2016 REMEDIAL EXCAVATION SUMMARY REPORT
MEAGHER COUNTY ROAD DEPARTMENT SHOP
WHITE SULPHUR SPRINGS, MONTANA

MDEQ Contract Number 414019
Task Order Number 13

- FINAL -

Prepared for:

Montana Department of Environmental Quality
Waste Management and Remediation Division
Post Office Box 200901
Helena, Montana 59620-0901

Prepared by:

Hydrometrics, Inc.
3020 Bozeman Avenue
Helena, Montana 59601

May 2017

TABLE OF CONTENTS

LIST OF TABLES iii
LIST OF FIGURES iii
LIST OF APPENDICES iii
1.0 INTRODUCTION 1-1
1.1 PROJECT BACKGROUND 1-3
1.1.1 Pre-2006 Investigations 1-3
1.1.2 2006 Site Investigation 1-5
1.1.3 2014 Groundwater Sampling 1-6
1.1.4 2015 Groundwater Sampling 1-7
1.1.5 2016 Site Investigation 1-8
2.0 2016 SOIL EXCAVATION INTERIM REMEDIAL ACTION 2-1
2.1 BACKFILL SOURCE SELECTION AND UTILIZATION 2-3
2.1.1 Backfill Utilization 2-4
2.2 MCMW-2 AREA EXCAVATION 2-5
2.2.1 MCMW-2 Area Excavation Confirmation Soil Sampling Analytical Results 2-6
2.3 OLD SHOP AREA EXCAVATION 2-9
2.3.1 Old Shop Area Excavation Confirmation Soil Sampling 2-11
2.4 DISCUSSION OF SOIL CONFIRMATION SAMPLE RESULTS 2-14
2.4.1 Direct Contact Construction Tier 1 RBSL Exceedances 2-14
2.4.2 Leaching To Groundwater Tier 1 RBSL Exceedances 2-14
2.4.3 Potential for Vapor Intrusion 2-17
3.0 MONITORING WELL REPLACEMENT 3-1
3.1 GROUNDWATER MONITORING BACKGROUND 3-1
3.2 MONITORING WELL MCMW-2R2 INSTALLATION 3-1
4.0 DATA QUALITY REVIEW 4-1
5.0 CONCLUSIONS 5-1
6.0 REFERENCES 6-1

LIST OF TABLES

TABLE 2-1. MEAGHER COUNTY PIT-RUN STOCKPILE BACKFILL SOURCE SAMPLES, ANALYTICAL RESULTS AND MONTANA BACKGROUND THRESHOLD VALUES.....2-4
TABLE 2-2. MCMW-2 AREA EXCAVATION CONFIRMATION SOIL SAMPLING ANALYTICAL RESULTS 2-8
TABLE 2-3. OLD SHOP AREA EXCAVATION WATER SAMPLING ANALYTICAL RESULTS.....2-10
TABLE 2-4. OLD SHOP AREA EXCAVATION CONFIRMATION SOIL SAMPLING ANALYTICAL RESULTS 2-12

LIST OF FIGURES

FIGURE 1-1. GENERAL LOCATION MAP 1-2
FIGURE 1-2. SITE LAYOUT AND PRE-EXCAVATION ESTIMATE OF CONTAMINATED SOIL AREAS.....1-4
FIGURE 2-1. 2016 REMEDIAL EXCAVATION AREA AND CONFIRMATION SAMPLING SITES.....2-2
FIGURE 2-2. GROUNDWATER BENZENE, TPH, AND TEH CONCENTRATION TRENDS, WELLS MCMW-3/3R AND MCMW-2/2R 2-16

LIST OF APPENDICES

APPENDIX A PROJECT SITE ACTIVITY CHECKLISTS
APPENDIX B PROJECT FIELD NOTES
APPENDIX C EXCAVATED SOIL DISPOSAL RECORD
APPENDIX D MCMW-2 AREA EXCAVATION & BACKFILL PHOTOLOG

APPENDIX E	OLD SHOP AREA EXCAVATION & BACKFILL PHOTOLOG
APPENDIX F	HYDROMETRICS, INC. STANDARD OPERATING PROCEDURES
APPENDIX G	MCMW-2 AREA EXCAVATED SOIL ANALYTICAL RESULTS
APPENDIX H	OLD SHOP AREA EXCAVATED SOIL ANALYTICAL RESULTS
APPENDIX I	OLD SHOP AREA EXCAVATION PIT WATER ANALYTICAL RESULTS
APPENDIX J	MEAGHER COUNTY REMEDIAL EXCAVATION DATA VALIDATION REPORTS
APPENDIX K	BACKFILL MATERIAL ANALYTICAL RESULTS
APPENDIX L	MCMW-2R2 REPLACEMENT MONITORING WELL INSTALLATION LOG & NOTES

2016 REMEDIAL EXCAVATION SUMMARY REPORT
MEAGHER COUNTY ROAD DEPARTMENT SHOP
WHITE SULPHUR SPRINGS, MONTANA

- FINAL -

1.0 INTRODUCTION

The Meagher County Road Department Shop (the Site) comprises an office and shop buildings within the equipment maintenance yard area at 508 West Garfield Street in the southwest portion of White Sulphur Springs, Montana (Figure 1-1). The Site is used for storage and maintenance of the County Road Department vehicles and equipment.

In the late 1980s, county employees discovered hydrocarbon-impacted soils while excavating for construction of the West Shop building. A 1989-1990 Site investigation revealed elevated concentrations of petroleum hydrocarbons in Site soils and groundwater (Hydrometrics, 1990). Subsequent sampling in 2002 and 2003 indicated that hydrocarbon concentrations remained elevated in shallow groundwater beneath the Site (Hydrometrics, 2002 and 2004).

Based on results of the 2003 Site investigation (Hydrometrics, 2004), the Montana Department of Environmental Quality (DEQ) requested that Meagher County undertake an additional Site investigation to delineate the extent of hydrocarbon-impacted soils which may act as sources for groundwater contamination. Subsequent investigations included:

- A 2006 Site investigation delineating hydrocarbon-contaminant source areas at the Site (Hydrometrics, 2008);
- Groundwater sampling events in 2014 (Hydrometrics, 2015) and 2015 (Hydrometrics, 2016a) to assess groundwater quality; and
- Soil and groundwater sampling March-April 2016 to further delineate the current nature and extent of hydrocarbon contamination to assist in planning Site remediation (Hydrometrics, 2016b).

Interim site remedial activities were initiated with Meagher County's in-kind August 2016 demolition of the Site's old garage/shop building. Utilizing SB-96 funding approved by the

2016 REMEDIAL EXCAVATION MEAGHER COUNTY ROAD DEPARTMENT SHOP SUMMARY REPORT	**GENERAL LOCATION MAP**	FIGURE **1-1**

Updated: 5/10/2017
I:\Land Projects\1604801\GIS\1604801H001.mxd

Hydrometrics, Inc.
Consulting Scientists and Engineers

2015 Montana Legislature, DEQ retained Hydrometrics to plan and oversee subsequent remedial activities including excavation and disposal of hydrocarbon-contaminated soil, excavation confirmation sampling, and excavation backfill using Meagher County in-kind supplies of fill material.

1.1 PROJECT BACKGROUND

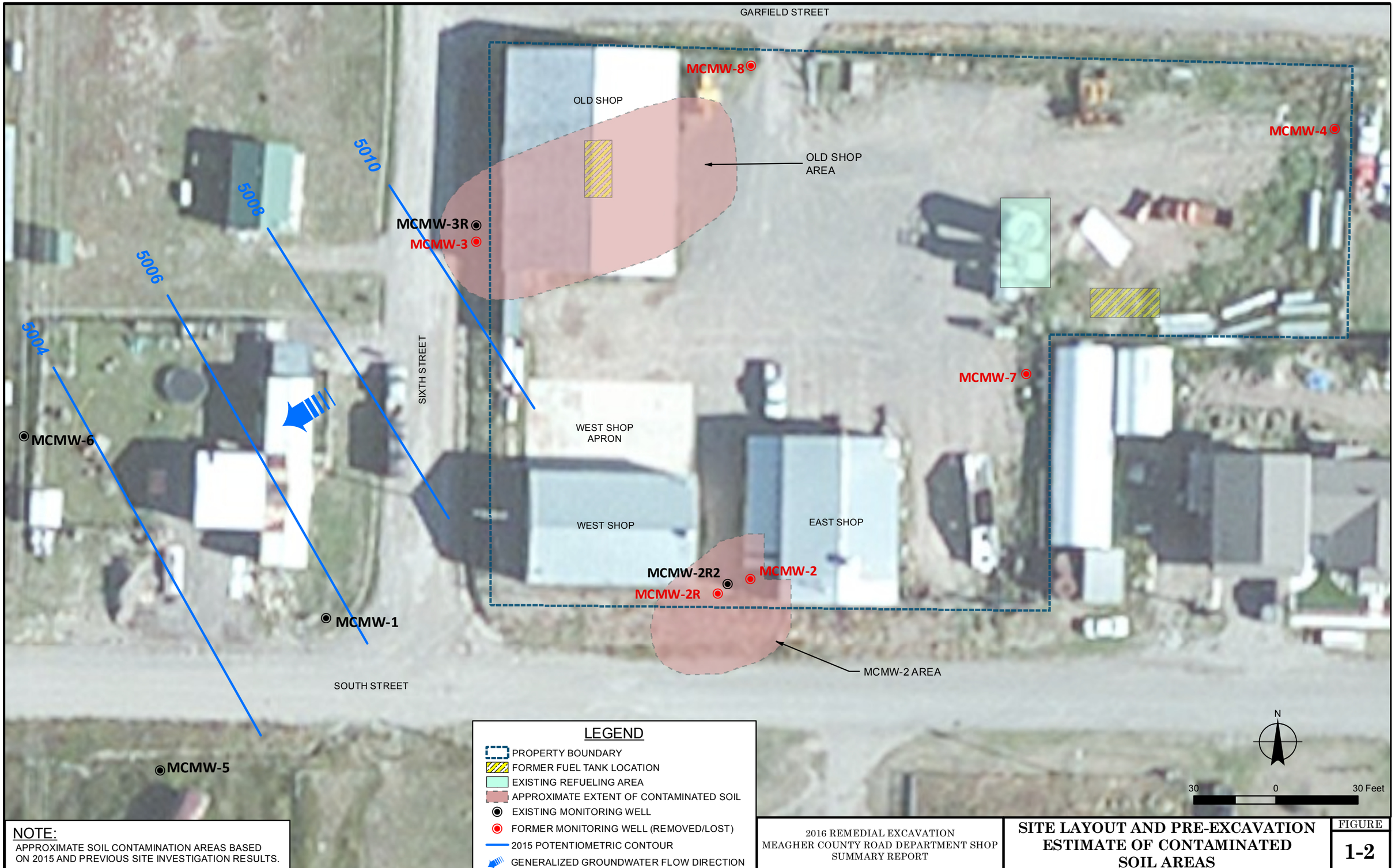
The Site encompasses approximately 1.2 acres and includes an office/shop building (East Shop), a shop/garage building (West Shop), and fuel storage and dispensing facilities (Figure 1-2). The former old garage/shop building (Old Shop) on the northwest corner of the Site was demolished in August 2016. The Site is bordered by South Street on the south side (with an open field immediately to the south), Sixth Street on the west side (with private residences immediately to the west), Garfield Street on the north side (with Montana Department of Transportation (MDT) maintenance and storage facilities immediately to the north) and private residences on the east side (Figure 1-2).

Hydrocarbon-impacted soils were first discovered by county employees in the late 1980s during excavation for a new garage/shop building (West Shop) in the southwest portion of the Site (Figure 1-2). Because the petroleum contamination was discovered prior to the establishment of the Petroleum Tank Compensation Fund, the release is likely not eligible for reimbursement. Potential source(s) of the hydrocarbon contaminants identified at that time included known past fuel surface spills and, possibly, leaks from fuel tanks and/or buried piping. Fuel storage tanks previously located on Site include a gasoline fuel tank located in a sump (a dirt-floor pit) within the Old Shop building, and a 10,000-gallon underground gasoline tank formerly located in the east portion of the Site (Figure 1-2). Both tanks and associated buried piping were reportedly excavated and removed from the Site by 1990 without regulatory oversight. Reportedly, the tanks appeared competent when they were removed. Unleaded gasoline and diesel fuel are currently stored in above ground tanks encircled by containment berms. The Site was listed on DEQ's Groundwater Remediation Program site list in 1989.

1.1.1 Pre-2006 Investigations

On behalf of Meagher County, Hydrometrics conducted a Site investigation at the equipment maintenance yard in 1989 and 1990 (Hydrometrics, 1990). The 1989-1990 Site investigation included excavation of 21 backhoe test pits and five auger boreholes for subsurface characterization and soil sampling, installation of five monitoring wells and groundwater sampling.

The 1989-1990 investigation revealed hydrocarbon impacts to soils and groundwater in two primary areas: (1) the Old Shop building, where a gasoline tank was formerly located, and



NOTE:
APPROXIMATE SOIL CONTAMINATION AREAS BASED ON 2015 AND PREVIOUS SITE INVESTIGATION RESULTS.

2016 REMEDIAL EXCAVATION
MEAGHER COUNTY ROAD DEPARTMENT SHOP
SUMMARY REPORT

SITE LAYOUT AND PRE-EXCAVATION ESTIMATE OF CONTAMINATED SOIL AREAS

FIGURE
1-2

Updated: 5/8/2017
I:\Land Projects\1604801\GIS\1604801H002.mxd

Hydrometrics, Inc.
Consulting Scientists and Engineers

(2) the southwest corner of the East Shop building near monitoring well MCMW-2 (Figure 1-2). Although present in other areas, hydrocarbon concentrations in these two areas were significantly higher than the remainder of the Site. Groundwater sampling results from July 2002 revealed elevated hydrocarbon concentrations in shallow groundwater within and immediately west of the Site, similar to concentrations detected during the 1989-1990 investigation.

In 2003, three additional monitoring wells (MCMW-6, -7, and -8; Figure 1-2) were installed and semi-annual groundwater sampling conducted at all Site monitoring wells. The 2003 Site Investigation Report (Hydrometrics, 2004) concluded:

- As of 2003 (and consistent with previous monitoring results), elevated hydrocarbon concentrations persisted in portions of the shallow groundwater system underlying the Site, particularly at monitoring wells MCMW-2 and MCMW-3. Differences in hydrocarbon signatures in the areas near well MCMW-3 (primarily gasoline range organics) and MCMW-2 (primarily diesel range organics) indicated two separate sources.
- Spatial trends in groundwater contaminants indicated the source areas were located within the footprint of the Old Shop building (upgradient of MCMW-3), and in the immediate vicinity of MCMW-2.
- Due to the consistent and relatively localized hydrocarbon concentrations present in Site groundwater over the past years, it was likely that hydrocarbon-impacted soils were continuing to act as source(s) of contaminants to shallow groundwater.

1.1.2 2006 Site Investigation

Based on the previous Site investigation results, Hydrometrics conducted an additional investigation in 2006 to further delineate the vertical and lateral distribution of hydrocarbon-impacted soils near the two suspected source areas (the Old Shop building and around monitoring well MCMW-2), and to assess the correlation between impacted soils and elevated hydrocarbon concentrations in groundwater. The 2006 investigation involved completion of ten soil borings using direct-push drilling, with lithologic logging of each boring core and collection of soil samples from targeted depths for analysis of hydrocarbon constituents, as well as semi-annual groundwater sampling at all Site monitoring wells. Consistent with the prior conceptual model of the site, the 2006 results provided additional indication that two primary areas of hydrocarbon contamination existed at the site: the Old Shop building and the area near monitoring well MCMW-2.

The results of the 2006 site investigation were summarized in a 2006 Site Investigation Report (Hydrometrics, 2008). Primary conclusions presented in the report included:

- Hydrocarbon concentrations in shallow groundwater remained elevated at two specific locations on and adjacent to the site, including monitoring wells MCMW-2 and MCMW-3. Well MCMW-2 exhibits elevated concentrations of heavier, diesel range hydrocarbons, while MCMW-3 is characterized by lighter gasoline range compounds. The difference in chemical signature, and the fact that the wells are cross-gradient to one another, indicates separate sources of petroleum compounds for these two areas.
- Although relatively low level hydrocarbons (EPH and VPH constituents) were present in groundwater samples from some other site wells, including upgradient well MCMW-4, exceedences of groundwater quality standards and risk-based screening levels (RBSLs) were limited to wells MCMW-2 and MCMW-3.
- Hydrocarbon concentrations at downgradient wells MCMW-1 and MCMW-6 were either near or below the analytical detection limits, indicating groundwater-borne contaminants had not migrated appreciably off-site. Off-site migration potential is likely limited by very low groundwater flow rates through the clayey soils, and possibly through natural attenuation.
- Based on the site history and site investigation results, petroleum-impacted soils in and around the old garage/shop building are believed to be the source of elevated hydrocarbon concentrations in groundwater at MCMW-3. A gasoline storage tank formerly located in the old garage/shop is suspected of being responsible, at least in part, for the elevated hydrocarbon concentrations in this area. The dirt floor in the building, coupled with the shallow water table (3 to 5 feet below ground surface), suggests that past surface spills of petroleum products may have contributed to the elevated hydrocarbon concentrations in this area as well. Similarly, hydrocarbon-impacted soils in the immediate vicinity of monitoring well MCMW-2 are responsible for the elevated diesel range hydrocarbons in this well. Soil sampling results showed hydrocarbon concentrations were relatively high immediately adjacent to the well, but decreased rapidly with distance from the well.
- As noted during previous site investigations, due to the consistent and relatively localized hydrocarbon concentrations present in Site groundwater over an extended period (greater than 15 years), it was likely that hydrocarbon-impacted soils were continuing to act as source(s) of contaminants to shallow groundwater.

1.1.3 2014 Groundwater Sampling

At the request of the Meagher County Commissioners, Hydrometrics conducted a groundwater sampling event at the Meagher County Site on November 7, 2014 (Hydrometrics, 2015). Prior to the event, four Site monitoring wells (MCMW-2, MCMW-4,

MCMW-7, and MCMW-8) were removed by Meagher County to accommodate maintenance yard activities. The 2014 sampling event found low or below detect hydrocarbon concentrations observed in the three downgradient off-site monitoring wells (MCMW-1, MCMW-5, and MCMW-6), continuing to indicate minimal or no impact from the Site (as observed during previous groundwater monitoring). Conversely, the groundwater sample from Site well MCMW-3 contained detectable concentrations of all volatile petroleum hydrocarbon constituents (except MTBE), with a number of constituent concentrations exceeding applicable groundwater quality standards or RBSLs. The sample also exceeded the 1,000 µg/L TEH screen level for EPH, with the EPH fractionation resulting in detectable concentrations of C9-C18 aliphatics, C11-C22 aromatics, and TEHs (the latter exceeding the RBSL).

A comparison of concentrations over time for well MCMW-3 conducted after collection and analysis of the 2014 groundwater samples (Hydrometrics, 2015) showed that concentrations of the lighter phase hydrocarbon constituents benzene, toluene, xylenes, naphthalene, and total petroleum hydrocarbons had all decreased from October 2003 to November 2014, while the heavier extractable petroleum hydrocarbons show mixed trends depending on the specific parameter. Concentration decreases ranged from 30% for benzene to 68% for naphthalene, with total purgeable hydrocarbons decreasing 48%. Overall, the 2014 sampling results indicated decreases in VPH concentrations at well MCMW-3 since 2003, and stable concentrations of EPH constituents based on the fractionation analyses.

1.1.4 2015 Groundwater Sampling

At the request of the Meagher County Commissioners, Hydrometrics conducted a groundwater sampling event at the Meagher County Site on December 1, 2015 (Hydrometrics, 2016a). Results for this sampling event continued to show low or below detect hydrocarbon concentrations in the three downgradient wells (MCMW-1, MCMW-5, and MCMW-6), indicating minimal or no impact from the Site. The December 2015 groundwater sample from Site well MCMW-3 contained detectable concentrations of all volatile petroleum hydrocarbon constituents (except MTBE), with a number of constituent concentrations exceeding applicable groundwater quality standards or RBSLs. The sample also exceeded the 1,000 µg/L TEH screen level for EPH, with the EPH fractionation resulting in detectable concentrations of C11-C22 aromatics and TEHs (the latter exceeding the RBSL).

The hydrocarbon concentrations observed at well MCMW-3 in December 2015 represented increases from the concentrations observed in November 2014 samples. For example, the November 2014 benzene concentration at this well of 2,950 µg/L increased to 5,400 µg/L in the December 2015 sample, total purgeable hydrocarbons increased from 20,200 µg/L to 50,000 µg/L, and TEHs increased from 5,350 µg/L to 6,430 µg/L over the same period.

Overall, concentrations of most hydrocarbon constituents analyzed in December 2015 were approximately double those reported in November 2014 from well MCMW-3 (Hydrometrics, 2016a). The analytical laboratory verified the December 2015 results through procedural checks (review of calibration, dilution factors, and other analytical procedures) and reanalysis of BTEX constituents using a different analytical method (EPA Method 8260). The increase in groundwater hydrocarbon concentrations in December 2015 relative to November 2014 was potentially related to the observed relatively large decrease in groundwater levels (a 1.26 foot decrease on average at the four site wells) over the same time period, since decreasing groundwater levels and associated groundwater flux can increase groundwater contaminant concentrations due to a lack of dilution.

The overall increase in groundwater hydrocarbon concentrations in December 2015 and the continued exceedance of DEQ-7 standards for multiple constituents at well MCMW-3 suggested an ongoing source in this area (i.e., local soils) contributing to the observed groundwater contamination. Additional groundwater monitoring and site investigation was conducted in early 2016 to further evaluate ongoing contaminant loading to groundwater and possible remedial alternatives.

1.1.5 2016 Site Investigation

At the request of Meagher County, Hydrometrics completed additional work at the Site in March-April 2016 under Montana Department of Natural Resources and Conservation (DNRC) Planning Grant RITP-16-0119. Objectives of the work performed under this Planning Grant (Hydrometrics, 2016a) were:

1. Further delineation of the areal extent and characteristics of hydrocarbon-contaminated soil at the Site and the relationship of sources to offsite migration of groundwater contaminants; and
2. Obtaining information necessary to develop an appropriate plan to remediate contaminated soils and mitigate offsite migration of related groundwater contaminants.

Replacement monitoring wells MCMW-2R and MCMW-3R were installed as part of the 2016 Planning Grant work.

The 2016 investigation confirmed the presence of two primary soil contamination areas, the Old Shop Area and the MCMW-2 Area. The approximate extent of hydrocarbon-contaminated soils in these two areas, as determined through multiple site investigations from 1989 through 2016, is shown on Figure 1-2. Soil TCLP data collected during the 2016 work indicated that contaminated soils were not a characteristic hazardous waste, thus

reducing the restrictions on soil handling, storage and disposal and increasing options for Site remediation.

Groundwater quality data from replacement well MCMW-3R showed a significant improvement from prior sampling results, most likely due to the excavation of approximately 10 cy of contaminated soil and replacement with clean soil during completion of replacement well MCMW-3R. For example, the benzene concentration at MCMW-3 in December 2015 (5,400 µg/L) decreased to 33 µg/L at replacement well MCMW-3R in April 2016, and the total purgeable hydrocarbon concentration decreased from 50,000 µg/L to 1,050 µg/L over the same period. Groundwater RBSL exceedances noted during the 2016 investigation were limited to benzene and C9-C10 aromatics at well MCMW-2R, and benzene at well MCMW-3R. These results indicated that removal of the highly impacted soils in the Old Garage/Shop Area would have a significant effect on groundwater quality in this area.

The information gained through the soil investigation and groundwater monitoring activities summarized above was used by DEQ to develop an interim remedial action for the Site, consisting of excavation of petroleum-contaminated soil with appropriate confirmation sampling. This interim remedial action was implemented in late summer and fall 2016 and is the subject of this report.

2.0 2016 SOIL EXCAVATION INTERIM REMEDIAL ACTION

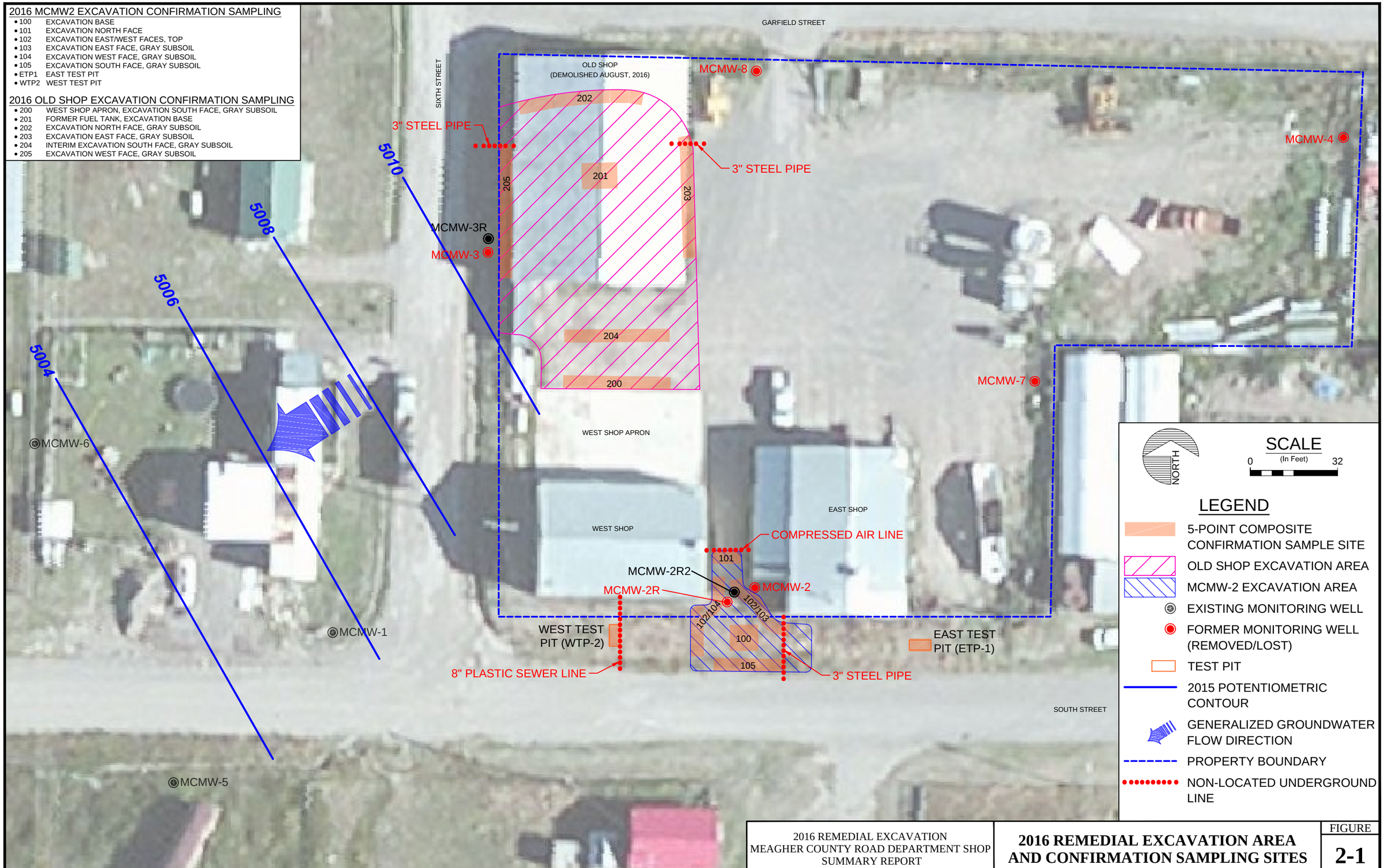
Interim Site remedial activities were initiated with Meagher County's in-kind demolition of the Site's old garage/shop (the Old Shop) building in August 2016. The Old Shop covered much of the contaminated soil, and its removal was necessary to allow for excavation of the contaminated soil. Meagher County coordinated with DEQ's Asbestos Control Program regarding potential asbestos concerns. Following demolition, DEQ and Hydrometrics met with Meagher County Commissioners and Meagher County Road Department employees on August 31, 2016 to inspect the Site and review plans for 2016 Site excavation and backfill of the Old Shop Area and the MCMW-2 Area. After the site meeting, Meagher County Luppold Road and Airport gravel pit backfill sources were inspected and sampled, as well as, at Meagher County's request, a stockpile of clay material excavated by 2015 City of White Sulphur Springs street reconstruction and hauled to the Luppold Road gravel pit. Checklist documentation for the meeting and inspections is provided in Appendix A; backfill sampling notes are included in Appendix B.

Excavation, backfill, and general project operations hazards were mitigated with pre-project utility locates, daily project personnel safety meetings, and Site controls including maintained exclusion zone fencing/flagging/cones and street closures with the approval of Meagher County, City of White Sulphur Springs, and Northwest Energy personnel.

Following project preparation and recruitment of the project earthwork and disposal sub-contractor Weave Consulting (Weave) in September 2016, remedial excavation began at the MCMW-2 Area on October 3, 2016 under Hydrometrics' oversight. Daily project field notes are presented in Appendix B. Excavated hydrocarbon-contaminated soils and entrained waters were hauled by Weave for regulated disposal at the Tri-County Disposal Valley View Landfill (VVL) south of East Helena, Montana. Landfill disposal records for the excavated material are provided in Appendix C. Photologs of project activity are presented in Appendix D (MCMW-2 Area) and Appendix E (Old Shop Area). Project remedial excavation concluded at the Old Shop Area on October 26, 2016. Excavation areas are highlighted in Figure 2-1.

In addition to general project oversight, Hydrometrics monitored excavated soil hydrocarbon contamination with a MiniRae 3000 portable photoionization detector (PID) to provide general direction, depth, and confirmation sampling guidance concurrent with excavation activities. PID readings are included in the daily field notes in Appendix B.

Hydrometrics conducted 5-point composite confirmation soil sampling to assess and document hydrocarbon contamination at the limits of final excavation. Confirmation



2016 REMEDIAL EXCAVATION
MEAGHER COUNTY ROAD DEPARTMENT SHOP
SUMMARY REPORT

2016 REMEDIAL EXCAVATION AREA AND CONFIRMATION SAMPLING SITES

FIGURE
2-1

UPDATE TIME: 4:16 PM
SPLETTENBERG\HEL\20170508\I:\LAND PROJECTS\1604801\DWG\1604801H002.DWG

Hydrometrics, Inc.
Consulting Scientists and Engineers

sampling was conducted according to Hydrometrics' standard operating procedures HSSOP-6 and HSSOP-57 (*see* Appendix F). Confirmation soil sampling site selection was based on excavated face examinations (including PID screening, visual appearance, presence or absence of hydrocarbon odors, and infrastructure limitations such as Site buildings, streets, and major underground utilities) and consultation with DEQ and Meagher County. Confirmation sampling locations are shown on Figure 2-1. The confirmation samples were analyzed by Energy Laboratories in Helena, Montana. Results of confirmation sample analysis are presented in Appendix G (MCMW-2 Area Soil) and Appendices H and I (Old Shop Area Soil and Water). Confirmation soil sample results are summarized in Tables 2-2 and 2-4 and corresponding data validation reports are provided in Appendix J.

2.1 BACKFILL SOURCE SELECTION AND UTILIZATION

At the August 31, 2016 pre-project meeting with DEQ and Hydrometrics, Meagher County representatives identified potential sources of backfill including stockpiled and in-situ pit-run materials at the Meagher County Airport (MCA) and Luppold Road gravel pits and a stockpile of clay material from City of White Sulphur Springs street reconstruction hauled to the Meagher County Luppold Road gravel pit. After the site meeting, the Meagher County Luppold Road and Airport gravel pit backfill sources were inspected and sampled. Hydrometrics and Meagher County met with local MDT personnel involved in the City of White Sulphur Springs street reconstruction project to discuss the stockpiled yellow clay material. Checklist documentation for the pre-project meeting and inspections with Meagher County is provided in Appendix A; backfill sampling notes are included in Appendix B.

Based on the site inspection, sampling observations, and discussions with MDT, Meagher County and City of White Sulphur Springs personnel, pit-run stockpile samples from the MCA and Luppold Road gravel pits were submitted to Energy Laboratories for laboratory analysis of bulk sample metals levels and to Pioneer Technical Services for geotechnical testing (Standard Proctor Moisture/Density). Clay material stockpiled from the City of White Sulphur Springs street reconstruction at the Meagher County Luppold Road gravel pit was not considered for project use due to reported sensitivity to moisture changes that might cause construction difficulties (MDT, 2016).

Laboratory and geotechnical test reporting (Appendix K) indicated pit-run material from both Meagher County gravel pits would be suitable for project backfill. The MCA pit-run stockpile was chosen for use, in consultation with DEQ and Meagher County, as it was the only source available in sufficient volume for project use. Based on this decision, the MCA pit-run sample fine fraction (<250 µm) was analyzed for metals levels. MCA pit-run laboratory metals data for the fine soil fraction is compared with corresponding Montana Background Threshold Values (BTVs) and Luppold Road pit-run bulk metals data in Table 2-1. Comparison of the data indicates no MCA backfill source exceedances of background

threshold values. Review of pit-run samples laboratory analytical data (*see* Section 4.0) indicated no quality assurance/quality control issues.

TABLE 2-1. MEAGHER COUNTY PIT-RUN STOCKPILE BACKFILL SOURCE SAMPLES, ANALYTICAL RESULTS AND MONTANA BACKGROUND THRESHOLD VALUES

Meagher County Airport Pit-Run Stockpile Backfill Source Sample APRP-1 Total Metals (fine fraction), mg/kg							
Arsenic	**Barium**	**Cadmium**	**Chromium**	**Lead**	**Selenium**	**Silver**	**Mercury**
15	151	<1	28	22	<1	<1	<0.5
Meagher County Luppold Road Pit-Run Stockpile Backfill Source Sample LPRP-1 Total Metals (bulk), mg/kg							
Arsenic	**Barium**	**Cadmium**	**Chromium**	**Lead**	**Selenium**	**Silver**	**Mercury**
5	67	<1	13	15	<1	<1	<0.5
Montana DEQ Background Threshold Values for Inorganics in Montana Soils Total Metals (fine fraction), mg/kg							
Arsenic	**Barium**	**Cadmium**	**Chromium**	**Lead**	**Selenium**	**Silver**	**Mercury**
22.5	429	0.7	41.7	29.8	0.7	0.3	NC

NC = Not Calculated

2.1.1 Backfill Utilization

A total of approximately 2900 cubic yards of backfill material was supplied and loaded by Meagher County from its MCA stockpile as an in-kind contribution to the project, including approximately 500 cubic yards to fill the MCMW-2 excavation and 2400 cubic yards to fill the Old Shop Area excavation. Backfill haulage and placement (utilizing Weave and Meagher County in-kind contribution personnel/equipment) and compaction by Weave was completed November 2, 2016. Backfill photos are included in Appendix D (MCMW-2 Area) and Appendix E (Old Shop Area) photologs. Mid-depth and final-grade compaction testing performed on Old Shop Area compacted backfill by Pioneer Technical Services indicated suitable compaction for future site construction. Field compaction testing results are presented in Appendix K.

DEQ's guidance for backfill utilization recommends the collection of approximately one composite backfill sample for every 400 cubic yards of backfill material brought into a site, unless a lesser frequency is justified and approved. For this project, for the 2,900 cubic yards of backfill utilized, ideally, seven samples should have been collected (unless otherwise approved). However, as stated above, due to an oversight Hydrometrics collected only two fill samples for metals. Both composite soil samples from the gravel pit showed metals results less than DEQ's Montana Background Threshold Values. The gravel pit lies within one soil type, the Binna-Utica complex, which suggests the fill material should be fairly homogenous. Soil mapping information from the Natural Resources Conservation Service indicates soils in the Binna-Utica complex are derived from limestone parent material. For these reasons, the initial metals results collected from the Meagher County gravel pit are believed to be representative of the fill material used at the Site.

2.2 MCMW-2 AREA EXCAVATION

The approximate area of hydrocarbon contamination in the area of monitoring well MCMW-2 and its replacement well is located between (and under) the southwest corner of the Site East Shop building, the southeast corner of the Site West Shop building, extending south (and under) South Street (Figure 1-2). Accurate GPS survey of the final excavation perimeter was not possible due to the small area of the excavation and poor instrument resolution. Figure 2-1, daily project field notes (Appendix B), and the Appendix D photolog provide reference for the following MCMW-2 Area excavation discussion.

Remedial excavation at the MCMW-2 Area was completed October 3-10, 2016 between the East and West Shop buildings, extending south to South Street and east between the East Shop building and South Street until the East Shop sewer service line was encountered. Excavation monitoring identified unimpacted surface gravelly soils to approximately 3-4 feet below ground surface (bgs), subtended by a subsurface zone of hydrocarbon-impacted gravelly gray sandy clay material at approximately 4-7 feet bgs over unimpacted cobbly brown clay extending to final excavation depth of approximately 10-12 feet. Groundwater encountered at approximately 6-9 feet bgs and accumulating in excavation bottoms was either pumped to the Old Shop Area to maintain excavation wall stability or excavated with impacted soils for landfill disposal.

In order to protect the stability of the East and West Shop buildings and South Street, as well as the East Shop underground clay sewer service line, impacted soils could not be excavated closer than 1-2 feet from the respective features, leaving an indeterminate amount of impacted soils below the shop buildings and below/along South Street. In consultation with DEQ and Meagher County, these features limited the final extent of MCMW-2 Area excavation to approximately 1000 square feet. To evaluate the extent of subsurface hydrocarbon impacts on the South Street shoulder further east and west of the MCMW-2

excavation, two test pits were excavated and sampled in the South Street shoulder between South Street and the East Shop building (East Test Pit or ETP-1) and between South Street and the West Shop building (West Test Pit or WTP-2) (Figure 2-1).

In addition to the East Shop underground clay sewer service line, MCMW-2 Area excavation encountered three underground lines that were not properly located prior to excavation. The locations of these lines are presented in Figure 2-1. These include:

- A ¾-inch copper compressed air line between the East and West Shops at the north limit of excavation (incorrect location, damaged during excavation and repaired by Meagher County personnel prior to backfill);
- An apparently abandoned 3-inch steel pipe between the southwest corner of the East Shop building and South Street (missed by utility locate, uncovered during excavation, inspected by Meagher County and City of White Sulphur Springs personnel, cut, no odor or material in pipe, capped prior to backfill); and
- An 8-inch plastic sewer line (missed by utility locate, damaged during West Test Pit excavation and repaired by Meagher County personnel/local contractor prior to backfill).

MCMW-2 Area excavation also encountered and removed the original (abandoned) MCMW-2 monitoring well and its replacement, monitoring well MCMW-2R.

A total of approximately 700 cubic yards (yards) of MCMW-2 Area soil was excavated, loaded, and hauled to landfill disposal. Due to the limited work space for excavation and loading between the shop building and between the buildings and South Street, and the variability in impacted soil depths, unimpacted surface soils could not be segregated prior to loading for landfill disposal and were ultimately disposed along with the contaminated soils.

2.2.1 MCMW-2 Area Excavation Confirmation Soil Sampling Analytical Results

Five-point composite confirmation soil samples were collected from the north, east, west, and south excavation faces, the base of the excavation, and from the East and West Test Pits on the South Street shoulder to document subsurface soil conditions before backfill placement. These confirmation sample locations are shown on Figure 2-1, and included:

- **Sample MCMW-100** from soil at the base (bottom) of the final excavation area;
- **Sample MCMW-101** from subsurface soil on the north face of the final excavation area;
- **Sample MCMW-102** from surface soils on the east and west face of the final excavation area at the base of the East and West Shop buildings;

- **Sample MCMW-103** from gray impacted subsurface soils on the east face of the final excavation area at the base of the East Shop building;
- **Sample MCMW-104** from gray impacted subsurface soils on the west face of the final excavation area at the base of the West Shop building;
- **Sample MCMW-105** from gray impacted subsurface soils on the south face of the final excavation area at South Street;
- **Sample ETP-1** from gray impacted subsurface soils in the East Test Pit east of the final excavation area between the East Shop building and South Street; and
- **Sample WTP-2** from gray impacted subsurface soils in the West Test Pit west of the final excavation area between the West Shop building and South Street.

