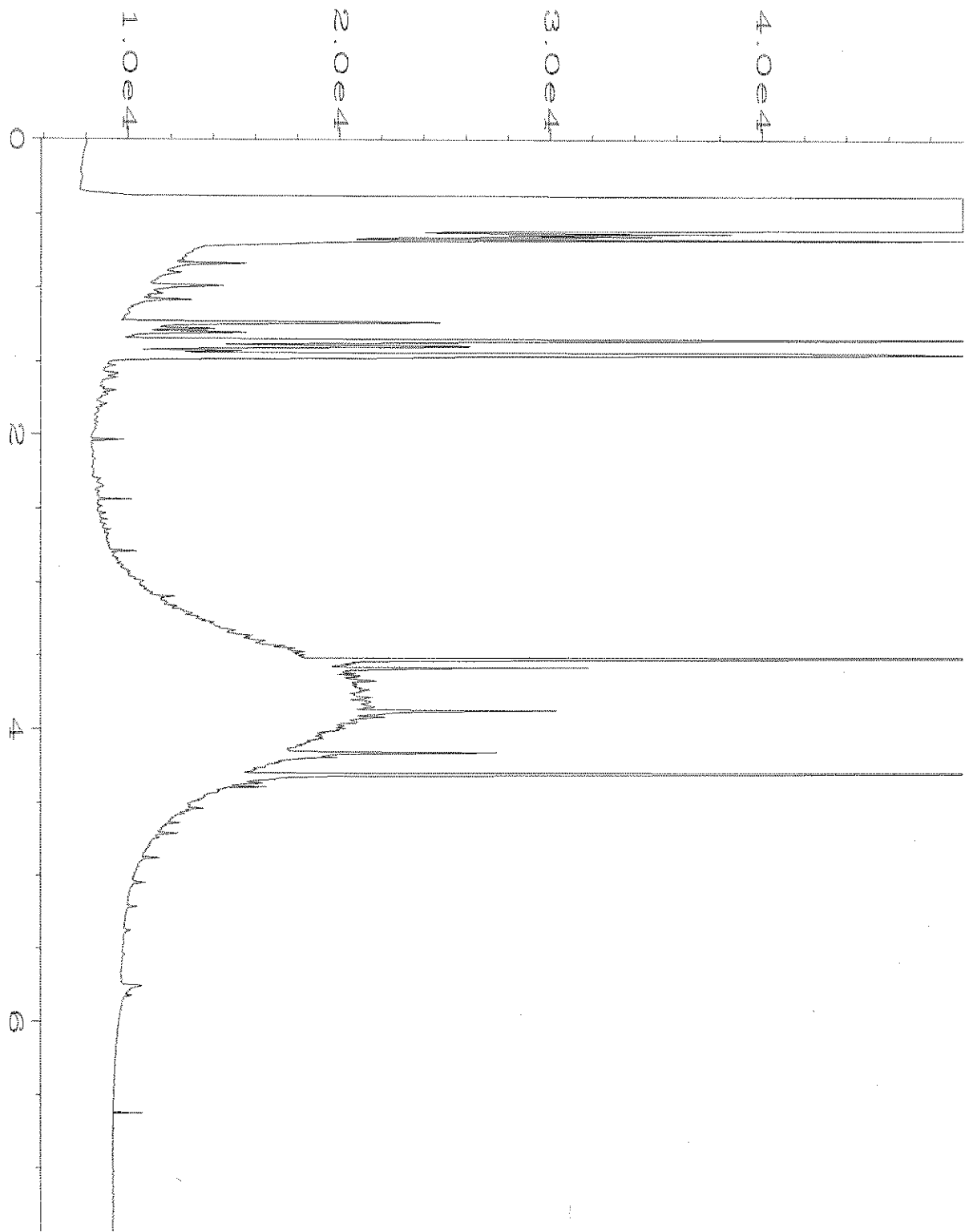


Data File Name	: C:\HPCHEM\1\DATA\07-30-21\033F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 33
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-03	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:57 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:40 AM		