MCMW-2 Area excavation confirmation samples were submitted to Energy Laboratories in Helena, Montana for EPH/VPH analysis. Results of laboratory analysis are presented in Table 2-2. Review of the laboratory data indicate exceedances of Tier 1 RBSLs for either leaching to groundwater or direct contact construction (DCC) screening levels (DEQ, 2016) at the following final excavation face sampling sites (Table 2-2):

Leaching to Groundwater Tier 1 RBSL Exceedances

- C9-C10 aromatics and C11-C22 aromatics in gray impacted subsurface soils on the east face of the final excavation area at the base of the East Shop building (sample MCMW2-103);
- C9-C10 aromatics in gray impacted subsurface soils on the west face of the final excavation area at the base of the West Shop building (sample MCMW2-104); and
- C9-C10 aromatics and C11-C22 aromatics in gray impacted subsurface soils on the south face of the final excavation area at South Street (sample MCMW2-105).

Leaching to groundwater RBSL exceedances were also noted for several constituents in gray impacted subsurface soils in East Test Pit ETP-1 (C11-C22 aromatics) and West Test Pit WTP-2 (C9-C10 aromatics, naphthalene, C11-C22 aromatics, and 2-methylnapthalene).

Direct Contact Construction Tier 1 RBSL Exceedances

- C9-C18 aliphatics in gray impacted subsurface soils on the east face of the final excavation area at the base of the East Shop building (sample MCMW2-103); and
- C9-C18 aliphatics in gray impacted subsurface soils on the south face of the final excavation area at South Street (sample MCMW2-105).

DCC Tier 1 RBSL exceedances were also noted for C9-C18 aliphatics in West Test Pit WTP-2. As described in detail in Section 2.4.1 of this report, although the C9-C18 aliphatics results in these samples exceeded the Tier 1 DCC RBSL, the results did not exceed the DEQ-adjusted DCC RBSL for the C9-C18 aliphatics fraction.

Table 2-2. MCMW-2 Area Excavation Confirmation Soil Sampling Analytical Results
Meagher County Shop Remedial Action, October 2016

Constituent	Tier 1 RBSLs		Tier 2 RBSL	Meagher County Confirmation Sample Results[1]							
	Leaching to GW 0-10 Feet	Direct Contact Construction	DEQ-Adjusted Direct Contact Construction	Sample MCMW2- 100 Base	101 N Face	102 EW Top	103 E Gray	104 W Gray	105 S Gray	ETP1 E Test Pit	WTP2 W Test Pit
C5-C8 Aliphatics	220	**410**	----	<2.3	<2.2	<2.2	41	20	8.6	<2.3	61
C9-C12 Aliphatics	11000	**640**	----	2.3	2.0	2.7	533	476	331	7.5	614
C9-C10 Aromatics	130	**1000**	----	<2.3	<2.2	<2.2	341	271	214	5.4	409
MTBE	0.078	**8900**	----	<0.11	<0.11	<0.11	<0.24	<0.23	<0.11	<0.12	<0.12
Benzene	0.07	**240**	----	<0.057	<0.055	<0.056	<0.12	<0.12	<0.056	<0.058	<0.06
Toluene	21	**5500**	----	<0.057	<0.055	<0.056	<0.12	<0.12	<0.056	<0.058	<0.06
Ethylbenzene	26	**1300**	----	<0.057	<0.055	<0.056	3.7	1.0	1.2	<0.058	4.0
Xylenes	320	**610**	----	<0.057	<0.055	<0.056	2.7	2.0	0.69	<0.058	0.96
Naphthalene	12	**140**	----	<0.11	<0.11	<0.11	12	8.3	7.3	0.41	15
EPH Screen	200	**200**	----	9.8	7.3	17	**4310**	**612**	**5780**	**8000**	**12100**
C9-C18 Aliphatics	53000	**900**	**7200**[2]	--	--	--	**2400**	408	**2960**	<56	**4860**
C19-C36 Aliphatics	NA	**200000**	----	--	--	--	393	120	598	4910	939
C11-C22 Aromatics	370	**3900**	----	--	--	--	1500	146	1510	871	2820
Acenaphthene	260	**3800**	----	--	--	--	<1.2	0.35	0.96 (J)	<1.9	<2.4
Anthracene	2600	**19000**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Benz(a)anthracene	6.8	**54**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Benzo(a)pyrene	2.3	**5.4**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Benzo(b)fluoranthene	23	**54**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Benzo(k)fluoranthene	230	**540**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Chrysene	690	**5400**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Dibenzo(a,h)anthracene	7.5	**5.4**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Fluoranthene	550	**2500**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Fluorene	770	**2500**	----	--	--	--	0.87	0.91	2.7	<1.9	4.9
Indeno(1,2,3-cd)pyrene	77	**54**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
Naphthalene	12	**140**	----	--	--	--	0.72	0.96	0.92 (J)	<1.9	<2.4
Pyrene	3400	**1900**	----	--	--	--	<1.2	<0.38	<1.5	<1.9	<2.4
1-methylnaphthalene	2.1	**1400**	----	--	--	--	--	--	--	--	--
2-methylnaphthalene	6.9	**250**	----	--	--	--	4.5	5.8	<1.5	<1.9	31

All results are mg/kg, dry weight

(1) Yellow highlighted values exceed Tier 1 Leaching to GW RBSLs; bold values exceed Tier 1 Direct Contact Construction RBSLs

(2) DEQ-adjusted Tier 2 RBSL for C9-C18 Aliphatics fraction calculated as [Tier 1 RBSL x 8] (see report Section 2.2.1). All C9-C18 Aliphatics results less than the calculated Tier 2 RBSL.

(J) Laboratory-flagged: Estimated Value. The analyte was present but less than the reporting limit.

2.3 OLD SHOP AREA EXCAVATION

The approximate area of hydrocarbon contamination in the Old Shop Area is located in the northwest corner of the Site under the Old Shop building (demolished August 2016), extending northeast (upgradient) and southwest (downgradient) past the West Shop Apron and further west to and under Sixth Street (Figure 1-2). Accurate GPS survey of the final excavation perimeter was not possible due to the small area of the excavation and poor instrument resolution. Figure 2-1, daily project field notes (Appendix B) and the Appendix E photolog provide reference for the following Old Shop Area excavation discussion.

Remedial excavation at the Old Shop Area was completed October 6-26, 2016 between the West Shop Apron on the south side and the north side of the Old Shop building location on Garfield Street, extending slightly upgradient (east) of the Old Shop building location and west to monitoring well MCMW-3R along Sixth Street on the west side of the Site. Excavation monitoring identified unimpacted surface gravelly soils to approximately 3-4 feet bgs, subtended by a subsurface zone of hydrocarbon-impacted gravelly gray sandy clay material at approximately 4-8 feet bgs over unimpacted cobbly brown clay extending to final excavation depth of approximately 10-12 feet.

Groundwater encountered at approximately 6-8 feet bgs and accumulating at the bottom of the excavation was either excavated with impacted soils for landfill disposal or pumped to temporary storage in the Meagher County water truck (approximately 4,000 gallons). One sample of accumulated groundwater was collected October 19, 2016 for EPH/VPH analysis. Laboratory analytical results for this sample are in Appendix I and are summarized in Table 2-3. Some of the excavation water sample results exceeded DEQ's Circular DEQ-7 Numerical Standards and RBSLs, which is not unexpected given that the water was in contact with contaminated soils and groundwater in this area is known to be contaminated. Most of the water in the truck was sprayed onto loads of contaminated soil going to the landfill for disposal to stabilize the loads and suppress dust. Approximately 200 gallons of the water in the truck was used in backfill compaction at the bottom of the excavation, and this was conducted prior to having the results of the excavation water sample. The use of the water for backfill compaction may have added a negligible amount of petroleum contamination back into the bottom of the excavation. Based on the total amount of volatile and extractable petroleum hydrocarbons in the water sample (25.98 milligrams per liter), the volume of water used for compaction (approximately 200 gallons or 757 liters), and the amount of fill material added to the Old Shop Excavation area (approximately 3636 tons or 330,000 kilograms), the average amount of hydrocarbon contamination added back into the excavation is equivalent to approximately 0.06 mg/kg. A total petroleum hydrocarbon value in soil of 0.06 mg/kg is less than any of the Tier 1 RBSLs for individual hydrocarbon compounds in subsurface soil. Therefore, the 200 gallons of water from the excavation that

Table 2-3. Old Shop Area Excavation Water Sampling Analytical Results
Meagher County Shop Remedial Action, October 2016

Constituent	Tier 1 Groundwater RBSL/Standard[1] (ug/L)	Analytical Results Old Shop Area Excavation Water Sample 05-300-BASE (ug/L)
C5-C8 Aliphatics	**650**	440
C9-C12 Aliphatics	**1400**	2060*
C9-C10 Aromatics	**1100**	988
Total Purgeable Hydrocarbons	NA	3380*
MTBE	**30**	<8.0 (D)
Benzene	**5**	133*
Toluene	**1000**	301
Ethylbenzene	**700**	70
Xylenes	**10000**	541
Naphthalene	**100**	21
EPH Screen	**1000**	41600
C9-C18 Aliphatics	**1400**	14500*
C19-C36 Aliphatics	**1000**	3760*
C11-C22 Aromatics	**1100**	3860*
Total Extractable Hydrocarbons	NA	22600*
Acenaphthene	**670**	<0.19
Acenaphthylene	NA	<0.19
Anthracene	**2100**	<0.19
Benz(a)anthracene	**0.5**	<0.19
Benzo(a)pyrene	**0.05**	<0.19
Benzo(b)fluoranthene	**0.5**	<0.19
Benzo(g,h,i)perylene	NA	<0.19
Benzo(k)fluoranthene	**5**	<0.19
Chrysene	**50**	<0.19
Dibenzo(a,h)anthracene	**0.05**	<0.19
Fluoranthene	**130**	<0.19
Fluorene	**1100**	<0.19
Indeno(1,2,3-cd)pyrene	**0.5**	<0.19
Naphthalene	**100**	0.21 (B) (UB)
Phenanthrene	NA	<0.19
Pyrene	**830**	<0.19
2-methylnaphthalene	**36**	<0.19

(1) Obtained from the September 2016 Version of Montana DEQ Tier 1 RBSL Tables (Table 3), accessed at:
http://deq.mt.gov/Portals/112/Land/StateSuperFund/Documents/rbca/rbca_table_3.pdf?ver=2016-10-05-125036-467

NA Not applicable
* Laboratory-flagged: The result exceeds the maximum contaminant level.
(D) Laboratory-flagged: Reporting limit increased due to sample matrix.
(B) Laboratory-flagged: The analyte was detected in the method blank.
(UB) Data validation flagged: Analyte not detected at reported concentration due to laboratory blank contamination.

was reused for backfill compaction is not likely to have resulted in any Tier 1 RBSL exceedances. Groundwater in this area will be monitored in the future.

In order to protect the stability of the concrete West Shop Apron / adjacent propane tanks storage area and Sixth Street, as well as monitoring well MCMW-3, impacted soils were excavated up to approximately 8 feet from the respective features, leaving an indeterminate amount of impacted soils below the West Shop Apron and below/along Sixth Street. In consultation with DEQ and Meagher County, these features limited the final extent of the Old Shop Area excavation to approximately 6000 square feet.

The Old Shop Area excavation encountered an abandoned 3-inch steel pipe on the northwest side of the Site excavation at Sixth Street and on the east side of the Site excavation in the maintenance yard; no pipe across the excavation area was encountered. The uncovered pipe segments, with no odor or material inside, were inspected by Meagher County and City of White Sulphur Springs personnel and capped prior to backfill. The locations of these line segments are presented in Figure 2-1. Excavation in the Old Shop Area also encountered and removed three concrete footings and occasional pieces of concrete and rebar which were broken down for landfill disposal after DEQ consultation.

A total of approximately 2300 cubic yards (yards) of Old Shop Area soil was excavated, loaded and hauled to landfill disposal. Due to the variability in impacted soil depths and the limited work space for Site excavation, excavated material stockpiles, backfill stockpiles and truck loading access, only a limited volume of unimpacted surface soils (approximately 50 cubic yards) could be segregated for backfill use. One composite sample of unimpacted surface soil from the several Site stockpiles used for backfill (OS-206-TOP) was collected October 25, 2016 for laboratory analysis. Analytical results, reported in Table 2-4, indicated these backfill soils did not exceed Tier 1 RBSLs. The laboratory analytical report for this sample is included in Appendix H.

2.3.1 Old Shop Area Excavation Confirmation Soil Sampling

Five-point composite confirmation soil samples were collected from the south, north, east, and west excavation faces, and the base of the excavation to document subsurface soil conditions before backfill placement. These confirmation sample locations are shown on Figure 2-1, and included:

- **Sample OSWSA-200** from gray impacted subsurface soils on the south face of the final excavation area at the West Shop Apron;
- **Sample OSFFT-201** from soil at the base (bottom) of the final excavation area;
- **Sample OS-202** from gray subsurface soils on the north face of the final excavation area;

Table 2-4. Old Shop Area Excavation Confirmation Soil Sampling Analytical Results
Meagher County Shop Remedial Investigation, October 2016

Constituent	Tier 1 RBSLs		Tier 2 RBSL	Meagher County Confirmation Sample Results[1]						
	Leaching to GW 0-10 Feet	Direct Contact Construction	DEQ-Adjusted Direct Contact Construction	OSWSA-200 SGray	OSFFT-201 Base	Sample OS- 202 N Gray	203 E Gray	204 S Gray	205 W Gray	206 TOP
C5-C8 Aliphatics	220	**410**	----	54	58	47	15	25	65	2.6
C9-C12 Aliphatics	11000	**640**	----	496	163	208	180	345	397	70
C9-C10 Aromatics	130	**1000**	----	323	92	122	109	185	219	33
MTBE	0.078	**8900**	----	<0.12	<0.20	<0.11	<0.11	<0.11	<0.11	<0.12
Benzene	0.07	**240**	----	0.21	0.17	<0.056	<0.056	<0.056	0.066	<0.058
Toluene	21	**5500**	----	0.11	2.5 (J-)	0.19	<0.056	0.12	0.51	<0.058
Ethylbenzene	26	**1300**	----	3.4	2 (J-)	2.0	1.1	1.1	2.8	0.19
Xylenes	320	**610**	----	7.2	13 (J-)	0.78	1.1	4.7	3.6	0.12
Naphthalene	12	**140**	----	14	2.9 (J-)	0.38	4.1	7.0	2.9	0.74
EPH Screen	200	**200**	----	**5500**	<12	**793**	**2350**	**4680**	**1090**	**519**
C9-C18 Aliphatics	53000	**900**	**7200**[2]	**2320**	--	317	**915**	**1820**	447	205
C19-C36 Aliphatics	NA	**200000**	----	439	--	52	187	387	93	49
C11-C22 Aromatics	370	**3900**	----	1190	--	146	513	954	169	85
Acenaphthene	260	**3800**	----	0.94	--	<0.37	0.27	0.66	<0.37	<0.39
Anthracene	2600	**19000**	----	<1.1	--	<0.37	<0.37	2.9	<0.37	<0.39
Benz(a)anthracene	6.8	**54**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Benzo(a)pyrene	2.3	**5.4**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Benzo(b)fluoranthene	23	**54**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Benzo(k)fluoranthene	230	**540**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Chrysene	690	**5400**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Dibenzo(a,h)anthracene	7.5	**5.4**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Fluoranthene	550	**2500**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Fluorene	770	**2500**	----	2.5	--	0.19	0.99	1.8	0.3 (J)	<0.39
Indeno(1,2,3-cd)pyrene	77	**54**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
Naphthalene	12	**140**	----	5.0	--	0.42	1.2	3.1	0.69	<0.39
Pyrene	3400	**1900**	----	<1.1	--	<0.37	<0.37	<1.1	<0.37	<0.39
1-methylnaphthalene	2.1	**1400**	----	--	--	--	--	--	--	--
2-methylnaphthalene	6.9	**250**	----	20	--	2.1	4.9	13	2.7	<0.39

All results are mg/kg, dry weight

(1) Yellow highlighted values exceed Tier 1 Leaching to GW RBSLs; bold values exceed Tier 1 Direct Contact Construction RBSLs

(2) DEQ-adjusted Tier 2 RBSL for C9-C18 Aliphatics fraction calculated as [Tier 1 RBSL x 8] (see report Section 2.3.1). All C9-C18 Aliphatics results less than the calculated Tier 2 RBSL.

(J) Laboratory-flagged: Estimated Value. The analyte was present but less than the reporting limit.

(J-) Data validation-flagged as Estimated Value, may be biased low. Additional information is presented in the corresponding Appendix J data validation report.

- **Sample OS-203** from gray subsurface soils on the east face of the final excavation area;
- **Sample OS-204** from gray impacted subsurface soils on the south face of the interim excavation area north of the West Shop Apron; and
- **Sample OS-205** from gray impacted subsurface soils on the west face of the final excavation area along Sixth Street.

Old Shop Area excavation confirmation samples were submitted to Energy Laboratories in Helena, Montana for EPH/VPH analysis. Results of laboratory analysis are presented in Table 2-4. Review of the laboratory data indicate exceedances of Tier 1 RBSLs for either leaching to groundwater or DCC standard (DEQ, 2016) at the following final excavation face sampling sites (Table 2-4):

Leaching to Groundwater Tier 1 RBSL Exceedances

- C9-C10 aromatics, benzene, naphthalene, C11-C22 aromatics, and 2-methylnapthalene in gray impacted subsurface soils on the south face of the final excavation area at the West Shop Apron (sample OSWSA-200);
- Benzene in soil at the base (bottom) of the final excavation area (sample OSFFT-201);
- C11-C22 aromatics in gray subsurface soils on the east face of the final excavation area (sample OS-203); and
- C9-C10 Aromatics in gray impacted subsurface soils on the west face of the final excavation area along Sixth Street (sample OS-205).

Leaching to groundwater RBSL exceedances were also noted for several constituents (C9-C10 aromatics, C11-C22 aromatics, and 2-methylnapthalene) in gray impacted subsurface soils on the south face of the interim excavation area north of the West Shop Apron (sample OS-204). These impacted soils were subsequently excavated for landfill disposal.

Direct Contact Construction Tier 1 RBSL Exceedances

- C9-C18 aliphatics in gray impacted subsurface soils on the south face of the final excavation area at the West Shop Apron (sample OSWSA-200); and
- C9-C18 aliphatics in gray subsurface soils on the east face of the final excavation area (sample OS-203).

As described in detail in Section 2.4.1 of this report, the C9-C18 aliphatics results in these samples did not exceed the DEQ-adjusted DCC RBSL for the C9-C18 aliphatics fraction.

DCC standard RBSL exceedances were also noted for C9-C18 aliphatics in gray impacted subsurface soils on the south face of the interim excavation area north of the West Shop

Apron (sample OS-204). As noted above, these impacted soils were subsequently excavated for landfill disposal.

2.4 DISCUSSION OF SOIL CONFIRMATION SAMPLE RESULTS

2.4.1 Direct Contact Construction Tier 1 RBSL Exceedances

As summarized in Sections 2.2.1 and 2.3.1, the remaining contaminated soil at the Site is deeper than two feet below ground surface. DEQ considers soil deeper than 2 feet to be "subsurface soil." Petroleum contaminant concentrations in subsurface soil confirmation samples (Tables 2-2 and 2-4) were compared to RBSLs that protect potential construction workers (the "Direct Contact Construction" or DCC RBSL values in Tables 2-2 and 2-4). With the exception of the C9-C18 aliphatics fraction results, all sample results are less than applicable Tier 1 RBSLs that protect construction workers.

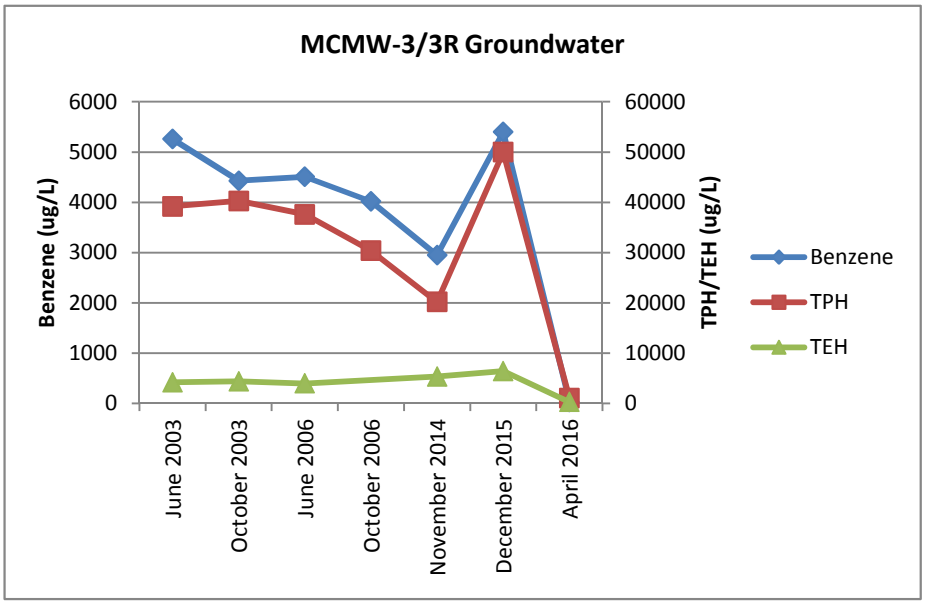
The Tier 1 DCC RBSL for C9-C18 aliphatics cited in Tables 2-2 and 2-4 is 900 mg/kg. The results that exceed this value range from 915 to 4,860 mg/kg. Because the C9-C18 aliphatics fraction is the only contaminant to exceed its DCC RBSL, and because the DCC RBSL for the C9-C18 aliphatics fraction has a target hazard quotient of 0.125 (or 1/8) in its calculation to provide assurance that the overall hazard index for a site will not exceed 1, DEQ has performed a Tier 2 adjustment of the C9-C18 aliphatics DCC RBSL. This Tier 2 adjustment consists of multiplying the Tier 1 DCC RBSL of 900 mg/kg by 8/1, which results in an adjusted DCC RBSL for the C9-C18 aliphatics of 7,200 mg/kg as shown in Tables 2-2 and 2-4 (900 mg/kg x 8 = 7,200 mg/kg). The highest soil confirmation sample result for the C9-C18 aliphatics fraction was 4,860 mg/kg, which is less than the adjusted DCC RBSL. Therefore, the remaining soil contamination at the Site does not pose an unacceptable risk to future excavation/construction workers.

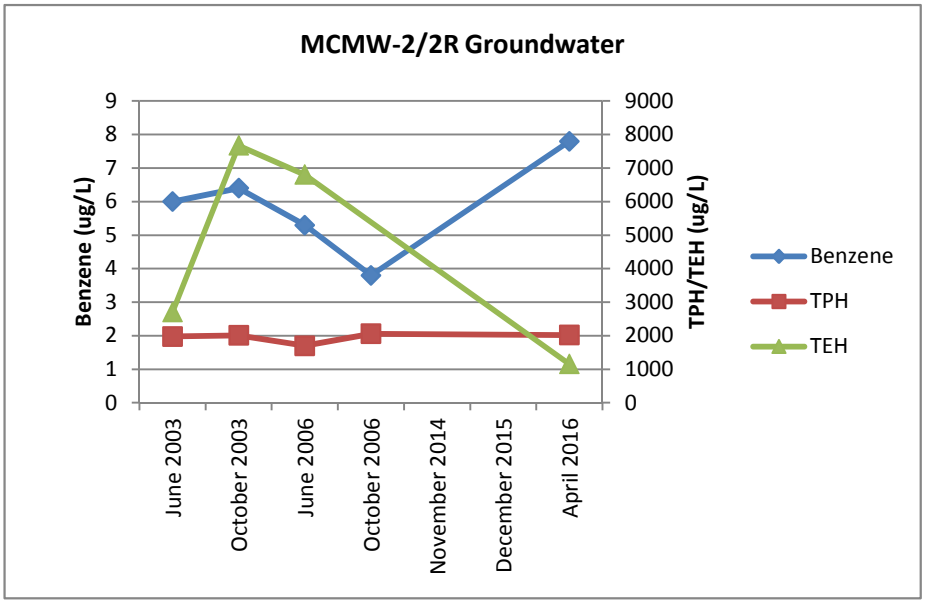
2.4.2 Leaching To Groundwater Tier 1 RBSL Exceedances

As summarized in Sections 2.2.1 and 2.3.1, petroleum contaminant concentrations in subsurface soil confirmation samples (Tables 2-2 and 2-4) were also compared to RBSLs that are protective of the leaching to groundwater pathway (i.e., soil concentrations that should not result in groundwater RBSL exceedances under default conservative leaching assumptions). The results in Tables 2-2 and 2-4 show that the groundwater leaching RBSLs were exceeded in soil confirmation samples at a number of locations for several different EPH/VPH constituents.

Despite the presence of remaining soil contamination at levels exceeding the groundwater leaching RBSLs in portions of the Site, the risk of groundwater contaminants migrating offsite at concentrations exceeding groundwater RBSLs is considered to be minimal based on both historical and current information regarding groundwater contamination, as follows:

- Groundwater monitoring data from the Site over more than 15 years of monitoring have shown that contamination is localized in the vicinity of wells MCMW-2/2R and MCMW-3/3R. These wells were installed in areas of worst-case soil contamination, and therefore represent potential worst-case conditions for groundwater contamination. Figure 2-2 shows benzene, total purgeable hydrocarbon (TPH), and total extractable hydrocarbon (TEH) concentrations in groundwater since 2003 at these two wells. Groundwater concentrations have shown some variability, but overall no strong trends, suggesting local contaminated soils have been acting as ongoing sources of groundwater contamination. As noted above in Section 1.1.5, 2016 monitoring data at well MCMW-3R showed that removal of the highly-impacted soils in the immediate vicinity of the well resulted in a significant improvement in groundwater quality. Benzene concentrations decreased from a previous range of 3,000 to over 5,000 µg/L to 33 µg/L in 2016 (Figure 2-2). This information suggests that removal of grossly contaminated soils at and near wells MCMW-3R and MCMW-2R2 should have significant beneficial effects on local groundwater quality in the future.
- Based on the initial time of discovery, the hydrocarbon contamination at the Site has been present since at least 1989-1990 (more than 25 years). During this period, monitoring data from downgradient wells MCMW-1, MCMW-5, and MCMW-6 (Figure 1-2) has shown that contamination has not migrated offsite at concentrations exceeding RBSLs. Therefore, it appears that although localized groundwater contamination is present in Site source areas with high soil hydrocarbon concentrations, migration of contaminants offsite is inhibited by limited groundwater flux, slow groundwater travel times, and/or attenuation of hydrocarbon constituents by natural degradation processes.
- Finally, protection of local groundwater resources and the effectiveness of the soil removal activities at reducing contaminant concentrations in groundwater will be evaluated through follow-up groundwater monitoring required by DEQ, to be conducted by Meagher County. The schedule and scope of this future groundwater monitoring is outside the scope of this report.





2016 REMEDIAL EXCAVATION SUMMARY REPORT MEAGHER COUNTY ROAD DEPARTMENT SHOP	**GROUNDWATER BENZENE, TPH, AND TEH CONCENTRATION TRENDS WELLS MCMW-3/3R AND MCMW-2/2R**	**FIGURE** **2-2**

2.4.3 Potential for Vapor Intrusion

Some contaminated soils were left in place because of the presence of overlying buildings (the East and West Shops) and other structures (the West Shop Apron and streets). As per previous discussion, comparison to RBSLs shows that contaminants in these soils do not pose an unacceptable risk to human direct contact. Possible risk to groundwater will be addressed with groundwater monitoring. The final exposure pathway that this document will address is the vapor intrusion pathway. Vapor intrusion occurs when volatile chemicals in soil and/or groundwater migrate into overlying buildings.

In the proximity of the East Shop, the primary volatile contaminants remaining at the Site at concentrations above RBSLs are the C9-C10 Aromatics and naphthalene. Of the five samples collected adjacent to East Shop, four of these (100, 101, 102, and East Test Pit) did not exceed any RBSLs. Sample 103 was also located adjacent to the East Shop, and had C9-C10 Aromatics at 341 mg/kg, which exceeds the leaching-to-groundwater RBSL of 130 mg/kg. The East Shop building is slab-on-grade, and contains a small office and breakroom attached to a large shop/garage that is used to store and maintain vehicles. While there may be some potential for vapor intrusion to occur at the East Shop due to contaminated soils under the building, the removal of large quantities of contaminated soil from the sides of the building is expected to lessen the potential for vapor intrusion.

The West Shop is a slab-on-grade garage/shop with no office space. Meagher County built the West Shop in approximately 1990. Confirmation samples collected from the perimeter of the West Shop include West Test Pit, 100, 101, 102, and 104. Of those, sample 104 had C9-C10 Aromatics at 271 mg/kg, which exceeds the leaching-to-groundwater RBSL of 130 mg/kg, and sample West Test Pit had C9-C10 Aromatics at 409 mg/kg and naphthalene at 15 mg/kg which exceeds the leaching-to-groundwater RBSL of 12 mg/kg. Before the West Shop was built, the excavation of the building's footprint unearthed petroleum-contaminated soils and prompted investigation of the Site. According to Hydrometrics (1990), Meagher County excavated approximately 1,200 cubic yards of contaminated soil from the footprint of the West Shop. While there may be some potential for vapor intrusion at the West Shop due to contaminated soils under the south side of the building, the removal of contaminated soil from the southeast corner of the building (in 2016) and the previous removal of contaminated soil from the building's footprint (1988/1989) is expected to lessen the potential for vapor intrusion.

The current and future expected use of the property is as a facility for maintaining and storing vehicles and other equipment. The shops store vehicles, gasoline-powered equipment, and petroleum-hydrocarbon substances used in vehicle use and maintenance. DEQ will evaluate and address the vapor intrusion pathway at the Site outside of the context of this report, similar to the issues with groundwater contamination.

3.0 MONITORING WELL REPLACEMENT

Two monitoring wells in the immediate remedial excavation area were previously removed. Well MCMW-2, previously located off the southwest corner of the East Shop building was damaged by Site activities and removed prior to the 2014 groundwater monitoring event (Section 1.1.3). Well MCMW-3, located immediately downgradient (west) of the Old Shop Area, was located in the road borrow ditch where storm water runoff would pond around the wellhead leading to potential concerns about the wellhead and annular seal integrity. RITP-16 grant funds were used to replace both of these wells in Spring 2016 so that groundwater conditions in the two contaminant source areas could continue to be monitored (Hydrometrics, 2016b). All project monitoring wells, including the two replacement wells, are shown on Figure 2-1.

3.1 GROUNDWATER MONITORING BACKGROUND

Well MCMW-3 was removed in 2016 during excavation of a test pit in the well location. Replacement well MCMW-3R was installed within the test pit excavation by placing 2-inch diameter schedule-40 PVC casing and screen in the excavation during backfilling with clean soils obtained from the Meagher County gravel pit. This well was completed to a total depth of 9.5 feet with 10-slot factory screen placed from 4 to 9.5 feet bgs. The well was completed with a sand filter pack (10/20 Colorado silica sand) from 3.5 to 9.5 feet, and bentonite chips from 3.5 feet to ground surface (Hydrometrics, 2016b).

3.2 MONITORING WELL MCMW-2R2 INSTALLATION

Replacement monitoring well MCMW-2R was removed as part of the MCMW-2 area remedial excavation on October 4, 2016. This well was replaced on November 8, 2016 after the completion of backfill, grading and fence reconstruction. Replacement well MCMW-2R2 was completed with an auger drill rig in approximately the same location as MCMW-2R (Figure 2-1). This well was completed to a total depth of 10 feet with 2-inch diameter 10-slot PVC screen from 5 to 10 feet bgs and 2-inch diameter schedule 40 PVC casing from the top of screen to 2.5 feet above ground surface. The well was completed with a 10/20 silica sand filter pack from 3 to 10 feet bgs and bentonite chips to ground surface. The well installation log and survey notes are in Appendix L.

4.0 DATA QUALITY REVIEW

Laboratory analytical data packages for the pit-run soil samples and excavation confirmation soil samples collected as part of the Meagher County Road Department Shop soil remediation project were reviewed to confirm that appropriate field sample handling, preservation, chain-of-custody, and laboratory quality assurance/quality control (QA/QC) procedures were followed during project implementation. The results of the data quality review and validation are in Appendix J.

Due the nature of the remedial excavation work and the sampling involved, limited field QC samples were necessary. All equipment (spoons, disposable scoops) used for confirmation sampling was single-use, and no equipment rinsate blanks were collected. All but one of the samples collected were soil samples. No field blanks were collected. No soil duplicate samples were collected. One water sample was collected from the excavation pit, and the laboratory-supplied trip blank reported all non-detect results, which indicates that cross-contamination of the water sample did not occur during transport or sampling. The laboratory sample results are generally proportionate to field PID readings. The contaminant concentrations in the laboratory results are expected to be attributable to contamination in the samples (not from cross-contamination or sample handling).

Samples were stored in iced coolers or refrigerated from the time of sampling until delivery to the analytical laboratory, and were transferred to the analytical laboratory under standard chain-of-custody protocols. All confirmation samples were received at the laboratory on ice. All but one of the sample sets were received by the laboratory at temperatures of 6 degrees Celsius or less. One sample delivery group (Work Order H16100086) was received at 7.6 degrees Celsius, a slightly higher temperature than 6 degrees Celsius. The samples in Work Order H16100086 were collected the same day they were delivered to the laboratory, on ice and it is likely that the samples did not have adequate time to chill; therefore, the quality of the samples is not expected to be affected and no qualification is required. Any deviations in sample temperature are noted in the data validation reports in Appendix J. All samples were extracted and analyzed within the appropriate holding times.

A review of laboratory QC information showed that laboratory QC samples of the proper type were analyzed and reported at the appropriate frequencies. A number of matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and/or relative percent differences (RPDs) exceeded laboratory control limits for multiple organic constituents in the Work Orders associated with the Meagher County Remedial Excavation project. Control limit exceedances for these laboratory QC sample types can occur with higher frequency for organic constituents in soils, due primarily to (1) inherent sample heterogeneity of soil samples causing differences in true constituent concentrations in separate sample aliquots, (2)

complications caused by variable moisture contents in separate sample aliquots, and (3) samples with high target values or matrix interference can impact the recovery of the analytes when the sample analyte concentration is greater than or equal to 4x the spike concentration added to the sample. Per laboratory quality assurance procedures and analytical method requirements, laboratory control sample (LCS) percent recoveries were used as the primary indicator of the quality of the VPH, EPH, and PAH soils data reported as part of the Meagher County Remedial Excavation project. All LCS percent recoveries for the associated Work Orders were within control limits, and all reported analytical data met the QA/QC specifications outlined in the laboratory's Quality Assurance manual. As a result of the MS/MSD deviations, some results in individual samples were given J flags, to indicate that the results are estimated. Both laboratory and data validation flags can be found in Tables 2-2 and 2-4, and in the data validation reports in Appendix J.

5.0 CONCLUSIONS

Interim site remediation activities were conducted at the Meagher County Road Department Shop site in late summer and fall 2016. The site remediation consisted of excavation and disposal of hydrocarbon-contaminated soil, excavation confirmation sampling, and excavation backfill using Meagher County in-kind supplies of fill material. One replacement monitoring well (MCMW-2R2) was also installed as part of this project. Remedial activities were conducted by Hydrometrics and an excavation subcontractor, under DEQ oversight and DEQ Contract Number 414019, Task Order 13.

Existing site information regarding soil contamination and associated groundwater contamination with hydrocarbons was used to target two areas of soil contamination for removal and disposal: one area near Site monitoring well MCMW-2R, and an additional area beneath the Old Shop. Remedial activities were initiated with Meagher County's in-kind August 2016 demolition of the Old Shop. Total quantities of soil excavated in the two areas were 700 cubic yards in the MCMW-2R area, and 2,300 cubic yards in the Old Shop area, for a total of approximately 3,000 cubic yards. The non-hazardous nature of the excavated material (confirmed during previous site investigation activities) allowed for disposal of the soils at a Montana-licensed solid waste facility.

Practical limits on the areas of excavation were determined in some cases by the need to protect existing building foundations and utilities. Confirmation samples collected from excavation faces showed some subsurface soil contamination remaining at selected excavation boundaries, with concentrations of selected constituents exceeding DCC standard and/or leaching to groundwater Tier 1 RBSLs. An adjusted Tier 2 RBSL for the only constituent exceeding the Tier 1 DCC RBSL (C9-C18 aliphatics) was calculated by DEQ, and all confirmation sample results were less than the Tier 2 DCC RBSL. Therefore, the remaining soil contamination at the Site does not pose an unacceptable risk to future excavation/construction workers.

Although areas of soil contamination at levels exceeding the groundwater leaching RBSLs remain in portions of the Site, the risk of groundwater contaminants migrating offsite at concentrations exceeding groundwater RBSLs is considered to be minimal based on both historical and current information regarding groundwater contamination. Groundwater contamination has remained localized and RBSL exceedances confined to onsite wells over an extended period of time (since hydrocarbon contamination was discovered in 1989-1990).

Monitoring data at well MCMW-3R also showed that removal of the highly-impacted soils in the immediate vicinity of the well resulted in a significant improvement in groundwater quality, suggesting that the additional excavation conducted as part of this project should have similar beneficial effects on local groundwater quality in the future. In addition, protection of local groundwater resources and the effectiveness of the soil removal activities at reducing contaminant concentrations in groundwater will be evaluated through follow-up groundwater monitoring required by DEQ, to be conducted by Meagher County. The schedule and scope of this future groundwater monitoring is outside the scope of this report. Because some volatile contamination remains at the Site under buildings at the Site, the potential exists for vapor intrusion, and DEQ will address this pathway outside of this report.

6.0 REFERENCES

Hydrometrics, Inc., 1990. Site Assessment of Petroleum Release at Meagher County Road Department Shop, White Sulphur Springs, Montana. Prepared for Board of County Commissioners, Meagher County. February 1990.

Hydrometrics, Inc., 2002. Letter to Meagher County Commissioners dated September 6, 2002, RE: Meagher County Road Department Site, July 2002 Groundwater Monitoring Results.

Hydrometrics, Inc., 2004. 2003 Site Investigation Report, Meagher County Highway Department Maintenance Shop, White Sulphur Springs, Montana. Prepared for Meagher County Commissioners. March 2004.

Hydrometrics, Inc., 2008. 2006 Site Investigation Report, Meagher County Equipment Maintenance Yard, White Sulphur Springs, Montana. Prepared for Meagher County. December 2008.

Hydrometrics, Inc., 2015. Technical Memorandum - November 2014 Groundwater Sampling at Meagher County Highway Department Maintenance Shop. From Bob Anderson (Hydrometrics) to Kimberly Deschene (Meagher County). January 20, 2015.

Hydrometrics, Inc., 2016a. Technical Memorandum - December 2015 Groundwater Sampling at Meagher County Highway Department Maintenance Shop. From Bob Anderson/Mark Walker (Hydrometrics) to Kimberly Deschene (Meagher County). February 11, 2016.

Hydrometrics, Inc., 2016b. Meagher County Road Department Maintenance Yard Cleanup Planning, Reclamation Development Program Grant RITP-16-0119. Final Report. Prepared for Meagher County Commissioners. October 2016.

Montana Department of Environmental Quality, 2016. Montana Risk-Based Corrective Action Guidance for Petroleum Releases. September 2016. Accessed at: http://deq.mt.gov/Land/statesuperfund/rbca_guide

Montana Department of Transportation, 2016. Special Provisions, State of Montana Department of Transportation Bid Package, Contract No. 10316; Federal Aid Project STPP 14-2(33)42, Main Street-White Sulphur Springs, Section I, sub-section 28, Moisture Sensitive Soils.

APPENDIX A

PROJECT SITE ACTIVITY CHECKLISTS

Meagher County Road Department Shop Remediation

Pre-Project Site Meeting Checklist
August 31, 2016, 9 a.m. to 10:30 a.m.

Location:

Meagher County Road Department Shop
508 West Garfield Street
White Sulphur Springs, Montana 59645

Attendees:

Ben Hurwitz	*Representing*	Meagher County Commissioner
Rod Brewer	*Representing*	Meagher County Commissioner
Bruce Smith	*Representing*	Meagher County Road Dept.
Bob Anderson	*Representing*	Hydrometrics
Mark Walker	*Representing*	Hydrometrics
Laura Alvey	*Representing*	Montana DEQ
Jamie Poell	*Representing*	Hydrometrics

Project Liaisons

Laura Alvey, Montana DEQ	444-0212	459-5043	lalvey@mt.gov
Jamie Poell, Hydrometrics	443-4150	459-2873	jpoell@hydrometrics.com
Bruce Smith, Meagher County:	547-3716	403-2130	roadcrew@itstriangle.com
Subcontractor:	*To Be Determined*		

Other Project Contacts

Bob Anderson, Hydrometrics	431-0236	randerson@hydrometrics.com
Mark Walker, Hydrometrics	459-7229	mwalker@hydrometrics.com
Ben Hurwitz, Meagher County Commissioner	547-3500	benhurwitzmt@gmail.com
Herb Townsend, Meagher County Commissioner	547-3453	con@mtintouch.net
Rod Brewer, Meagher County Commissioner	547-3549	rbrewer@meaghercounty.mt.gov
Subcontractor: *To Be Determined*		

1. Project review

Schedule	**Tentative schedule:**
	Begin work late September/early October 2016
	Complete work by November 4, 2016
Coordination with shop activities	Bruce sees no problem with project conflicting with county shop activity
Communications plan	
project liaisons	noted on page 1 (meeting attendance sheet)
field work advance notifications	Hydrometrics advance minimum notifications include 2 weeks for DEQ liaison and one week for Meagher County liaison
field work daily notifications	Hydrometrics will update Meagher County liaison daily as work proceeds
City of White Sulphur Springs	Meagher County liaison will notify City of WSS of upcoming work Meagher County liaison will coordinate 6th Street closure with City of WSS
neighbors	Meagher County liaison will coordinate 6th Street closure with street resident
emergency	Meagher County liaison will notify local emergency service of upcoming work Two emergency service personnel work at the county shop
weekly progress reports	Hydrometrics will schedule weekly (end of week) calls with DEQ during project planning and implementation, followed up with a written summary of the call

2. Remediation site tour/inspection

Soil removal areas	
	Area 1 = demolished shop location
	Area 2 = small area between buildings on south side
	Screening Levels: Upper 2 feet=Tier 1 RBSLs
	Below 2 feet=Construction worker RBSLs and GW protection SLs
	Monitoring well testing if necessary; downgradient GW monitoring necessary if 100% removal is not possible
	Area 3 = Approximately 10 cubic yards stockpiled at County Leepold Road gravel pit
	Excavation Plan:
	1. Excavate Area 1 first, collect and submit confirmation samples
	2. Excavate Area 2 while waiting for Area 1 lab results cannot excavate underneath adjacent buildings excavate to the south as necessary, try not to disturb fence

Wells

monitoring

monitoring well locations noted
water table is fairly shallow
assume no dewatering will be necessary during excavations

Utilities

overhead

several lines above west side of Area 1, lowest = 20 feet above ground
no lines above Area 2

underground

below ground utility lines west of Area 1, on west side of 6th Street
below ground gas, phone and air lines in/adjacent to Area 2

locates

Hydrometrics will ensure that utility locates are completed prior to initiation of field work

Access/traffic

security fencing

Meagher County shop has standard orange security fencing
Hydrometrics will ask contractor to include provision for installation of taller, interlocking cyclone fence segments as needed to secure the site as work progresses

local traffic control

Meagher County liaison will notify City of WSS of upcoming work
Meagher County liaison will coordinate street closures and lane reductions with City of WSS
Meagher County shop has traffic cones available for use

other shop activities

Bruce sees no problem with project conflicting with county shop activity
Bruce will assist with construction of a small stormwater berm on the east side of Area 1 using gravel from an adjacent pile
Water and electricity are available for contractor's use

contractor staging area

Bruce will make space available for contractor staging area/equipment/trailer

work activity hours

Bruce will assist contractor with site access as needed
Work on weekends is acceptable

Fencing

removal/replacement

Area 1 had no permanent fence (the demolished shop building was the fence)
Area 2 permanent fence (up to approximately 40 feet) may need to be removed/replaced if remedial excavation is required

3. Meagher County in-kind project contributions

Remediation site

security fencing	Meagher County shop has standard orange security fencing available as needed
traffic signage / cones	Meagher County shop has traffic cones available for use
	Meagher County liaison will coordinate street closures and lane reductions with City of WSS
city and neighbor notifications	Meagher County liaison will notify City of WSS of upcoming work
	Meagher County liaison will coordinate 6th Street closure with City of WSS
	Meagher County liaison will coordinate 6th Street closure with street resident
utility locates	Meagher County liaison will assist with utility locates as needed
staging area power	Water and electricity are available for contractor's use
property fencing replacement	Meagher County shop will assist with fencing replacement as needed
property utility replacement	Meagher County shop will assist with line movement / replacement as needed/able

Backfill

Supply clean suitable backfill	Meagher County will provide backfill from any of several sources, including :
	County Gravel Pit on Leepold Road (2 miles away), pit run material
	County Gravel Pit on Leepold Road (2 miles away), yellow clay stockpile (from WSS Main Street excavations)
	County Airport Gravel Pit (4 miles away), pit run material
Load, haul, place, compact backfill	Meagher County will assist the project/contractor with loading/haul/placement of backfill material required by the project; contractor will be responsible for compaction of all placed backfill material to specification in excavation Area 1 and Area 2
	Meagher County shop will provide water / water truck as need to assist backfill compaction

4. Backfill sources inspection

1. Stockpiled backfill — Yellow clay stockpile (from WSS Main Street excavations)

location County Gravel Pit on Leepold Road, 2 miles to shop site

access open, immediately off Leepold Road

volume approximately 1600 cubic yards

suitability clay with few gravels and cobbles
per MDOT report, "may cause construction difficulties"

2. Stockpiled backfill — Pit run stockpile

location County Gravel Pit on Leepold Road, 2.3 miles to shop site

access open, off Leepold Road

volume approximately 1500 cubic yards

suitability sandy gravel
similar pit run material from adjacent Mikesell gravel pit used by MDOT
in WSS Main Street backfill / construction

3. In-situ native backfill — Pit run material source

location County Gravel Pit on Leepold Road, 2.2 miles to shop site

access open, off Leepold Road

volume 2000 cubic yards + available

suitability sandy gravel
similar pit run materail from adjacent Mikesell gravel pit used by MDOT
in WSS Main Street backfill / construction

4. Stockpiled backfill — Pit run stockpile

location County Airport Gravel Pit, 4.0 miles to shop site

access open, 1.5 miles west of Highway 89

volume approximately 9000 cubic yards

suitability sandy gravel

		similar pit run material from adjacent Mikesell gravel pit used by MDOT in WSS Main Street backfill / construction
5. In-situ native backfill		Pit run material source
	location	County Airport Gravel Pit, 4.0 miles to shop site
	access	open, 1.5 miles west of Highway 89
	volume	2000 cubic yards + available
	suitability	clayey sandy gravel Bruce indicated that this material should compact better than pit run from other county gravel pit

Meagher County Road Department Shop Remediation

Post-Project Site Meeting Checklist
November 1-2, 2016 (conducted intermittently when personnel were available)

Location: Meagher County Road Department Shop
508 West Garfield Street
White Sulphur Springs, Montana 59645

Attendees:

Bruce Smith	*Representing*	Meagher County Road Department
Tim Collins	*Representing*	Meagher County Road Department
Daryl Mesecher	*Representing*	City of White Sulphur Springs
Tizer DeMers	*Representing*	Weave Consulting
Wade Juntunen	*Representing*	Weave Consulting
Jamie Poell	*Representing*	Hydrometrics

Project Liaisons

Jamie Poell, Hydrometrics	443-4150	459-2873	jpoell@hydrometrics.com
Bruce Smith, Meagher County:	547-3716	403-2130	roadcrew@itstriangle.com
Laura Alvey, Montana DEQ	444-0212	459-5043	lalvey@mt.gov

Other Project Contacts

Bob Anderson, Hydrometrics	431-0236	randerson@hydrometrics.com
Mark Walker, Hydrometrics	459-7229	mwalker@hydrometrics.com
Ben Hurwitz, Meagher County Commissioner	547-3500	benhurwitzmt@gmail.com
Herb Townsend, Meagher County Commissioner	547-3453	con@mtintouch.net
Rod Brewer, Meagher County Commissioner	547-3549	rbrewer@meaghercounty.mt.gov
Ryder Juntunen, Weave Consulting	690-5863	rjuntunen@weavemanagement.com

1. Project Completion Review

Schedule	Finish final grade backfill compaction morning of November 2, 2016
	Pioneer will be on site by noon November 2, 2016 to perform final compaction testing
	Finish final general site and ditch grading Novmeber 2, 2016
	Fencecrafters will remove site security fence November 4, 2016
	Weave will demobilize equipment by November 9, 2016
	Hydrometrics will install monitoring well MCMW-2 in November 2016
Coordination with shop activities	Bruce and Tim see no problem with project completion activities conflicting with county shop activity, including temporary storage of Weave equipment and the removal of security fencing

Communications plan

project liaisons Meagher County will contact Jamie Poell or Laura Alvey if any issues arise after project completion November 2, 2016

field work advance notifications Hydrometrics will notify Bruce Smith in advance of MCMW-2 well installation

2. Remediation site inspection

Soil removal areas

Bruce approved of structure limitations on excavations

Meagher County will build up the final 6 inches of West Shop apron grade with its gravel

Bruce approved of excavation backfill to grade. Meagher County will add gravel as required in the future

Bruce and Daryl approved of South, Sixth, and Garfiled Street post-project conditions, including ditch grading, street shoulder grading, and street shoulder grass seeding

Monitoring Wells

Monitoring well MCMW-3 was left in place at the western extreme of Old Shop Area excavation

Hydrometrics will install monitoring well MCMW-2 in November 2016

assume no dewatering will be necessary during excavations

Utilities

overhead overhead lines were not disturbed during the project

underground Bruce approves of West Shop sewer service line repair and re-grade

Bruce approves of West Shop air line repair and re-grade

Bruce approves of West Shop propane line re-installation and re-grade

Bruce and Daryl approve of project disconnection/seal of unknown underground steel lines at MCMW-2 and Old Shop excavations

Access/traffic

permanent fencing Meagher County has plans to install permanent site fencing along Sixth Street and Garfield Street, and to re-install the South Street fencing south of monitoring well MCMW-2

Bruce indicated that there are no concerns with site area security until the permanent fencing is in place

local traffic control Meagher County shop traffic cones and signs returned to West Shop

contractor staging area Bruce approves short-term contractor demobilization staging area use/condition

3. Meagher County in-kind project contributions

Remediation site

security fencing	Meagher County shop loaned standard orange security fencing for project use
traffic signage / cones	Meagher County shop loaned traffic cones and signage for project use
city and neighbor notifications	Meagher County liaison coordinated project activities with City of WSS, including street closures, lane reductions, street cleaning, underground utility location, repair, and removal Meagher County liaison coordinated 6th Street activities with street resident
utility locates	Meagher County liaison assisted with utility locates
power and water	Meagher County provided water and electricity for contractor's project use
office space	Meagher County provided office space and restroom facilities for contractor's project use
property fencing	Meagher County has plans to install permanent site fencing along Sixth Street and Garfield Street, and to re-install the South Street fencing south of monitoring well MCMW-2 (removed by Meagher County crew for project access)
property utilities	Meagher County shop assisted with West Shop propane line movement for MCMW-2 excavation access, West Shop air line repair, and West Shop sewer service line repair

Backfill

Supply clean suitable backfill	Meagher County provided excavation backfill from its Airport Gravel Pit
Load, haul, place, compact backfill	Meagher County assisted the project/contractor with loading/haul/placement of backfill material required by the project Meagher County shop assisted with ongoing and final backfill grading Meagher County shop provided its water truck and pump/hoses to dewater excavation groundwater accumulation and to store the water for subsequent use in placed backfill compaction

APPENDIX B

PROJECT FIELD NOTES

Potential Backfill Source Sampling

DAILY PROJECT FIELD LOG

Date: 8/31/16
Project Oversight: James Poell
Project: Meagher County Shop Remediation
Project Number: 16048
Client: MDEQ
Contractor: Hydrometrics

Begin Work: 1430
End Work: 1800

Weather: ptly cloudy, dry
Temperature: Hi 82°F Lo 78°F
Wind: SW breeze
Precipitation: 0

Safety: Review plans for sampling w/ Bruce Smith, MC shop backhoe operator. Maintain backhoe clearance, eyesight coordination for sampling backhoe pits

PERSONNEL				
Name	**Affiliation**	**Purpose**	**PPE**	**Notes**
James Poell	Hydrometrics	backfill sampling	✓	
Bruce Smith	Meagher County Shop	backhoe operator	✓	

EQUIPMENT OPERATING	
On Site	**Off Site**
Backhoe	Hydrometrics and Meagher County trucks

PROJECT ACTIVITIES

1430
Meet Bruce at Luppold Road gravel pit. Flag test pit locations on yellow clay stockpile for sampling after safety meeting. Bruce will excavate these test pits (see sketch) while I collect composite samples at

PROJECT ACTIVITIES (continued)

Airport gravel pit (county-owned) pit run pile and adjacent native sources.

All sub-sampling points photographed, sketched and surveyed with GPS.

Samples collected/composited into 2 1-gallon ziplocs and 2 5-gallon buckets for laboratory and geotechnical analyses:

ID	Sample Source	Depth	Time
APRP-1	Airport Pit Run Pile	0-20 (face)	1500
AN-1	Airport Native Source	0-8 (face)	1540
LPRP-1	Luppold Pit Run Pile	0-15 (face)	1650
LN-1	Luppold Native Source	0-8 (face)	1715
LP-1	Luppold Pile (yellow clay) East 1/2	0-10 (test pit/face)	1740
LP-2	Luppold Pile (yellow clay) West 1/2	0-10 (test pit/face)	1805

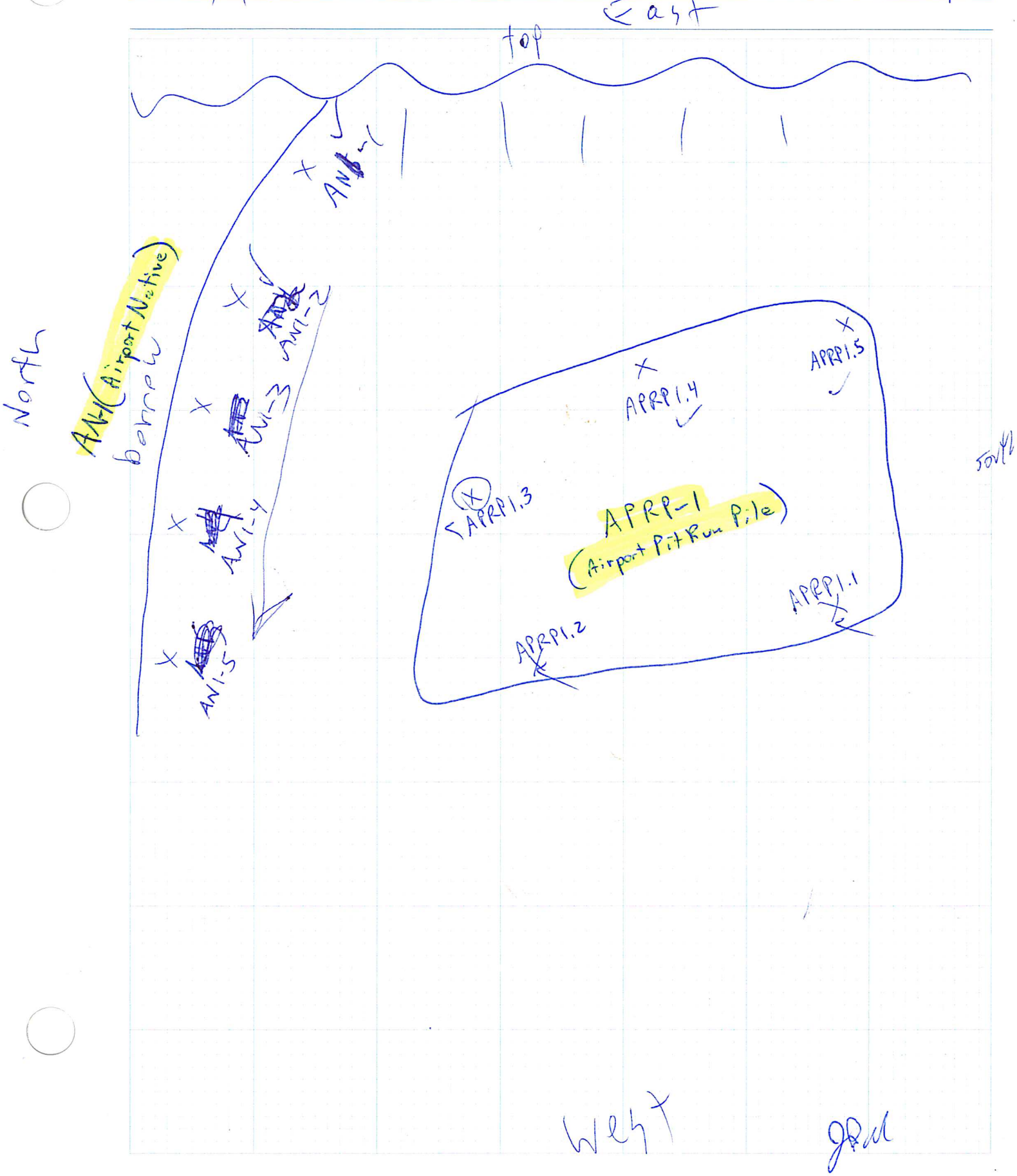
Issues: Ø

Photos: ✓

By: [signature] **Date:** 8/31/16

Hydrometrics, Inc.
consulting scientists and engineers

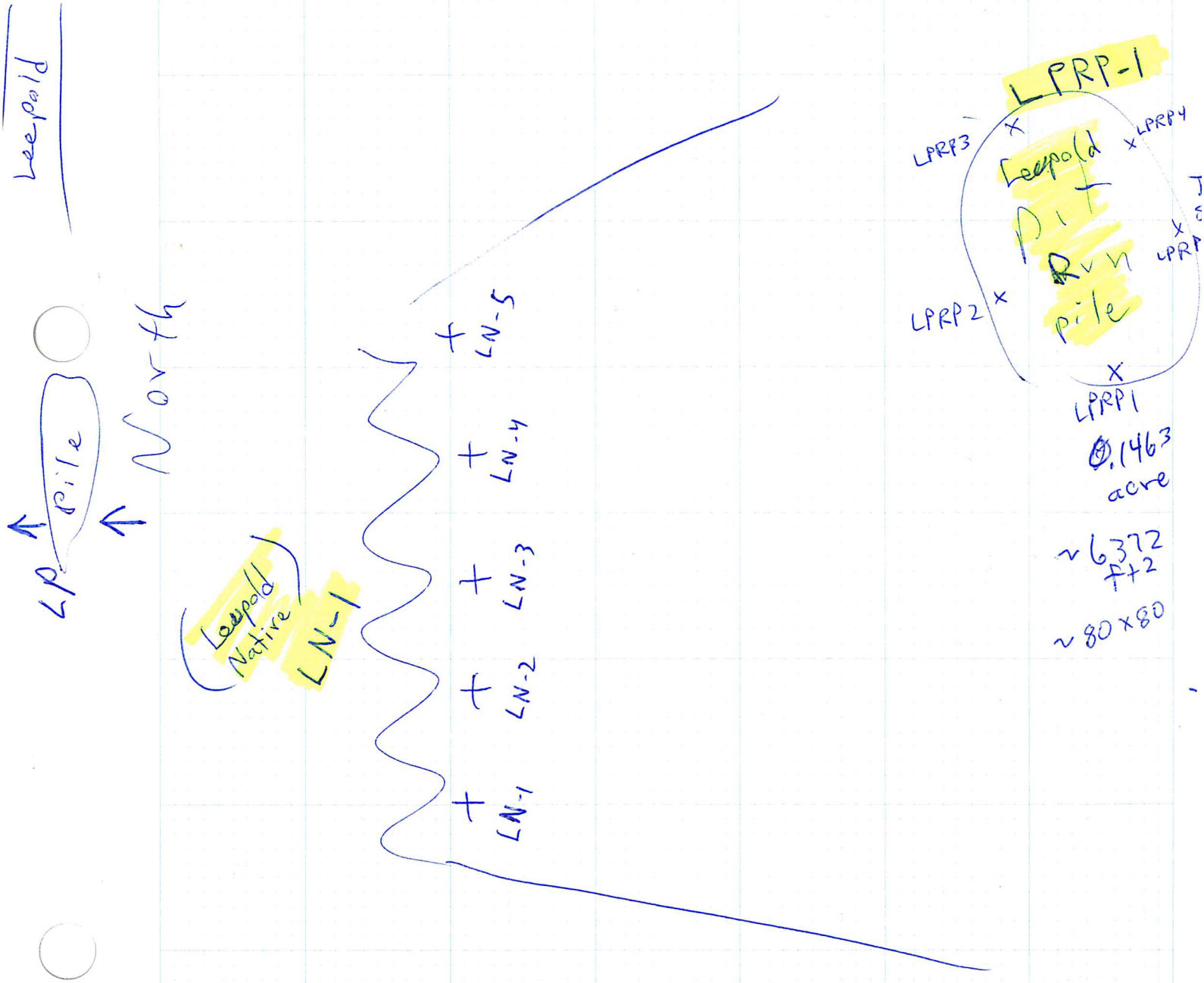
Date: 8/31/16	By: JR	Checked:	Project Number: 16048	Page: 1/3



JRd

Hydrometrics, Inc.
consulting scientists and engineers

Date: 8/31/16	By: JP	Checked:	Project Number: 16048	Page: 2/3



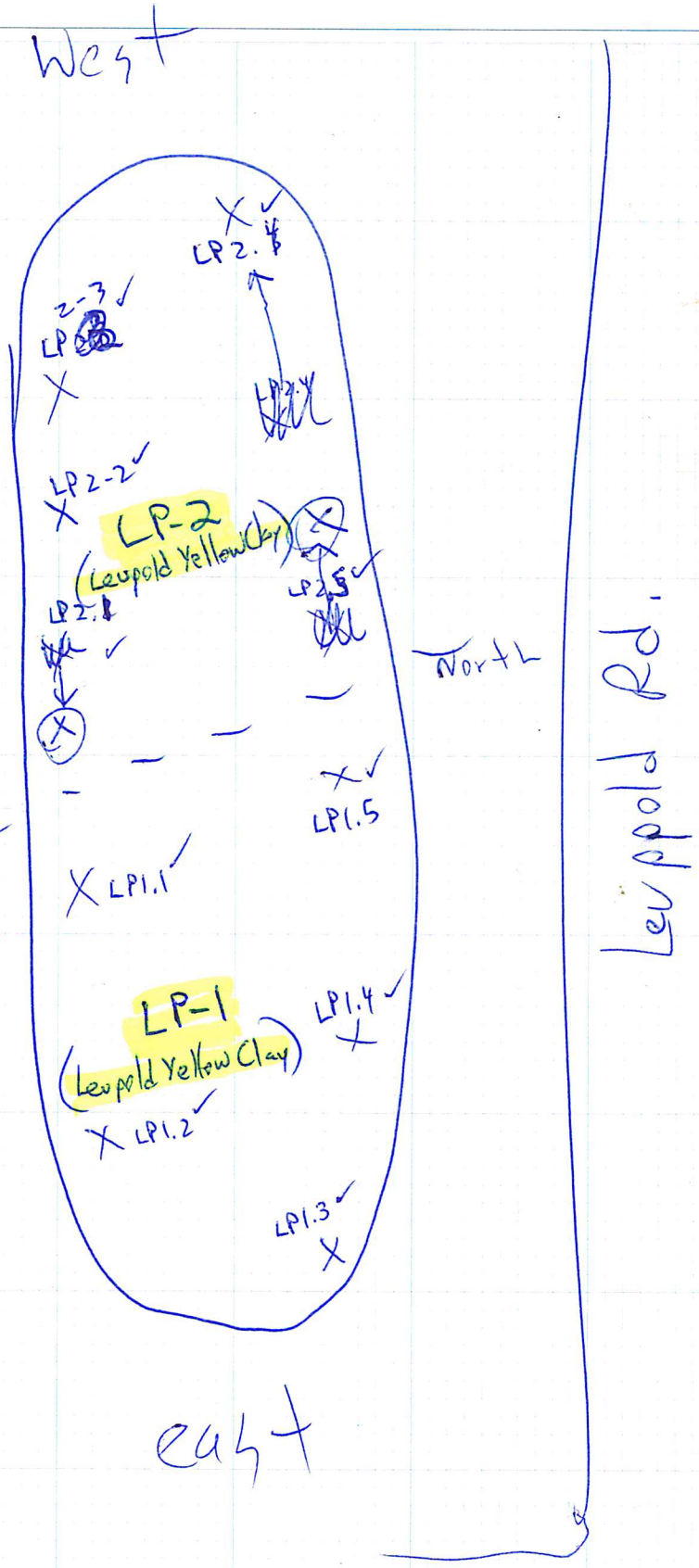
JPM

Hydrometrics, Inc.
consulting scientists and engineers

Date: 8/31/16	By: JP	Checked:	Project Number: 16048	Page: 3/3

Sampling + Photo order

LP 1.4
1.5
2.5
2.4
2.3
2.2
2.1
1.1
1.2
1.3



JP

Rite in the Rain®

ALL-WEATHER

UNIVERSAL

№ 373-MX

Meagher County Shop Remediation

Project Liaisons			
	Laura Alvey, Montana DEQ	444-0212 (459-5043)	lalvey@mt.gov
	Jamie Poell, Hydrometrics	459-2873	jpoell@hydrometrics.com
Gate combination = 9119	Meagher County: (Bruce)	403-2130 / Shop # 547-3716	
	Subcontractor: (Weave)	970-846-7182 (Eric Bonner)	
FenceCrafters (Doug, Johnny) 449-4302		406-690-5863 (Ryder Juntunen)	
		406-565-0445 (Tizer DeMers)	
Other Project Contacts		307-272-2637 (Kevin Mader)	
Bob Anderson, Hydrometrics		431-0236	randerson@hydrometrics.com
Mark Walker, Hydrometrics		459-7229	mwalker@hydrometrics.com
Ben Hurwitz, Meagher County Commission		547-3500	benhurwitzmt@gmail.com
Herb Townsend, Meagher County Commission		547-3453	con@mtintouch.net
Rod Brewer, Meagher County Commission		547-3549	rbrewer@meaghercounty.mt.gov
Bruce Smith, Meagher County Shop		403-2130	roadcrew@itstriangle.com
Subcontractor: Weave			

Daryl - Town of WSS PWD/roads 224-3429

Tim Collings, MC Shop 547-4022

Northwest Energy (Buck) 949-2998

Pioneer (compaction test) 443-6053
→ Kelly, Kevin, Steve

MADE IN TACOMA
SINCE 1916
Rite in the Rain®
DEFYING MOTHER NATURE

Name Jamie Poell
Hydrometrics

Address 3020 Bozeman Avenue
Helena, Montana 59601

Phone 406-443-4150 x154 / mobile 406-459-2873
Email jpoell@hydrometrics.com

Projects
16048 Meagher County Shop Remediation

MADE IN USA RITE GREEN Archival paper

RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE
1	September 30, 2016 Site Mobilization/Inspection/Planning	9/30/16
1	October 2, 2016 Site Mobilization/Setup	10/2/16
2	October 3, 2016 MCMW-2 Area Excavation + Haul	10/3/16
6	October 4, 2016 MCMW-2 Area Excavation + Haul	10/4/16
11	October 5, 2016 MCMW-2 Area Excavation + Haul	10/5/16
15	October 6, 2016 MCMW-2 Area Excavation + Haul	10/6/16
19	October 6, 2016 Old Shop Excavation	10/6/16
20	October 7, 2016 Old Shop Excavation/MCMW2 Excav. + Haul	10/7/16
24	October 10, 2016 MCMW2 Excavation/Haul/Backfill/Old Shop Excavation + Haul	10/10/16
28	October 11, 2016 MCMW2 Backfill/Old Shop Excavation + Haul	10/11/16
31	October 12, 2016 MCMW2 Backfill/Old Shop Excavation + Haul	10/12/16
36	October 13, 2016 Old Shop Area Excavation + Haul	10/13/16
40	October 14, 2016 Old Shop Area Excavation + Haul	10/14/16
42	October 16, 2016 Old Shop Area Excavation + Haul	10/16/16
45	October 17, 2016 Old Shop Area Excavation + Haul	10/17/16
48	October 18, 2016 Old Shop Area Excavation + Haul	10/18/16
51	October 19, 2016 Old Shop Excavation + Haul	10/19/16
53	October 20, 2016 Old Shop Excavation + Haul	10/20/16
54	October 21, 2016 Old Shop Excavation + Haul	10/21/16
56	October 24, 2016 Old Shop Excavation + Haul	10/24/16
59	October 25, 2016 Old Shop Excavation + Haul, Backfill	10/25/16
62	October 26, 2016 Old Shop Excavation, Haul, Backfill	10/26/16
63	October 27, 2016 Old Shop Haul and Backfill	10/27/16
64	October 28, 2016 Old Shop Haul and Backfill	10/28/16
65	October 29, 2016 Old Shop Backfill	10/29/16
66	October 30, 2016 Old Shop Haul and Backfill	10/30/16
67	October 31, 2016 Old Shop Backfill	10/31/16
68	November 1, 2016 Old Shop Backfill and Cleanup	11/1/16
69	November 2, 2016 Old Shop Backfill and Cleanup	11/2/16

September 30, 2016 Site Mobilization / Inspection / Planning (1)

Personnel: Jamie Poell, Hydrometrics Weather: Ptly cloudy, W breeze, 55°F
Bruce Smith, Meagher County
Ryder Juntenen, Weave
Eric Bonner, Weave → on site manager for the project, excavator operator

1000 Meet on site
Doug - Fencecrafters setting up security fencing panels (9/16" deep socket)
Weave's CAT 313F excavator delivered; trucks mobilizing Sunday, Oct. 2
Shop yard gate combination = 9119
Bruce: yard area is ours to use; will assist w/excavation, has road signage
Town sewage lagoon project trucks are using South Street - need to work around that traffic, keep closure of street to minimum, Bruce will coordinate that.
Eric has highway truck signage that he will maintain
Will begin excavation MCMW-2 area between shop buildings - will allow time for lab confirmation while other area is being excavated.
Bruce will widen berm area S & E of old shop site, JP will mark ~ perimeter of contamination area
Confirmed utility locates marking (phone, power, water, sewer) on South Street, clear on east side of 6th street.
Plan to begin work 0700 October 3, 2016

October 2, 2016 Site Mobilization / Setup

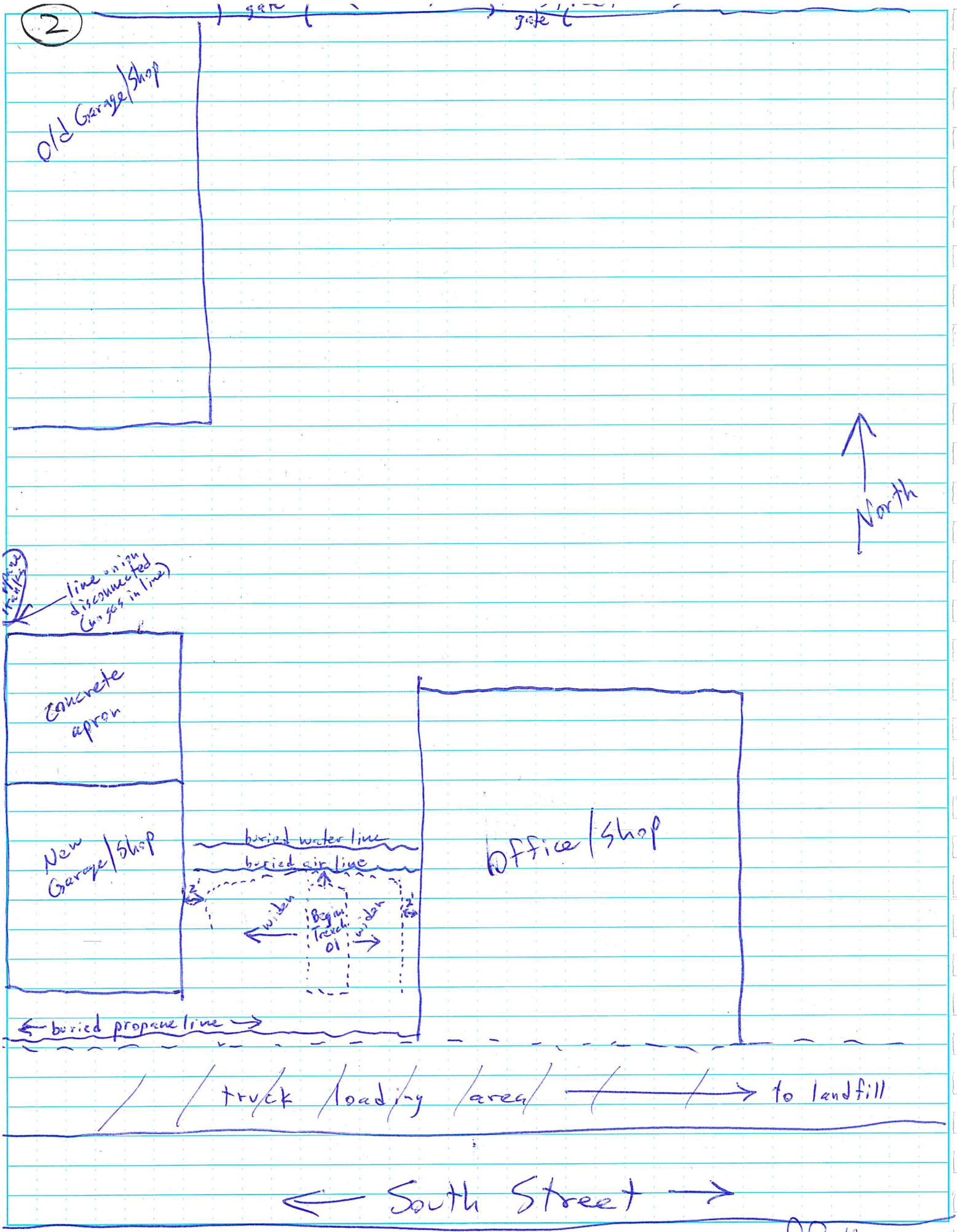
Personnel: Jamie Poell, Hydrometrics Weather: Cloudy, 50°F, West wind

1400 Arrive at shop, set up project table / work space in MC Office/Shop building
Unload supplies, equipment

1800 Check on Weave haul trucks
- sending 3 trucks, staging at truck stop overnight

Rite in the Rain. Scale: 1 square =

2



Scale: 1 square = (not to scale)

October 3, 2016

October 3, 2016 MCMW-2 Area Excavation & Haul

Personnel: Jamie Powell, Hydrometrics
Bruce Smith, MC
Tim Collins, MC
Jim Gregory, MC
Kevin Mader, Weave/Warren
Eric Bonner, Weave

Weather: 40°F, NW wind, cloudy/rain

Equipment: MC Backhoe
Weave Excavator CAT 313F
3 - Weave bellydumps w/pup trailers, ~36-40 yds³/truck

0630 MC Crew: remove steel fence at MCMW-2
unhook propane line at west side tank and clear line
remove old safety fence inside security corridor at old shop site

MCMW-2 SWL = 5.73
MCMW-3 SWL = 5.62 (old shop area)

Bruce will be gone after tomorrow's meeting / Tim Collins will be contact

0720 Kevin Mader, Weave/Warren on site
Site assessment
Bring trucks to staging area west of site on south side of South Street
One truck vandalized overnight (tire cut), will repair this morning
Set up excavator at MCMW-2

0815 Check ambient PID readings
Safety meetings, safety review / signatures

0915 Begin excavation "Trench 1" between buildings north of MCMW-2, to 4' depth
0-1 lt. brown sandy gravel (SG) PID = 10.7
1-2.5 brown SG PID = 11.3
*2.5-4+ gray clay PID = 424.1 → use color as ~ indication of material to excavate

Check South Street for traffic with arrangement to load trucks on north shoulder - set out cones
Begin loading trucks

1000 ~ lens of free water at 6' depth on east side of trench

1030 both trucks scaled, leave for Valley View Landfill (VVL) in East Helena
Use MC backhoe to clear/sample North face of excavation area (Bruce)
Clearing, Bruce hit 3/4" copper air line between buildings at ~6' depth

JPowell

Rite in the Rain

Scale/Square =

(4) October 3, 2016 MCMW-2 Area Excavation & Haul

PID calibrated Sept. 28, 2016 by GeoTech — Mini Rae 3000 PID, S/N 592-910802 (GeoTech Rental)

Location	Depth	PID time	ppm PID reading	Notes
propane line by MCMW-2 (east)	2'	0830	5.1	black & brown clay/gravel, moist
indoor ambient (heated space)	—	0835	5.5	air temp (room) = 69.6°F
background (ziploc air)	—	0836	5.7	—
propane line by MCMW-2 (east)	2'	0838	4.1	black/brown gravelly clay, moist
Trench 1 ~~area~~	0-1'	0910	10.7	lt. brown sandy gravel, moist
Trench 1 area	1-2.5'	0912	11.3	brown sandy gravel, moist
Trench 1 area	2.5-4'+	0914	424.1	gray clay — very strong odor, moist
Trench 1 area	6-7'	0952	655.6	gray gravelly clay, moist
Trench 1 area, north end	7'	1048	601.1	gray brown, moist
Trench 1 area, north end	6-7'	1100	10.3	brown clay/gravel, moist
Trench 1 area, east wall 2' from shop	3-7'	1138	621.7	gray gravelly clay to clay, moist
Trench 1 area, west wall, 2' from shop	3-7'	1146	48.8	brown gravelly clay, moist
Trench 1 area, bottom	8'	1155	389.3	brown cobbly/gravelly clay, moist
Trench 1 area, bottom	10'	1230	152.6	brown cobbly/gravelly clay, moist
indoor ambient	—	1235	2.6	air temp (room) = 68.9°F
outdoor ambient by Trench 1 area	—	1237	1.5	air temp = 48°F
background (ziploc air)	—	1240	9.7	—
Trench 1 area, bottom	11'	1340	37.1	lt. brown cobbly/gravelly clay, moist
Trench 1 area, bottom	12'	1510	15.5	lt. brown cobbly/gravelly sandy clay, moist

JPall

Scale: 1 square = _____

October 3, 2016 MCMW-2 Area Excavation + Haul

1100 Brown 6-7' sample at north end of excavation PID = 10.3
Will ~ use as north extreme of MCMW-2 excavation
Bruce: MC will repair copper air line after excavation when backfill up to its lev
: OK to excavate to minimum of 2' from building foundation

1150 3rd truck repaired (tire) and loading
Excavation on east side completed to ~ 8' depth (approx. 2' from building)
Excavation on west side down to ~8' depth, ~2' from building on N end,
moving south (away from building) as excavate to the south

1220 3rd truck loaded + depart / Day Total ~ 120 yds³
Trench bottom light brown, gravelly/cobbly clay PID = 152.6

1300 Ben Hurwitz on site ~10 minutes / looked at excavation + discussed

1325 Set up South Street security fence w/Eric, excavator on north side of fence,
trucks for loading will be on south side of fence.

1340 Dig excavation area to ~11' deep for sample, no more room to
stockpile excavated material for next loading
11' deep, brown cobbly/gravelly clay PID = 37.1

1400 Catch up on notes, 45°F, strong NW wind

1420 Eric - Weave trucks (3) at VVL unloaded but had to be pulled out
by VVL bulldozer - too muddy, no more loads until it
dries out or another plan. One truck has a problem w/alternator.
Meantime, will try to get 12' depth sample from excavation / PID = 15.5
results indicate general excavation to 12' depth maximum for Trench 1 Area, check again
Rest of day (and tomorrow?) until trucks can be loaded again for
VVL, will work with Eric to begin digging on SE side of
~ old shop contamination zone - more room to work + stockpile
for later truck loading there, MCMW-2 excavation will
be circled w/ caution tape / barrier.