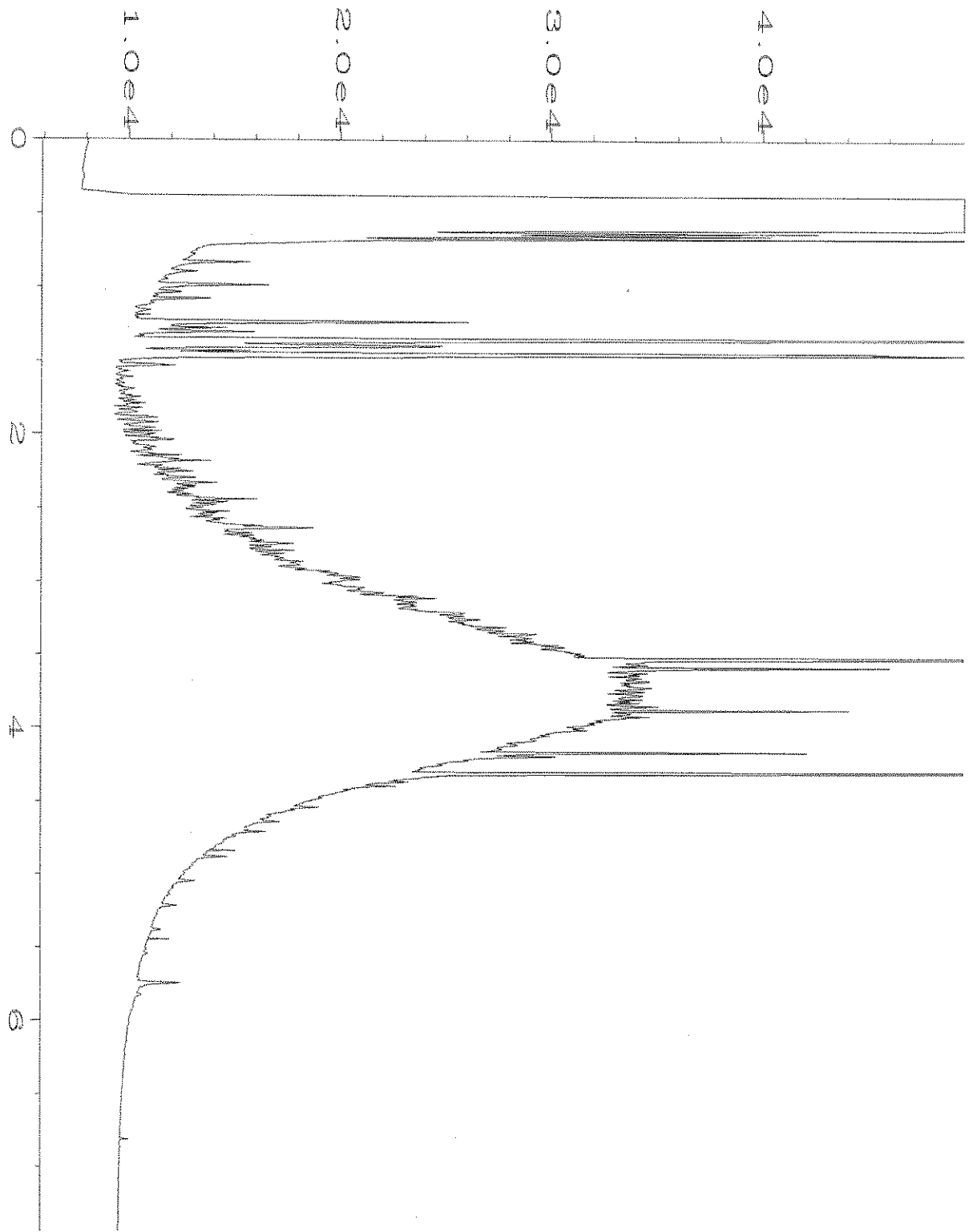




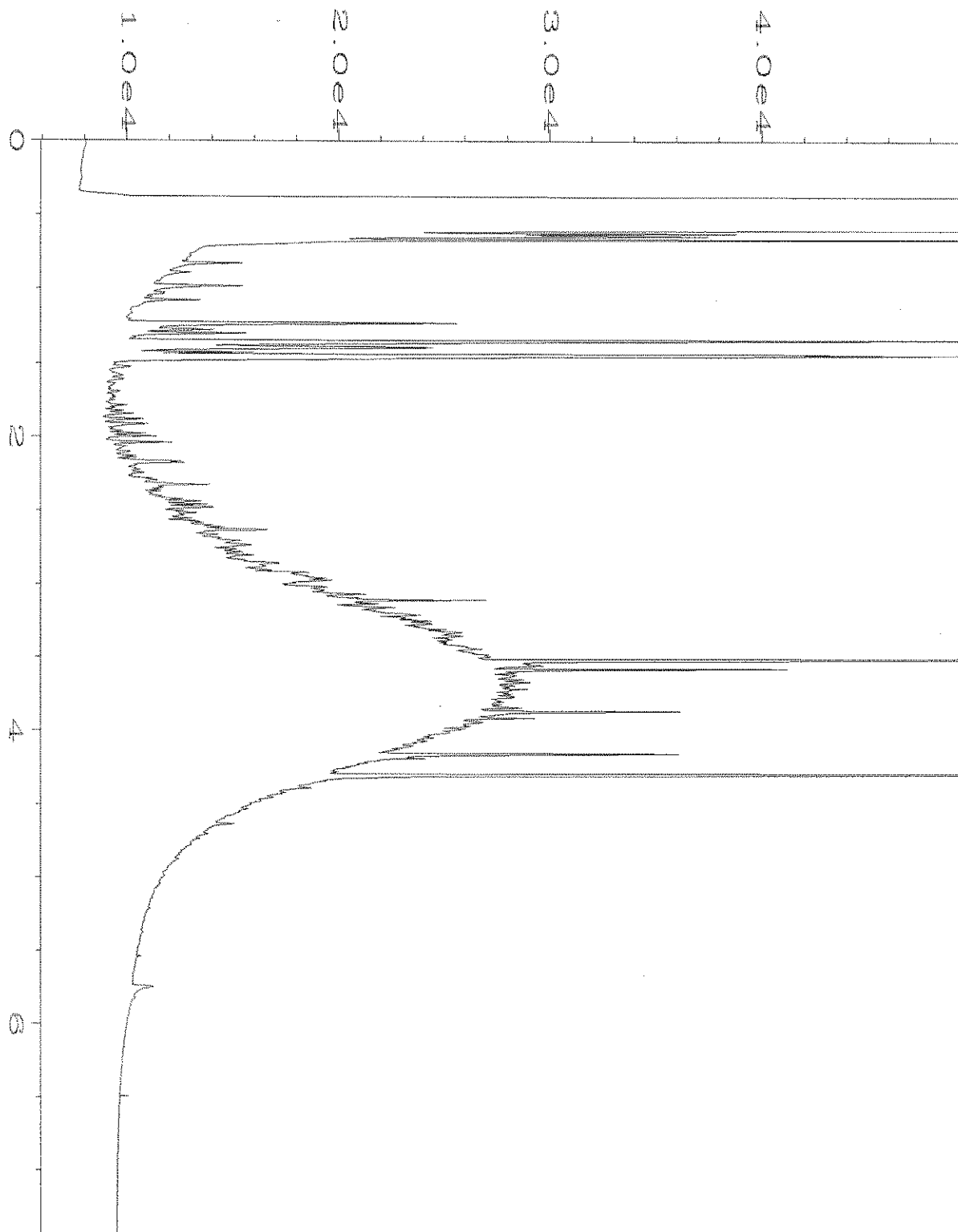
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Operator	: TL	Vial Number	: 34
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-04	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:09 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



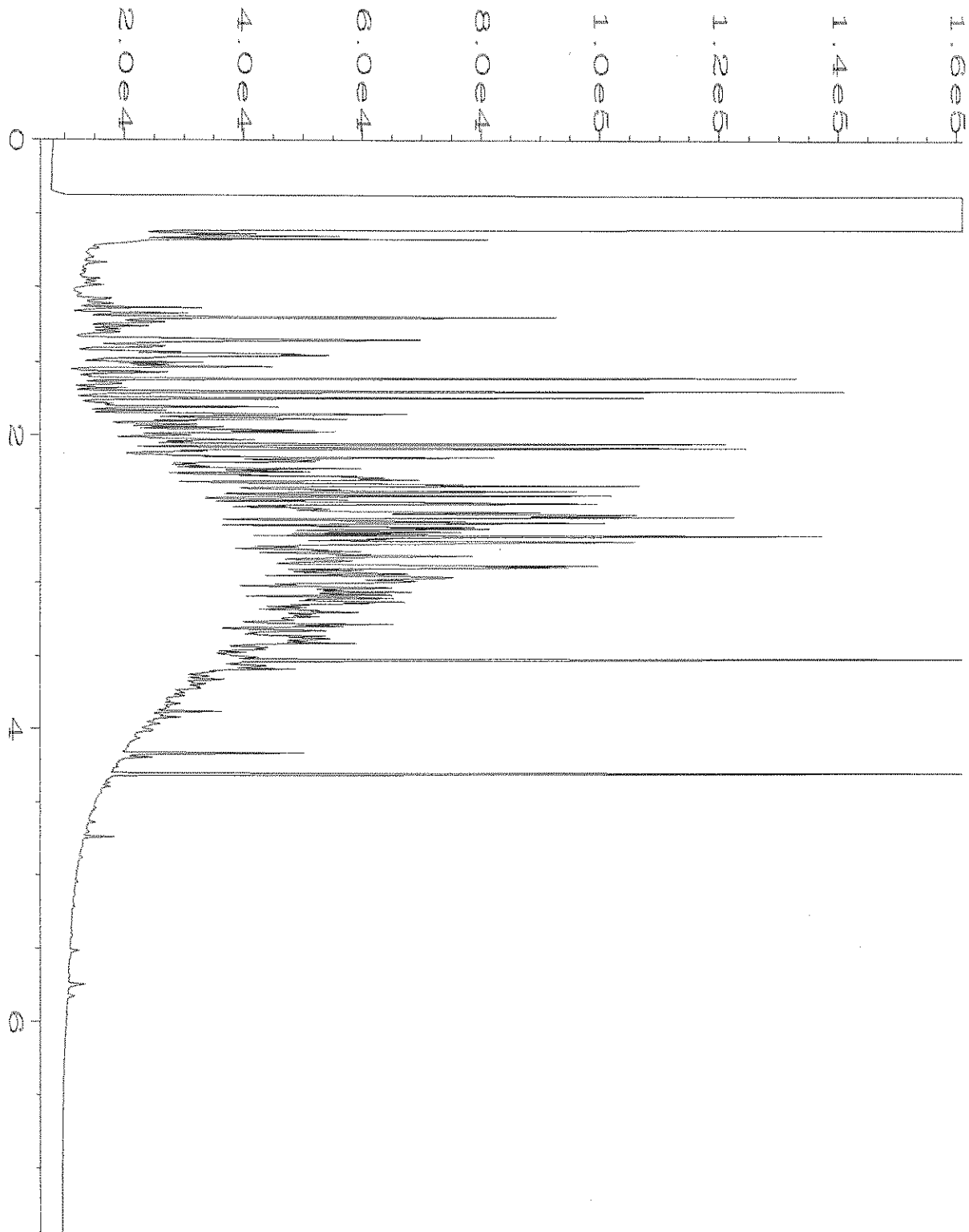
Data File Name	: C:\HPCHEM\1\DATA\07-30-21\035F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 35
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-05	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:21 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