Bruce has his crew hauling backfill from airport to stockpile in shop yard
1515 Call Mark Walker w/update
1530 Eric: Weave planning to have 3 trucks to load 0800 tomorrow morning
We will not begin digging at old shop - leave excavator at MCMW-2
for tomorrow. Eric depart 1550.
1630 Finish notes + depart

Scale: 1 square = _____

(6) October 4, 2016 MCMW-2 Area Excavation & Haul

Personnel: Jamie Pell, Hydrometrics
Bruce Smith, Meagher County
Tim Collins, Meagher County
Jim Gregory, Meagher County
Eric Bonner, Weave

Weather: 35°F, NW wind, cloudy, light rain

Equipment: MC Backhoe
Weave Excavator
(Weave cancelled trucks today)
MC dump truck

0700 On site, organize equipment, supplies; inspect area
Trench 1, free water ponded ~ 11' bgs
Run PID ambients, background
Bruce: yesterday MC crew hauled ~70 yds³ backfill from airport gravel pit to yard stockpile.

0800 Eric on site; no trucks will run today due to VVLandfill muddy conditions (rain) and forecast rain.
Meagher County truck is available, per Tim & Bruce, to haul and place contaminated, excavated loads for interim storage on old shop site. This would allow us to finish the MCMW-2 Area excavation and get confirmation samples to the lab to minimize the time the 12' deep excavation will be open between the shop buildings.

0815 Discuss the modified excavation plan with Mark Walker and Laura Alvey, approved this plan.

0830 Safety meeting / safety review
- be aware of public street traffic and MCMW-2 excavation / 12' deep!
Eric operating excavator
Jim driving dump truck
> identify temporary stockpile location in ~ center of old shop site

0845 Begin excavation / clear south west face of excavated area & sample for PID:
0-4' brown clayey gravel PID = 9.5
4-7' gray sandy clay PID = 651.1

0915 Sketch site, photos

Scale: 1 square = _____

October 4, 2016 MCMW-2 Area Excavation + Haul

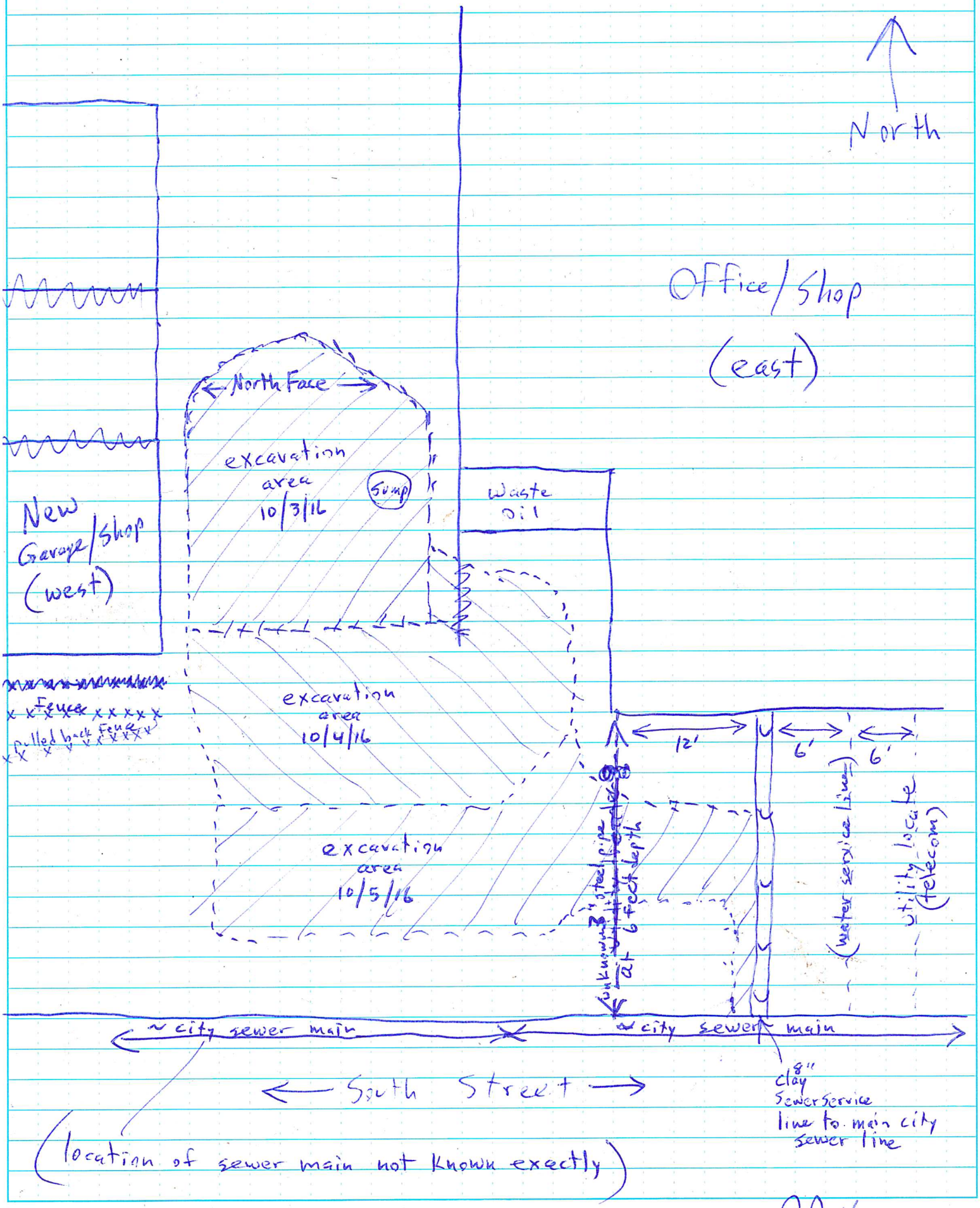
(PID readings collected indoors, heated space)

Location	Depth	PID Time	PID reading (ppm)	Notes
indoor ambient (heated)	—	0735	0.6	room temp. = 75.3°F
outdoor ambient by Trench 1	—	0740	0.2	temp = 35°F
background (ziploc air)	—	0745	5.3	room temp = 70.9°F
SW face of excavated area	0-4'	0855	9.5	brown clayey gravel, moist
SW face of excavated area	4-7'	0857	651.1	gray sandy clay, moist
SW face of excavated area	6-7'	1012	605.8	gray sandy clay, moist
SE face of excavated area	6-7'	1015	470.8	gray sandy clay, moist
South face of excavated area	6-8'	1110	355.1	gray sandy clay, gravels, moist
indoor ambient	—	1200	2.8	temp = 72.3°F
outdoor ambient, N side excavation	—	1205	1.4	upwind
outdoor ambient, S side excavation	—	1210	1.0	downwind
outdoor ambient, S side temporary stockpile	—	1215	2.2	downwind
outdoor ambient, N side temporary stockpile	—	1220	0.7	upwind
background (ziploc air)	—	1225	7.2	room temp = 71.2°F
South face, excavated area,		1450	645.2	gray sandy clay, moist
SE excavated area, 15' N of street 6-7'		1605	693.0	gray sandy clay, moist (≈10' W of SW shop corn
SE excavated area, 15' N of street 0-4'		1607	15.9	brown silty clay, moist "
SE excavated area, 15' N of street (bottom) 10'		1645	~~67.3~~ 56.1	brown silty clay, cobbly, moist / bottom of exca
indoor ambient		1650	~~67.3~~ 1.8	room temp = 67.3°F
outdoor ambient, South of excavated area	—	1655	1.8	downwind, outdoor temp = 44°F
outdoor ambient, South of temporary stockpile	—	1700	2.1	downwind
background (ziploc air)	—	1705	9.7	temp = 68.5°F

Rite in the Rain

Scale: 1 square = _____

(8) October 4, 2016 MCMW-2 Area Excavation & Haul



Scale: 1 square = 2 feet

0940 MC truck tire needs repair (in MC shop)

Ground Water accumulating in base of excavation, remove w/ excavator bucket and place on SE corner of excavation area to infiltrate - mixed with gray/brown material from bottom. Excavate ~15 ft area at bottom, east side, to ~13' feet to serve as sump for rest of excavation area - keep bottom relatively dry for confirmation sampling later.

SW excavation area will include monitoring well MCMW-2, will remove the well as excavate.

0955 remove MCMW-2 monitoring well
pull gray samples at depth for PID, SW + SE corners of excavation

1010 MC truck hauling again
Get outdoor mat + boot scraper to keep MC shop (indoor) area being used for PID/sampling clean.

1020 Uncovered propane line just south of MCMW-2 (along old fenceline)
Bruce wants to keep the line, excavate around it - will slowdown excavation

1040 DEQ/DNRC Arrive Laura Alvey, Erica Mortensen (DEQ), Heidi Folnagy (DNRC)
Inspect site, observe excavation, PID sampling
Review plans, VVL/disposal delay, confirmation sampling → OK to sample contiguous similar lithologies (e.g. gray material on east/south/west faces) as one composite for characterization.

1330 Discuss sump w/ Tim; go to hardware store to get sump pump + hose for pit bottom

1400 Excavate sump, NE corner of excavation using MC backhoe to ~13.5' depth
Perforate 5 gallon bucket, secure electric sump pump w/ float, hook up + place in sump hole
Run line (hose) to old shop area for discharge, should be <20 gallons/day

1430 Called by Ryder - trying to schedule remote compactor and trucks. Told him we could use the compactor by Monday/Tuesday Oct 10/11. He's not sure if a loader is available or if they want to send one (idle time after MCMW-2 filled). Told him we could use the loader to load trucks for VVL while county loader loads backfill at airport pit. Tim has county loader at the pit + we could use backhoe to place fill in excavated area, excavator to spread lifts before they are compacted.

Rite in the Rain. Scale: 1 square =

(10) October 4, 2016 MCMW-2 Area Excavation + Haul

1330 Stop work, Eric hit an unidentified underground cable ~3/8", 24" deep 15' N of South Street. Telecom called / ~~op~~ shop phones work / telecom inspected & okay - defunct, abandoned line.

Gray contaminated trending SE, deeper past waste oil containment structure towards South Street. Can't get in past propane line to dig it out. Work w/ Tim + Jim to unhook the union at the shop/office SW ~~north~~ corner - propane line is now loose enough to move over & wire off onto waste oil container, getting it out of the way so Eric can excavate.

1600 Tim talking to City of WSS r.e. closing South Street Wednesday morning

1645 Crew begins shutdown for day, placing security fence
Eric expects 1 truck in morning ~7am
MC bellydump & dump truck available next week to haul backfill
Jim's MC dump truck hauled 20 loads, 12 yds³/load to temporary stockpile at old shop area today,
total excavated ~240 yds³, temporarily stockpiled

1715 Finish notes, inspect fencing, lock up

Scale: 1 square = _____

October 5, 2016 MCMW-2 Area Excavation & Haul

Personnel: Jamie Paell, Hydrometrics
Tim Colling, Meagher County
Jim Gregory, Meagher County
Eric Bonner, Weave

Weather: 30°F, west breeze, cloudy, light rain & snow

Equipment: MC Backhoe
Weave Excavator
1 ~~2~~ Weave Bellydumps

0700 Inspect site, PID ambient + background readings

0720 Eric on site with 1 bellydump truck, a second on the way, will try to send to VV Landfill today
Tim + Jim will set up South Street road closure for loading now that excavation is between shop buildings + South Street.
Safety meeting, safety review – traffic, weather, power lines

0740 Begin loading Weave truck, ~40 yds³

0800 Done loading, Eric called ~~w/news~~ VV Landfill, is closed (driver told him)
Need to dump Weave truckload before it sets up, OK in yard per TC with other temporary stockpile

Pit sump pump set up yesterday is not working – TC + JG working to fix

0900 Replace sump pump, reinstall + pumping ~5 gpm to old shop area
Moving east security fence panels on South Street for excavation there.
Will resume loading MC dump truck for temporary stockpiling

0915 City rep (Daryl) over to look at road shoulder between South Street and office/shop building where we will excavate next. Sewer connection?/water connection located ~ feet east of SW corner of the building, probably goes straight to South Street, not sure + he estimates the main sewer line (clay) follows the ~ north side of South Street, so Eric will be watching for that.

Sample excavation area bottom, SW and SE for PID

* SW corner of excav. under propane line, PID 18.1 at 13' depth (excav. bottom)

JPM

Rite in the Rain

Scale: 1 square = _____

(12) October 5, 2016 MCMW-2 Area Excavation & Haul

Location	Depth	PID time	PID reading ppm	Notes
indoor ambient	—	0705	1.0	indoor temp 71.9°F
outdoor ambient, S side excav area	—	0710	0.5	outdoor temp 34°F
outdoor ambient, S side temporary stockpile	—	0715	0.3	"
background (ziploc air)	—	0720	4.3	indoor temp 70.2°F
SW excav. corner under propane line, bottom	11'	0935	38.1	brown clay, moist
SE excav. corner 10'N of South Street, bottom	11'	0940	26.1	brown clay/gravels, moist
SW excav. corner under propane line, bottom	12'	0952	45.1	brown clay, moist
SW excav. corner under propane line, bottom	13'	1007	18.1	brown clay, moist
South center excav. under propane line, bottom	12'	1020	30.1	brown clay, moist
South center excav. under propane line, bottom	13'	1032	59.1	brown clay, moist
SW excavation at unknown 3" steel pipe	6'	1142	524.7	gray sandy clay, moist
SW excavation between E shop corner + street	3-4'	1144	8.1	brown silty clay, moist
SW excavation at unknown 3" steel pipe	10'	1335	26.8	brown sandy clay, moist
East excavation, 10' E of 3" steel pipe	7-8'	1338	575.2	gray sandy clay, moist
indoor ambient	—	1340	2.6	indoor temp = 75.4°F
outdoor ambient at excavation, N	—	1342	0.9	outdoor temp = 44°F
background (ziploc air)	—	1344	3.7	indoor temp = 74.1°F
SW excavation at unknown 3" steel pipe	11'	1404	47.4	brown clay, cobbly, moist
"	12'	1422	12.2	brown clay, cobbly, moist
below clay sewer line, 12' east of east shop SW corner	5-6'	1428	502.2	gray sandy clay, moist
indoor ambient	—	1700	2.1	room temp = 73.1°F
outdoor ambient at excavation, N	—	1705	0.8	outdoor temp = 42°F
background (ziploc air)	—	1710	4.2	room temp = 71.6°F

JPull

Scale: 1 square = _____

1015 Snowing
Sump pump caught up w/accumulated water, off, pumped ~30 gallons to old shop area

1050 Eric uncover ~3" steel pipe at 6' depth ~4' SW of east shop corner between shop and South Street. Clear the soil away by hand, call City. Daryl has no record of the line, OKs Tim to drill a hole in it – nothing in line. OK to cut the line, remove an 18" segment. The pipe is in the gray material, horizon ~3-4' thick here

Cut pipe, inside PID readings 12-18 ppm

Continue loading dumptruck for temporary stockpile
Send update to MWalker + BAnderson
1300 Eric told 2 trucks are on the way after a truck just arrived
Loaded the first truck to go to VVLandfill
Kevin + Ryder told Eric that landfill will take the loads today
→ communication problems between VVL, Warren trucks + Weave personnel

Excavating east between shop building and street
Checking PIDs

1345 Excavating east, uncovered 8" clay sewer service line ~12' east of SW corner of east shop building. Telecom locate is another 8-10' east of this.
Gray material extends length of east trench to the clay sewer line
Clay sewer service line is ~5' deep

1530 Loading temporary stockpile loads
Send photos / call MWalker
Send update to Hydro + DEQ (Laura) with pics
Conference call to discuss a plan for east excavation
→ clean up existing excavation + get confirmation samples in morning
→ confirmation samples to lab in morning, 48 hour Rush
→ excavate a test pit east of telecom locate, SE corner of shop to see if contaminated gray material is there

ELabs notified (advance) of confirmation sample delivery tomorrow morning for 48-Hour Rush analysis.

JPM

Rite in the Rain. Scale: 1 square =

(14) October 5, 2016 MCMW-2 Area Excavation & Haul

1600 On site, Eric has one truck on the way (arrived), 2 more trucks coming from Belgrade tomorrow.
Eric will load the Weave truck now with remaining material in the existing excavation area

1645 Loaded truck departs for EH / disposal tomorrow a.m.

MC Crew open road up, help w/ placement of security fence

Walk site, pick up tools, trash

1730 Catch up on notes & leave

Final Load Counts for October 5, 2016

12	MC dumptruck loads to temporary stockpile	144 yds^3
1	Weave truck to temporary stockpile	40 yds^3
		184 yds^3

1	Weave truck to VV Landfill	40 yds^3

Temporary Stockpile	240 yds^3	MC dumptruck	10/4/16
	144 yds^3	MC dumptruck	10/5/16
	40 yds^3	Weave truck	10/5/16
	424 yds^3 in temporary stockpile from MCMW-2 Excavation		

VV Landfill	120 yds^3	Weave trucks (3)	10/3/16
	40 yds^3	Weave truck (1)	10/5/16
	160 yds^3		

* MCMW-2 Excavation Oct. 3-5, 2016 = 424 + 160 = 584 yds^3

J Bell

Scale: 1 square = _____

October 6, 2016 MCMW-2 Area Excavation & Haul

Personnel: Jamie Poell, Hydrometrics
Tim Collins, Meagher County
Eric Bonner, Weave

Weather: 32°F, light snow, W breeze

Equipment: MC Backhoe
Weave Excavator
1 Weave bellydump/pup
1 Weave dumptruck/pup

0700 Safety review - be careful sampling, walking on edges of excavation
Prepare sample jars, packing, COC for MCMW-2 confirmation sampling

0730 Begin confirmation sampling w/ Eric + excavator; MC backhoe getting samples from north end of excavation
Sampling log:

Sample	Time	Location	PID ppm	PID time
MCMW2-100-BASE	0735	bottom, brown clay, cobbly, moist, 12-13' bgs	19.1	0745
MCMW2-101-N FACE	0745	north face, brown SiC, moist, 0-12' bgs	9.2	0755
MCMW2-102-EWTOP	0755	E and W surface horizon, brown SiC, moist, 0-2/4' bgs	15.1	0805
MCMW2-103-EGRAY	0810	E face gray horizon, gray SClay, moist, 2/4-8/10' bgs	410.5	0820
MCMW2-104-WGRAY	0825	W face gray horizon, gray SClay, moist, 2/4-8/10' bgs	322.9	0835

(still excavating south face along South Street, ∴ not sampled today)
*ground water accumulating at ~ 12-13' bgs

0845 Weave bellydump loaded at MCMW-2 (15 yds³) and temporary stockpile (30 yds³) — 45 yds³ total
departs for VV Landfill w/ confirmation samples, custody to be transferred to Ray Woods, Hydrometrics, for delivery to Energy Labs Helena for 48-Hour Rush EPH/VPH analysis.

0855 Begin loading Weave dumptruck/pup from temporary stockpile
0915 Weave dumptruck departs w/ ~ 40 yds³ to VVL
Eric use MC Backhoe to clean up material on South Street, put fence back up
0950-1015 Eric load second Weave bellydump/pup
~~1000~~ ~~1030~~ ~~Dig test pit SE corner of Office/shop (East) building between buildings and South Street (Eric using MC backhoe)~~
1020 Eric load third Weave bellydump/pup (return truck from yesterday afternoon)
1040 Departs w/ load for VVL
Dig test pit #1 SE corner of office/shop (East) building between buildings and South Street using MC Backhoe (Eric)

Collect PID samples

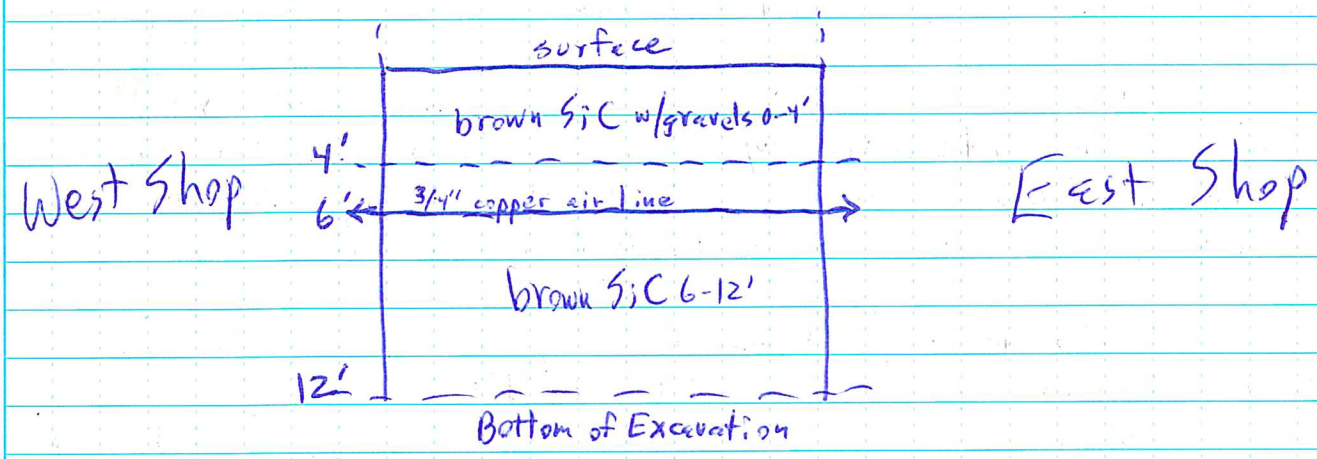
JPoell

Rite in the Rain
Scale: 1 square = ___

(16) October 6, 2016 MCMW-2 Area Excavation + Haul

Location	Depth	PID time	PID reading ppm	Notes
indoor ambient	—	0725	1.6	room temp = 71.2°F
outdoor ambient, N side excavation	—	0727	1.0	outdoor temp = 31°F
background (ziploc air)	—	0729	3.3	room temp = 71.0°F
MCMW2-100-BASE sample mix ziploc	12-13'	0745	19.1	brown clay, cobbly, moist
MCMW2-101-NFACE sample mix ziploc	0-12'	0755	9.2	brown SiC, moist
MCMW2-102-EW TOP sample mix ziploc	0-2/4'	0805	15.1	brown SiC, gravels, moist
MCMW2-103-E GRAY sample mix ziploc	2/4-8/10'	0820	410.5	gray sandy clay, moist
MCMW2-104-W GRAY sample mix ziploc	2/4-8/10'	0835	322.9	gray sandy clay, moist
Test Pit 1 SE corner E shop building	0-4'	1130	7.5	brown SiC, moist
Test Pit 1 SE corner E Shop building, east end of pit	4-5.5'	1135	278.1	gray sandy clay, moist
Test Pit 1 SE corner E Shop bldg., west end of pit	6-7'	1148	143.8	gray sandy clay, moist
Test Pit 1 3' further east	1.5-3'	1210	9.4	gray sandy clay, moist

North Face Profile Sketch

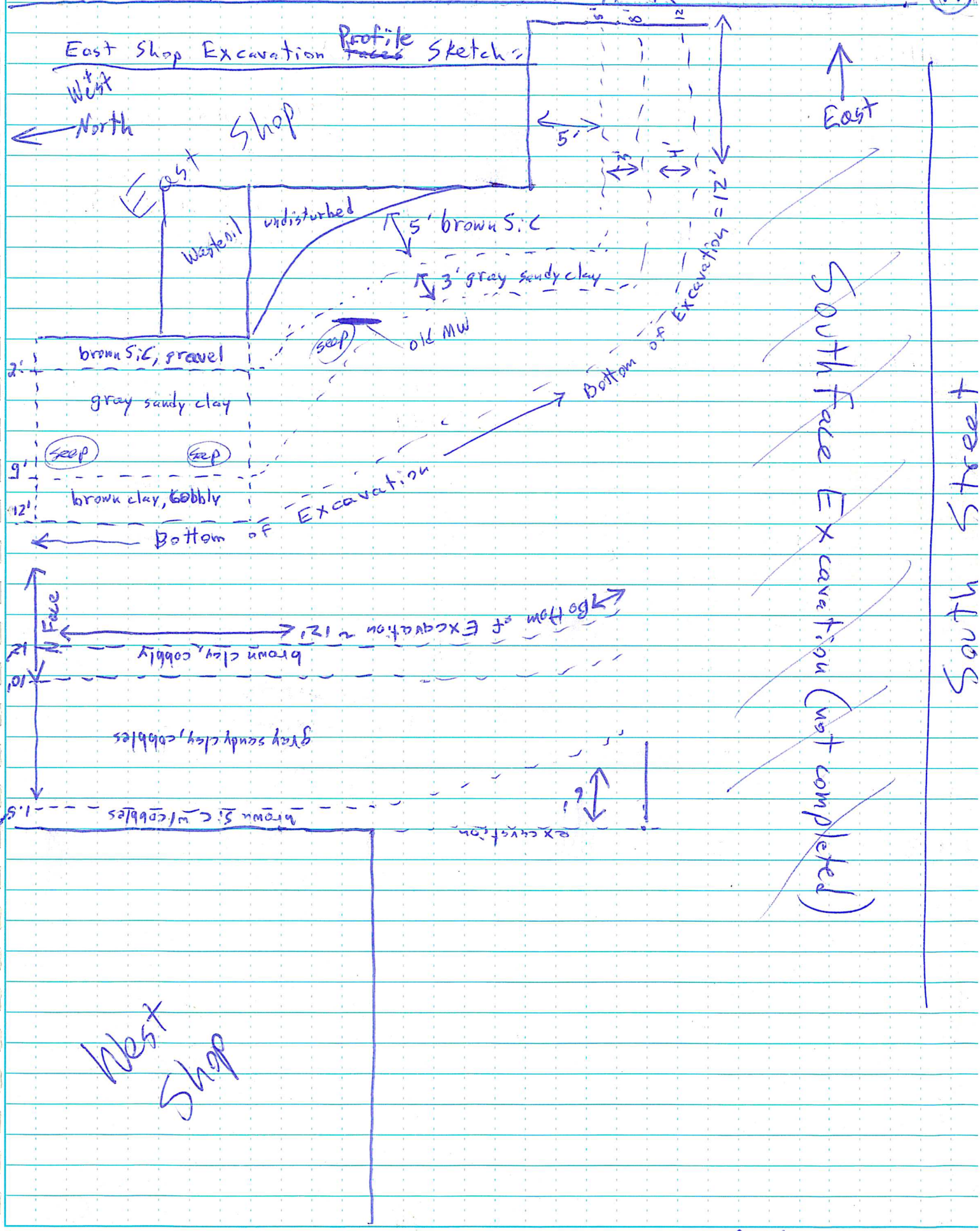


Scale: 1 square = 2 ft.

JPM

October 6, 2016 MCMW-2 Excavation + Haul

East Shop Excavation ~~Faces~~ Profile Sketch:



Scale: 1 square = 2 ft.

(18) October 6, 2016 MCMW-2 Excavation + Haul

1155 Another Weave bellydump/pup arrives (#4 today)

1230 Draft update email w/pics on Test Pit #1 to DEQ, Hydro
1400 Total Weave trucks today, loaded = 7

1620 Two Weave trucks arrive for load, 1 bellydump, 1 dump truck
- will unload at VVL tomorrow morning

- Tim helps load w/ MC backhoe

1700 MC Crew leaves
Weave truck arrives, return loaded, could not get the load to dump at VVL

Total yardage hauled today, minus the return load = 315 yds^3

Eric unloading returned truck

Catch up on notes

1815 Weave done, 1 truck can't be cleaned out (load is sticking and plugging bellydump).

Inspect site, close gates and truck access panels.

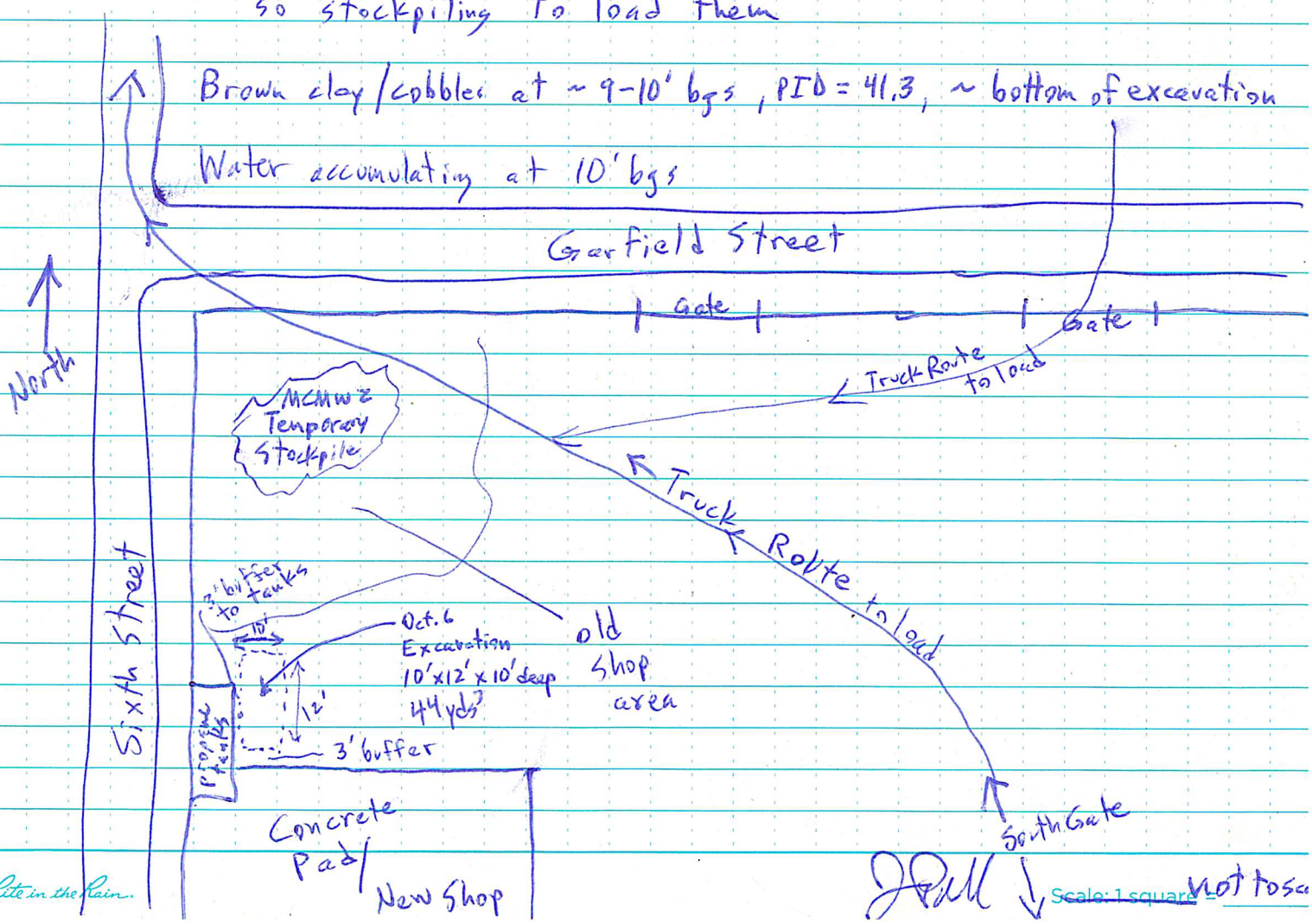
JPull

Scale: 1 square = _____

October 6, 2016 Old Shop Excavation

Location	Depth	PID time	PID ppm	Notes
NW corner New Shop Pad / Propane Tanks	2-3'	1520	568.2	gray clay, moist, odor
"	6-7'	1550	699.1	gray sandy clay, gravels/cobbles, moist, o
"	9-10'	1615	41.3	brown clay, cobbly, moist
indoor ambient	—	1645	2.2	indoor temp 66.7°F
outdoor ambient at stockpile	—	1647	1.1	Outdoor temp 55°F
background (ziploc bag)	—	1649	3.6	indoor temp 65.9°F

1515 Begin Old Shop Excavation after plans w/weave, MC
~ perimeter of Old Shop Contamination (2006 Figure 1) marked, East 1/2
Gray clay contaminated soil at corner of new shop pad and propane tanks (~ SW corner of old shop site), strong odor, to ~ 8' depth extends to the new shop pad, leave ~ 3' space between excavation and pad / propane tank enclosure.
Expecting 2 more trucks today, up to 9 trucks tomorrow so stockpiling to load them



Rite in the Rain.

(20) October 7, 2016 Old Shop Excavation/MCMWZ Excavation & Haul

Personnel: Jamie Poell, Hydrometrics
Eric Banner, Weave

Weather: 32°F, Ptly cloudy, NW breeze

Equipment: Weave excavator
MC backhoe
3 Weave bellydumps

0645 On site, open gates, shop
MC off on Fridays
2 Weave trucks waiting
Eric will be late, truck problem

0725 Eric arrives, warm up equipment, line up truck
Discuss bellydump problems w/ loads not dropping out
Safety review / watch traffic, gates on corners
SW corner of old shop, excavated yesterday, has free water at 9' bgs to depth of excavation, ~10' bgs. Eric will dig a sump when he can.

0750 Eric begin loading first bellydump
3rd empty truck arrived

0810 First bellydump loaded / depart
~20 minutes to load a bellydump/pup from stockpile

0830 Second truck loaded & depart
Truck #3 is the truck with the stuck load from last night
Eric & driver trying to clear the loads using hand tools — excavator can't reach in

0840 Call w/ Laura → review progress, we'll look at preliminary data from ELab on MCMWZ confirmation samples.
OK to finish south face MCMWZ excavation, dig test pit (west) to see if contamination extends far west to South/Sixth Streets corner

0930 OK South Street closure w/ Daryl, WSS Street Dept.
Set out road closure/detour signs

Weave is sending over lube product for bellydump trucks to keep loads from sticking. If that doesn't work, may need to switch to side dumps / less capacity.

Scale: 1 square = _____

0945 - Begin loading the third empty truck from South Street, MCMW2 pit, south face, will excavate toward South Street City Main Sewer Line the rest of the day and dig a west Test Pit #2.

PID Monitoring

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	1000	0.7	room temp = 67.5°F
background (ziploc air)	—	1002	3.1	"
outdoor ambient, N side MCMW2	—	1005	1.4	outdoor temp = 45°F
1030 Eric's replacement arrived / third truck loaded, will be back today Replacement is Tizer / review & sign HASP				
SE Corner at South Street	0-6'	1245	2.2	brown SiC overburden, sl. moist
SE Corner at South Street	6-9.5'	1300	367.7	gray sandy clay, moist, odor
SE Corner at South Street	10.5'	1303	45.1	brown clay, cobbly, moist
Test Pit #2 between W Shop & South Street	0-4.5'	1455	9.8	brown SiClay, sl. moist
Test Pit #2 between W Shop & South Street	4.5-6'	1500	399.7	gray fine sand, moist, odor
Sample MCMW2-WTP2 ziploc remainder	4.5-6'	1505	423.9	gray fine sand, moist, odor
Sample MCMW2-ETP1 ziploc remainder	3-5.5'	1631	213.3	gray sandy clay, moist, sl. odor
indoor ambient	—	1635	1.1	indoor temp = 67.1°F
background (ziploc air)	—	1637	2.9	"
outdoor ambient, N side MCMW2	—	1640	1.2	outdoor temp = 50°F
MCMW2-ETP1	0-2	1645	~~0-2~~ 8.9	red brown SiC, gravelly, sl. moist
MCMW2-ETP1	2-3	1647	~~2-3~~ 9.9	gray sandy clay, sl. moist, gravel
MCMW2-ETP1	3-5.5	1650	~~3-5.5~~ 295.5	gray sandy clay, moist
MCMW2-ETP1	5.5-7	1652	~~5.5-7~~ 44.3	brown clay, cobbly, moist

1040 Review preliminary lab data for confirmation samples / MWalker forwarded to Lam

Eric reviewing job sites w/ Tizer DeMers (his replacement till Tuesday)

1100 Pull sump pump from MCMW-2, clean it up
Spot Tizer/backhoe with loads of pit run to begin backfill on N Face to stabilize E & W sides and build up for copper air line repair Monday.

1130 Truck returned from VVL for second load today, loading on South Street (Truck load #4)

(22) October 7, 2016 MCMW-2 Excavation & Haul

1150 Empty truck arrives for Load #5

Sump pump set up in sump hole at SW corner of Old Shop site

1230 Loaded #5 departs
Sample 0-6' overburden on SE corner of site at South Street, PID = 2.2
Use to backfill below 8" clay sewer service line, ~20 yds³, down to gray

Clear unknown 3" steel pipe to South Street, cut at street
after OK from Daryl, WSS Street Dept.
Continue placing pit run backfill into N Face area below damaged air line
1400 Expansion plugs and expanding poly foam in pipe to seal each end of the 3" pipe.

Bring excavator around to compact the fill below the air line
Call Ryder for an update on trucks this afternoon
Ryder → no trucks this afternoon, planning to use side dumps ~~tomorrow~~ Monday
Will coordinate loading side dumps w/backfill on way into WSS, before loading with waste for landfill Monday.

1445 Dig Test Pit #2, west shop building to South Street ~ location of 2006 Fig 2-1 MCSB-5 (no MDEQ RBSL Exceedences).

			PID
Test Pit #2	0-4½'	brown Si Clay	9.8
	4½-6'	gray, fine sand	399.7
	6'+	brown clay	14.9

1505 Collect composite sample MCMW2-WTP2 423.9 4.5-6' bgs, gray

Excavator dug down just to the west of the green 8" West shop drain/sewer service line, cracked it on the shop side of the test pit. Leaking water. Called Bruce Smith/left a message. Leave pit open, extend security fence to fence it off.

1530 Collect composite sample MCMW2-ETP1
(Test Pit #1)
Interruption:
Weekly update call w/Laura
1600 Tizer placing security fence/cleaning up site

Scale: 1 square = _____

MCMW2-ETP1 (East Test Pit #1):

re-excavate as part of sampling after October 6, 2016 initial di

free water has accumulated overnight at ~ 5.5' bgs

Clean east face of East Test Pit #1:

		PID ppm
0-2'	red brown SiC, gravelly, sl. moist	8.9
2-3'	gray sandy clay, gravelly, sl. moist	9.9
3-5.5'	gray sandy clay, moist	295.5
5.5-7'	brown clay, cobbly, moist	44.3

1730 Finish site fencing, inspection
Catch up on notes
Lock buildings & fences
Depart site

1900 Arrive Helena

(24) October 10, 2016 MCMW-2 Excavation + Haul + Backfill / Old Shop Excavation + Haul

Personnel: Jamie Paell, Hydrometrics
Bruce Smith, Meagher County
Tim Collins, MC
Jim Gregory, MC
Jake Kusek, MC
Tizer DeMers, Weave

Weather: 45°F, light rain, & wind

Equipment: MC backhoe
Weave excavator
2 Weave side dumps
1 Wacker Neuson RTSC2 compactor
2 MC bellydumps

0645 Meet MC crew at shop (still dark) review last week's progress and plan to fix west shop service line break, backfill MCMW2 and excavate Old shop site.

0725 MC begin clearing damaged air line for repair/replace
Inspect site w/Bruce
2 Weave side dumps waiting at South Street turnaround
Old Shop sump kept water level down below 10' over the weekend, pumping water onto Old Shop soil to be excavated
MCMW2 excavation, center, has water to ~1' depth at ~12' bgs
No sloughing on MCMW2 or Old Shop excavation pit walls
Tizer (Weave) arrived, safety/HASP reviewed

0745 Safety review — excavations + traffic
MC will haul backfill for MCMW2 today, Weave trucks will just haul waste to VV Landfill
~26 excavator buckets (3/4 yard) per side dump

0805 Tizer loading the 2 side dumps from remaining material on south face MCMW2 at South Street

Call Ryder (Weave) — he has no idea how many trucks (side dumps) we'll get today; they know we need as many as possible, will check

Sample	Time	Location	PID ppm	PID time
MCMW-2-105-SGRAY	0840	S face gray horizon, gray gravelly S Clay, moist	405.0	0850

→ samples bagged + in cooler

JPaell

Scale: 1 square = _____

0820 Both sidedumps leave for VVL
MCMWZ excavation completed, clean South Face on South Street and collect composite gray contaminated sample, wavy horizon 2-3' thick, beginning at 6-7' deep bgs, sandy clay w/gravels,

0840 Sample South face MCMWZ along South Street
PID = 405.0

0855 Line Tizer out on continuing Old Shop excavation/loading plan
MC Crew working to open up trench at West shop sewer service line break.