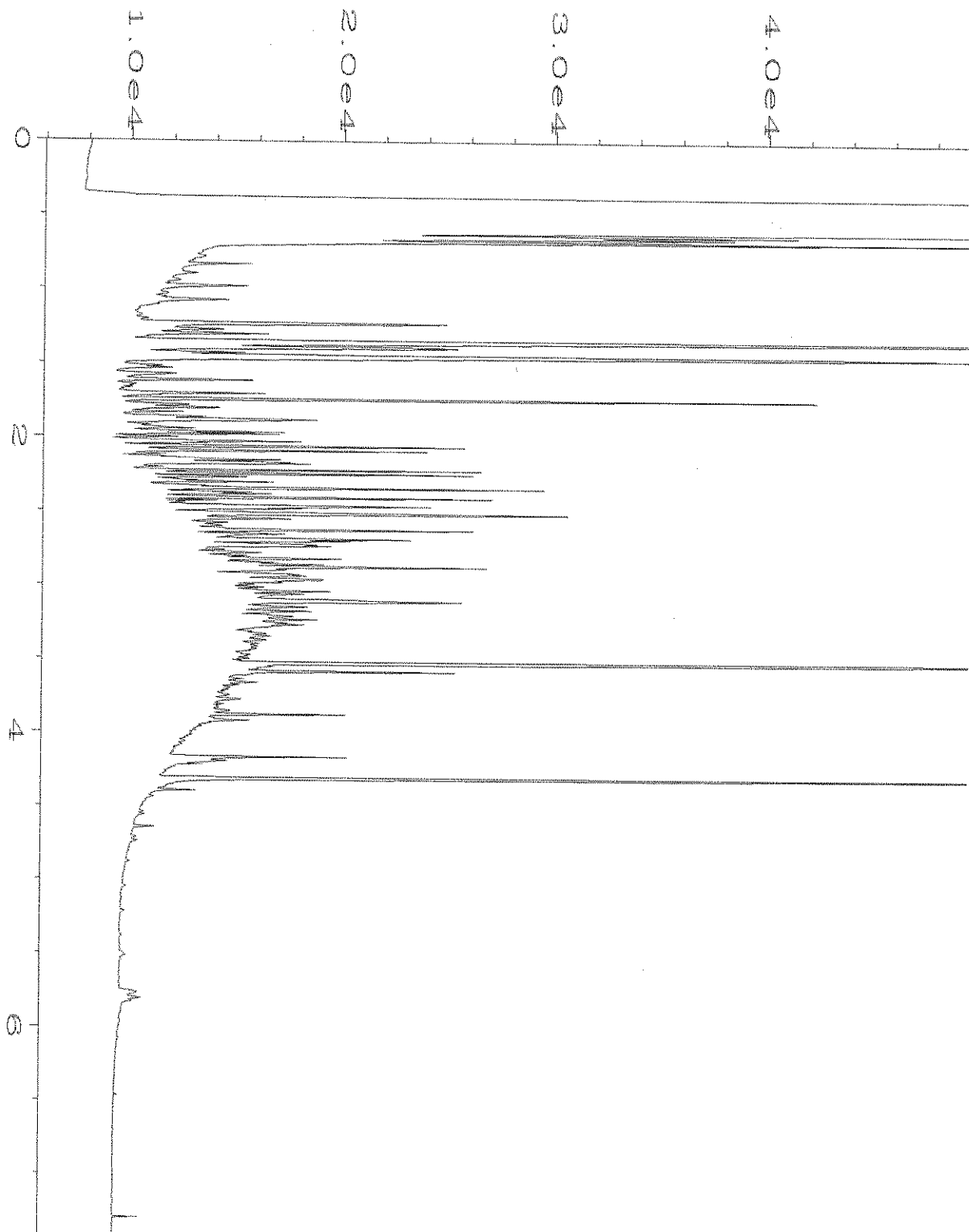
Data File Name	: C:\HPCHEM\1\DATA\07-30-21\036F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 36
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-06	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:32 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:41 AM		



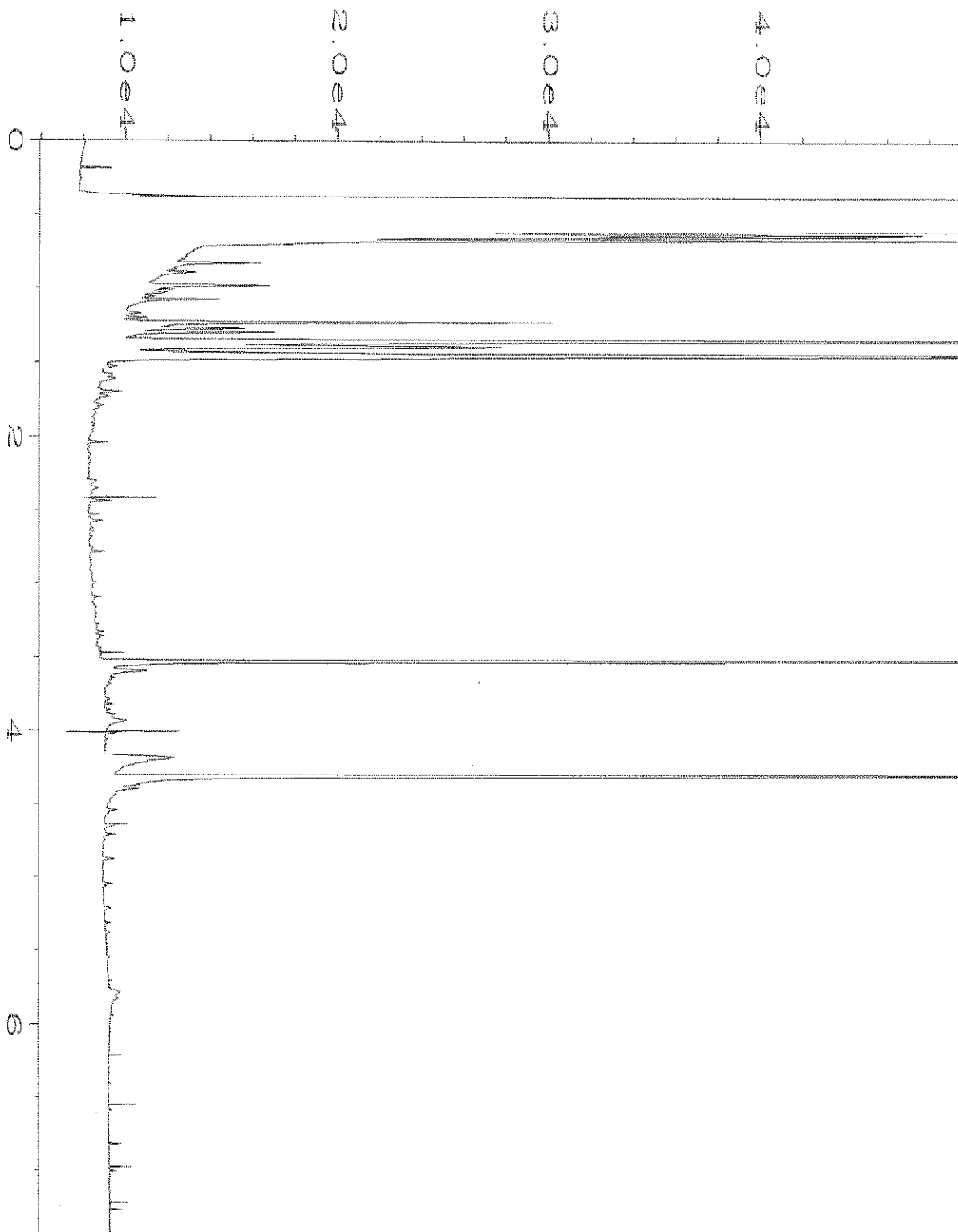
Data File Name	: C:\HPCHEM\1\DATA\07-30-21\037F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 37
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-07	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:44 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:42 AM		



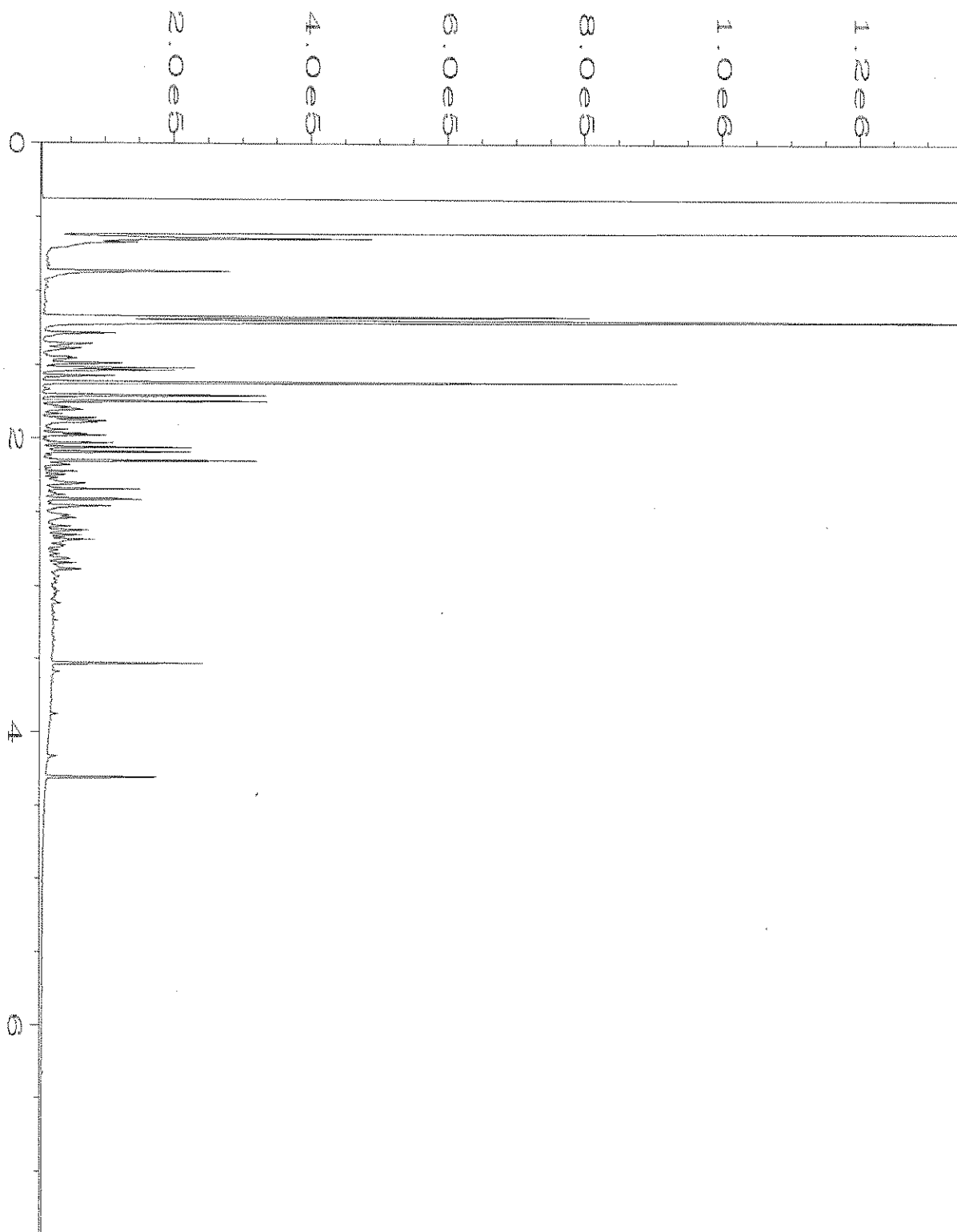
Data File Name	: C:\HPCHEM\1\DATA\07-30-21\038F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 38
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-08	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 05:56 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:44 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\039F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 39
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-09	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:08 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:45 AM		