0915 First MC bellydump sets ~14 yds³ backfill on South Street, Bruce push backfill into MCMWZ pit (Jim driving & loading at airport pit).

1000 Second MC bellydump load placed & pushed in
Sample Old Shop Excavation for PID

0-3.5' brown and black pea gravel/asphalt fill, sl. moist PID = 16.4
3.5-8' gray sandy clay, gravelly, moist PID = 555.2
8-10' brown clay, cobbly, moist PID = 25.1
Jim and Jake off to get MC bellydump #2 hauling backfill
1015 Tizer over w/excavator to spread out the 2 loads of backfill and tamp them down

Open Garfield and Sixth Street security fencing to allow Weave trucks in and out

1025 Compactor (remove control sheepsfoot) arrives w/ Wade (Weave), safety review

1030 Both bellydumps arrive w/backfill, still setting up in MCMWZ with compactor so drop loads in MC shop yard

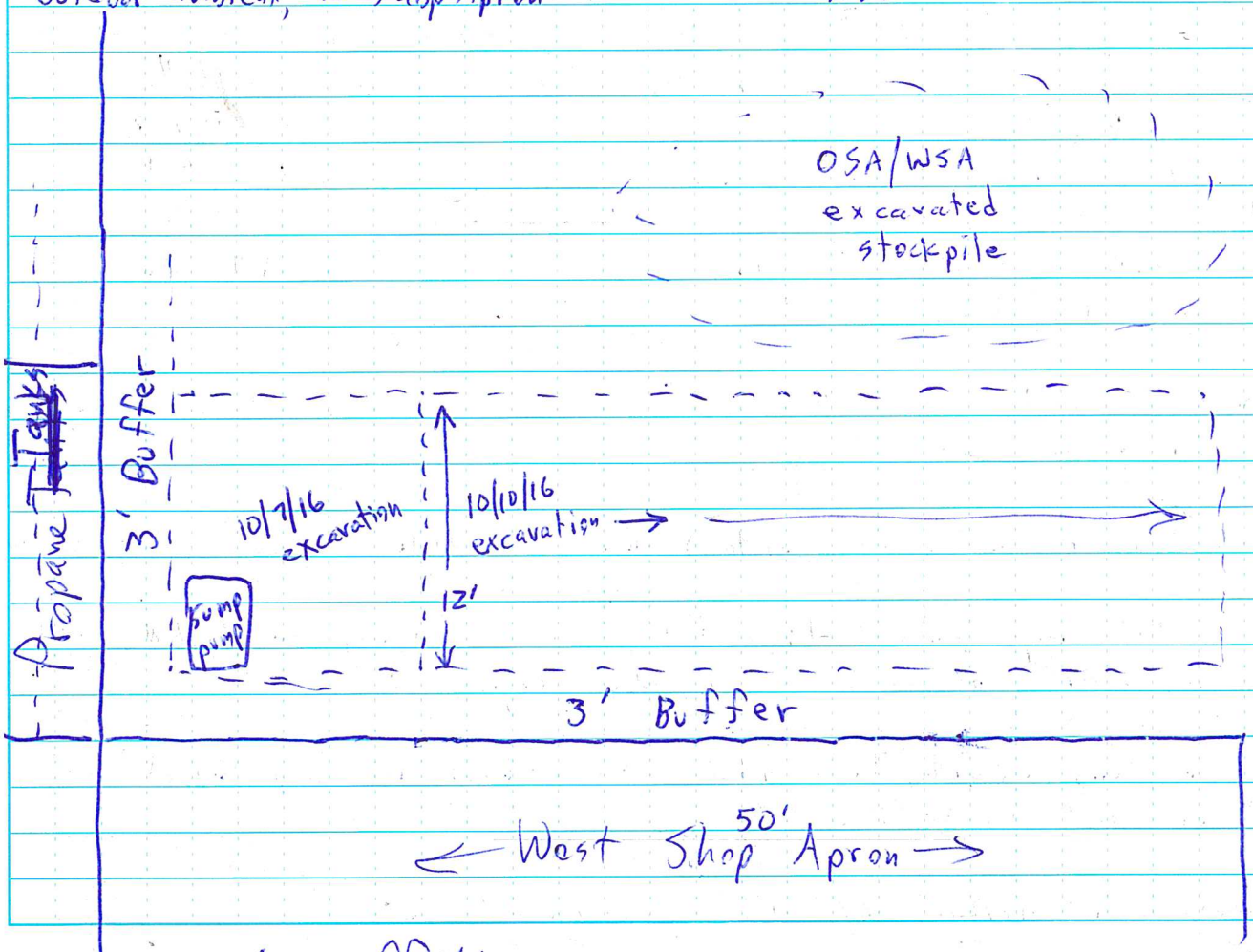
1045 1st Weave Bellydump returns from VVL, ~2½ hours roundtrip / 20 yds³
Tizer will load from Old Shop site

Compactor working MCMWZ along South Street

October 10, 2016

(26) MCMW2 Backfill / Old Shop Excavation + Haul

Location	Depth	PID Time	PID ppm	Notes
indoor ambient	—	0700	2.1	indoor temp = 67.7°F
background (ziploc air)	—	0702	8.2	"
outdoor ambient, N End of MCMW2	—	0704	1.5	outdoor temp = 45°F
MCMW2-105-5GRAY	6-8.5'	0850	405.0	gray sandy clay, gravelly, moist, odor
Old Shop at West Shop Apron	0-3.5'	1010	16.4	brown/black pea gravel/asphalt mix, sl. moist
"	3.5-8'	1012	555.2	gray sandy clay, gravelly, moist, odor
"	8-10'	1014	25.1	brown clay, cobbly, moist to odor
OS/WSA ~ 10' east of previous samples	4.5-5.5'	1128	515.5	gray brown sandy C, gravelly, odor, moist
OS/WSA + 5' east of previous sample	8-9'	1305	727.6	gray sandy clay, gravelly, odor, moist
indoor ambient	—	1310	7.7	indoor temp = 71.5°F
background (ziploc air)	—	1312		"
outdoor ambient, W Shop Apron	—	1314	1.4	outdoor temp = 40°F
South face MCMW2 at South Street, 0-3' bgs	0-3'	1400	7.7	Brown SiC, gravelly, ~~o~~ odor, moist
~~West~~ face MCMW2 at South Street, 0-3' bgs	0-3'	1402	13.8	"
OS/WSA + 5' east of previous sample	5-6'	1610	420.3	Gray sandy clay, gravelly, odor, moist
indoor ambient	—	1630		indoor temp = 64.3°F
background (ziploc air)	—	1632		"
outdoor ambient, W Shop Apron	—	1634		outdoor temp = 36°F



Scale: 1 square = 2'

1105 Weave truck #1 leaves with its second load

Weave Load Counts, October 10, 2016:

~~HHH~~ I

2 of these loads from MCMWZ temporary stockpile
4 of these loads from OS excavation

total = 6 loads, ~20 yd³/load = 120 yds³ hauled to WVL

1115 2 MC bellydumps drop backfill on South Street, Tizer pushing in with MC backhoe, spread w/ excavator for compaction

1130 Second Weave truck returns, Tizer loading at OS (Old Shop)
Wade finish pushing South Street backfill into MCMWZ using MC backhoe
MC bellydumps drop at MC yard, South Street

1150 Load #4 on second Weave truck departs

1300 Tizer digging at OS
Wade compacting
MC hauling backfill

1345 Truck #1 arrives for Load #5, Tizer loading from MCMWZ temporary stockpile
1355 Truck #1 departs w/ Load #5

1435 Truck #2 arrives for Load #6
Tizer loading from MCMWZ temporary stockpile
1450 Truck #2 leaves w/ Load #6

1545 Tizer → no more trucks loading today
Close up Garfield / Sixth Street security fences
Tizer back to digging OS at west shop apron, done at end (east) of apron.
MCMWZ filled along South Street to within ~2-3' of street level
1700 Inspect, catch up on notes & lock up

(28) October 11, 2016 MCMWZ Backfill / Old Shop Area Excavation & Haul

~~0700 Brock~~

Personnel: Jamie Pell, Hydrometrics
Bruce Smith, Meagher County
Tim Collins, MC
Jim Gregory, MC
Jake Kusek, MC
Eric Bonner, Weave

Weather: 30°F, Snowing, 6" snow on ground, N wind

Equipment: MC Backhoe
2 MC bellydump trucks
2 Weave side dumps
1 Wacker Neuson RT5C2 compactor

0700 Bruce plowing airport
Tim backfilling under unhooked propane line – MC wants to hook up the propane line today due to cold weather
Jim & Jake hauling backfill from airport for MCMWZ

0745 Eric on site
Review plan to center further excavation efforts on the Old Shop site at the location of the Former Fuel Tank. One truck waiting to be loaded, after that I'll flag the location to begin excavation. Subsequent trucks will be loaded from West Shop Apron excavated pile or the Former Fuel Tank location.

0800 Bruce back from airport
Explain plan to excavate at fuel tank location in OS Area
Safety review w/ everyone – snowy conditions
Security fence removed on SW side OS Area for trucks to leave (entering through N gate).
Plumber on site to repair sewer service line break between West Shop and South Street.

0830 First MC bellydump load on South Street, belly door frozen shut
Eric loading first side dump truck from waste pile

0845 Loaded side dump truck stuck / pushed out sidedump
Second side dump unloaded VVL this morning + on way back

0905 Eric driving compactor out of way so MC can spread backfill along South Street
Talked w/ M Walker on phone – update and plans for backfill, OS excavation
Will collect a confirmation sample on south face at OS/WS Apron excavation, none needed on other sides or bottom.

Pell

Scale: 1 square = _____

Weave Load Counts October 11, 2016:

III (3) OSA/WS Apron stockpile

—O— OSA/ Former Fuel Tank excavation

0920 Both MC bellydumps have dumped their backfill loads, one in yard (frozen) and one in South Street for backhoe to place in MCMW2 excavation.
Broken sewer service line repaired, will be backfilled

Talked to Ryder (Weave) r.e. need for more trucks
- Weave/Warren knows the situation, should have 4-5 trucks tomorrow
- driver quit, ...
- told him after today backfilling, we will only be working at OS Area and have nothing to do if we don't get more trucks.

Sump pump turned off - frozen hose

0950 Collect 5-point composite confirmation sample OSWSA-200-SGRAY, 4.5-7.5' bgs across West Shop Apron excavation face on SW side of Old Shop site (see PID log) PID in ziploc after filling jars = 504.6 ppm)

1015 Backfilling MCMW2 w/ backhoe on South Street, exavator from north backfill stockpile.
Bruce hooked up propane line to get heat in the 2 shops

Eric: Both our side dump trucks are not moving due to poor conditions/closure on highway 12 between Townsend and East Helena.

1035 Bruce to Lippold Pit w/asbestos inspector & backhoe

 October 11, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	0917	1.4	68.4°F room temp
background (ziploc air)	—	0919	6.6	"
outdoor ambient, OSA/WSApron	—	0921	1.1	28°F outdoor temp
OSWSA-200-SGRAY	4.5-7.5'	1000	504.6	5 point composite, 5 face WSApron excavation gray sandy clay, gravels, odor, moist

1120 Yesterday's last truck back, loaded & sent to VVL, side dump²
Continue backfilling/compacting w/excavator, sheepsfoot (Eric)
Backhoe still at Luppold Pit w/asbestos inspector

1215 Bruce back w/backhoe, bellydump load of the waste pile from Luppold Pit (~10 yds³)

First truck this morning back, loaded & sent side dump³

Eric not sure either truck will be back today

1310 Tim backfilling sewer service line trench (after repair)
Jake's MC bellydump out for repair this afternoon
Eric backfilling MCMW2 from the north / compacting
Bruce spreading backfill from South Street bellydump loads into MCMW2
OS/WSA sump pump turned back on

1500 Sump pump turned off / freezing temp overnight, OS area getting boggy

1545 Eric's excavator low on fuel, needs to get fuel tank for the excavator onto his new truck for tomorrow.
Bruce backfilling from South Street about up to grade. We may run trucks through that route (between shops) loading for OS waste.

1600 Weave trucks won't be back today, 1 is broken down/in for repair and the second truck was stopped for overweight load.
Eric gone to get fuel tank, gone for the day.
MC crew fence up

1630 Finish notes, lock up, depart site

Scale: 1 square = _____

October 12, 2016 McMW2 Backfill / Old Shop Excavation & Haul

Personnel: Jamie Paell, Hydrometrics
Bruce Smith, Meagher County
Eric Bonner, Weave

Weather: 17°F, clear, wind SW

Equipment: Weave excavator
2 Weave side dumps

0700 Safety review - cold + ice

1 Weave side dump waiting
Eric fueling excavator

Yesterday's overweight truck was 32,000 lbs, 12,000 lbs (6T) over limit
→ was loaded w/ 28 excavator bucketloads
→ no ticket, but restricted

Fences down, truck in to load
1 track frozen on excavator

0750 Truck #1 returned from scale, overweight, Eric took a couple buckets off
Will be ~ 21 excavator buckets of very wet material / side dump

Mark off ~ boundary of Old Shop & Former Fuel Tank location to begin excavation

0815 Begin excavating OSA/FFT location, strong gasoline odor

0820 Weave truck back, Eric move a couple buckets from front axle to middle
SW wind blowing hard

0830 Remove ~ 3'x3'x3' concrete footing/rebar from edge of NW corner of OSA/FFT excavation, set aside. Bruce thinks it was footing for an OS support post.

0900 Remove another concrete footing from SW edge of OSA/FFT excavation, set asi
MC crew working on McMW2 backfill completion
Truck #2 arrive, loading

Pace + aerial scale the site for page 33 sketch

JPaell

(32) October 12, 2016

Location	Depth	PID Time	PID ppm	Notes
indoor ambient	—	0845	1.5	indoor temp 73.8°F
background (ziploc air)	—	0847	8.1	"
outdoor ambient, OSA/FFT location	—	0849	0.5	outdoor temp 20°F
SW OSA/FFT excavation	0-2.5'	0855	96.0	brown sandy clay, gravels, slight odor, moist
"	2.5-5'	0858	1475	gray sandy clay, strong odor, moist
outdoor ambient, OSA/FFT, upwind of pile	—	0905	42.6	excavation very odiferous (gasoline)
NW OSA/FFT excavation	9-10'	1000	1884	gray sandy clay, gravels, strong odor, moist
" bottom	10-11'	1003	80.2	brown clay, cobby, sl. odor, moist
outdoor ambient, OSA/FFT location	—	1008	28.7	outdoor temp 26°F, strong gasoline odor
outdoor ambient, outside exclusion zone (east shop entrance)	—	1009	1.1	"

1010 Compactor is clogged w/ frozen mud, bring in shop to thaw

* SAFETY NOTICE: Advise Eric & MC crew that the excavation at OSA/FFT is very stinky (gasoline odor) but PID ambient is 28.7, below HASP standard (100 ppm) in the exclusion zone. However, if the existing conditions are irritating, quit work and leave the exclusion zone.

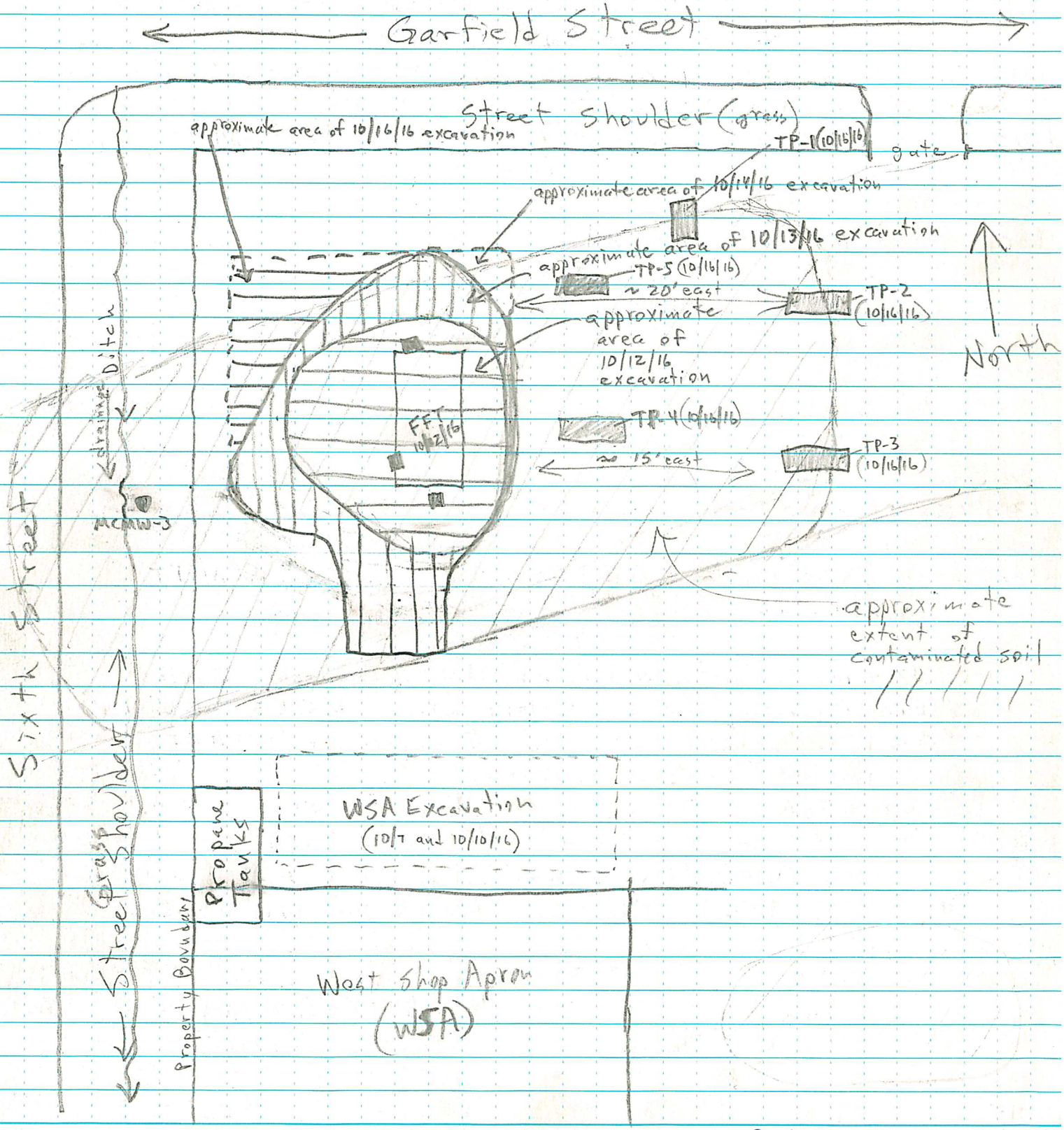
Location	Depth	PID time	PID ppm	Notes
center, OSA/FFT excavation bottom Sample OSFFT-201-BASE	10-11'	1100	127.4	brown + black clay, cobbly, sl. odor, sl. moist
southend, OSA/FFT excavation, S Face	5-6'	1145	1460	gray sandy gravel, odor, moist
OSA/FFT S end + 10' south, Face	5-6'	1335	2411	gray sandy gravel, odor, moist
OSA/FFT W side + 5' west, Face	5-6'	1340	1287	gray sand, coarse, few gravel, odor, moist
OSA/FFT N end + 5' north, Face	5-6'	1350	1281	gray sand, coarse, gravels, odor, moist
OSA/FFT E side + 5' east, Face	5-6'	1355	1646	gray sand, fine + coarse, few gravel, odor, moist
indoor ambient	—	1400	7.9	indoor temp = 73°F
background (ziploc air)	—	1404	8.2	"
outdoor ambient, OSA/FFT	—	1408	6.6	outdoor temp 42°F, odor
OSA/FFT N end + 10' north, Face	5-6' ~~10-11'~~	1515	2304	gray sandy gravel, odor, moist
" , bottom	10-11' ~~5-6'~~	1520	190.5	brown clay, gravel + cobbles, sl. odor, moist
OSA/FFT W side + 20' west, Face	5-6'	1630	1411	gray sandy gravel, odor, moist
" , bottom	10-11	1635	127.6	brown clay, gravel + cobbles, sl. odor, moist
OSA/FFT S side + 20' south, Face	5-6'	1650	1648	gray sandy gravel, odor, moist
OSA/FFT S side + 20' south, bottom	10-11'	1655	98.3	brown clay, gravel + cobbles, odor, moist
indoor ambient	—	1700	3.3	indoor temp = 71°F
background (ziploc air)	—	1702	8.0	"
outdoor ambient (OSA/FFT)	—	1704	8.8	outdoor temp = 48°F

Scale: 1 square = _____

October 12, 2016

Weave Load Counts October 12, 2016:

I	OSA/WSA stockpile, total = 1
IIII	OSA/FFT stockpile, total = 4



■ = concrete footing

Scale: 1 square = 5'

October 12, 2016

1020 Call Weave (Ryder) - problem is # of available drivers, will get back w/update

1030 Excavating OSA/FFT
Call MWalker with update on trucking issue, OSA/FFT excavation and plans. Will forward email from Warren for Mark to followup on at management level. OK to work Sunday October 16 if we can → Eric is willing, at a minimum can excavate + stockpile; if trucks are available we can run trucks to VVL, open 8-3 Sundays.

1050 Collect OSA/FFT excavation bottom confirmation composite sample
OSFFT-201-BASE 10-11' bgs, brown/black clay, cobbly, sl. odor, sl. moist PID = 127.4

1105 First truck this morning (#1) on site to load from OSA/FFT stockpile (second load for Truck #1)

1130 Truck #2 return/loaded/sent w/ second load

1230 Excavating OSA/FFT
Send email to MWalker, Weave/Warren team → need trucks, plans

MC has spread 2 bellydump loads over top of MCMW2 to bring it to grade

1315 Call Laura - leave message

1320 Set up to sample expanded excavation area around OSA/FFT
See PID notes

MC Crew compacting MCMW2, building up backfill stockpile
Eric excavating, expanding OSA/FFT footprint 10' south, 5' to the W, N, + E
Stockpiling material to 12' on SE corner of OSA/FFT for loading onto trucks
GW seepage on NW/NE side of OSA/FFT excavation, 6-8' bgs

1400 Out of space SE corner of OSA/FFT to stockpile, will dig + stockpile west side, NW corner of OSA/FFT, loading future trucks from big stockpile on SW corner.

South face of OSA/FFT is almost twice the PID (2411 ppm) as west and north sides of OSA/FFT (~1290 ppm). East side PID = 1646 ppm.

1415 Truck #1 return/load/sent w/ third load

JPM

Scale: 1 square = _____

1430 Jeremy Harwood (Hydrometrics) stopped by to pick up the 3 confirmation samples from this week - he'll deliver them (iced cooler) to Mark Walker for ELab submittal.

1610 Jordan (Truck #2) will not be back today, had a flat tire
Eric → should have a 3rd truck tomorrow
Clean off west OSA/FFT face for sampling
Clean off south OSA/FFT face for sampling

1705 Final PID readings collected
Eric = 3 trucks tomorrow, possibly 4 per Sam Buchanan
Close up security fences
Update sketches, notes
MC crew, Eric gone
MC crew will not be available tomorrow, backhoe available

1730 Close up, lock gates, depart

* Total of 5 truckloads to VV Landfill, 20 yds^3/load = 100 yds^3

Final OSA/FFT excavation ~ 35' x 30' x 10' deep ≈ 400 yds^3 excavated

(36) October 13, 2016 Old Shop Area Excavation + Haul

Personnel: Jamie Poell, Hydrometrics
~~Tizer DeMers, Weave~~
Tizer DeMers, Weave

Weather: 30°F, clear, calm

Equipment: Weave excavator
MC backhoe available
3 ~~2~~ Weave side dumps
2 ~~3~~ Weave belly dumps
1 Weave side dump
arrived at 1455

0645 MC crew departing to grade county roads
MC backhoe available
Tizer arrives
Safety review
Open security fencing for trucks

0715 Truck #1 load (Ray), side dump 1 (20T)
Loading from stockpile SE of FFT, material is from FFT and WSA excavations.

0730 Truck #2 load, side dump 2

0845 Truck #3 load, belly dump 1 — exit through MCMWZ onto South Street

0805 Truck #4 load, belly dump 2 (40T, 20T trailer + 20T pup)

0825 Truck #3 returns for load on pup after scaling

0835 Truck #5 load, side dump 3
Set out road work signs on South, Sixth and Garfield Streets

0845 Truck #5 depart
Laura returned yesterday's call, update, no concern for the 3 concrete footings — clean them up, Laura will discuss disposal with Bruce

Review excavation + loading plan w/ Tizer
→ excavating NE side of excavation until trucks return

1035 Truck #1 return / load — side dump 4
Distribute emails / pics / drawings to Hydrometrics + Laura

Scale: 1 square = _____

JPoell

Weave Load Counts October 13, 2016

~~IIII~~ ~~IIII~~ Weave Side Dump Trucks (~20 yds³/load)

~~IIII~~ Weave Belly Dump Trucks (~40 yds³/load)

1105 Sample N face after excavating another 5' north
1-5' PID = 42.9 ppm
5-9' PID = 967.9 ppm
10-11' PID = 33.9 ppm
see PID notes

1125 Truck #4 arrive/load (Preston) - bellydump 3

1140 Truck #2 arrive/load - sidedump 5

1200 Truck #5 arrive/load - sidedump 6

1230 Sample NE OSA excavation face after excavation ~5' NE
1-4' PID = 11.6 ppm
6-8' PID = 1785 ppm
10-11' PID = 112.2 ppm
see PID notes

1240 Truck #3 arrive/load → bellydump 4 → SE stockpile too wet for his first unloading, move to load from ~ drier material in NW stockpile by Garfield/Sixth Streets.

1330 Truck #1 arrive/load - sidedump 7

1415 Sample W face of OSA excavation after excavation ~5' W
0-3' PID = 66.5
4-6' PID = 2783
10-11' PID = 362.7
see PID notes

1440 Truck #2 arrive/load - sidedump 8
Truck #4 arrive/load next - bellydump 5

1445 Truck #5 arrive/load next - sidedump 9

Rite in the Rain.

Scale: 1 square =

October 13, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	1050	1.4	indoor temp = 69°F
background (ziploc air)	—	1052	4.9	"
outdoor ambient at E excavation	—	1055	11.7	outdoor temp = 46°F
OSA Excav + 5'N, face	1-5'	1120	42.9	light gray SiC, few gravel, odor, moist
" , face	5-9'	1122	967.9	gray brown SC, gravelly, odor, moist
" , bottom	10-11'	1124	33.9	brown C, cobbly, odor, moist
OSA Excav + 5'NE, face	1-4'	1235	11.6	light brown SC, few gravel, odor, moist
" , face	6-8'	1240	1785	gray brown SC, gravelly, odor, moist
" , bottom	10-11'	1245	112.2	brown C, cobbly, odor, moist
indoor ambient	—	1400	2.2	indoor temp = 70°F
background (ziploc air)	—	1402	7.8	"
outdoor ambient at E excavation	—	1405	12.3	outdoor temp = 58°F
OSA Excav + 5' W, face	0-3'	1438	66.5	brown, lt. brown, black SC, odor, moist
" , face	4-6'	1440	2783	gray brown C, gravels, odor, moist
" , bottom	10-11'	1442	362.7	brown SC, cobbly, odor, moist
OSA Excav + 15' S, face	0-4'	1605	262.1	gray C, SC, gravels, odor, moist
" S, face	4-10'	1607	506.3	gray brown C, gravels, odor, moist
" S, bottom	10-11'	1610	108.3	brown C, cobbly, sl. odor, moist
indoor ambient	—	1625	3.9	indoor temp = 69°F
background (ziploc air)	—	1627	6.9	"
outdoor ambient at E excavation	—	1633	11.4	outdoor temp = 58°F

JPal

Scale: 1 square = _____

1455 Truck #6 (new side dump) arrive / load - sidedump 10

1520 Done loading trucks for the day
Tizer will set up and excavate south between SW and SE waste stockpiles

1550 Sample OSA South excavation face after excavation ~15' south:
0-4' PID = 262.1
4'-10' PID = 506.3
10-11' PID = 108.3

1615 Tizer done cleaning out bottom of OSA, south end excav.
Little room left for more digging until we send loads tomorrow - Tizer depart.

1630 Cleanup, fencing up

1645 MC crew back - they'll lock up.

Weave Load Counts October 13, 2016:

Side Dumps 10 at ~20 yds³/load ≈ 200 yds³

Belly Dumps 5 at ~40 yds³/load ≈ 200 yds³

total ≈ 400 yds³ hauled

October 13, 2016 OSA Excavation Volume ≈ 100 yds³
- see page 33 sketch

(40) October 14, 2016 Old Shop Area Excavation & Haul

Personnel: Janie Paell, Hydrometrics
Tizer DeMers, Weave

Equipment: Weave excavator
MC backhoe available
3 Weave side dumps
1 Weave belly dumps
MC loader (from airport)

Weather: 60°F, W breeze, Ptly cloudy

0645 On site, open up w/ Tizer
Safety review / forecast for rain / wind
Street signs up
Review plans w/ Tizer - I leave ~1pm, he will drop street signs and lock up after last loads sent this afternoon / caution tape up on exclusion zone

0730 Truck #1 load (Ray) - sidedump[1]

0740 Truck #2 arrive / load - sidedump[2]

0750 Truck #3 arrive / load - belly dump[1]

Continue excavating N 1/2 of east face and E 1/2 of N face where we can dig between SE and NW stockpiles.
Call Ryder → he'll check on more trucks
we will have trucks Sunday
asked him to confirm Sunday trucks this afternoon
Call w/ M Walker - plan for today:
OSA South Side clear face, confirmation sample
Excavate NE / get PIDs
Load trucks

0900 Eric on site to take compactor back
He will be the operator on Sunday, tentative plan to meet on site 0800 Sunday

0935 Truck #4 arrive/load - sidedump[3]

Hydraulic line on excavator bucket is leaking badly, down till repaired
~~Parts store in town~~
Cast-iron connector is broken also / Tizer calling T+E Rental
(cast iron arm connecting excavator arm to bucket is broken)
(hydraulic line is also broken, cut when arm broke)

JPM

Scale: 1 square = _____

October 14, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	1000	1.2	indoor temp 69°F
background (ziploc air)	—	1002	7.7	"
outdoor ambient, OSA E excav	—	1005	10.2	outdoor temp 58°F
OSA, E Face, N 1/2	0-4'	1025	140.9	lt. brown SiC, sl. odor, moist
"	4-9'	1027	2055	gray SC, odor, moist, (gravels)
" bottom	9-10'	1029	36.9	brown SC, sl. odor, moist (cobbly)
OSA, N Face, E 1/2	0-4'	1040	16.3	lt. brown SiC, sl. odor, moist
"	4-9'	1042	1706	gray SC, odor, moist (gravels)
"	9-10'	1044	32.0	brown SC, sl. odor, cobbly, moist
" bottom	10-11'	1046	29.1	brown C, sl. odor, cobbly, moist
indoor ambient	—	1245	1.5	indoor temp 68°F
background (ziploc air)	—	1247	7.8	"
outdoor ambient, OSA E excav.	—	1250	11.8	outdoor temp 54°F

1030 No Helena T&E replacement excavators / Sam Buchanan checking around state for other T&E replacement availability. Use MC backhoe load in meantime.

1050 Truck #1 arrive / load w/ MC backhoe loader side dump 4
Truck #2 arrive / load w/ MC backhoe loader side dump 5

Strong SW wind, light rain

1105 Tried calling Bruce - Call Tim, OK to use airport loader to load trucks ~~today~~ today & Sunday. Will drive Tizer out to get it after loading Truck #2.

1155 Truck #3 arrive / load (bellydump) 2
Tizer on the way with MC Loader from airport

1230 Truck #4 arrive / load side dump 6

1335 Depart site, Tizer will call w/ total loads for the day after locking up.
Return to Helena for weekly update meeting w/ Laura Alvey.

* October 14, 2016 OSA Excavation Volume ~ 50 yds³

* Total Loads October 14, 2016

Side Dumps 7 at ~ 20 yds³ / load = 140 yds³
Belly Dumps 2 at ~ 40 yds³ / load = 80 yds³
total ≈ 220 yds³

Rite in the Rain. JPM

Scale: 1 square = _____

(42) October 16, 2016 Old Shop Area Excavation + Haul

Personnel: Jamie Poell, Hydrometrics
Eric Bonner, Weave

Weather: 42°F, light rain & breeze

Equipment: MC loader
Weave excavator (replacement)
5 Weave side dumps

0700 On site, open gates, inspect site
Prep for loading, street signs up
Talk to drivers - loading on Garfield Street using MC loader
~4 loader buckets / truck ≈ 20 yds³ / truck

0800 Eric on site
Safety review
Plans for loading / test pits, excavation later

0810 Truck #1 (Steve red) load, sidedump¹

Truck #2 (0782 - Ray) load, sidedump²

Truck #3 (0666) load, sidedump³

Truck #4 (0783) load, sidedump⁴

2 trucks back after scaling for additional material

0900 Truck #4 depart

Use GPS to calculate area of OSA excavation as of October 14, 2016. Area ~ 1300 ☐, 10' deep ≈ 500 yds³ hole volume

Eric will clean up waste stockpile on NW corner of excavation and then build it up from excavation on west side, working north from the MCMW3 well to the NW corner of the excavation and then east from that corner to the vertical N face cleared by Tizer October 14. Next loads will be loaded from the NW stockpile. Eric will add 1-2 buckets of pit bottom water to each side dump to dewater the bottom - try & see if that works for loading + haulage + for keeping excavation bottom dewatered. See sketch page 33.

JPoell

Scale: 1 square = _____

October 16, 2016

0930 Truck #5 arrives (0781), load, sidedump[s]

Eric cleaning W face from well MCMW3 to NW corner
Sample W face here, 3-6' bgs PID = 1610
8-9' bgs PID = 1921
10-11' bgs PID = 71.1
} see PID notes

Hit 3" steel pipe ~2' bgs - came right out, same type pipe as at MCMW2

Location	Depth	PID time	PID ppm	Notes
OSA, W face 15' NE of MCMW3	3-6'	1010	1610	gray sandy clay, gravels, odor, moist
"	8-9'	1015	1921	gray SC, gravels, odor, moist
"	10-11'	1020	71.1	brown clay, cobbly, sl. odor, moist
indoor ambient	—	1030	1.0	indoor temp = 63°F
background (ziploc air)	—	1032	11.1	"
outdoor ambient, E side OSA excav	—	1035	6.2	outdoor temp = 58°F / rain
OSA, NW Corner, 12'E + 30'N of MCMW3	9-10'	1130	140.5	brown clay, cobbly, odor, moist
"	5-9'	1133	1533	gray SC, gravels, odor, moist
"	2-5'	1136	35.3	lt. brown C, sl. odor, moist
"	0-2'	1140	314.7	black + red SC, sl. odor, moist, gravels
OSA, NE, TP-1	0-2'	1330	30.0	gray SC, sl. odor, moist
	2-4'	1333	5.2	lt. brown C, sl. odor, moist
	4-5.5'	1336	60.9	gray SC, sl. odor, moist
	5.5-6.5'	1340	9.9	brown SC, sl. odor, cobbles, moist
indoor ambient	—	1345	1.4	indoor temp = 71°F
background (ziploc air)	—	1347	8.8	"
outdoor ambient, E Side OSA excav	—	1350	6.6	outdoor temp = 64°F
OSA, E TP-2	0-1.5'	1406	13.9	black gravelly clay, sl. odor, sl. moist
"	1.5-4'	1409	319.2	gray clay, sl. odor, moist
"	4-8'	1412	501.9	gray SC, gravels, sl. odor, moist
"	8-9'	1415	89.9	brown clay
OSA, SE TP-3	0-1.5'	1426	7.5	black gravelly clay, sl. odor, sl. moist
"	1.5-3'	1428	403.1	gray SC, sl. odor, moist
"	3-5'	1430	544.4	gray C, sl. odor, moist
"	5-9'	1433	547.3	gray SC, gravels, sl. odor, moist
"	9-10'	1435	191.9	brown clay, cobbles, sl. odor, moist
OSA, E TP-4 (south ½)	3-6'	1457	384.7	gray SC, sl. odor, moist
"	6-9'	1500	608.9	gray SC, gravels, sl. odor, moist
OSA, E TP-5 (north ½)	3-6'	1542	44.8	gray SC, sl. odor, moist
"	6-8'	1545	381.2	gray SC, gravels, sl. odor, moist
indoor ambient	—	1640	2.1	indoor temp = 70°F
Rita in background (ziploc air)	—	1642	7.9	
outdoor ambient E Side OSA excav	—	1645	[illegible]	outdoor temp = 58°F

JPM

Scale: 1 square =

(44) October 16, 2016

1105-1130 Sample NW corner of excav. area, see PID notes, close to MCSB-10

1130 Truck #2 arrive/load, side dump 6

1145 Truck #1 arrive/load, side dump 7

1155 Truck #3 arrive/load, side dump 8

1200 Truck #4 arrive/load, side dump 9
Bruce on site, update Friday/today

1230 Truck #5 arrive/load, side dump 10

1250 Mark 3 test pits, TP-1 (NE OSA) ~20 NE of NE corner excav.
TP-2 (E OSA) ~20' E of E face excav.
TP-3 (SE OSA) ~15' E of E face excav.
See page 33 sketch

Excavate & sample test pits → see PID notes

1430 Truck #2 arrive/load, sidedump 11

1445 Mark out Test Pits TP-4 and TP-5 (see page 33 sketch)

1500 Truck #4 arrive/load, sidedump 12

TP-4 (E OSA) ~7' E of E face excav.

TP-5 (NE OSA) ~10' E of NE corner excav.

1505 Truck #1 arrive/load, side dump 13

1550 Fill in TPs 1-5, will consolidate stockile on N side so we can excavate North face several feet north, check ~5-9' bgs gray/gravels for PID.