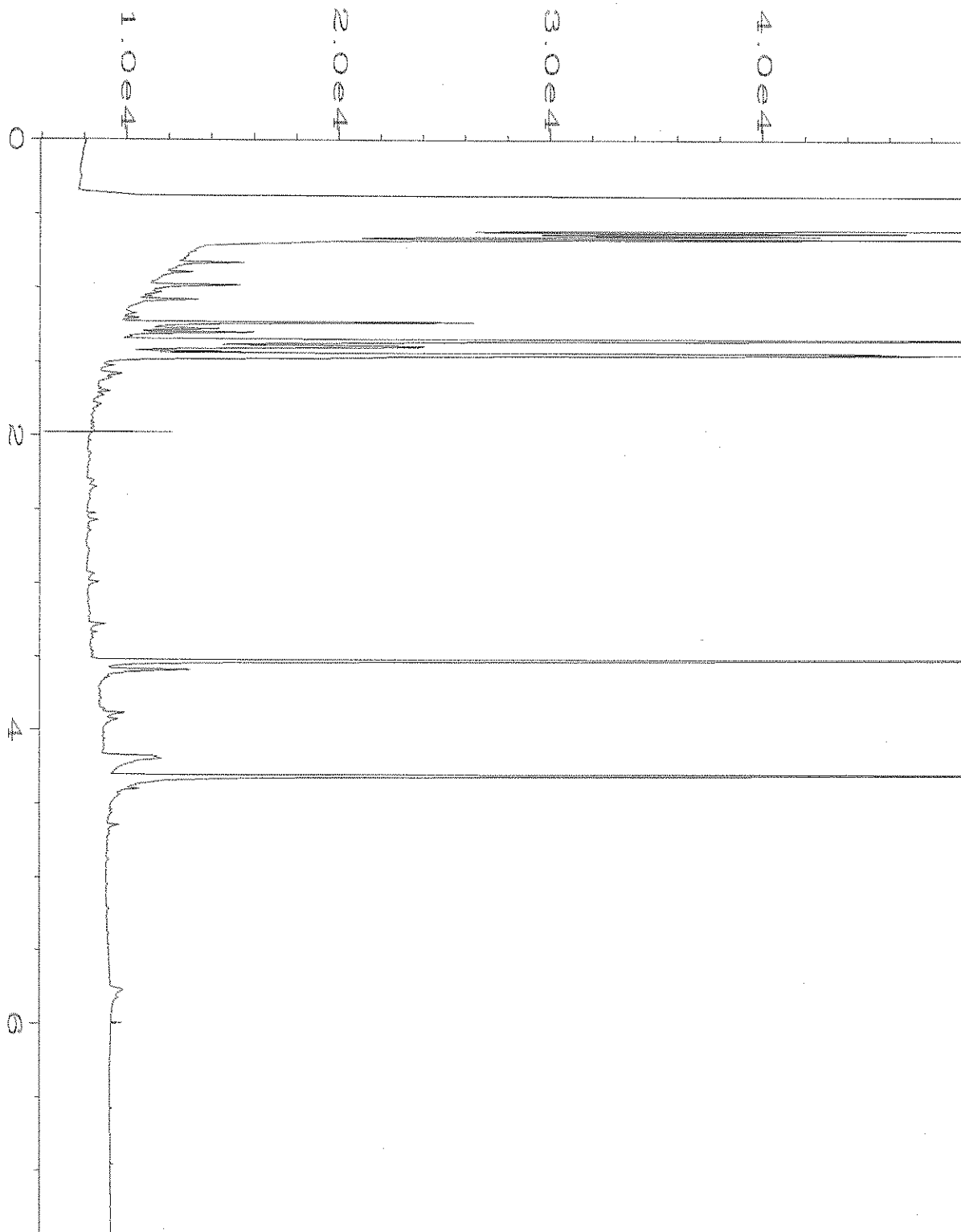


Data File Name	: C:\HPCHEM\1\DATA\07-30-21\040F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 40
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-10	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:19 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:47 AM		

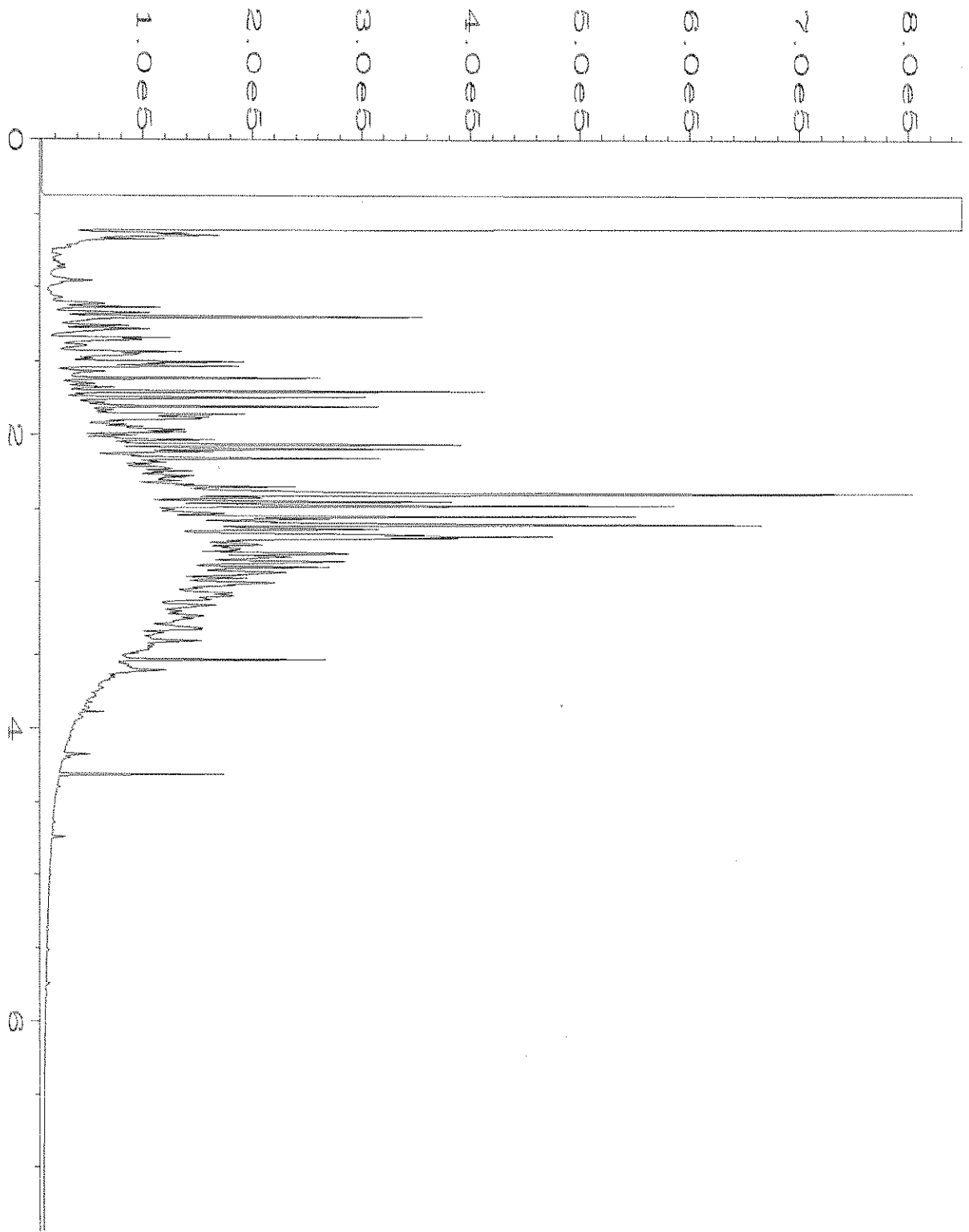


Data File Name	: C:\HPCHEM\1\DATA\07-30-21\041F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 41
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-11	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:31 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:47 AM		