October 16, 2016 OSA excavation volume ~ 75 yds^3

* Total loads October 16, 2016 = 13 sidedumps at ~20 yds^3/load ≈ 260 yds^3

1700 Eric: replacing rental excavator (breakdown) + sending it back
Tizer tomorrow 0730
Fences up, inspect, locked up, signs down

JPM

Scale: 1 square = _____

October 17, 2016 Old Shop Area Excavation & Haul

Personnel: Jamie Paell, Hydrometrics
Tizer DeMers, Weave

Weather: 38°F, light rain, calm

Equipment: Weave excavator
4 Weave side dumps
1 Weave dumptruck & pup
MC backhoe

0645 On site, open up
1 truck waiting

0700 Tizer on site, MC crew not available
Safety review

0715 Truck #1 (#781 Jordan) loaded, = side dump[1]

0800 Tizer cleared NW corner at Garfield & Sixth Streets, will stockpile ~ 0-4' clean excavated surface soils for use as backfill. PID sample = 63.3 ppm.
Truck #2 is Weave dump truck & pup arrive/load, = dumptruck[1]

0820 Truck #3 side dump (#783) arrive/load = side dump[2]
Truck #4 side dump (#782) arrive/load = side dump[3]

0825 Collect 4-8' gray SC gravel sample, N face + 2' N for PID from loading bucket

0840 Truck #5 side dump (#9915, red) arrive/load = side dump[4]
Collect 4-8' gray SC gravel sample, N face + 5' N for PID from loading bucket

0845 → Same, ~ 10' E of NW ~~[illegible]~~ corner, 5' N of excav PID = 1788

0900 " , ~8' N of excav PID = 1176
" , ~10' N of excav PID = 789.3

~ definition of N extent (face) of area to be excavated
Tizer begin excavation of a clean NW corner face

0940 Collect samples on NE/E excavation face
Excavator low on fuel / Eric on way w/fuel from Townsend / excavator off
Tizer using MC backhoe to grade off E side of OSA excavation area ahead of E face excavation when excavator is fueled.
Raining

1010 Truck #1 back for load sidedump[5]

1025 Eric on site to fuel excavator

(46) October 17, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	0755	0.8	indoor temp = 67°F
background (ziploc air)	—	0758	2.9	"
outdoor ambient, OSA E excav.	—	0800	1.1	outdoor temp = 40°F
OSA North face + 5' N	0-4'	0815	63.3	lt. brown SiC, ⊖ odor, sl. moist STOCKPILED
OSA North face + 2' N	4-8'	0835	1672	gray SC, gravelly, odor, moist
OSA North face + 5' N	4-8'	0845	1852	gray SC, gravelly, odor, moist
OSA North face, NW+5' N	4-8'	0855	1788	"
OSA North face, NW+8' N	4-8'	0910	1176	"
OSA North face, NW+10' N	4-8'	0920	789.3	gray/brown SC, gravelly, odor, moist
OSA NE corner	4-8'	0945	278.1	lt. brown SiC, gravelly, sl. odor, moist
OSA NE corner, 8' SouE face	4-8'	0950	12.5	brown SC, gravelly, sl. odor, moist
OSA NW corner + 10' N	0-4'	1055	155.2	lt. brown SiC, sl. odor, moist
OSA NW corner + 10' N	4-8'	1100	199.9	gray brown SC, sl. odor, moist
OSA NE corner	0-4'	1200	8.8	lt. brown SC, ⊖ odor, sl. moist, STOCKPILED
OSA E face, N end	0-4'	1210	11.3	"
OSA E face, N end	4-8'	1215	1305	gray SC, gravelly, odor, moist
OSA E face, N end + 5' E	4-8'	1235	25.7	gray brown SC, gravelly, sl. odor, moist
OSA E face, middle	4-8'	1240	1189	gray SC, gravelly, odor, moist
OSA E face, middle	0-4'	1245	229.3	lt. brown SiC, sl. odor, moist
OSA E face, middle + 5' E	4-8'	1305	877.2	gray SC, gravelly, sl. odor, moist
OSA E face, middle + 5' E	2-3'	1310	525.7	gray SC, sl. odor, moist
OSA E face, middle + 5' E	0-2'	1330	224.2	brown/black gravelly clay, sl. odor, sl. moist
OSA E face, middle + 5' E	8-9'	1335	88.5	brown C, cobbly, sl. odor, moist
OS-202-NGRAY conf. sample	4-8'	1440	505.7	gray SC, gravelly, odor, moist
indoor ambient	—	1445	2.6	indoor temp = 72°F
background (ziploc air)	—	1447	4.7	"
outdoor ambient, OSA E excav.	—	1450	6.6	outdoor temp = 46°F
OSA E face, SE end	4-7'	1455	814.3	gray SC, gravelly, odor, moist
OSA SE face	4-8'	1545	2364	gray SC, gravelly, odor, moist
indoor ambient	—	1600	1.9	indoor temp = 72°F
background (ziploc air)	—	1602	4.5	"
outdoor ambient, OSA E excav.	—	1605	3.9	outdoor temp = 46°F

Scale: 1 square = _____

1050 Sample NW corner, 10' N of yesterday, 0-4' PID = 155.2
4-8' PID = 199.9

1100 Truck #2 return/load dump truck[2]

1125 Truck #3 return/load side dump[6]

N face cleaned up off bottom
Mark ~3' to excavate off east face, 0~4' above gray impacted gravels layer to be segregated to backfill stockpile by gate on N side of site. Screening PID as the east face is excavated.

1130 Truck #4 return/load side dump[7]

1150 Truck #5 return/load side dump[8]

1210 Clearing and sampling E face, working north to south
Excavate face ~5' east to get PIDs <1000 ppm

1335 Truck #1 return/load side dump[9]

1345 Truck #2 return/load dump truck[3]
1405 Truck #3 return/load side dump[10]
1430 Collect north face OSA confirmation sample OS-202-NGRAY
Ziploc PID, after sampling/compositing = 505.7 ppm

1435 Truck #4 return/load side dump[11]

1525 Truck #5 return/load side dump[12]

1545 SE face PID = 2364,
Clear off SE/stockpile for tomorrow
October 17, 2016 OSA excavation ~150 yds^3

Total loads October 17, 2016 = 12 side dumps + 3 dump trucks at ~20 yds^3/load ≈ 300 yds^3

1700 Fence up, lock doors, inspect, signs down, depart

Rite in the Rain.

Scale: 1 square =

(48) October 18, 2016 Old Shop Area Excavation & Haul

Personnel: Jamie Paell, Hydrometrics
Tizer DeMers, Weave

Weather: 36°F, ptly cloudy, calm

Equipment: Weave excavator
Weave side dumps

MC crew not available

0630 Errands, on site w/ Tizer, open gates
Safety review

0700 Truck #1 (781) load from N end/Garfield Street — side dump 1
Truck #2 (783) " — side dump 2

Tizer cleaning last of load stockpile on N side for next loading using MC backhoe
Set up excavator on SE site load stockpile

0750 Truck #3 (782) load from N end & SE stockpile — side dump 3
Tizer loading from W side of SE stockpile so we can excavate south face after a few loads are removed from the edge

0830 Truck #4 (red) load from SE stockpile — side dump 4

Tizer using MC backhoe to clean up roads and excavation sloughing

0945 SE corner area cleared, PID = 408.3
Move to SW corner area, top of waste stockpile to excavate SW corner back to S and W.

1015 SW Corner PID = 2260, keep digging S and W
Collect E face confirmation sample 05-203-EGRAY, PID = 600.1

1020 Daryl, City of WSS, stopped by after my call to advise on Sixth Street underground lines (none) and the overhead power poles "tension" line (non-conductive) that the Weave operator would like temporarily dropped so he can load trucks on Sixth Street later this week. Got NWE local rep # (Buck, 949-2998) and left a message.

1025 Truck #3 return/load — side dump 5
Truck #1 return/load — side dump 6

JPell

Scale: 1 square = _____

October 18, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	0710	2.1	indoor temp = 70°F
background (ziploc air)	—	0712	6.3	"
outdoor ambient, E OSA excav	—	0715	2.4	outdoor temp = 36°F
SE corner, OSA excav.	4-8'	0850	485.7	gray SC, gravelly, odor, moist
SE corner, OSA excav.	4-8'	0935	408.3	gray SC, gravelly, odor, sl. moist
E Face, OSA excavation sample	4-8'	1015	600.1	gray SC, gravelly, odor, moist
SW corner, OSA excav.	4-8'	1015	2260	gray SC, gravelly, odor, sl. moist
SW Corner + 10' SW, OSA excav	4-8' ~~1320~~	1320 ~~1325~~	2032	gray SC, gravelly, odor, sl. moist
Mid-South Face, OSA excav	4-8'	~~2258~~	2258	gray SC, gravelly, odor, moist
SW Corner + another 5' SW, OSA excav	4-9'	1345	444.5	gray SC, gravelly, odor, moist
Mid-South Face, +5' South, OSA excav	4-8'	1410	883.1	gray SC, gravelly, odor, moist
Mid-South Face, +5' South, 5' E "	4-9'	1420	896.6	gray SC, gravelly, odor, moist
indoor ambient	—	1430	1.9	indoor temp = 72°F
background (ziploc air)	—	1435	6.6	"
outdoor ambient, E OSA excav	—	1440	3.2	outdoor temp = 52°F
S Face, OSA excavation conf. sample	4-9'	1500	562.7	gray SC, gravelly, odor, moist
indoor ambient	—	1640	1.4	indoor temp = 68°F
background (ziploc air)	—	1642	5.2	"
outdoor ambient, E OSA excav.	—	1645	3.3	outdoor temp = 52°F

Rite in the Rain.

Scale: 1 square = _____

(50) October 18, 2016

1030 - Goto hardware store for visquene + PVC pipe for ditch drain

1100 - Meet NWE on site — can't drop Sixth Street tension line

1115 Truck #3 return/load side dump 7

1145 Truck #4 return/load side dump 8

1200 Install ditch drainage pipe (40') in ditch bottom, 4" PVC Sch. 40
Cover w/ clean OSA 0-4 soil

Install sorbent boom at inlet, outlet of drainage pipe along Sixth Street, 2 locations between OSA + sewer drain at Sixth + South Street intersection (NE corner) and around the sewer drain.

1345 sample SW corner after digging further S + SW
Truck #2 return/load side dump 8

1400 Work east from SW to SE corner, clearing S face

1420 Truck #3 return/load side dump 10

1500 S face cleared, collect S face confirmation sample OS-204-SGRAY
PID = 562.7

1505 Truck #4 return/load side dump 11

1545 No more trucks
Tizer out of room to stack until a couple loads tomorrow
Tizer departs - taking cooler w/ OSA N, E, and S ~~confi~~ face confirmation samples to MWalker, Hydro Helena for submittal to lab tomorrow

October 18, 2016 OSA SE to SW excavation ~100 yds³

Total loads October 18, 2016 = 4 side dumps, 11 trips total = 220 yds³
from N stockpile and SE stockpile, S face

1600 Install sorbent booms (2) on OSA excavation and (1) on WSA excavation pooled water.

1630 Talk to Eric - Weave needs 2 days notice to get compactor here

1700 MC crew here, fences/tape up, depart

JPM

Scale: 1 square = _____

October 19, 2016 Old Shop Excavation + Haul

Personnel: Jamie Paell, Hydrometrics
Tizer DeMers, Weave

Weather: 40°F, ptly cloudy, calm

Equipment: Weave excavator
MC backhoe
4 Weave side dumps

0630 Meet Tizer on site, drop fences
Safety meeting
Bruce asked Tizer if he could use the rental excavator (now equipped by T+E w/a jackhammer) to break up the 3 concrete footings for easier handling / disposal at special location in town landfill. Reminded Bruce to let Laura know this plan.
Bruce OK w/plan to backfill WSA bottom, compacting w/excavator until compactor arrives

0700 Truck #1 (0782) on site for load — sidedump 1
Truck #2 (0783) load — sidedump 2

~~3rd truck, driver (Jordan) is sick not driving~~

0750 Truck #3 (0781) load (Jordan back) — sidedump 3
0820 Collect PID face samples, water sample OS-300-BASE from pooled water at bottom of OSA excav.
0840 Truck #4 (red) return/load — side dump 4

0855 Tizer pull sorbent boom from WSA, begin adding backfill using MC backhoe

0910 Talked w/Laura, update her on this morning's activities and plans for the rest of the week, next week.
She is gone 20-21 October, so just email her an update Friday for Weekly Update #7. May come to inspect Monday, Oct. 24.
1015 Truck #1 return/load
1045 Sweep up shop office, review tasks w/Tizer, remind to drop traffic signs and stretch exclusion zone tape around excavations at end of day + security fencing. Contact #'s for Meagher County, City of WSS + Hydrometrics on shop office desk

1100 Depart site, Helena to deliver water sample to lab

52 October 19, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	0725	0.8	indoor temp = 69°F
background (ziploc air)	—	0730	3.9	"
outdoor ambient	—	0735	1.6	outdoor temp = 40°F
SW Corner, OSA excav.	0-4'	0840	12.3	gray SC, gravelly, odor, moist
S face, OSA excav.	0-1'	0845	17.5	red/black C, gravelly, sl. odor, sl. moist
S face, OSA excav.	1-4'	0850	95.0	gray SC, gravels, odor, sl. moist
S face, OSA excav.	9-10'	0855	69.9	brown C, cobbles, sl. odor, moist
indoor ambient	—	1030	1.0	indoor temp = 68°F
background (ziploc air)	—	1033	4.6	"
outdoor ambient	—	1035	1.4	outdoor temp = 44°F

Scale: 1 square = _____

October 20, 2016

(JP not on site, Tizer loading trucks from stockpiles)

Tizer loaded 12 side dumps for VVLandfill

Preston's belly dump truck broke down - no haulage

Tizer reported loads at end of day

(54) October 21, 2016

Personnel: Jamie Paell
Tizer DeMers

Weather: 48°F, ptly cloudy, W breeze

Equipment: Weave excavator
2 Weave side dumps

0930 arrive on site from Helena
safety review w/ Tizer

1 Weave side dump broke down (Ray) - to Townsend for repair/replace
1 Weave driver out sick
1 Weave bellydump truck (Preston) is still broken down

OSA/WSA excavation >1/2 filled w/backfill, still very wet on west end. Add no more backfill.

OSA main excavation, SW corner and SE corner cleaned out yesterday, Tizer still loading SW corner stockpile material, minor excavation on West face - no room to stockpile.

OSA 0-4' clean segregated for backfill, stockpiled on NW corner and by main yard gate on Garfield Street.

1025 Collect ~~cleaned~~ exposed W face w/ excavator, run PIDs

~ Remaining to excavate on W side to MCMW3 =
~ 15' x 70' x 10' ≈ 400 yds³
minus 0-4' clean segregation of ~ 150 yds³
leaves ~ 250 yds³ left to excavate on W side OSA
+
~ 40 yds³ excavated stockpile
= ~ 300 yds³ left to haul
≈ 15-20 truck loads left to haul to VVLandfill

Bouldery rubble excavated from W OSA face, apparently an old building foundation pier, ~ 3 x 3' x 4' deep bgs ending ~ 11' east of MCMW3 - no connection to MCMW3.

JP

October 21, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	1020	2.0	indoor temp = 75°F
background (ziploc air)	—	1022	2.3	"
outdoor ambient, E side OSA excav.	—	1025	1.9	outdoor temp = 50°F
OSA W face, 10' E of MCMW3	0-4'	1035	59.1	lt. brown SiC, sl. odor, sl. moist
OSA W face, 10' E of MCMW3	4-8'	1040	2345	gray SC gravel, odor, moist
West OSA 0-4' backfill pile	0-4'	1045	23.2	lt. brown SiC, sl. moist, sl. odor
OSA, W, 20' N of MCMW3	0-4'	1125	12.1	lt. brown SiC, sl. moist, sl. odor
OSA, W, 20' N of MCMW3	4-5'	1130	109.2	brown C, cobbly, moist, sl. odor
OSA, W, 20' N of MCMW3	5'+	1135	559.7	gray SC gravel, odor, moist
indoor ambient	—	1145	2.0	indoor temp = 72°F
background (ziploc air)	—	1147	3.1	"
outdoor ambient, E side OSA excav.	—	1150	2.2	outdoor temp = 52°F

1050 dig test pit ~20' directly N of MCMW3
see PID log
gravelly gray material 5'+ = 559.7 PID

1200 review plans w/ Tizer, no loads Sunday
return to Helena

Rite in the Rain

Scale: 1 square = _____

(56) October 24, 2016 Old Shop Area Excavation and Haul

Personnel: Jamie Poell, Hydrometrics
Tizer ~~Dellers~~, Weave
Tim Collings, MC
Jim Gregory, MC
Jake Kusek, MC

Weather: 40°F, calm, ptly. cloudy

Equipment: Weave excavator
MC backhoe
MC loader (airport pit)
MC ~~bellydumps~~ Water Truck
MC dumptruck
3 Weave side dump trucks

0630 On site, meet w/ MC crew & discuss plans for temporary stockpile of west side OSA excavated material using MC dumptruck - finish excav. work if not enough trucks

→ ~~build a berm using bellydump loads of backfill from airport, place OSA pit water above the berm to dewater the pit, hydrate the backfill material prior to placement and compaction.~~

→ Tizer dig a sump on S side OSA, MC will pump to water truck, use in compaction

0700 Red sidedump / on Sixth Street for loading — sidedump 1

0783 sidedump / on Sixth Street for loading — sidedump 2

Safety meeting

0720 Begin loading first 2 trucks

0800 Finalize plans for dewatering OSA using pump / MC water truck (Fire truck) and interim excavation of west face using MC dump truck, stockpiling loads on N side OSA at Garfield Street
Tim at airport pit prepping backfill stockpile for loading

0900 Call Ryder - he's clueless as to why we have only 2 trucks
Send email to Weave / Warren asking for more trucks / plans
Call Kevin Mader - 1 truck may be in shop, 1 driver out sick, will call me back w/ update on trucks and delivery of loader, compactor by noon.
OSA pit almost dewatered - 4000 gallons in Water truck, ~1000 gallons on WSA
MC begin building OSA pit access ramp on SE corner with backfill material
Tizer loading MC dumptruck from west side, building stockpile on Garfield Street

JPoell

Scale: 1 square = _____

October 24, 2016

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	0820	1.1	indoor temp = 69°F
background (ziploc air)	—	0822	4.4	"
outdoor ambient, E side OSA excav.	—	0825	2.7	outdoor temp = 40°F
SW corner, 10' N of propane testpit	0-3.5'	0835	13.1	lt. brown SiC, sl. odor, moist
"	3.5-9'	0840	1534	gray SC, gravelly, odor, moist
"	9'+	0845	297.3	brown C, gravelly, sl. odor, moist
15' N of MCMW3	4-9'	0950	1677	gray SC, gravelly, odor, moist
10' N of MCMW3	0-4'	1005	38.3	lt. brown SiC, sl. odor, moist
"	4-9'	1010	1441	gray SC, gravelly, odor, moist
"	9-10'	1015	145.6	brown C, sl. odor, moist, cobbles
indoor ambient	—	1200	2.9	indoor temp = 71°F
background (ziploc air)	—	1202	3.3	"
outdoor ambient, E side OSA excav.	—	1205	2.8	outdoor temp = 50°F
SW ~5' N of WSA NW corner	3-8'	1400	376.6	gray SC, gravelly, odor, moist
SW ~3' N of WSA NW corner	3-8'	1620	1527	gray SC, gravelly, odor, moist
W face, ~10' S of MCMW3	3-8'	1630 ~~2214~~	2240	gray brown SC, gravelly, odor, moist
S face/Oct 24 excav corner, middle	3-8'	1635 ~~0.8~~	606	gray SC, gravelly, odor, moist
indoor ambient	—	1645	2.1	indoor temp = 70°F
background (ziploc air)	—	1647	2.2	"
Outdoor ambient, E side OSA excav	—	1650	0.8	outdoor temp = 61°F

(58) October 24, 2016

1000 West side excavation + hauling to temporary stockpile
PID sampling
Uncover ~4' long 30" concrete pipe (empty) ~ 10' SE of MCMW3

1115 3rd Sidedump (782) arrive/load — sidedump 3

1120 Trucks 1 + 2 back for next loads — sidedump 4
sidedump 5

MC filling [redacted]DSA center bottom after dewatering
Digging/interim stockpiling from West/SW towards propane tanks

PID sampling
1420 #782 return/load — sidedump 6
PID sampling
1435 Red #1 return/load — sidedump 7
1440 783 #2 return/load — sidedump 8

1600 Tizer grease excavator + depart
PID sampling

1700 MC Crew depart
1715 Finish scans, notes, lock up, fences up

Oct. 24
Totals: Excavated Volume ≈ 150 yds^3
8 sidedumps ~ 160 yds^3 to VVL

Scale: 1 square = _____

October 25, 2016 Old Shop Area Excavation & Haul, Back Fill (59)

Personnel: Jamie Poell, Hydrometrics
Tizer Deffers, Weave
Tim Collins, MC
Jim Gregory, MC
Jake Kusek, MC

Weather 50°F, W breeze, ptly cloudy

Equipment: Weave excavator
3 Weave side dumps
MC dump truck
MC backhoe
MC Water truck (compaction water
Weave Cat CP34 compactor

0630 On site, fences down, signs up
Eric will be delivering compactor by 0930, checking on loader
Tizer will check w/ Eric on compactor size
Safety review

0655 Sidedumps 782 + 783 loading on Sixth Street — sidedump 1
Review MC plans w/Tim: — sidedump 2
→ Jake haul backfill to stockpile
→ Jim/dumptruck haul OSA excavated material to temporary stockpile
→ Tim backfill low spots in bottom of OSA excavation
→ As soon as done on west face, clean up perimeter + re-establish ditch

0730 Tizer start loading MC dumptruck loads on SW corner of site

0740 Sam Buchanan call, can get more trucks but needs approval, told him to get approval from Mark Walker – he'll call.
Tizer confirmed w/ Will Parr we are getting a rolling compactor today, but loaders are in short supply – he's working on that.
Sidedump (Red) loaded — sidedump 3

0830 Call w/ M Walker & Laura Alvey
Review progress
Will completely excavate the south face to the WSA excavation
Collect west face confirmation sample and 0-4' salvaged clean soil/back fill from stockpiles confirmation sample
Reviewed problems w/ Weave, assistance from MC personnel/equipment
Review backfill plans, plan to use excavated area dewater in MC water truck for backfill lift compaction application

0940 Eric arrives w/ compactor

Rite in the Rain. JPoell Scale: 1 square = _____

(60) October 25, 2016

1020 #782 return/load — sidedump 4

1040 #783 return/load — sidedump 5

flag MCMW3
brace MCMW3 w/Tpost/tieoff

1130 Red (#3 truck) sidedump return/load — sidedump 6
West face sampling

1230 Complete west face excavation
Confirmation sample OS-205-WGRAY collected, PID = 1595
Excavator working in bottom of OSA excavation to spread backfill in low spots, compact before compactor - bottom fill is very wet due to saturation from pooled groundwater (dewatered yesterday). 2 MC bellydumps hauling backfill, 14 yds³/truck.
Tim spreading backfill + building backfill pile w/MC backhoe.

1320 #782 return/load from WSA/OSA "island" — sidedump 7

1330 Collect clean topsoil (0-4', salvaged for backfill) composite sample, PID = 48.8

1340 4-8' gray sample in "island" excavation, ~1/2 way east, PID = 465.5

Location	Depth	PID time	PID ppm	Notes
indoor ambient	—	1030	1.2	indoor temp = 68°F
background (ziploc air)	—	1032	4.4	"
outdoor ambient (E side OSA excav)	—	1035	2.2	outdoor temp = 55°F
OSA, final excav SW Corner	3.5-9'	1045	3275	gray SC, gravelly, odor, moist
OSA, final excav SW Corner	9-10'	1050	128.6	brown C, gravel/cobbles, sl. odor, moist
OSA, final excav SW Corner	0-3.5	1055	4.9	lt. brown SiC, ⊖ odor, sl. moist
W face at MCMW3 (2' south)	4-8'	1110	1773	gray SC, gravelly, odor, moist
S face 5' N of propane tanks	4-8'	1135	1840	gray SC, gravelly, odor, moist
W face between SW corner + MCMW3	4-8'	1140	2469	gray SC, gravelly, odor, moist
NW corner, final excav area	4-9'	1145	386.7	gray brown SC, gravelly, odor, moist
NW corner, final excav area	9-10'	1150	33.1	brown clay, cobbly, sl. odor, moist
W face between NW corner + MCMW3	4-9'	1155	2072	gray brown SC, gravelly, odor, moist
NW corner, final excav area	0-4'	1200	11.2	brown SiC, sl. odor, sl. moist
OS-205-WGRAY W face composite	4-9'	1230	1595	gray brown SC, gravelly, odor, moist
OS-206-TOP OSA clean soil composite	0-4'	1335	48.8	brown SiC, ⊖ odor, sl. moist
indoor ambient	—	1345	2.1	indoor temp = 72°F
background (ziploc air)	—	1350	3.1	"
outdoor ambient E OSA excav	—	1355	2.2	outdoor temp = 58°F

Scale: 1 square = _____

1350 #783 return/load from "island" sidedump 8

1400 Leaving it to Tim + Tizer to fix the Sixth Street ditch
— rain forecast Friday + Monday

Gone 26th, Tizer will finish loading out "island" excavation and then work w/ MC crew on backfill + compaction. Call w/ load counts, info on loader delivery.

1430 Depart site.

Side dump #9 loaded at end of day

October 25 Totals:

Remaining West Face and "island" excavated volume ≈ 150 yds^3
9 side dumps to VV Landfill, ~180 yds^3

(62) October 26, 2016 Old Shop Area Excavation, Haul, Backfill

Jamie Poell, Hydrometrics oversight not on site today

Personnel: Tizer DeMers, Weave
Tim Collins, Meagher County
Jim Gregory, Meagher County
Jake Kusek, Meagher County

Equipment: Weave excavator
Weave loader (afternoon)
2 MC bellydump trucks
4 Weave sidedumps
MC loader

Tizer used excavator to load sidedumps from OSA excavated material stockpile.

When not loading trucks for VVL, Tizer spreading backfill from backfill stockpile (using MC loader in morning) and compacting lifts.

MC hauling backfill when possible

Sixth Street ditch on west side of OSA regraded using MC grader, sorbent booms replaced.
MC using water truck pit water on excavation stockpile sent to VVL

October 26 Totals: Remaining "island" excavated volume ~100 yds^3
13 sidedumps to VVLandfill, ~260 yds^3

Scale: 1 square = _____

October 27, 2016 Old Shop Area Haul and Backfill

Personnel: Jamie Powell, Hydrometrics
Tizer Akers, Weave
Wade Juntunen, Weave
Tim Collins, Meagher County
Jim Gregory, Meagher County
Jake Kusek, Meagher County

Weather: 55°F, W breeze, overcast

Equipment: Weave excavator
Weave loader
Weave compactor
4 Weave side dumps
2 MC bellydumps
MC loader (airport pi
MC backhoe
MC water truck

1000 Arrive on site, Weave building lifts & compacting them as built
MC hauling backfill with bellydumps, using backhoe to build site stockpile.
MC applying pit water from MC water truck onto VVL-bound stockpile

1015 Safety review

1120 Backfill sampled from bellydump loads - 2 5-gallon buckets
+ PID = 1.7 ppm

Excavation area ~75 X 80' ~6000 ☐', ~10 ft deep ~60000 ft³
~2222 yds³

(Garmin hand-held GPS not giving accurate readings)

1245 Pioneer (Kevin) on site to test compaction on OSA
Results: compaction at ~98% of Proctor, good on moisture
Will ~~send~~ email results tomorrow / advised add no water to lifts.
Updated Tim on results

Met w/ Tim & Tizer
- excavated stockpile should be completely gone to VVL tomorrow
- Weave keeping 2 sidedumps on project to haul back fill
- MC will not provide personnel to load trucks at pit, Tizer will work out loading w/ drivers
- MC off tomorrow (Friday). Tizer will work with Wade continuing to build 8" lifts and compact them, loading trucks for VVL as they arrive.

11 side dump loads to VVL (~220 yds³)

1330 Depart site, return to Helena w/ samples and PID

JP

Rite in the Rain

Scale: 1 square =

(64) October 28, 2016 Old Shop Area Haul and Backfill

Jamie Poell, Hydrometrics oversight, not on site today

Personnel: Tizer DeMers, Weave
Wade Juntunen, Weave
(Meagher County personnel off on Fridays)

Equipment: Weave excavator
Weave loader
4 Weave side-dump trucks
Weave compactor

Tizer loading sidedumps from excavated stockpile
Wade compacting lifts that Tizer spreads when not loading trucks. Backfill source = site stockpile built by MC.

October 28 Totals: 9 sidedump loads to VVL (~180 yds^3)

Scale: 1 square = _____

JPW

October 29, 2016 Old Shop Backfill
(Saturday)

Personnel: Eric Bonner, Weave

Equipment: Weave excavator
Weave loader
Weave compactor
4 Weave side-dump trucks
MC loader (airport pit)

VVLandfill closed on Saturday

Side-dumps loading backfill at airport pit after using up all of site backfill stockpile, dumps now drive through OSA to dump loads.

Eric consolidate remaining ~~exca~~ excavated material pile for loading to VVL tomorrow

Eric spread backfill and compact

October 29 Totals: not available, check scale tix later (per Eric)

(66) October 30, 2016 Old Shop Haul and Backfill
(Sunday)

Personnel: Eric Bonner, Weave
Jamie Poell, Hydrometrics

Equipment: Weave excavator
Weave loader
Weave compactor
4 Weave side dump trucks
MC loader (airport pit)

Eric load out side dumps with remaining OS excavated material stockpile.

Grade off stockpile area post-loading

After VVL haulage, side dumps load & deliver backfill to OS site

Eric spread & compact backfill

October 30 Totals: 6 sidedumps to VVL (~120 yds^3), final haulage
Weave backfill loads not available, check scale tickets later (Eric).

JPoell

Scale: 1 square = _____

October 31, 2016 Old Shop Backfill

Jamie Poell, Hydrometrics oversight, not on site today

Personnel: Tizer DeMers, Weave
Wade Juntunen, Weave
Tim Collins, Meagher County
Jim Gregory, Meagher County
Jake Kusek, Meagher County

Equipment: Weave excavator
Weave loader
Weave compactor
MC backhoe
2 MC ~~side dump~~ belly-dump trucks
2 Weave side dump trucks
MC loader (airport pit)
MC water truck

Tizer spreading backfill delivered by Weave and MC trucks, Wade compacting the spread ~~backfill~~ backfill lifts (≤ 8" depth).

MC water truck apply last of pit water to site for compaction and dust control.

(68) November 1, 2016 Old Shop Backfill and Cleanup

Personnel: Jamie Poell, Hydrometrics
Tizer DeMers, Weave
Wade Juntunen, Weave
Tim Collins, Meagher County
Jim Gregory, Meagher County
Jake Kusek, Meagher County

Weather: 50°F, calm, ptly cloudy

Equipment: MC backhoe
MC grader
2 MC bellydumps
MC loader (airport pit)
Weave excavator
Weave loader
Weave compactor

0955 Arrive on site, Weave spreading/compacting, MC hauling backfill and grading site/streets/ditches
Safety review

Inspect site w/ Tim Collins and Tizer

Ditches cleaned out/graded along Sixth and Garfield Streets
Sixth, South, and Garfield Streets cleaned off using grader, backhoe
Tim use grader to clean ~ drainage along South Street.

Per Tim, MC may want to install a gate where fence was removed for MCMW-2 excavation. No decision yet, but may need to move well a few feet east or west or make the well a flush-mount if they want a gate (MCMW-2).

Tizer use excavator to straighten up Garfield Street fencepost pushed sideways by Weave equipment - Tim OK with the fix.

Site fencing - per Tim, Bruce has talked to fencer about new fencing on site post-excavation.

1400 Backfill and compaction completed, site cleaned up, Weave depart

Inspections w/ Tim, review plans
MCMW-3 checked, well cap adjusted + locked.
1530 Depart site

JPoell

Scale: 1 square = _____

November 2, 2016 Old Shop Backfill and Cleanup

Personnel: Jamie Poell, Hydrometrics
Bruce Smith, Meagher County
Wade Juntunen, Weave

Weather: 40°F, west breeze, ptly. cloud

Equipment: Weave excavator
Weave loader
Weave compactor

0645 Meet Bruce Smith on site, review work to date completed in his absence
Shop yard has been scraped/cleaned to Tim's/Bruce's satisfaci

Bruce OK with rental fencing panels return to Fencecrafters

Bruce OK with plans to finish site compaction, seed and track in along South, Sixth, and Garfield streets/regraded ditches.

Bruce is not sure about MCMW-2 and fence or gate placement. Told him we can work around their plans for a fence or gate, possibly moving well to the side or installing as a flush-mount.
Told Bruce we are planning to install MCMW-2 later next wee will keep him updated.

0730 Call Fencecrafters (Johnny), notified that the rental fencing panels can be picked up. He confirmed that and the panels will be removed by the end of the week.

Pick up site, seed South, Sixth and Garfield Street shoulde
Confirm Pioneer for compaction testing

1030 Wade arrives on site, running compactor after safety review
Brought trailer for compactor, told him about their signs
Will get loader and excavator later this week
23 rental fence panels + clamps & footers for Fencecrafters, leaving fences up until they come to take them away.

Daryl (City of WSS) stopped by, looked at streets, OK with cleanup

JPoell

Rite in the Rain.

Scale: 1 square =

(70) November 2, 2016

Meagher County Backfill Load Counts:

CONSTRUCTION—MINING—INDUSTRIAL EQUIPMENT . . . SALES—SERVICE—RENTALS

Pioneer EQUIPMENT AND SUPPLY COMPANY

215 CENTENNIAL
P.O. BOX 3087
BUTTE, MT. 59702

FAX (406) 723-8579
PH. (406) 723-9500
(866) 207-3008

Jake Kusek:

Backfill Load Counts, Meagher County Haulage

	Loads	YRDS
10-3-16	5	70
10-10	13	
10-10	10	322
10-11	7	98
10-12	14	196
10-25	17	238
10-26	17	238
10-27	28	392
10-31	4	56
11-1	12	168
		1778

Have a Nice Day

~ 14-16 yds³ / bellydump truck load

Scale: 1 square = _____

November 2, 2016

1040 Sam Buchanan call to confirm the excavated material is hydrocarbon contaminated. The bellydump load from 2 weeks ago still cannot be emptied; they are planning to clean it out by hand & will use appropriate PPE

1110 Mark ~~MCMWW~~ MCMW-2 ~ location between shops, ~ halfway between (9'), ~~west~~ east of SE corner of west shop building clear of underground lines (propane line ~5' south, air line ~18' north) and any overhead lines. Photos for reference.

Wade 1 pass w/compactor over seeded South Street shoulder to firm seedbed & take out ruts/humps

1125 Rob (Pioneer) on site to do compaction testing on ~ Future shop location

Bouma on site to pick up Weave loader - Wade fueling it.

4 Compactions 92-96% of Proctor, 5-6% moisture. Call G Lorenson & review results - acceptable.

1210 Pioneer, Bouma depart site

1230 Wade loading compactor
Call Bruce, he is OK with MCMW-2 location as I described/marked it. No need to do a flush-mount, just do a regular stick-up well as it was before removal

1430 Final inspections, return to Helena

Rite in the Rain.