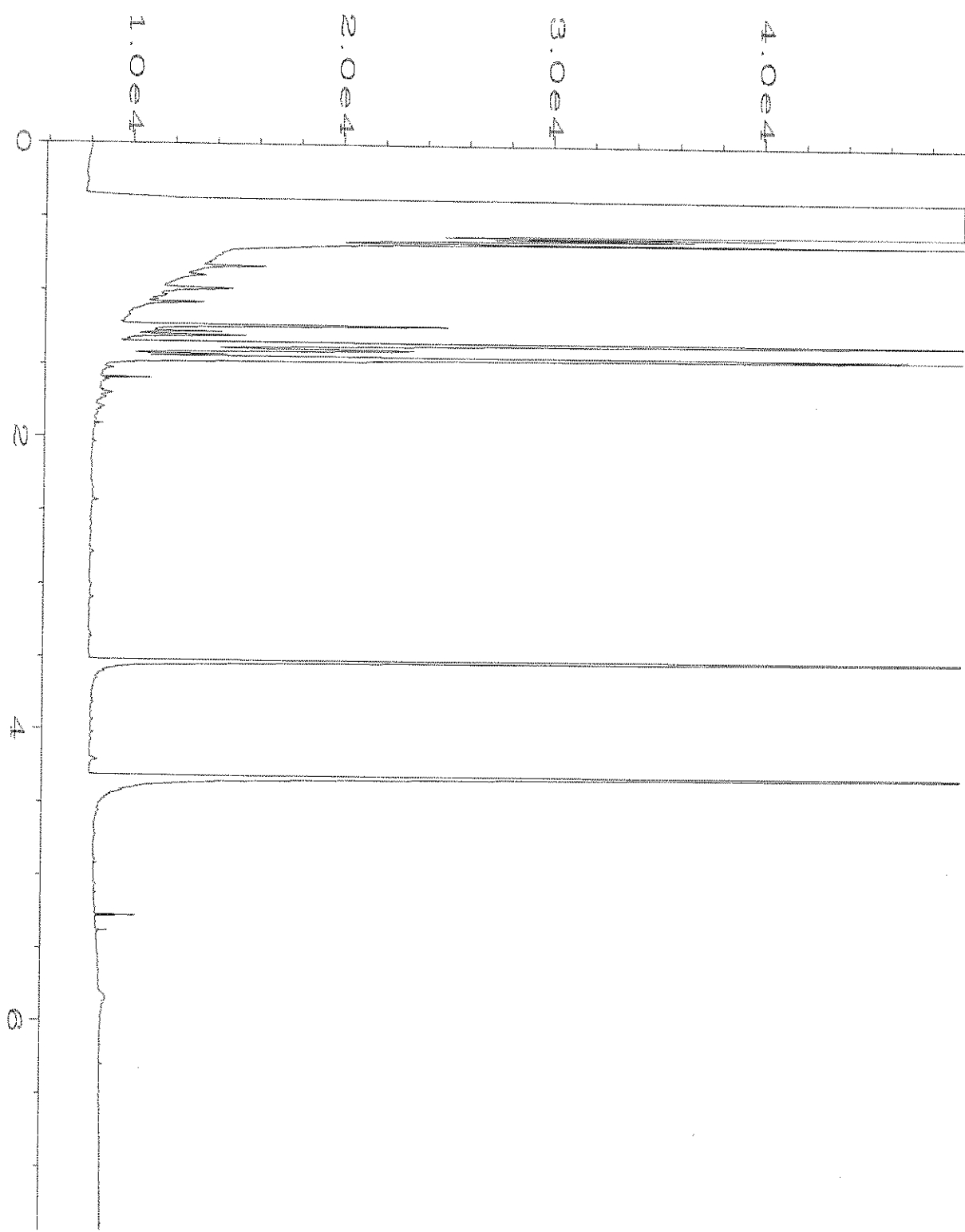




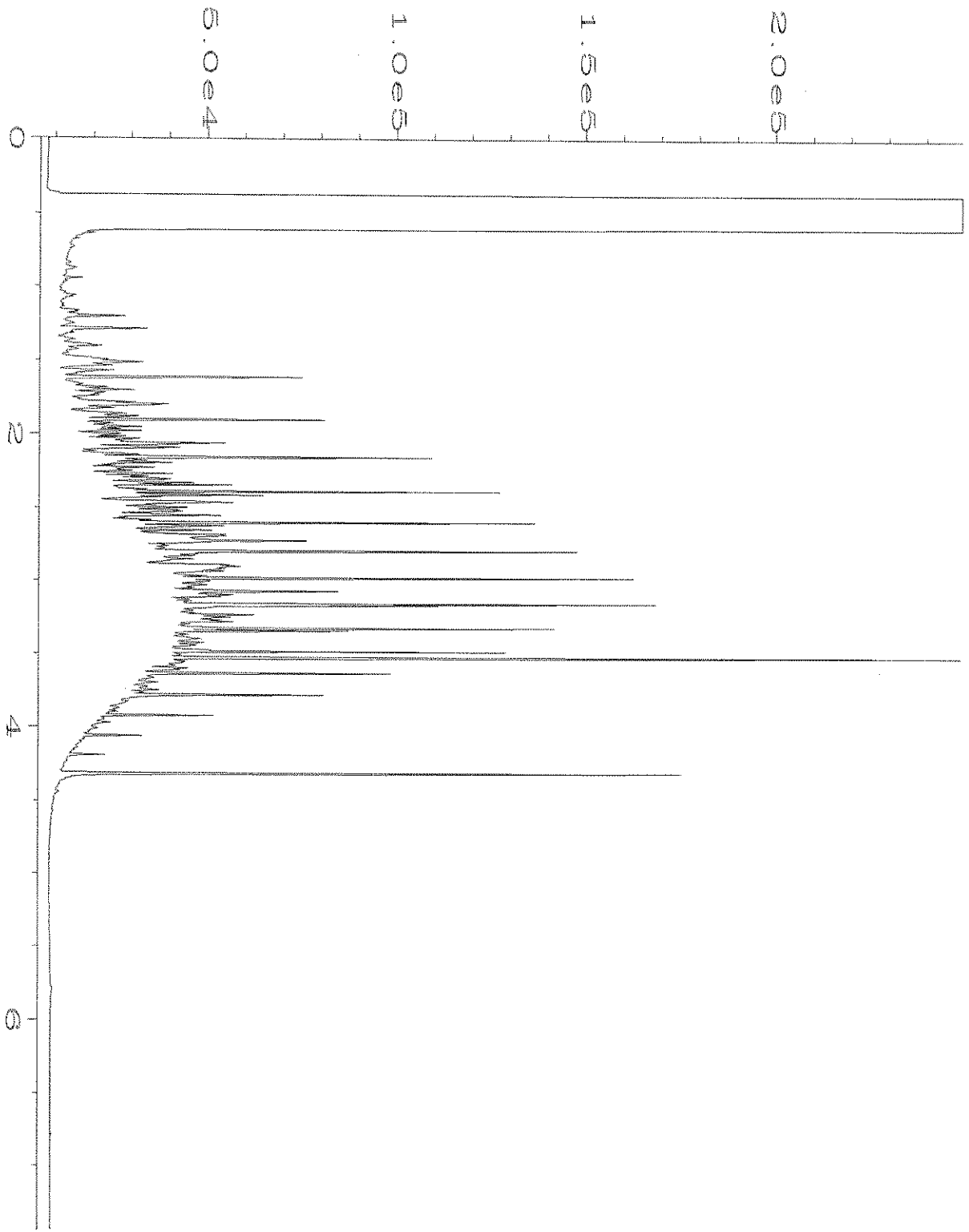
Data File Name	: C:\HPCHEM\1\DATA\07-30-21\042F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 42
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-12	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:43 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\043F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 43
Instrument	: GC1	Injection Number	: 1
Sample Name	: 107508-13	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 06:55 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\028F1001.D	Page Number	: 1
Operator	: TL	Vial Number	: 28
Instrument	: GC1	Injection Number	: 1
Sample Name	: 01-1759 mb	Sequence Line	: 10
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 04:01 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:48 AM		



Data File Name	: C:\HPCHEM\1\DATA\07-30-21\003F1101.D	Page Number	: 1
Operator	: TL	Vial Number	: 3
Instrument	: GC1	Injection Number	: 1
Sample Name	: 500 Dx 63-79C	Sequence Line	: 11
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 30 Jul 21 07:18 PM	Analysis Method	: DEFAULT.MTH
Report Created on:	02 Aug 21 09:50 AM		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Vineta Mills, M.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

March 3, 2022

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on February 25, 2022 from the Coleman Oil Yakima 41392, F&BI 202470 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0303R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 25, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil Yakima 41392, F&BI 202470 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
202470 -01	MW16-5
202470 -02	MW16-12