Scale: 1 square = _____

Scale: 1 square = _____

APPENDIX C

EXCAVATED SOIL DISPOSAL RECORD

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE			**PRIOR BALANCE**	.00
10/03/16	1	LANDFILL TONNAGE	10/03/16	12.67 tons	266.07
10/03/16		12.67 TONS CONTAMINATED SOIL			
10/03/16	1	LANDFILL TONNAGE	10/03/16	15.10 tons	317.10
10/03/16		15.10 TONS CONTAMINATED SOIL			
10/03/16	1	LANDFILL TONNAGE	10/03/16	16.14 tons	338.94
10/03/16		16.14 TONS CONTAMINATED SOIL			
10/03/16	1	LANDFILL TONNAGE	10/03/16	10.70 tons	224.70
10/03/16		10.70 TONS CONTAMINATED SOIL			
10/03/16	1	LANDFILL TONNAGE	10/03/16	19.24 tons	404.04
10/03/16		19.24 TONS CONTAMINATED SOIL			
10/03/16	1	LANDFILL TONNAGE	10/03/16	16.89 tons	354.69
10/03/16		16.89 TONS CONTAMINATED SOIL			
10/05/16	1	LANDFILL TONNAGE	10/05/16	9.31 tons	195.51
10/05/16		9.31 TONS CONTAMINATED SOIL			
10/05/16	1	LANDFILL TONNAGE	10/05/16	16.25 tons	341.25
10/05/16		16.25 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE	10/06/16	15.63 tons	328.23
10/06/16		15.63 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE	10/06/16	17.53 tons	368.13
10/06/16		17.53 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 1 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/06/16	1	LANDFILL TONNAGE 10/06/16	26.56 tons		557.76
10/06/16		26.56 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	29.22 tons		613.62
10/06/16		29.22 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	11.29 tons		237.09
10/06/16		11.29 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	14.32 tons		300.72
10/06/16		14.32 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	27.35 tons		574.35
10/06/16		27.35 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	31.15 tons		654.15
10/06/16		31.15 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	18.79 tons		394.59
10/06/16		18.79 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	16.24 tons		341.04
10/06/16		16.24 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	15.78 tons		331.38
10/06/16		15.78 TONS CONTAMINATED SOIL			
10/06/16	1	LANDFILL TONNAGE 10/06/16	22.68 tons		476.28
10/06/16		22.68 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 2 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/07/16	1	LANDFILL TONNAGE 10/07/16	23.27 tons		488.67
10/07/16		23.27 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	16.59 tons		348.39
10/07/16		16.59 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	17.42 tons		365.82
10/07/16		17.42 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	18.21 tons		382.41
10/07/16		18.21 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	29.82 tons		626.22
10/07/16		29.82 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	29.20 tons		613.20
10/07/16		29.20 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	12.08 tons		253.68
10/07/16		12.08 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	26.83 tons		563.43
10/07/16		26.83 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	13.42 tons		281.82
10/07/16		13.42 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	15.98 tons		335.58
10/07/16		15.98 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 3 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/07/16	1	LANDFILL TONNAGE 10/07/16	15.60 tons		327.60
10/07/16		15.60 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	17.15 tons		360.15
10/07/16		17.15 TONS CONTAMINATED SOIL			
10/07/16	1	LANDFILL TONNAGE 10/07/16	19.10 tons		401.10
10/07/16		19.10 TONS CONTAMINATED SOIL			
10/10/16	1	LANDFILL TONNAGE 10/10/16	26.19 tons		549.99
10/10/16		26.19 TONS CONTAMINATED SOIL			
10/10/16	1	LANDFILL TONNAGE 10/10/16	23.67 tons		497.07
10/10/16		23.67 TONS CONTAMINATED SOIL			
10/10/16	1	LANDFILL TONNAGE 10/10/16	26.15 tons		549.15
10/10/16		26.15 TONS CONTAMINATED SOIL			
10/10/16	1	LANDFILL TONNAGE 10/10/16	26.75 tons		561.75
10/10/16		26.75 TONS CONTAMINATED SOIL			
10/10/16	1	CITY EH RESIDENT 10/10/16	24.56 tons		515.76
10/10/16		24.56 TONS CONTAMINATED SOIL			
10/11/16	1	LANDFILL TONNAGE 10/11/16	27.73 tons		582.33
10/11/16		27.73 TONS CONTAMINATED SOIL			
10/11/16	1	LANDFILL TONNAGE 10/11/16	31.99 tons		671.79
10/11/16		31.99 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 4 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/11/16	1	LANDFILL TONNAGE 10/11/16	30.37 tons		637.77
10/11/16		30.37 TONS CONTAMINATED SOIL			
10/11/16	1	NON-CODED 10/01/16-10/31/16			42.40
10/11/16		20 GAL DIESEL FUEL @ $2.12/GAL			
10/11/16	1	LANDFILL TONNAGE 10/01/16-10/31/16	32.41 tons		680.61
10/11/16		32.41 TONS CONTAMINATED SOIL			
10/12/16	1	LANDFILL TONNAGE 10/12/16	23.38 tons		490.98
10/12/16		23.38 TONS CONTAMINATED SOIL			
10/12/16	1	LANDFILL TONNAGE 10/12/16	22.01 tons		462.21
10/12/16		22.01 TONS CONTAMINATED SOIL			
10/12/16	1	LANDFILL TONNAGE 10/12/16	22.88 tons		480.48
10/12/16		22.88 TONS CONTAMINATED SOIL			
10/12/16	1	LANDFILL TONNAGE 10/12/16	23.90 tons		501.90
10/12/16		23.90 TONS CONTAMINATED SOIL			
10/12/16	1	LANDFILL TONNAGE 10/12/16	23.09 tons		484.89
10/12/16		23.09 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	6.45 tons		135.45
10/13/16		6.45 TONS C&D			
10/13/16	1	LANDFILL TONNAGE 10/13/16	22.33 tons		468.93
10/13/16		22.33 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 5 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/13/16	1	LANDFILL TONNAGE 10/13/16	22.02 tons		462.42
10/13/16		22.02 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	19.65 tons		412.65
10/13/16		19.65 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	13.32 tons		279.72
10/13/16		13.32 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	26.39 tons		554.19
10/13/16		26.39 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	20.88 tons		438.48
10/13/16		20.88 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	23.74 tons		498.54
10/13/16		23.74 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	25.91 tons		544.11
10/13/16		25.91 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	19.34 tons		406.14
10/13/16		19.34 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	24.71 tons		518.91
10/13/16		24.71 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	23.23 tons		487.83
10/13/16		23.23 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 6 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/13/16	1	LANDFILL TONNAGE 10/13/16	12.09 tons		253.89
10/13/16		12.09 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	24.45 tons		513.45
10/13/16		24.45 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	23.62 tons		496.02
10/13/16		23.62 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	14.20 tons		298.20
10/13/16		14.20 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	28.29 tons		594.09
10/13/16		28.29 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	22.73 tons		477.33
10/13/16		22.73 TONS CONTAMINATED SOIL			
10/13/16	1	LANDFILL TONNAGE 10/13/16	22.29 tons		468.09
10/13/16		22.29 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	22.66 tons		475.86
10/14/16		22.66 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	21.80 tons		457.80
10/14/16		21.80 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	24.40 tons		512.40
10/14/16		24.40 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 7 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/14/16	1	LANDFILL TONNAGE 10/14/16	19.45 tons		408.45
10/14/16		19.45 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	21.05 tons		442.05
10/14/16		21.05 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	21.90 tons		459.90
10/14/16		21.90 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	22.35 tons		469.35
10/14/16		22.35 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	21.72 tons		456.12
10/14/16		21.72 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	20.94 tons		439.74
10/14/16		20.94 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	22.72 tons		477.12
10/14/16		22.72 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	23.69 tons		497.49
10/14/16		23.69 TONS CONTAMINATED SOIL			
10/14/16	1	LANDFILL TONNAGE 10/14/16	23.14 tons		485.94
10/14/16		23.14 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	23.42 tons		491.82
10/16/16		23.42 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 8 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/16/16	1	LANDFILL TONNAGE 10/16/16	22.11 tons		464.31
10/16/16		22.11 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	24.53 tons		515.13
10/16/16		24.53 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	22.17 tons		465.57
10/16/16		22.17 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	23.80 tons		499.80
10/16/16		23.80 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	24.75 tons		519.75
10/16/16		24.75 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	24.93 tons		523.53
10/16/16		24.93 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	26.20 tons		550.20
10/16/16		26.20 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	12.72 tons		267.12
10/16/16		12.72 TONS CONTAMINATED SOIL			
10/16/16	1	LANDFILL TONNAGE 10/16/16	22.57 tons		473.97
10/16/16		22.57 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	26.94 tons		565.74
10/17/16		26.94 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 9 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/17/16	1	LANDFILL TONNAGE 10/17/16	31.69 tons		665.49
10/17/16		31.69 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	23.39 tons		491.19
10/17/16		23.39 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	23.45 tons		492.45
10/17/16		23.45 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	22.73 tons		477.33
10/17/16		22.73 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	23.76 tons		498.96
10/17/16		23.76 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	22.70 tons		476.70
10/17/16		22.70 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	27.55 tons		578.55
10/17/16		27.55 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	26.88 tons		564.48
10/17/16		26.88 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	30.71 tons		644.91
10/17/16		30.71 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	23.70 tons		497.70
10/17/16		23.70 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 10 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/17/16	1	LANDFILL TONNAGE 10/17/16	22.48 tons		472.08
10/17/16		22.48 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	24.51 tons		514.71
10/17/16		24.51 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	22.40 tons		470.40
10/17/16		22.40 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	31.68 tons		665.28
10/17/16		31.68 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	23.50 tons		493.50
10/17/16		23.50 TONS CONTAMINATED SOIL			
10/17/16	1	LANDFILL TONNAGE 10/17/16	24.35 tons		511.35
10/17/16		24.35 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	23.66 tons		496.86
10/18/16		23.66 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	22.31 tons		468.51
10/18/16		22.31 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	23.79 tons		499.59
10/18/16		23.79 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	23.19 tons		486.99
10/18/16		23.19 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 11 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/18/16	1	LANDFILL TONNAGE 10/18/16	25.63 tons		538.23
10/18/16		25.63 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	22.88 tons		480.48
10/18/16		22.88 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	23.31 tons		489.51
10/18/16		23.31 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	26.07 tons		547.47
10/18/16		26.07 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	26.71 tons		560.91
10/18/16		26.71 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	21.82 tons		458.22
10/18/16		21.82 TONS CONTAMINATED SOIL			
10/18/16	1	LANDFILL TONNAGE 10/18/16	23.81 tons		500.01
10/18/16		23.81 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.84 tons		500.64
10/19/16		23.84 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	12.60 tons		264.60
10/19/16		12.60 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	26.04 tons		546.84
10/19/16		26.04 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 12 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/19/16	1	LANDFILL TONNAGE 10/19/16	24.54 tons		515.34
10/19/16		24.54 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	24.63 tons		517.23
10/19/16		24.63 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.67 tons		497.07
10/19/16		23.67 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	24.99 tons		524.79
10/19/16		24.99 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	22.49 tons		472.29
10/19/16		22.49 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	24.14 tons		506.94
10/19/16		24.14 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.34 tons		490.14
10/19/16		23.34 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	26.83 tons		563.43
10/19/16		26.83 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.57 tons		494.97
10/19/16		23.57 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.50 tons		493.50
10/19/16		23.50 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 13 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/19/16	1	LANDFILL TONNAGE 10/19/16	12.36 tons		259.56
10/19/16		12.36 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	23.46 tons		492.66
10/19/16		23.46 TONS CONTAMINATED SOIL			
10/19/16	1	LANDFILL TONNAGE 10/19/16	24.23 tons		508.83
10/19/16		24.23 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	26.51 tons		556.71
10/20/16		26.51 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	23.64 tons		496.44
10/20/16		23.64 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	22.73 tons		477.33
10/20/16		22.73 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	26.55 tons		557.55
10/20/16		26.55 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	23.95 tons		502.95
10/20/16		23.95 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	22.59 tons		474.39
10/20/16		22.59 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	21.95 tons		460.95
10/20/16		21.95 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 14 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/20/16	1	LANDFILL TONNAGE 10/20/16	22.69 tons		476.49
10/20/16		22.69 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	23.66 tons		496.86
10/20/16		23.66 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	27.37 tons		574.77
10/20/16		27.37 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	23.79 tons		499.59
10/20/16		23.79 TONS CONTAMINATED SOIL			
10/20/16	1	LANDFILL TONNAGE 10/20/16	28.31 tons		594.51
10/20/16		28.31 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	23.23 tons		487.83
10/21/16		23.23 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	23.91 tons		502.11
10/21/16		23.91 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	24.76 tons		519.96
10/21/16		24.76 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	23.31 tons		489.51
10/21/16		23.31 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	24.02 tons		504.42
10/21/16		24.02 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 15 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/21/16	1	LANDFILL TONNAGE 10/21/16	23.94 tons		502.74
10/21/16		23.94 TONS CONTAMINATED SOIL			
10/21/16	1	LANDFILL TONNAGE 10/21/16	26.73 tons		561.33
10/21/16		26.73 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	27.61 tons		579.81
10/24/16		27.61 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	23.61 tons		495.81
10/24/16		23.61 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	25.10 tons		527.10
10/24/16		25.10 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	23.72 tons		498.12
10/24/16		23.72 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	24.32 tons		510.72
10/24/16		24.32 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	26.99 tons		566.79
10/24/16		26.99 TONS CONTAMINATED SOIL			
10/24/16	1	LANDFILL TONNAGE 10/24/16	23.68 tons		497.28
10/24/16		23.68 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	28.32 tons		594.72
10/25/16		28.32 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 16 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/25/16	1	LANDFILL TONNAGE 10/25/16	23.05 tons		484.05
10/25/16		23.05 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	23.56 tons		494.76
10/25/16		23.56 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	26.58 tons		558.18
10/25/16		26.58 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	28.85 tons		605.85
10/25/16		28.85 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	23.69 tons		497.49
10/25/16		23.69 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	21.20 tons		445.20
10/25/16		21.20 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	22.23 tons		466.83
10/25/16		22.23 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	23.02 tons		483.42
10/25/16		23.02 TONS CONTAMINATED SOIL			
10/25/16	1	LANDFILL TONNAGE 10/25/16	28.75 tons		603.75
10/25/16		28.75 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	24.50 tons		514.50
10/26/16		24.50 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 17 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/26/16	1	LANDFILL TONNAGE 10/26/16	27.23 tons		571.83
10/26/16		27.23 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	24.63 tons		517.23
10/26/16		24.63 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	22.25 tons		467.25
10/26/16		22.25 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	23.62 tons		496.02
10/26/16		23.62 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	24.54 tons		515.34
10/26/16		24.54 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	28.02 tons		588.42
10/26/16		28.02 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	28.87 tons		606.27
10/26/16		28.87 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	23.23 tons		487.83
10/26/16		23.23 TONS CONTAMINATED SOIL			
10/26/16	1	LANDFILL TONNAGE 10/26/16	22.68 tons		476.28
10/26/16		22.68 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	22.17 tons		465.57
10/27/16		22.17 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 18 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/27/16	1	LANDFILL TONNAGE 10/27/16	24.52 tons		514.92
10/27/16		24.52 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	27.28 tons		572.88
10/27/16		27.28 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	23.53 tons		494.13
10/27/16		23.53 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	20.60 tons		432.60
10/27/16		20.60 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	23.70 tons		497.70
10/27/16		23.70 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	23.46 tons		492.66
10/27/16		23.46 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	26.79 tons		562.59
10/27/16		26.79 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	22.93 tons		481.53
10/27/16		22.93 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	23.77 tons		499.17
10/27/16		23.77 TONS CONTAMINATED SOIL			
10/27/16	1	LANDFILL TONNAGE 10/27/16	27.07 tons		568.47
10/27/16		27.07 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 19 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602

Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/27/16	1	LANDFILL TONNAGE 10/27/16	23.84 tons		500.64
10/27/16		23.84 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	23.97 tons		503.37
10/28/16		23.97 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	25.92 tons		544.32
10/28/16		25.92 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	26.43 tons		555.03
10/28/16		26.43 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	24.33 tons		510.93
10/28/16		24.33 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	22.80 tons		478.80
10/28/16		22.80 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	20.78 tons		436.38
10/28/16		20.78 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	27.66 tons		580.86
10/28/16		27.66 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	26.59 tons		558.39
10/28/16		26.59 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	23.88 tons		501.48
10/28/16		23.88 TONS CONTAMINATED SOIL			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 20 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT

Tri County Disposal
3630 York Road
Helena, MT 59602
Phone (406) 227-6300 Fax (406) 227-0188

STATEMENT

BILL DATE 11/01/16

ACCOUNT# 744036

DUE DATE 11/30/16

WEAVE CONSULTING
2348 N FRONTAGE RD
BILLINGS, MT 59101

AMOUNT YOU ARE PAYING _____

SERVICE ADDRESS: LANDFILL USE (EAST HELENA, MT)

DATE					AMOUNT
	LOCATION: LANDFILL USE				
10/28/16	1	LANDFILL TONNAGE 10/28/16	21.86 tons		459.06
10/28/16		21.86 TONS CONTAMINATED SOIL			
10/28/16	1	LANDFILL TONNAGE 10/28/16	22.53 tons		473.13
10/28/16		22.53 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	15.23 tons		319.83
10/30/16		15.23 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	24.28 tons		509.88
10/30/16		24.28 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	22.91 tons		481.11
10/30/16		22.91 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	27.55 tons		578.55
10/30/16		27.55 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	23.20 tons		487.20
10/30/16		23.20 TONS CONTAMINATED SOIL			
10/30/16	1	LANDFILL TONNAGE 10/30/16	24.90 tons		522.90
10/30/16		24.90 TONS CONTAMINATED SOIL			
10/31/16	<1>	NON-CODED 10/01/16-10/31/16			<21,442.81>
10/31/16		VOLUME DISCOUNT CREDIT $4.50/TON			
10/31/16		DIRT HAULED 10/3- 10/31			
10/31/16		**RATE OF $16.50 PER TON EFFECTIVE			

You may now pay your bill online at tcd.us.com
Sign in using your account number and the last four numbers of the phone number you have on file with us.

STATEMENT ACCT# 744036	CURRENT	30 DAY	60 DAY	90 DAY	DATE 11/01/16 PAGE 21 OF 21

1.5% per month late charge assessed on past due amounts

PLEASE PAY THIS AMOUNT 78,623.64

APPENDIX D

MCMW-2 AREA
EXCAVATION & BACKFILL PHOTOLOG

Photo 1. Airport Pit Run Backfill Stockpile, August 31, 2016.

Photo 2. Airport Pit Run Backfill Material, August 31, 2016.

Photo 3. MCMW-2, Pre-Excavation, September 30, 2016.

Photo 4. MCMW-2, Pre-Excavation South Street, September 30, 2016.

Photo 5. MCMW-2, Excavation Initiation, October 3, 2016.

Photo 6. MCMW-2, South Street Loading, October 4, 2016.

Photo 7. MCMW-2, Well Removal, October 4, 2016.

Photo 8. MCMW-2, Sampling with MDEQ Oversight, October 4, 2016.

Photo 9. MCMW-2, Excavation, Propane Line and Dewatering, October 5, 2016.

Photo 10. MCMW-2, Excavation, Unknown Steel Pipe (foreground) and Clay Shop Sewer Line (background), October 5, 2016.

Photo 11. MCMW-2, East Test Pit, October 6, 2016.

Photo 12. MCMW-2, East Test Pit, October 7, 2016.

Photo 13. MCMW-2, Loading from Temporary Stockpile, October 6, 2016.

Photo 14. MCMW-2, North Face and Damaged Shop Air Line, October 5, 2016.

Photo 15. MCMW-2, East Face Below East Shop Building, October 5, 2016.

Photo 16. MCMW-2, West Face Below West Shop Building, October 5, 2016.

Photo 17. MCMW-2, South Face on South Street, October 10, 2016.

Photo 18. MCMW-2, Bottom Face, October 10, 2016.

Photo 19. MCMW-2, South Street Loading, October 7, 2016.

Photo 20. MCMW-2, Backfill Placement, October 7, 2016.

Photo 21. MCMW-2, West Test Pit, October 7, 2016.

Photo 22. MCMW-2, South Street Loading, October 10, 2016.

Photo 23. MCMW-2, Backfill Placement from South Street, October 10, 2016.

Photo 24. MCMW-2, Backfill Placement and Compaction, October 10, 2016.

Photo 25. MCMW-2, Backfill Placement and Compaction, October 11, 2016.

Photo 26. MCMW-2, Post-Grade, November 2, 2016.

Photo 27. MCMW-2, South Street Shoulder Post-Grade, November 2, 2016.

Photo 28. MCMW-2, Replacement Well and Fence, November 17, 2016.

APPENDIX E

OLD SHOP AREA
EXCAVATION & BACKFILL PHOTOLOG

Photo 1. Pre-Project Site Meeting, August 31, 2016.

Photo 2. Old Shop Site, Pre-Excavation, September 11, 2016.

Photo 3. Old Shop Site, Pre-Excavation, September 30, 2016.

Photo 4. Old Shop Site, Excavation Initiation, October 6, 2016.

Photo 5. Old Shop Site, South Face Below West Shop Apron, October 12, 2016.

Photo 6. Old Shop Site, Former Fuel Tank Area Excavation, October 12, 2016.

Photo 7. Old Shop Site, Bottom Face, Former Fuel Tank Area, October 12, 2016.

Photo 8. Old Shop Site, Former Fuel Tank Area Excavation, October 13, 2016.

Photo 9. Old Shop Site, Excavation and Loading, October 14, 2016.

Photo 10. Old Shop Site, North Face, October 21, 2016.

Photo 11. Old Shop Site, East Face, October 21, 2016.

Photo 12. Old Shop Site, South Face, October 21, 2016.

Photo 13. Old Shop Site, Backfill Ramp, Dewatering and Excavation, October 24, 2016.

Photo 14. Old Shop Site, West Face Excavation at MCMW-3, October 24, 2016.

Photo 15. Old Shop Site, West Face, October 25, 2016.

Photo 16. Old Shop Site, South Excavation Loading, October 25, 2016.

Photo 17. Old Shop Site, MCMW-3, October 27, 2016.

Photo 18. Old Shop Site, Backfill Compaction and Loading, October 27, 2016.

Photo 19. Old Shop Site, Initial Backfill Compaction Testing, October 27, 2016

Photo 20. Old Shop Site, Final Backfill Grading and Compaction, November 1, 2016.

Photo 21. Old Shop Site, Final Backfill Compaction Testing, November 2, 2016.

Photo 22. Old Shop Site, Post-Grade, November 2, 2016.

Photo 23. Old Shop Site, Post-Grade Yard Area, November 2, 2016.

Photo 24. Old Shop Site, Permanent Fence, January 14, 2016.

APPENDIX F

HYDROMETRICS, INC.
STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURE

PROCEDURE FOR COLLECTING SURFACE SOIL SAMPLES©

HS-SOP-6

1.0 PURPOSE

This SOP describes the procedure for collecting a surface soil sample for subsequent chemical analysis. The project work plan and sampling and analysis plan will define the depth interval of the surface soil sample, usually either 0 to 2 inches or 0 to 6 inches and should be consulted prior to sampling.

Soil types and soil characteristics can vary considerable within and between sampling sites. It is important, therefore, that detailed records be taken; particularly of the sampling location, depth, and soil characteristics such as grain size and color. While this SOP describes a general procedure for collection surface soil samples, because of soil heterogeneity issues, modifications to this procedure may be appropriate depending on site-specific conditions and data collection objectives. Therefore, the project specific sampling and analysis plan should be consulted for any deviations to the procedure described below.

2.0 EQUIPMENT

- Stainless steel spoon or plastic spoon;
- Wide mouth glass jar (organics);
- 1 gallon size Zip-lock plastic bags (metals);
- Personal protective equipment (PPE) as required by the project HASP;;
- Measuring tape; and
- Field notebook.

When sampling for metals, a stainless steel or plastic spoon should be used for collecting the sample. Sampling tools which are plated with chrome or other materials are to be avoided.

3.0 PROCEDURE

1. Locate the site to be sampled and record the site name and location in the field notebook (**HSOP-31**). The notes and drawings should outline the property boundary, location of sample units and sample sites, sample site names, sample depths and sample numbers, as appropriate. Field notes and logs should also document the thickness and type of overlay material (asphalt, concrete, brick, etc.) removed to reveal the surface soil prior to performing sampling activities.

2. An approximate 1x1 foot area should be delineated with the sample collected from the top several inches of soil within this area as outlined in the project sampling and analysis plan. A stainless steel or plastic spoon should be used to collect the sample. Generally, between 100 and 500 grams of soil is required. If more sample is required the sampling area should be expanded without increasing the depth of sampling.

3. If a sod layer is present, sod should be removed or folded back prior to sampling. Sod should not be included on the surface soil sample unless specifically required by the work plan. In this case, refer to HS-SOP-12, Procedure for Sampling Sod.

4. For grab samples, soil collected using a stainless steel or plastic spoon (at the surface or at depth) should be placed directly into the sample container. For metals samples a plastic zip-lock bag is an appropriate container. For organic samples, a glass container is required unless otherwise specified. Generally, coarse material should be excluded from the sample (greater than approximately 1/4 inch where feasible).

5. For composite samples or field split samples, the soil grab sample should be transferred from the stainless steel or plastic spoon to a stainless steel mixing bowl, Teflon tray, or similar device free of potential sample contaminants. Once all grab samples are collected, the sample should be thoroughly mixed prior to transferring the sample to the sample container. Note that samples for volatile organic constituents should not be mixed to minimize potential losses to the atmosphere. Alternately, composite samples may be obtained by transferring each grab sample directly to the plastic sample bag, provided there is sufficient room in the sample to ensure thorough mixing of the sample within the bag. (Since the laboratory may only use a small portion of the total sample, it is important that the sample be thoroughly mixed so that the analysis is representative of all sample grab locations.)

6. Sample containers should be labeled, at a minimum, with sample date and sample number to permit cross referencing with the field notebook. If the sample is not to be submitted as a completely blind sample, other information may also be appropriate including sample depth, station identification, soil type. Refer to **HSOP-29**, Labeling and Documentation of Samples.

7. Refer to **HSOP-4** (Chain-of-Custody Procedures, Packing and Shipping Samples) for sample handling procedures.

8. All equipment which contacts the soil should be decontaminated after collecting the sample. Refer to **HSOP-7**, Decontamination of Sampling Equipment.

4.0 ASSOCIATED REFERENCES

HSOP-31	**FIELD NOTEBOOKS**
HSOP-29	**LABELING AND DOCUMENTATION OF SAMPLES**
HSOP-4	**CHAIN-OF-CUSTODY PROCEDURES, PACKING, AND SHIPPING SAMPLES**
HSOP-7	**DECONTAMINATION OF SAMPLING EQUIPMENT**

STANDARD OPERATING PROCEDURE

SOIL SAMPLING PROCEDURE FOR TEST PITS
HS-SOP-57

1.0 PURPOSE

This procedure describes the technique for collecting soil samples from test pits excavated with a backhoe.

2.0 EQUIPMENT

- Stainless steel trowel;
- Ziplock plastic bags (inorganic samples) or glass jars with teflon covers (organic samples);
- Surgical gloves; and
- Ladder.

3.0 PROCEDURE

1. Locate site on map, record site description (**Identification and Description of Field Sampling Sites - HSOP-2** and use form **HF-407**).

2. Direct the backhoe operator to excavate the pit. For pits deeper than 5 feet, one pit face will be sloped in accordance with OSHA requirements.

3. Using the stainless steel trowel, collect samples at depths specified in project work plan. First scrape area of pit wall to be sampled, discarding these first scrapings, then scrape again to peel off sample of uniform thickness throughout depth to be sampled. Be sure to clean trowel between depths sampled.

4. For grab samples, soil collected using a stainless steel or plastic spoon (at the surface or at depth) should be placed directly into the sample container. For metals samples a plastic zip-lock bag is an appropriate container. For organic samples, a glass container is required unless otherwise specified. Generally, coarse material should be excluded from the sample (greater than approximately 1/4 inch where feasible).

5. For composite samples or field split samples, the soil grab sample should be transferred from the stainless steel or plastic spoon to a stainless steel mixing bowl, Teflon tray, or similar device free of potential sample contaminants. Once all grab samples are collected, the sample should be thoroughly mixed prior to transferring the sample to the sample container. Note that samples for volatile organic constituents should not be mixed to minimize potential losses to the atmosphere. Alternately, composite samples may be obtained by transferring each grab sample directly to the plastic sample bag, provided there is sufficient

room in the sample to ensure thorough mixing of the sample within the bag. (Since the laboratory may only use a small portion of the total sample, it is important that the sample be thoroughly mixed so that the analysis is representative of all sample grab locations.)

6. Record date and time, depth of samples, soil description, etc. on **HF-703** (**Test Pit Field Form**). A blank form is attached.

7. Direct backhoe operator to backfill pit.

8. Decontaminate trowel and backhoe bucket in accordance with between sample sites, in accordance with **HSOP-7** (**Decontamination of Sampling Equipment**).

STANDARD OPERATING PROCEDURE
FIELD TEST PIT LOG COVER FORM©
(HF-FORM-703)

HYDROMETRICS, INC.® **Test Pit Name:**
Field Log Cover Form

Project Information

Name _____
Client _____
Property Owner _____
Project Number _____

Point Identifying Information

Point ID _____
County _____
State _____
Legal Desc. _____
Desc. Location _____
Samp. # Prefix _____
Hole Depth _____
Elevation (GS) _____
Elevation (MP) _____
Northing _____
Easting _____

Excavation Information

Date Started _____
Date Finished _____
Recorded By _____
Equipment Owner _____
Equipment Operator _____
Excavation Method _____
Excavation Dimensions (L x W x D) _____

Measuring Information

Datum _____
Static Water Level _____
Static Water Date _____
MP Description _____
MP Height _____

Signature

STANDARD OPERATING PROCEDURE
TEST PIT FIELD FORM: GRAPHICAL LOGS©
(HF-FORM-703)

HYDROMETRICS, INC.® Photos: Y N **Test Pit Name:**

Test Pit Field Form: Graphical Logs Personnel: Page _____ of _____

Sample Collection Log

Depth	Length	Number	Date	Time	Sample Type	Notes

Geological Log

Top Depth	Bot. Depth	Hatching	Material Name	Unit Name
Description				
Description				
Description				
Description				

Graphical Description (optional)

APPENDIX G

MCMW-2 AREA
EXCAVATED SOIL ANALYTICAL RESULTS

ANALYTICAL SUMMARY REPORT

October 14, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100086 Quote ID: H1313 - EPH/VPH

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 5 samples for Hydrometrics Inc on 10/6/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100086-001	MCMW2-100-Base	10/06/16 7:35	10/06/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture
H16100086-002	MCMW2-101-N Face	10/06/16 7:45	10/06/16	Soil	Same As Above
H16100086-003	MCMW2-102-EWTop	10/06/16 7:55	10/06/16	Soil	Same As Above
H16100086-004	MCMW2-103-EGray	10/06/16 8:10	10/06/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100086-005	MCMW2-104-WGray	10/06/16 8:25	10/06/16	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100086

Report Date: 10/14/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-001
Client Sample ID: MCMW2-100-Base

Report Date: 10/14/16
Collection Date: 10/06/16 07:35
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	12.5	wt%		0.2		SW3550C	10/07/16 08:18 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/06/16 18:43 / tjb
Benzene	ND	mg/kg-dry		0.057	0.04	MA-VPH	10/06/16 18:43 / tjb
Toluene	ND	mg/kg-dry		0.057	10	MA-VPH	10/06/16 18:43 / tjb
Ethylbenzene	ND	mg/kg-dry		0.057	10	MA-VPH	10/06/16 18:43 / tjb
m+p-Xylenes	ND	mg/kg-dry		0.057		MA-VPH	10/06/16 18:43 / tjb
o-Xylene	ND	mg/kg-dry		0.057		MA-VPH	10/06/16 18:43 / tjb
Xylenes, Total	ND	mg/kg-dry		0.057	30	MA-VPH	10/06/16 18:43 / tjb
Naphthalene	ND	mg/kg-dry		0.11	9	MA-VPH	10/06/16 18:43 / tjb
C9 to C10 Aromatics	ND	mg/kg-dry		2.3	100	MA-VPH	10/06/16 18:43 / tjb
C5 to C8 Aliphatics	ND	mg/kg-dry		2.3	40	MA-VPH	10/06/16 18:43 / tjb
C9 to C12 Aliphatics	2.3	mg/kg-dry	J	2.3	90	MA-VPH	10/06/16 18:43 / tjb
Total Purgeable Hydrocarbons	2.9	mg/kg-dry		2.3	100	MA-VPH	10/06/16 18:43 / tjb
Surr: VPH Aromatics Surrogate	96.0	%REC		70-130		MA-VPH	10/06/16 18:43 / tjb
Surr: VPH Aliphatics Surrogate	94.0	%REC		70-130		MA-VPH	10/06/16 18:43 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	9.8	mg/kg-dry	J	11	200	SW8015M	10/06/16 21:38 / jdh
Surr: o-Terphenyl	117	%REC		40-140		SW8015M	10/06/16 21:38 / jdh

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-002
Client Sample ID: MCMW2-101-N Face

Report Date: 10/14/16
Collection Date: 10/06/16 07:45
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	9.2	wt%		0.2		SW3550C	10/07/16 08:18 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/06/16 17:42 / tjb
Benzene	ND	mg/kg-dry		0.055	0.04	MA-VPH	10/06/16 17:42 / tjb
Toluene	ND	mg/kg-dry		0.055	10	MA-VPH	10/06/16 17:42 / tjb
Ethylbenzene	ND	mg/kg-dry		0.055	10	MA-VPH	10/06/16 17:42 / tjb
m+p-Xylenes	ND	mg/kg-dry		0.055		MA-VPH	10/06/16 17:42 / tjb
o-Xylene	ND	mg/kg-dry		0.055		MA-VPH	10/06/16 17:42 / tjb
Xylenes, Total	ND	mg/kg-dry		0.055	30	MA-VPH	10/06/16 17:42 / tjb
Naphthalene	ND	mg/kg-dry		0.11	9	MA-VPH	10/06/16 17:42 / tjb
C9 to C10 Aromatics	ND	mg/kg-dry		2.2	100	MA-VPH	10/06/16 17:42 / tjb
C5 to C8 Aliphatics	ND	mg/kg-dry		2.2	40	MA-VPH	10/06/16 17:42 / tjb
C9 to C12 Aliphatics	2.0	mg/kg-dry	J	2.2	90	MA-VPH	10/06/16 17:42 / tjb
Total Purgeable Hydrocarbons	3.2	mg/kg-dry		2.2	100	MA-VPH	10/06/16 17:42 / tjb
Surr: VPH Aromatics Surrogate	98.0	%REC		70-130		MA-VPH	10/06/16 17:42 / tjb
Surr: VPH Aliphatics Surrogate	98.0	%REC		70-130		MA-VPH	10/06/16 17:42 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	7.3	mg/kg-dry	J	11	200	SW8015M	10/06/16 20:50 / jdh
Surr: o-Terphenyl	92.0	%REC		40-140		SW8015M	10/06/16 20:50 / jdh

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-003
Client Sample ID: MCMW2-102-EWTop

Report Date: 10/14/16
Collection Date: 10/06/16 07:55
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.8	wt%		0.2		SW3550C	10/07/16 08:18 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/06/16 19:44 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/06/16 19:44 / tjb
Toluene	ND	mg/kg-dry		0.056	10	MA-VPH	10/06/16 19:44 / tjb
Ethylbenzene	ND	mg/kg-dry		0.056	10	MA-VPH	10/06/16 19:44 / tjb
m+p-Xylenes	ND	mg/kg-dry		0.056		MA-VPH	10/06/16 19:44 / tjb
o-Xylene	ND	mg/kg-dry		0.056		MA-VPH	10/06/16 19:44 / tjb
Xylenes, Total	ND	mg/kg-dry		0.056	30	MA-VPH	10/06/16 19:44 / tjb
Naphthalene	ND	mg/kg-dry		0.11	9	MA-VPH	10/06/16 19:44 / tjb
C9 to C10 Aromatics	ND	mg/kg-dry		2.2	100	MA-VPH	10/06/16 19:44 / tjb
C5 to C8 Aliphatics	ND	mg/kg-dry		2.2	40	MA-VPH	10/06/16 19:44 / tjb
C9 to C12 Aliphatics	2.7	mg/kg-dry		2.2	90	MA-VPH	10/06/16 19:44 / tjb
Total Purgeable Hydrocarbons	3.3	mg/kg-dry		2.2	100	MA-VPH	10/06/16 19:44 / tjb
Surr: VPH Aromatics Surrogate	95.0	%REC		70-130		MA-VPH	10/06/16 19:44 / tjb
Surr: VPH Aliphatics Surrogate	97.0	%REC		70-130		MA-VPH	10/06/16 19:44 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	17	mg/kg-dry		11	200	SW8015M	10/06/16 22:26 / jdh
Surr: o-Terphenyl	89.0	%REC		40-140		SW8015M	10/06/16 22:26 / jdh

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-004
Client Sample ID: MCMW2-103-EGray

Report Date: 10/14/16
Collection Date: 10/06/16 08:10
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	16.5	wt%		0.2		SW3550C	10/07/16 08:18 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	D	0.24	0.08	MA-VPH	10/06/16 21:47 / tjb
Benzene	ND	mg/kg-dry	D	0.12	0.04	MA-VPH	10/06/16 21:47 / tjb
Toluene	ND	mg/kg-dry	D	0.12	10	MA-VPH	10/06/16 21:47 / tjb
Ethylbenzene	3.7	mg/kg-dry		0.12	10	MA-VPH	10/06/16 21:47 / tjb
m+p-Xylenes	1.6	mg/kg-dry		0.12		MA-VPH	10/06/16 21:47 / tjb
o-Xylene	1.1	mg/kg-dry		0.12		MA-VPH	10/06/16 21:47 / tjb
Xylenes, Total	2.7	mg/kg-dry		0.12	30	MA-VPH	10/06/16 21:47 / tjb
Naphthalene	12	mg/kg-dry	*	0.24	9	MA-VPH	10/06/16 21:47 / tjb
C9 to C10 Aromatics	341	mg/kg-dry	*	4.8	100	MA-VPH	10/06/16 21:47 / tjb
C5 to C8 Aliphatics	41	mg/kg-dry	*	4.8	40	MA-VPH	10/06/16 21:47 / tjb
C9 to C12 Aliphatics	533	mg/kg-dry	*	4.8	90	MA-VPH	10/06/16 21:47 / tjb
Total Purgeable Hydrocarbons	724	mg/kg-dry	*	4.8	100	MA-VPH	10/06/16 21:47 / tjb
Surr: VPH Aromatics Surrogate	100	%REC		70-130		MA-VPH	10/06/16 21:47 / tjb
Surr: VPH Aliphatics Surrogate	106	%REC		70-130		MA-VPH	10/06/16 21:47 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	4310	mg/kg-dry	*	12	200	SW8015M	10/06/16 20:02 / jdh
Surr: o-Terphenyl	94.0	%REC		40-140		SW8015M	10/06/16 20:02 / jdh

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	2400	mg/kg-dry	*	36	200	MA-EPH	10/11/16 23:10 / eli-b
C19 to C36 Aliphatics	393	mg/kg-dry		36	20000	MA-EPH	10/11/16 23:10 / eli-b
Surr: 1-Chloro-octadecane	81.0	%REC		40-140		MA-EPH	10/11/16 23:10 / eli-b
C11 to C22 Aromatics	1500	mg/kg-dry	*	36	400	MA-EPH	10/12/16 00:35 / eli-b
Total Extractable Hydrocarbons	4490	mg/kg-dry		36		MA-EPH	10/12/16 00:35 / eli-b
Surr: 2-Bromonaphthalene	109	%REC		40-140		MA-EPH	10/12/16 00:35 / eli-b
Surr: 2-Fluorobiphenyl	79.0	%REC		40-140		MA-EPH	10/12/16 00:35 / eli-b
Surr: o-Terphenyl	142	%REC	S	40-140		MA-EPH	10/12/16 00:35 / eli-b

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.
- S=Surrogate recovery outside QC advisory limits due to positive sample matrix interference.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	4.5	mg/kg-dry		1.2		SW8270C	10/11/16 19:28 / eli-b
Acenaphthene	ND	mg/kg-dry		1.2	200	SW8270C	10/11/16 19:28 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
S - Spike recovery outside of advisory limits.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-004
Client Sample ID: MCMW2-103-EGray

Report Date: 10/14/16
Collection Date: 10/06/16 08:10
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Acenaphthylene	ND	mg/kg-dry		1.2		SW8270C	10/11/16 19:28 / eli-b
Anthracene	ND	mg/kg-dry		1.2	2000	SW8270C	10/11/16 19:28 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.2	0.2	SW8270C	10/11/16 19:28 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.2	0.02	SW8270C	10/11/16 19:28 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.2	0.2	SW8270C	10/11/16 19:28 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.2		SW8270C	10/11/16 19:28 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.2	2	SW8270C	10/11/16 19:28 / eli-b
Chrysene	ND	mg/kg-dry		1.2	20	SW8270C	10/11/16 19:28 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.2	0.02	SW8270C	10/11/16 19:28 / eli-b
Fluoranthene	ND	mg/kg-dry		1.2	300	SW8270C	10/11/16 19:28 / eli-b
Fluorene	0.87	mg/kg-dry	J	1.2	300	SW8270C	10/11/16 19:28 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.2	0.2	SW8270C	10/11/16 19:28 / eli-b
Naphthalene	0.72	mg/kg-dry	J	1.2	4	SW8270C	10/11/16 19:28 / eli-b
Phenanthrene	1.2	mg/kg-dry		1.2		SW8270C	10/11/16 19:28 / eli-b
Pyrene	ND	mg/kg-dry		1.2	200	SW8270C	10/11/16 19:28 / eli-b
Surr: 2-Fluorobiphenyl	81.0	%REC		40-140		SW8270C	10/11/16 19:28 / eli-b
Surr: o-Terphenyl	93.0	%REC		40-140		SW8270C	10/11/16 19:28 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-005
Client Sample ID: MCMW2-104-WGray

Report Date: 10/14/16
Collection Date: 10/06/16 08:25
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	14.7	wt%		0.2		SW3550C	10/07/16 08:18 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	D	0.23	0.08	MA-VPH	10/06/16 20:46 / tjb
Benzene	ND	mg/kg-dry	D	0.12	0.04	MA-VPH	10/06/16 20:46 / tjb
Toluene	ND	mg/kg-dry	D	0.12	10	MA-VPH	10/06/16 20:46 / tjb
Ethylbenzene	1.0	mg/kg-dry		0.12	10	MA-VPH	10/06/16 20:46 / tjb
m+p-Xylenes	1.5	mg/kg-dry		0.12		MA-VPH	10/06/16 20:46 / tjb
o-Xylene	0.51	mg/kg-dry		0.12		MA-VPH	10/06/16 20:46 / tjb
Xylenes, Total	2.0	mg/kg-dry		0.12	30	MA-VPH	10/06/16 20:46 / tjb
Naphthalene	8.3	mg/kg-dry		0.23	9	MA-VPH	10/06/16 20:46 / tjb
C9 to C10 Aromatics	271	mg/kg-dry	*	4.7	100	MA-VPH	10/06/16 20:46 / tjb
C5 to C8 Aliphatics	20	mg/kg-dry		4.7	40	MA-VPH	10/06/16 20:46 / tjb
C9 to C12 Aliphatics	476	mg/kg-dry	*	4.7	90	MA-VPH	10/06/16 20:46 / tjb
Total Purgeable Hydrocarbons	711	mg/kg-dry	*	4.7	100	MA-VPH	10/06/16 20:46 / tjb
Surr: VPH Aromatics Surrogate	90.0	%REC		70-130		MA-VPH	10/06/16 20:46 / tjb
Surr: VPH Aliphatics Surrogate	92.0	%REC		70-130		MA-VPH	10/06/16 20:46 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	612	mg/kg-dry	*	12	200	SW8015M	10/06/16 19:13 / jdh
Surr: o-Terphenyl	68.0	%REC		40-140		SW8015M	10/06/16 19:13 / jdh

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	408	mg/kg-dry	*	12	200	MA-EPH	10/11/16 19:37 / eli-b
C19 to C36 Aliphatics	120	mg/kg-dry		12	20000	MA-EPH	10/11/16 19:37 / eli-b
Surr: 1-Chloro-octadecane	90.0	%REC		40-140		MA-EPH	10/11/16 19:37 / eli-b
C11 to C22 Aromatics	146	mg/kg-dry		12	400	MA-EPH	10/11/16 20:20 / eli-b
Total Extractable Hydrocarbons	704	mg/kg-dry		12		MA-EPH	10/11/16 20:20 / eli-b
Surr: 2-Bromonaphthalene	75.0	%REC		40-140		MA-EPH	10/11/16 20:20 / eli-b
Surr: 2-Fluorobiphenyl	72.0	%REC		40-140		MA-EPH	10/11/16 20:20 / eli-b
Surr: o-Terphenyl	96.0	%REC		40-140		MA-EPH	10/11/16 20:20 / eli-b

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	5.8	mg/kg-dry		0.38		SW8270C	10/11/16 19:58 / eli-b
Acenaphthene	0.35	mg/kg-dry	J	0.38	200	SW8270C	10/11/16 19:58 / eli-b
Acenaphthylene	ND	mg/kg-dry		0.38		SW8270C	10/11/16 19:58 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100086-005
Client Sample ID: MCMW2-104-WGray