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/03/22

Date Received: 02/25/22

Project: Coleman Oil Yakima 41392, F&BI 202470

Date Extracted: 02/28/22

Date Analyzed: 03/01/22

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
MW16-5 202470-01	<0.02	<0.02	<0.02	<0.06	<5	81
MW16-12 202470-02	<0.02	<0.02	<0.02	<0.06	<5	79
Method Blank 02-345 MB	<0.02	<0.02	<0.02	<0.06	<5	97

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/03/22

Date Received: 02/25/22

Project: Coleman Oil Yakima 41392, F&BI 202470

Date Extracted: 02/25/22

Date Analyzed: 02/25/22

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 48-168)
MW16-5 202470-01	<50	<250	94
MW16-12 202470-02	<50	<250	95
Method Blank 02-528 MB	<50	<250	94



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/03/22

Date Received: 02/25/22

Project: Coleman Oil Yakima 41392, F&BI 202470

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 202438-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	75	69-120
Toluene	mg/kg (ppm)	0.5	75	70-117
Ethylbenzene	mg/kg (ppm)	0.5	80	65-123
Xylenes	mg/kg (ppm)	1.5	79	66-120
Gasoline	mg/kg (ppm)	20	80	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/03/22

Date Received: 02/25/22

Project: Coleman Oil Yakima 41392, F&BI 202470

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 202460-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	86	88	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	86	74-139

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

202470

SAMPLE CHAIN OF CUSTODY

02.25.22

COI/VS-B1

Page # 1 of 1

Report To: Ken Nogueire

SAMPLE # (signature) [Signature]

Company: PBS Engineering & Environment

PROJECT NAME: Coleman Oil Yard

PO # 41392

Address: 214 E. Geary St, Ste 300

REMARKS

INVOICE TO

City, State, ZIP: Seattle, WA 98102

Phone: 206 572 8163 Email: Ken.nogueire@pbsenv.com

Project Specific R/Ls - Yes / No

TURNAROUND TIME  
Standard Turnaround  
RUSH  
Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL  
Dispose after 30 days  
Archive Samples  
Other \_\_\_\_\_

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes			
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					
MLD46-5	01A-0	2/24/22	905	Soil		X	X	X								Retired 402/22 and 2 vials ↓
MLD46-12	02 J	1	925	"		X	X	X								2/25

Friedman & Bruye, Inc.  
3012 16th Avenue West  
Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE		PRINT NAME		COMPANY		DATE		TIME	
Reinquished by: <u>[Signature]</u>	<u>[Signature]</u>	<u>Wesley Davis</u>	<u>PBS</u>						
Received by: <u>[Signature]</u>	<u>[Signature]</u>	<u>Wesley Davis</u>	<u>PBS</u>						
Reinquished by: <u>[Signature]</u>	<u>[Signature]</u>	<u>Wesley Davis</u>	<u>PBS</u>						
Received by: <u>[Signature]</u>	<u>[Signature]</u>	<u>Wesley Davis</u>	<u>PBS</u>						

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Vineta Mills, M.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 4, 2022

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on March 29, 2022 from the Coleman Oil-Yakima 41392, F&BI 203501 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0404R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 29, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil-Yakima 41392, F&BI 203501 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
203501 -01	MW-10
203501 -02	MW-14
203501 -03	MW-16
203501 -04	MWBNSF-1

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

Date Extracted: 03/30/22

Date Analyzed: 03/31/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
MW-10 203501-01	<1	<1	<1	<3	<100	104
MW-14 203501-02	<1	<1	<1	<3	<100	103
MW-16 203501-03	<1	<1	<1	<3	<100	88
MWBNSF-1 203501-04	<1	<1	<1	<3	<100	102
Method Blank 02-625 MB	<1	<1	<1	<3	<100	85

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

Date Extracted: 03/30/22

Date Analyzed: 03/30/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW-10 203501-01	240 x	<250	134
MW-14 203501-02	110 x	<250	148
MW-16 203501-03	190 x	<250	144
MWBNSF-1 203501-04	<50	<250	134
Method Blank 02-761 MB2	<50	<250	148



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 203466-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	95	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	102	74-118
Gasoline	ug/L (ppb)	1,000	92	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/04/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	104	63-142	0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

203501

SAMPLE CHAIN OF CUSTODY

03.24.22

Page #

1 of 1 E02

V03

Report To Ken Nogeire

Company, PBS Engineering and Environmental

Address 214 E Galer St, Unit 300

City, State, ZIP Seattle, Washington 98102

Phone 206-766-7614 Email ken.nogeire@pbsusa.com

SAMPLERS (signature)	
PROJECT NAME	PO #
Coleman Oil - Yakima	41392
REMARKS	INVOICE TO
Project Specific Rls - Yes / No	

TURNAROUND TIME	SAMPLE DISPOSAL
Standard Turnaround	
RUSH	Dispose after 30 days
Rush charges authorized by:	Archive Samples
Other	

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082			
MW-10	01 A-D	3/25/22	1720	Water	4	X	X	X						X per EN 3/24/22 ME
MW-14	02		1450			X	X	X						1 VOC broken Tue 3/24
MW-16	03		1416			X	X	X						1 VOC broken Tue 3/24
MWBNSF-1	04		1545			X	X	X						

SIGNATURE		PRINT NAME		COMPANY		DATE		TIME	
Relinquished by: <i>[Signature]</i>		Wesley Garcia		PBS		3/28/22		1500	
Received by: <i>[Signature]</i>									
Relinquished by:								Samples received at 4:00	
Received by: <i>[Signature]</i>		Tokata Anastasia		F+R		3/29/22		9:32	

Friedman & Bruya, Inc.  
 3012 16th Avenue West  
 Seattle, WA 98119-2029  
 Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Vineta Mills, M.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

April 6, 2022

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the additional results from the testing of material submitted on March 29, 2022 from the Coleman Oil-Yakima 41392, F&BI 203501 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0406R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 29, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil-Yakima 41392, F&BI 203501 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
203501 -01	MW-10
203501 -02	MW-14
203501 -03	MW-16
203501 -04	MWBNSF-1

The NWTPH-Dx surrogate in the method blank exceeded the acceptance criteria. Nothing was detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

Date Extracted: 03/30/22

Date Analyzed: 04/04/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>  
Sample Extracts Passed Through a  
Silica Gel Column Prior to Analysis  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 47-140)
MW-10 203501-01	<50	<250	121
MW-14 203501-02	<50	<250	130
MW-16 203501-03	<50	<250	129
Method Blank 02-761 MB2	<50	<250	141 vo

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22

Date Received: 03/29/22

Project: Coleman Oil-Yakima 41392, F&BI 203501

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	116	116	61-133	0



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

**Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

203501

SAMPLE CHAIN OF CUSTODY

03.29.22

V03 E02

Report To: Ken Nagele

Company: PBS Engineering and Environmental

Address: 214 E Galer St, Unit 300

City, State, ZIP: Seattle, Washington 98102

Phone: 206-766-7614

Email: ken.nagele@pbsusa.com

SAMPLERS (signature)

PROJECT NAME

Coleman Oil - Yakima

REMARKS

Project Specific RIs - Yes / No

PO #

41392

INVOICE TO

TURNAROUND TIME

Standard Turnaround RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days  
Archive Samples  
Other

ANALYSERS REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Dx/SG	Notes
MW-10	01A-D	3/25/22	1320	Water	4	X	X	X				X	1 VOC broken Tue 3/22
MW-14	02		1450			X	X	X				X	14:58 Tue 3/22
MW-16	03		1416			X	X	X				X	1 VOC broken Tue 3/22
MWBNSF-1	04		1525			X	X	X				X	1 VOC broken Tue 3/22

Friedman & Bryva, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE

Relinquished by: Wesley Garcia

Received by: [Signature]

Relinquished by: [Signature]

Received by: [Signature]

PRINT NAME

Wesley Garcia

COMPANY

PBS

DATE

3/28/22

TIME

1500

Samples received at

4:00

Torala Cristata

F+R

3/29/22 9:32

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
Vineta Mills, M.S.  
Eric Young, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
(206) 285-8282  
fbi@isomedia.com  
www.friedmanandbruya.com

August 4, 2022

Ken Nogeire, Project Manager  
PBS Engineering and Environmental, Inc.  
214 E. Galer St, Suite 300  
Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on July 26, 2022 from the Coleman Oil-Yakima 41392, F&BI 207430 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
PBS0804R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 26, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Coleman Oil-Yakima 41392, F&BI 207430 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
207430 -01	MW-16
207430 -02	MW-15
207430 -03	MW-14
207430 -04	MW-10
207430 -05	MW-9
207430 -06	MW-2
207430 -07	MW-6
207430 -08	MW-1
207430 -09	MW-7
207430 -10	MW-13
207430 -11	BNSF-1
207430 -12	MW-5
207430 -13	MW-DUP

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22  
 Date Received: 07/26/22  
 Project: Coleman Oil-Yakima 41392, F&BI 207430  
 Date Extracted: 08/01/22  
 Date Analyzed: 08/02/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-16 207430-01	<1	<1	<1	<3	<100	104
MW-15 207430-02 1/100	960	<100	580	770	14,000	100
MW-14 207430-03	<1	<1	<1	<3	<100	103
MW-10 207430-04	<1	<1	<1	<3	<100	107
MW-9 207430-05	<1	<1	<1	<3	<100	106
MW-2 207430-06 1/5	90	<5	14	20	2,300	101
MW-6 207430-07 1/20	28	<20	38	<60	4,300	103
MW-1 207430-08 1/40	810	<40	60	<120	5,100	101
MW-7 207430-09	<1	<1	<1	<3	<100	103
MW-13 207430-10	<1	<1	18	35	1,400	117
BNSF-1 207430-11	<1	<1	<1	<3	<100	104

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22

Date Received: 07/26/22

Project: Coleman Oil-Yakima 41392, F&BI 207430

Date Extracted: 08/01/22

Date Analyzed: 08/02/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW-5 207430-12 1/10	83	20	32	100	7,700	106
MW-DUP 207430-13	<1	<1	18	36	1,500	115
Method Blank 02-1716 MB	<1	<1	<1	<3	<100	101

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22

Date Received: 07/26/22

Project: Coleman Oil-Yakima 41392, F&BI 207430

Date Extracted: 07/28/22

Date Analyzed: 07/28/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW-16 207430-01	110 x	<250	123
MW-15 207430-02	1,900 x	<250	121
MW-14 207430-03	<50	<250	131
MW-10 207430-04	1,400 x	400 x	125
MW-9 207430-05	1,600 x	590 x	125
MW-2 207430-06	15,000 x	770 x	150
MW-6 207430-07	4,100 x	530 x	132
MW-1 207430-08	12,000 x	840 x	ip
MW-7 207430-09	1,200 x	350 x	ip
MW-13 207430-10	1,400 x	<250	146
BNSF-1 207430-11	160 x	<250	ip
MW-5 207430-12	48,000 x	2,100 x	146

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22

Date Received: 07/26/22

Project: Coleman Oil-Yakima 41392, F&BI 207430

Date Extracted: 07/28/22

Date Analyzed: 07/28/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW-DUP 207430-13	1,600 x	270 x	147
Method Blank 02-1851 MB	<50	<250	146



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22

Date Received: 07/26/22

Project: Coleman Oil-Yakima 41392, F&BI 207430

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 207471-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	99	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	105	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/04/22

Date Received: 07/26/22

Project: Coleman Oil-Yakima 41392, F&BI 207430

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	112	111	63-142	1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

207430

07-26-22

CITY/STATE of RI

207430

Ken Nagel

207430

Ken Nagel

07-26-22

CITY/STATE of RI

Report to

Company

Address 214 E Galvest, unit 300

City, State, ZIP Seattle, WA 98102

Phone 206-766-7614 Email Ken.Nagel@prosser.com

SAMPLERS (signature) *Ken Nagel*  
PROJECT NAME Columbia Oil-Yard  
PO # 49352

REMARKS

INVOICE TO

TURNAROUND TIME  
 Standard turnaround  
 RUSH  
Rush charges authorized by:

SAMPLE DISPOSAL  
 Archive samples  
 Other  
Default: Dispose after 30 days

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082			
MW-16	01 A-D	7/21/22	1237	W	4	X	X	X							
MW-15	02		1318	W	4	X	X	X							
MW-14	03		1401	W	4	X	X	X							
MW-10	04	7/22/22	1031	W	4	X	X	X							
MW-9	05		1210	W	4	X	X	X							
MW-2	06		1325	W	4	X	X	X							
MW-6	07		1415	W	4	X	X	X							
MW-1	08		1505	W	4	X	X	X							
MW-7	09		1608	W	4	X	X	X							
MW-13	10	7/24/22	1436	W	4	X	X	X							

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Friedman & Bryna, Inc.

Ph. (206) 285-8282

Received by: *Ken Nagel*

Received by: *Ken Nagel*

Received by: *Ken Nagel*

Received by: *Ken Nagel*

Received by: *Ken Nagel*

Relinquished by: *Ken Nagel*

Relinquished by: *Ken Nagel*

Relinquished by: *Ken Nagel*

Relinquished by: *Ken Nagel*

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Received by: *Ken Nagel*

Received by: *Ken Nagel*

Received by: *Ken Nagel*

2071430

SAMPLE CHAIN OF CUSTODY

07-26-22

CIV/WV4

Report To: Ken Noszire

Company: PBS

Address: 214 E Galer St, unit 300

City, State, ZIP: Seattle, WA 98102

Phone: 206-766-7114 Email: ken.noszire@prostate.com

07-26-22

Page # 2 of 2

SAMPLERS (signature)	<u>[Signature]</u>
PROJECT NAME	<u>Colman Oil - Yarrow</u>
PO #	<u>41392</u>
REMARKS	
INVOICE TO	

TURNAROUND TIME

Standard turnaround

RUSH

Rush charges authorized by: \_\_\_\_\_

SAMPLE DISPOSAL

Archive samples

Other \_\_\_\_\_

Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED							Notes		
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082			
BNSF-1	11A-D	7/24/22	1535	W	4	X	X	X							
MW-5	12		1613	W	4	X	X	X							
MW-DUP	B		1700	W	4	X	X	X							

SIGNATURE		PRINT NAME		COMPANY		DATE	TIME
Relinquished by:	<u>[Signature]</u>	<u>Justin Garrison</u>		<u>PBS</u>		<u>7/25/22</u>	<u>1530</u>
Received by:	<u>[Signature]</u>						
Relinquished by:	<u>[Signature]</u>						
Received by:	<u>[Signature]</u>	<u>Justin Garrison</u>			<u>PBS</u>		
Received by:	<u>[Signature]</u>						
Received by:	<u>[Signature]</u>	<u>Justin Garrison</u>			<u>PBS</u>		

Friedman & Bruya, Inc.  
Ph. (206) 285-8282

Received at 5 7/26/22