Report Date: 10/14/16
Collection Date: 10/06/16 08:25
DateReceived: 10/06/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		0.38	2000	SW8270C	10/11/16 19:58 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		0.38	0.2	SW8270C	10/11/16 19:58 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		0.38	0.02	SW8270C	10/11/16 19:58 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		0.38	0.2	SW8270C	10/11/16 19:58 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		0.38		SW8270C	10/11/16 19:58 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		0.38	2	SW8270C	10/11/16 19:58 / eli-b
Chrysene	ND	mg/kg-dry		0.38	20	SW8270C	10/11/16 19:58 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		0.38	0.02	SW8270C	10/11/16 19:58 / eli-b
Fluoranthene	ND	mg/kg-dry		0.38	300	SW8270C	10/11/16 19:58 / eli-b
Fluorene	0.91	mg/kg-dry		0.38	300	SW8270C	10/11/16 19:58 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		0.38	0.2	SW8270C	10/11/16 19:58 / eli-b
Naphthalene	0.96	mg/kg-dry		0.38	4	SW8270C	10/11/16 19:58 / eli-b
Phenanthrene	1.5	mg/kg-dry		0.38		SW8270C	10/11/16 19:58 / eli-b
Pyrene	ND	mg/kg-dry		0.38	200	SW8270C	10/11/16 19:58 / eli-b
Surr: 2-Fluorobiphenyl	83.0	%REC		40-140		SW8270C	10/11/16 19:58 / eli-b
Surr: o-Terphenyl	37.0	%REC	S	40-140		SW8270C	10/11/16 19:58 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
S - Spike recovery outside of advisory limits.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: B_103454
Lab ID: MB-103454-T34634	Method Blank				Run: SUB-B268536				10/11/16 11:50
C9 to C18 Aliphatics	ND	mg/kg	10						
C19 to C36 Aliphatics	ND	mg/kg	10						
Surr: 1-Chloro-octadecane			0.17	89	40	140			
Lab ID: LCS-103454-T34634	Laboratory Control Sample				Run: SUB-B268536				10/11/16 13:15
C9 to C18 Aliphatics	28.9	mg/kg	10	72	40	140			
C19 to C36 Aliphatics	51.8	mg/kg	10	97	40	140			
n-Nonane	2.21	mg/kg	0.17	33	30	140			
n-Decane	2.78	mg/kg	0.17	42	40	140			
n-Dodecane	4.29	mg/kg	0.17	64	40	140			
n-Tetradecane	5.45	mg/kg	0.17	82	40	140			
n-Hexadecane	6.17	mg/kg	0.17	93	40	140			
n-Octadecane	6.36	mg/kg	0.17	95	40	140			
n-Nonadecane	6.46	mg/kg	0.17	97	40	140			
n-Eicosane	6.44	mg/kg	0.17	97	40	140			
n-Docosane	6.45	mg/kg	0.17	97	40	140			
n-Tetracosane	6.53	mg/kg	0.17	98	40	140			
n-Hexacosane	6.58	mg/kg	0.17	99	40	140			
n-Octacosane	6.12	mg/kg	0.17	92	40	140			
n-Triacontane	6.52	mg/kg	0.17	98	40	140			
n-Hexatriacontane	6.46	mg/kg	0.17	97	40	140			
Surr: 1-Chloro-octadecane			0.17	89	40	140			
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: SUB-B268536				10/11/16 16:05
C9 to C18 Aliphatics	42.0	mg/kg-dry	12	87	40	140			
C19 to C36 Aliphatics	68.7	mg/kg-dry	12	107	40	140			
n-Nonane	3.90	mg/kg-dry	0.20	48	30	140			
n-Decane	5.04	mg/kg-dry	0.20	62	40	140			
n-Dodecane	6.34	mg/kg-dry	0.20	79	40	140			
n-Tetradecane	7.28	mg/kg-dry	0.20	90	40	140			
n-Hexadecane	8.14	mg/kg-dry	0.20	101	40	140			
n-Octadecane	8.38	mg/kg-dry	0.20	104	40	140			
n-Nonadecane	8.53	mg/kg-dry	0.20	106	40	140			
n-Eicosane	8.51	mg/kg-dry	0.20	105	40	140			
n-Docosane	8.54	mg/kg-dry	0.20	106	40	140			
n-Tetracosane	8.65	mg/kg-dry	0.20	107	40	140			
n-Hexacosane	8.72	mg/kg-dry	0.20	108	40	140			
n-Octacosane	8.13	mg/kg-dry	0.20	101	40	140			
n-Triacontane	8.67	mg/kg-dry	0.20	108	40	140			
n-Hexatriacontane	8.49	mg/kg-dry	0.20	105	40	140			
Surr: 1-Chloro-octadecane			0.20	101	40	140			
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: SUB-B268536				10/11/16 17:30
C9 to C18 Aliphatics	39.8	mg/kg-dry	12	82	40	140	5.3	20	

Qualifiers:

RL - Analyte reporting limit. ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: B_103454
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: SUB-B268536			10/11/16 17:30	
C19 to C36 Aliphatics	65.4	mg/kg-dry	12	101	40	140	5.0	20	
n-Nonane	3.88	mg/kg-dry	0.20	48	30	140	0.6	30	
n-Decane	4.68	mg/kg-dry	0.20	58	40	140	7.5	20	
n-Dodecane	6.00	mg/kg-dry	0.20	74	40	140	5.6	20	
n-Tetradecane	6.94	mg/kg-dry	0.20	86	40	140	4.9	20	
n-Hexadecane	7.72	mg/kg-dry	0.20	96	40	140	5.2	20	
n-Octadecane	7.92	mg/kg-dry	0.20	98	40	140	5.6	20	
n-Nonadecane	8.07	mg/kg-dry	0.20	100	40	140	5.6	20	
n-Eicosane	8.07	mg/kg-dry	0.20	100	40	140	5.3	20	
n-Docosane	8.13	mg/kg-dry	0.20	101	40	140	4.9	20	
n-Tetracosane	8.23	mg/kg-dry	0.20	102	40	140	4.9	20	
n-Hexacosane	8.30	mg/kg-dry	0.20	103	40	140	4.9	20	
n-Octacosane	7.74	mg/kg-dry	0.20	96	40	140	5.0	20	
n-Triacontane	8.26	mg/kg-dry	0.20	102	40	140	4.9	20	
n-Hexatriacontane	8.13	mg/kg-dry	0.20	101	40	140	4.3	20	
Surr: 1-Chloro-octadecane			0.20	95	40	140			
Lab ID: MB-103454-T34634	Method Blank				Run: SUB-B268536			10/11/16 12:32	
C11 to C22 Aromatics	ND	mg/kg	10						
Total Extractable Hydrocarbons	ND	mg/kg	10						
Naphthalene	ND	mg/kg	0.17						
2-MethylNaphthalene	ND	mg/kg	0.17						
Acenaphthylene	ND	mg/kg	0.17						
Acenaphthene	ND	mg/kg	0.17						
Fluorene	ND	mg/kg	0.17						
Phenanthrene	ND	mg/kg	0.17						
Anthracene	ND	mg/kg	0.17						
Fluoranthene	ND	mg/kg	0.17						
Pyrene	ND	mg/kg	0.17						
Benzo(a)Anthracene	ND	mg/kg	0.17						
Chrysene	ND	mg/kg	0.17						
Benzo(b)Fluoranthene/Benzo(k)Fluoran	ND	mg/kg	0.17						
Benzo(a)Pyrene	ND	mg/kg	0.17						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	ND	mg/kg	0.17						
Benzo(g,h,I)perylene	ND	mg/kg	0.17						
Surr: 2-Bromonaphthalene			0.17	105	40	140			
Surr: 2-Fluorobiphenyl			0.17	94	40	140			
Surr: o-Terphenyl			0.17	91	40	140			
Lab ID: LCS-103454-T34634	Laboratory Control Sample				Run: SUB-B268536			10/11/16 13:57	
C11 to C22 Aromatics	108	mg/kg	10	95	40	140			
Total Extractable Hydrocarbons	189	mg/kg	10	91	40	140			
Naphthalene	3.88	mg/kg	0.17	58	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: B_103454
Lab ID: LCS-103454-T34634	Laboratory Control Sample				Run: SUB-B268536				10/11/16 13:57
2-MethylNaphthalene	5.02	mg/kg	0.17	75	40	140			
Acenaphthylene	5.29	mg/kg	0.17	79	40	140			
Acenaphthene	6.36	mg/kg	0.17	95	40	140			
Fluorene	6.28	mg/kg	0.17	94	40	140			
Phenanthrene	6.09	mg/kg	0.17	91	40	140			
Anthracene	6.58	mg/kg	0.17	99	40	140			
Fluoranthene	6.80	mg/kg	0.17	102	40	140			
Pyrene	6.91	mg/kg	0.17	104	40	140			
Benzo(a)Anthracene	6.50	mg/kg	0.17	97	40	140			
Chrysene	7.02	mg/kg	0.17	105	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	13.8	mg/kg	0.17	103	40	140			
Benzo(a)Pyrene	6.66	mg/kg	0.17	100	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	13.1	mg/kg	0.17	99	40	140			
Benzo(g,h,I)perylene	6.34	mg/kg	0.17	95	40	140			
Surr: 2-Bromonaphthalene			0.17	79	40	140			
Surr: 2-Fluorobiphenyl			0.17	93	40	140			
Surr: o-Terphenyl			0.17	105	40	140			
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: SUB-B268536				10/11/16 16:47
C11 to C22 Aromatics	144	mg/kg-dry	12	105	40	140			
Total Extractable Hydrocarbons	255	mg/kg-dry	12	102	40	140			
Naphthalene	5.59	mg/kg-dry	0.20	69	40	140			
2-MethylNaphthalene	6.97	mg/kg-dry	0.20	86	40	140			
Acenaphthylene	7.23	mg/kg-dry	0.20	90	40	140			
Acenaphthene	8.29	mg/kg-dry	0.20	103	40	140			
Fluorene	7.76	mg/kg-dry	0.20	96	40	140			
Phenanthrene	8.20	mg/kg-dry	0.20	102	40	140			
Anthracene	8.59	mg/kg-dry	0.20	107	40	140			
Fluoranthene	8.97	mg/kg-dry	0.20	111	40	140			
Pyrene	9.14	mg/kg-dry	0.20	113	40	140			
Benzo(a)Anthracene	8.79	mg/kg-dry	0.20	109	40	140			
Chrysene	9.22	mg/kg-dry	0.20	114	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	18.2	mg/kg-dry	0.20	113	40	140			
Benzo(a)Pyrene	8.93	mg/kg-dry	0.20	111	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	17.5	mg/kg-dry	0.20	109	40	140			
Benzo(g,h,I)perylene	8.43	mg/kg-dry	0.20	105	40	140			
Surr: 2-Bromonaphthalene			0.20	70	40	140			
Surr: 2-Fluorobiphenyl			0.20	100	40	140			
Surr: o-Terphenyl			0.20	108	40	140			
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: SUB-B268536				10/11/16 18:12
C11 to C22 Aromatics	142	mg/kg-dry	12	103	40	140	1.4	20	
Total Extractable Hydrocarbons	249	mg/kg-dry	12	100	40	140	2.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: B_103454
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: SUB-B268536			10/11/16 18:12	
Naphthalene	5.67	mg/kg-dry	0.20	70	40	140	1.4	20	
2-MethylNaphthalene	6.96	mg/kg-dry	0.20	86	40	140	0.0	20	
Acenaphthylene	7.22	mg/kg-dry	0.20	90	40	140	0.0	20	
Acenaphthene	8.32	mg/kg-dry	0.20	103	40	140	0.3	20	
Fluorene	7.71	mg/kg-dry	0.20	96	40	140	0.6	20	
Phenanthrene	8.04	mg/kg-dry	0.20	100	40	140	1.9	20	
Anthracene	8.46	mg/kg-dry	0.20	105	40	140	1.5	20	
Fluoranthene	8.79	mg/kg-dry	0.20	109	40	140	2.0	20	
Pyrene	8.97	mg/kg-dry	0.20	111	40	140	1.9	20	
Benzo(a)Anthracene	8.60	mg/kg-dry	0.20	107	40	140	2.2	20	
Chrysene	9.04	mg/kg-dry	0.20	112	40	140	2.0	20	
Benzo(b)Fluoranthene/Benzo(k)Fluoran	17.9	mg/kg-dry	0.20	111	40	140	1.9	20	
Benzo(a)Pyrene	8.75	mg/kg-dry	0.20	108	40	140	2.1	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	17.3	mg/kg-dry	0.20	107	40	140	1.6	20	
Benzo(g,h,I)perylene	8.32	mg/kg-dry	0.20	103	40	140	1.4	20	
Surr: 2-Bromonaphthalene			0.20	74	40	140			
Surr: 2-Fluorobiphenyl			0.20	98	40	140			
Surr: o-Terphenyl			0.20	105	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH								Analytical Run: B_R268536	
Lab ID: CCV_1011HP303r-S	Continuing Calibration Verification Standard							10/11/16 09:37	
n-Nonane	6.92	mg/kg	0.17	104	75	125			
n-Decane	6.83	mg/kg	0.17	103	75	125			
n-Dodecane	7.19	mg/kg	0.17	108	75	125			
n-Tetradecane	7.13	mg/kg	0.17	107	75	125			
n-Hexadecane	7.19	mg/kg	0.17	108	75	125			
n-Octadecane	7.15	mg/kg	0.17	107	75	125			
n-Nonadecane	7.14	mg/kg	0.17	107	75	125			
n-Eicosane	7.14	mg/kg	0.17	107	75	125			
n-Docosane	7.14	mg/kg	0.17	107	75	125			
n-Tetracosane	7.14	mg/kg	0.17	107	75	125			
n-Hexacosane	7.19	mg/kg	0.17	108	75	125			
n-Octacosane	6.87	mg/kg	0.17	103	75	125			
n-Triacontane	7.21	mg/kg	0.17	108	75	125			
n-Hexatriacontane	7.22	mg/kg	0.17	108	75	125			
Surr: 1-Chloro-octadecane			0.17	109	75	125			
Lab ID: CCV_1011HP319r-S	Continuing Calibration Verification Standard							10/11/16 21:02	
n-Nonane	6.89	mg/kg	0.17	103	75	125			
n-Decane	6.82	mg/kg	0.17	102	75	125			
n-Dodecane	7.17	mg/kg	0.17	108	75	125			
n-Tetradecane	7.07	mg/kg	0.17	106	75	125			
n-Hexadecane	7.16	mg/kg	0.17	107	75	125			
n-Octadecane	7.12	mg/kg	0.17	107	75	125			
n-Nonadecane	7.10	mg/kg	0.17	107	75	125			
n-Eicosane	7.09	mg/kg	0.17	106	75	125			
n-Docosane	7.08	mg/kg	0.17	106	75	125			
n-Tetracosane	7.09	mg/kg	0.17	106	75	125			
n-Hexacosane	7.15	mg/kg	0.17	107	75	125			
n-Octacosane	6.84	mg/kg	0.17	103	75	125			
n-Triacontane	7.18	mg/kg	0.17	108	75	125			
n-Hexatriacontane	7.22	mg/kg	0.17	108	75	125			
Surr: 1-Chloro-octadecane			0.17	109	75	125			
Lab ID: CCV_1011HP304r-S	Continuing Calibration Verification Standard							10/11/16 10:20	
Naphthalene	6.65	mg/kg	0.17	100	75	125			
2-MethylNaphthalene	6.94	mg/kg	0.17	104	75	125			
Acenaphthylene	6.72	mg/kg	0.17	101	75	125			
Acenaphthene	6.95	mg/kg	0.17	104	75	125			
Fluorene	6.59	mg/kg	0.17	99	75	125			
Phenanthrene	6.74	mg/kg	0.17	101	75	125			
Anthracene	6.80	mg/kg	0.17	102	75	125			
Fluoranthene	6.75	mg/kg	0.17	101	75	125			
Pyrene	6.78	mg/kg	0.17	102	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH								Analytical Run: B_R268536	
Lab ID: CCV_1011HP304r-S	Continuing Calibration Verification Standard							10/11/16 10:20	
Benzo(a)Anthracene	6.75	mg/kg	0.17	101	75	125			
Chrysene	6.85	mg/kg	0.17	103	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	13.6	mg/kg	0.17	102	75	125			
Benzo(a)Pyrene	6.76	mg/kg	0.17	101	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	13.6	mg/kg	0.17	102	75	125			
Benzo(g,h,I)perylene	6.73	mg/kg	0.17	101	75	125			
Surr: 2-Bromonaphthalene			0.17	98	75	125			
Surr: 2-Fluorobiphenyl			0.17	106	75	125			
Surr: o-Terphenyl			0.17	103	75	125			
Lab ID: CCV_1011HP320r-S	Continuing Calibration Verification Standard							10/11/16 21:45	
Naphthalene	6.73	mg/kg	0.17	101	75	125			
2-MethylNaphthalene	7.13	mg/kg	0.17	107	75	125			
Acenaphthylene	6.79	mg/kg	0.17	102	75	125			
Acenaphthene	6.98	mg/kg	0.17	105	75	125			
Fluorene	6.63	mg/kg	0.17	99	75	125			
Phenanthrene	6.78	mg/kg	0.17	102	75	125			
Anthracene	6.85	mg/kg	0.17	103	75	125			
Fluoranthene	6.79	mg/kg	0.17	102	75	125			
Pyrene	6.82	mg/kg	0.17	102	75	125			
Benzo(a)Anthracene	6.82	mg/kg	0.17	102	75	125			
Chrysene	6.86	mg/kg	0.17	103	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	13.7	mg/kg	0.17	102	75	125			
Benzo(a)Pyrene	6.81	mg/kg	0.17	102	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	13.7	mg/kg	0.17	103	75	125			
Benzo(g,h,I)perylene	6.79	mg/kg	0.17	102	75	125			
Surr: 2-Bromonaphthalene			0.17	99	75	125			
Surr: 2-Fluorobiphenyl			0.17	107	75	125			
Surr: o-Terphenyl			0.17	104	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34649
Lab ID: LCS-34649	Laboratory Control Sample				Run: GC2_161005A				10/05/16 14:03
2-Methylpentane	2.57	mg/kg-dry	0.10	103	70	130			
n-Butylcyclohexane	2.73	mg/kg-dry	0.10	109	70	130			
n-Decane	2.70	mg/kg-dry	0.10	108	70	130			
n-Pentane	2.45	mg/kg-dry	0.10	98	30	130			
Methyl tert-butyl ether (MTBE)	2.46	mg/kg-dry	0.10	99	70	130			
Benzene	2.55	mg/kg-dry	0.050	102	70	130			
Toluene	2.50	mg/kg-dry	0.050	100	70	130			
Ethylbenzene	2.51	mg/kg-dry	0.050	101	70	130			
m+p-Xylenes	5.29	mg/kg-dry	0.050	106	70	130			
o-Xylene	2.64	mg/kg-dry	0.050	106	70	130			
Naphthalene	2.49	mg/kg-dry	0.10	100	70	130			
Total Purgeable Hydrocarbons	39.1	mg/kg-dry	2.0	104	70	130			
Surr: VPH Aromatics Surrogate			0.050	102	70	130			
Surr: VPH Aliphatics Surrogate			0.050	103	70	130			
Lab ID: MB-34649	Method Blank				Run: GC2_161005A				10/05/16 15:23
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	0.10						
Benzene	ND	mg/kg-dry	0.050						
Toluene	ND	mg/kg-dry	0.050						
Ethylbenzene	ND	mg/kg-dry	0.050						
m+p-Xylenes	ND	mg/kg-dry	0.050						
o-Xylene	ND	mg/kg-dry	0.050						
Naphthalene	ND	mg/kg-dry	0.10						
C9 to C10 Aromatics	ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics	ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics	ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons	ND	mg/kg-dry	2.0						
Xylenes, Total	ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate			0.050	104	70	130			
Surr: VPH Aliphatics Surrogate			0.050	105	70	130			
Lab ID: H16100036-003AMS	Sample Matrix Spike				Run: GC2_161005A				10/05/16 16:24
Methyl tert-butyl ether (MTBE)	2.66	mg/kg-dry	0.11	96	70	130			
Benzene	2.78	mg/kg-dry	0.056	100	70	130			
Toluene	2.77	mg/kg-dry	0.056	100	70	130			
Ethylbenzene	2.64	mg/kg-dry	0.056	95	70	130			
m+p-Xylenes	5.58	mg/kg-dry	0.056	101	70	130			
o-Xylene	2.70	mg/kg-dry	0.056	97	70	130			
Naphthalene	2.65	mg/kg-dry	0.11	96	70	130			
Total Purgeable Hydrocarbons	42.4	mg/kg-dry	2.2	102	70	130			
Surr: VPH Aromatics Surrogate			0.056	100	70	130			
Surr: VPH Aliphatics Surrogate			0.056	100	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34649
Lab ID: H16100036-003AMSD	Sample Matrix Spike Duplicate				Run: GC2_161005A				10/05/16 16:55
Methyl tert-butyl ether (MTBE)	2.69	mg/kg-dry	0.11	98	70	130	1.0	20	
Benzene	2.81	mg/kg-dry	0.055	102	70	130	1.1	20	
Toluene	2.77	mg/kg-dry	0.055	101	70	130	0.0	20	
Ethylbenzene	2.67	mg/kg-dry	0.055	97	70	130	1.0	20	
m+p-Xylenes	5.65	mg/kg-dry	0.055	103	70	130	1.3	20	
o-Xylene	2.75	mg/kg-dry	0.055	100	70	130	1.5	20	
Naphthalene	2.71	mg/kg-dry	0.11	98	70	130	1.9	20	
Total Purgeable Hydrocarbons	41.9	mg/kg-dry	2.2	102	70	130	1.0	20	
Surr: VPH Aromatics Surrogate			0.055	98	70	130			
Surr: VPH Aliphatics Surrogate			0.055	97	70	130			
Method: MA-VPH									Analytical Run: R119309
Lab ID: CCV_1006GC202r-S	Continuing Calibration Verification Standard								10/06/16 14:37
1,2,4-Trimethylbenzene	2.64	mg/kg-dry	0.10	106	75	125			
2,2,4-Trimethylpentane	2.57	mg/kg-dry	0.10	103	75	125			
2-Methylpentane	2.50	mg/kg-dry	0.10	100	75	125			
n-Butylcyclohexane	2.48	mg/kg-dry	0.10	99	75	125			
n-Decane	2.52	mg/kg-dry	0.10	101	75	125			
n-Pentane	2.43	mg/kg-dry	0.10	97	75	125			
Methyl tert-butyl ether (MTBE)	2.50	mg/kg-dry	0.10	100	75	125			
Benzene	2.51	mg/kg-dry	0.050	101	75	125			
Toluene	2.50	mg/kg-dry	0.050	100	75	125			
Ethylbenzene	2.47	mg/kg-dry	0.050	99	75	125			
m+p-Xylenes	5.14	mg/kg-dry	0.050	103	75	125			
o-Xylene	2.55	mg/kg-dry	0.050	102	75	125			
Naphthalene	2.47	mg/kg-dry	0.10	99	75	125			
Surr: VPH Aromatics Surrogate			0.050	84	70	130			
Surr: VPH Aliphatics Surrogate			0.050	84	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW3550C									Batch: R119306
Lab ID: H16100086-005ADUP	Sample Duplicate				Run: EXTRACT OV 2_161006A			10/07/16 08:18	
Moisture	15.4	wt%	0.20				4.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Batch: 34634
Lab ID: MB-34634	Method Blank				Run: HHP2_161005A				10/05/16 14:59
Total Extractable Hydrocarbons	ND	mg/kg-dry	10						
Surr: o-Terphenyl			0.17	97	40	140			
Lab ID: LCS-34634	Laboratory Control Sample				Run: HHP2_161005A				10/05/16 15:48
Total Extractable Hydrocarbons	217.0	mg/kg-dry	10	105	60	140			
Surr: o-Terphenyl			0.17	107	40	140			
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: HHP2_161005A				10/06/16 01:29
Total Extractable Hydrocarbons	274.2	mg/kg-dry	12	110	60	140			
Surr: o-Terphenyl			0.20	103	40	140			
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: HHP2_161005A				10/06/16 02:18
Total Extractable Hydrocarbons	275.5	mg/kg-dry	12	110	60	140	0.5	20	
Surr: o-Terphenyl			0.20	103	40	140			
Method: SW8015M									Analytical Run: R119311
Lab ID: CCV_1006GC401r-S	Continuing Calibration Verification Standard								10/06/16 18:25
n-Nonane	6.822	mg/kg-dry		102	75	125			
n-Decane	7.084	mg/kg-dry		106	75	125			
n-Dodecane	6.984	mg/kg-dry		105	75	125			
n-Tetradecane	7.208	mg/kg-dry		108	75	125			
n-Hexadecane	6.950	mg/kg-dry		104	75	125			
n-Octadecane	6.957	mg/kg-dry		104	75	125			
n-Nonadecane	6.996	mg/kg-dry		105	75	125			
n-Eicosane	6.976	mg/kg-dry		105	75	125			
n-Docosane	6.962	mg/kg-dry		104	75	125			
n-Tetracosane	7.000	mg/kg-dry		105	75	125			
n-Hexacosane	6.955	mg/kg-dry		104	75	125			
n-Octacosane	7.000	mg/kg-dry		105	75	125			
n-Triacontane	6.970	mg/kg-dry		105	75	125			
n-Hexatriacontane	6.668	mg/kg-dry		100	75	125			
Surr: o-Terphenyl			0.17	106	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103491
Lab ID: MB-103491-103454-T346	Method Blank				Run: SUB-B268557				10/11/16 16:56
2-Methylnaphthalene	ND	mg/kg	0.33						
Acenaphthene	ND	mg/kg	0.33						
Acenaphthylene	ND	mg/kg	0.33						
Anthracene	ND	mg/kg	0.33						
Benzo(a)anthracene	ND	mg/kg	0.33						
Benzo(a)pyrene	ND	mg/kg	0.33						
Benzo(b)fluoranthene	ND	mg/kg	0.33						
Benzo(g,h,i)perylene	ND	mg/kg	0.33						
Benzo(k)fluoranthene	ND	mg/kg	0.33						
Chrysene	ND	mg/kg	0.33						
Dibenzo(a,h)anthracene	ND	mg/kg	0.33						
Fluoranthene	ND	mg/kg	0.33						
Fluorene	ND	mg/kg	0.33						
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.33						
Naphthalene	ND	mg/kg	0.33						
Phenanthrene	ND	mg/kg	0.33						
Pyrene	ND	mg/kg	0.33						
Surr: 2-Fluorobiphenyl			0.33	92	40	140			
Surr: o-Terphenyl			0.33	85	40	140			
Lab ID: LCS-103491	Laboratory Control Sample				Run: SUB-B268557				10/11/16 17:26
2-Methylnaphthalene	4.29	mg/kg	0.33	64	40	140			
Acenaphthene	5.55	mg/kg	0.33	83	40	140			
Acenaphthylene	4.99	mg/kg	0.33	75	40	140			
Anthracene	5.70	mg/kg	0.33	86	40	140			
Benzo(a)anthracene	6.31	mg/kg	0.33	95	40	140			
Benzo(a)pyrene	6.00	mg/kg	0.33	90	40	140			
Benzo(b)fluoranthene	5.83	mg/kg	0.33	87	40	140			
Benzo(g,h,i)perylene	6.67	mg/kg	0.33	100	40	140			
Benzo(k)fluoranthene	6.36	mg/kg	0.33	95	40	140			
Chrysene	6.45	mg/kg	0.33	97	40	140			
Dibenzo(a,h)anthracene	6.32	mg/kg	0.33	95	40	140			
Fluoranthene	6.12	mg/kg	0.33	92	40	140			
Fluorene	5.82	mg/kg	0.33	87	40	140			
Indeno(1,2,3-cd)pyrene	6.14	mg/kg	0.33	92	40	140			
Naphthalene	3.73	mg/kg	0.33	56	40	140			
Phenanthrene	5.59	mg/kg	0.33	84	40	140			
Pyrene	6.21	mg/kg	0.33	93	40	140			
Surr: 2-Fluorobiphenyl			0.33	86	40	140			
Surr: o-Terphenyl			0.33	90	40	140			
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: SUB-B268557				10/11/16 18:27
2-Methylnaphthalene	5.87	mg/kg-dry	0.41	72	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit. ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103491
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: SUB-B268557			10/11/16 18:27	
Acenaphthene	7.55	mg/kg-dry	0.41	93	40	140	0.0	40	
Acenaphthylene	6.79	mg/kg-dry	0.41	84	40	140	0.0	40	
Anthracene	7.96	mg/kg-dry	0.41	98	40	140	0.0	40	
Benzo(a)anthracene	8.49	mg/kg-dry	0.41	105	40	140	0.0	40	
Benzo(a)pyrene	8.05	mg/kg-dry	0.41	99	40	140	0.0	40	
Benzo(b)fluoranthene	7.47	mg/kg-dry	0.41	92	40	140	0.0	40	
Benzo(g,h,i)perylene	8.74	mg/kg-dry	0.41	108	40	140	0.0	40	
Benzo(k)fluoranthene	8.71	mg/kg-dry	0.41	108	40	140	0.0	40	
Chrysene	8.89	mg/kg-dry	0.41	110	40	140	0.0	40	
Dibenzo(a,h)anthracene	8.06	mg/kg-dry	0.41	99	40	140	0.0	40	
Fluoranthene	8.27	mg/kg-dry	0.41	102	40	140	0.0	40	
Fluorene	7.65	mg/kg-dry	0.41	94	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene	8.23	mg/kg-dry	0.41	102	40	140	0.0	40	
Naphthalene	5.54	mg/kg-dry	0.41	68	40	140	0.0	40	
Phenanthrene	7.57	mg/kg-dry	0.41	93	40	140	0.0	40	
Pyrene	8.85	mg/kg-dry	0.41	109	40	140	0.0	40	
Surr: 2-Fluorobiphenyl			0.41	92	40	140			
Surr: o-Terphenyl			0.41	97	40	140			
Lab ID: H16090596-001AMSD	Sample Matrix Spike				Run: SUB-B268557			10/11/16 18:57	
2-Methylnaphthalene	5.97	mg/kg-dry	0.41	74	40	140	1.8	40	
Acenaphthene	7.32	mg/kg-dry	0.41	90	40	140	3.0	40	
Acenaphthylene	6.84	mg/kg-dry	0.41	84	40	140	0.8	40	
Anthracene	7.76	mg/kg-dry	0.41	96	40	140	2.5	40	
Benzo(a)anthracene	8.79	mg/kg-dry	0.41	108	40	140	3.4	40	
Benzo(a)pyrene	7.76	mg/kg-dry	0.41	96	40	140	3.7	40	
Benzo(b)fluoranthene	7.47	mg/kg-dry	0.41	92	40	140	0.0	40	
Benzo(g,h,i)perylene	8.37	mg/kg-dry	0.41	103	40	140	4.3	40	
Benzo(k)fluoranthene	8.00	mg/kg-dry	0.41	99	40	140	8.5	40	
Chrysene	8.14	mg/kg-dry	0.41	100	40	140	8.9	40	
Dibenzo(a,h)anthracene	7.86	mg/kg-dry	0.41	97	40	140	2.5	40	
Fluoranthene	8.35	mg/kg-dry	0.41	103	40	140	1.0	40	
Fluorene	7.64	mg/kg-dry	0.41	94	40	140	0.2	40	
Indeno(1,2,3-cd)pyrene	8.05	mg/kg-dry	0.41	99	40	140	2.1	40	
Naphthalene	5.52	mg/kg-dry	0.41	68	40	140	0.4	40	
Phenanthrene	7.64	mg/kg-dry	0.41	94	40	140	0.8	40	
Pyrene	8.39	mg/kg-dry	0.41	104	40	140	5.3	40	
Surr: 2-Fluorobiphenyl			0.41	89	40	140			
Surr: o-Terphenyl			0.41	92	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/14/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100086

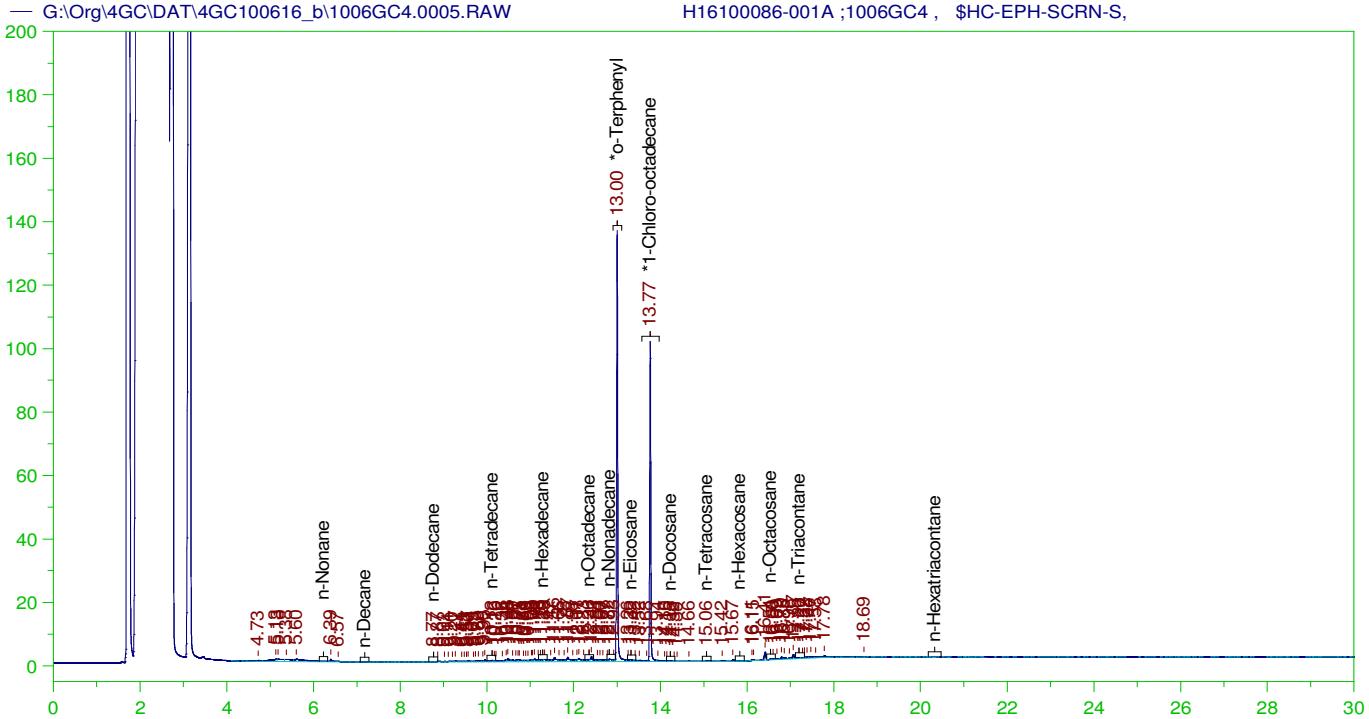
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C								Analytical Run: B_R268557	
Lab ID: 11-Oct-16_CCV_2	Continuing Calibration Verification Standard							10/11/16 16:25	
2-Methylnaphthalene	2.30	mg/kg	0.33	92	70	130			
Acenaphthene	2.38	mg/kg	0.33	95	80	120			
Acenaphthylene	2.28	mg/kg	0.33	91	70	130			
Anthracene	2.38	mg/kg	0.33	95	70	130			
Benzo(a)anthracene	2.65	mg/kg	0.33	106	70	130			
Benzo(a)pyrene	2.42	mg/kg	0.33	97	80	120			
Benzo(b)fluoranthene	2.49	mg/kg	0.33	100	70	130			
Benzo(g,h,i)perylene	2.56	mg/kg	0.33	103	70	130			
Benzo(k)fluoranthene	2.43	mg/kg	0.33	97	70	130			
Chrysene	2.43	mg/kg	0.33	97	70	130			
Dibenzo(a,h)anthracene	2.48	mg/kg	0.33	99	70	130			
Fluoranthene	2.42	mg/kg	0.33	97	80	120			
Fluorene	2.50	mg/kg	0.33	100	70	130			
Indeno(1,2,3-cd)pyrene	2.53	mg/kg	0.33	101	70	130			
Naphthalene	2.47	mg/kg	0.33	99	70	130			
o-Terphenyl	2.46	mg/kg	0.33	98	70	130			
Phenanthrene	2.39	mg/kg	0.33	95	70	130			
Pyrene	2.46	mg/kg	0.33	98	70	130			
Surr: 2-Fluorobiphenyl			0.33	96	70	130			

Qualifiers:

RL - Analyte reporting limit. ND - Not detected at the reporting limit.

MCMW2-100-Base Batch ID: 34634

— G:\Org\4GC\DAT\4GC100616_b\1006GC4.0005.RAW H16100086-001A ;1006GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100086-001A ;1006GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC100616_b\1006GC4.0005.RAW
Date & Time Acquired: 10/6/2016 9:38:37 PM
Method File: G:\Org\4GC\Methods\SR010816AB.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.29 Dilution: 2 S.A.: 1

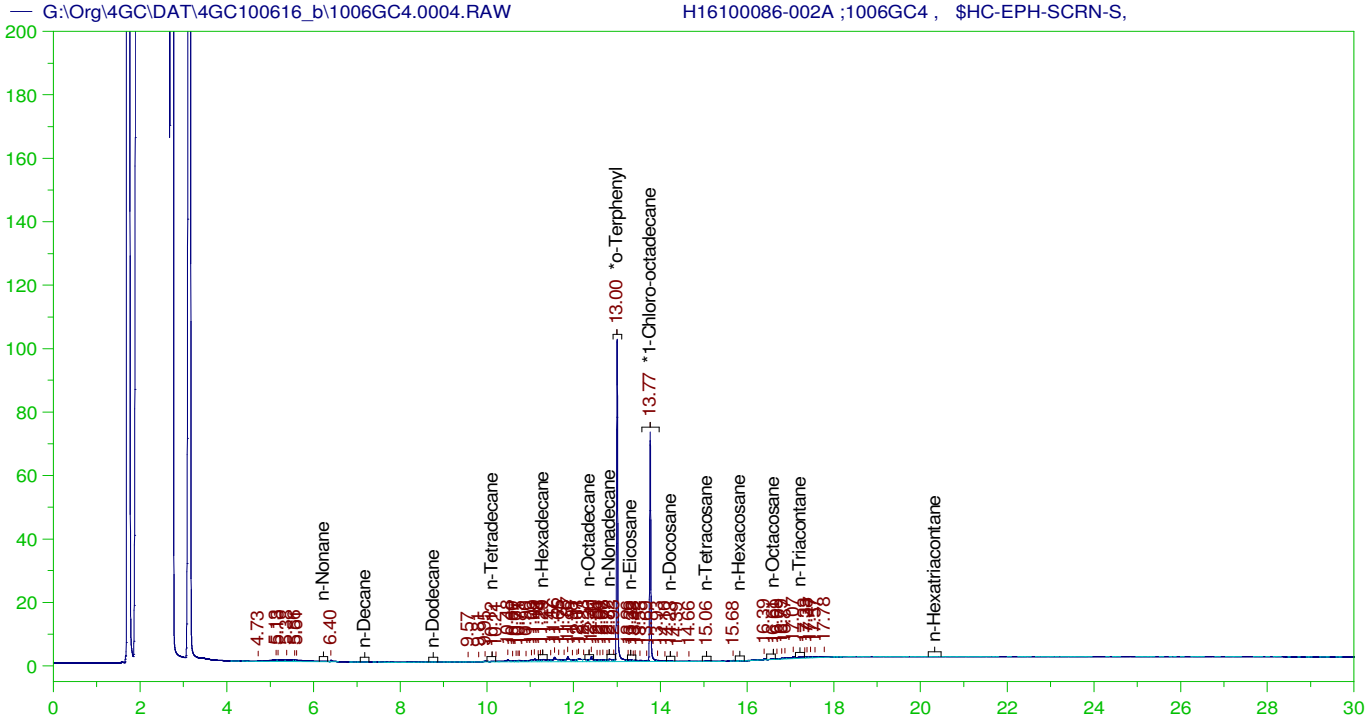
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.999	236535	7.607	8.9	116.99	-
*1-Chloro-octadecane	13.766	184621	7.607	8.9	116.99	-

DRO Area:183779.8 DRO Amount: 7.640219
TEH Area:236377 TEH Amount: 9.826828
C9-C18 Area:135407.5 C9-C18 Amount: 5.686659
C19-C36 Area:59913.98 C19-C36 Amount: 2.465893

MCMW2-101-N Face Batch ID: 34634

— G:\Org\4GC\DAT\4GC100616_b\1006GC4.0004.RAW H16100086-002A ;1006GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100086-002A ;1006GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC100616_b\1006GC4.0004.RAW
Date & Time Acquired: 10/6/2016 8:50:26 PM
Method File: G:\Org\4GC\Methods\SR010816AB.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 27.6 Dilution: 2 S.A.: 1

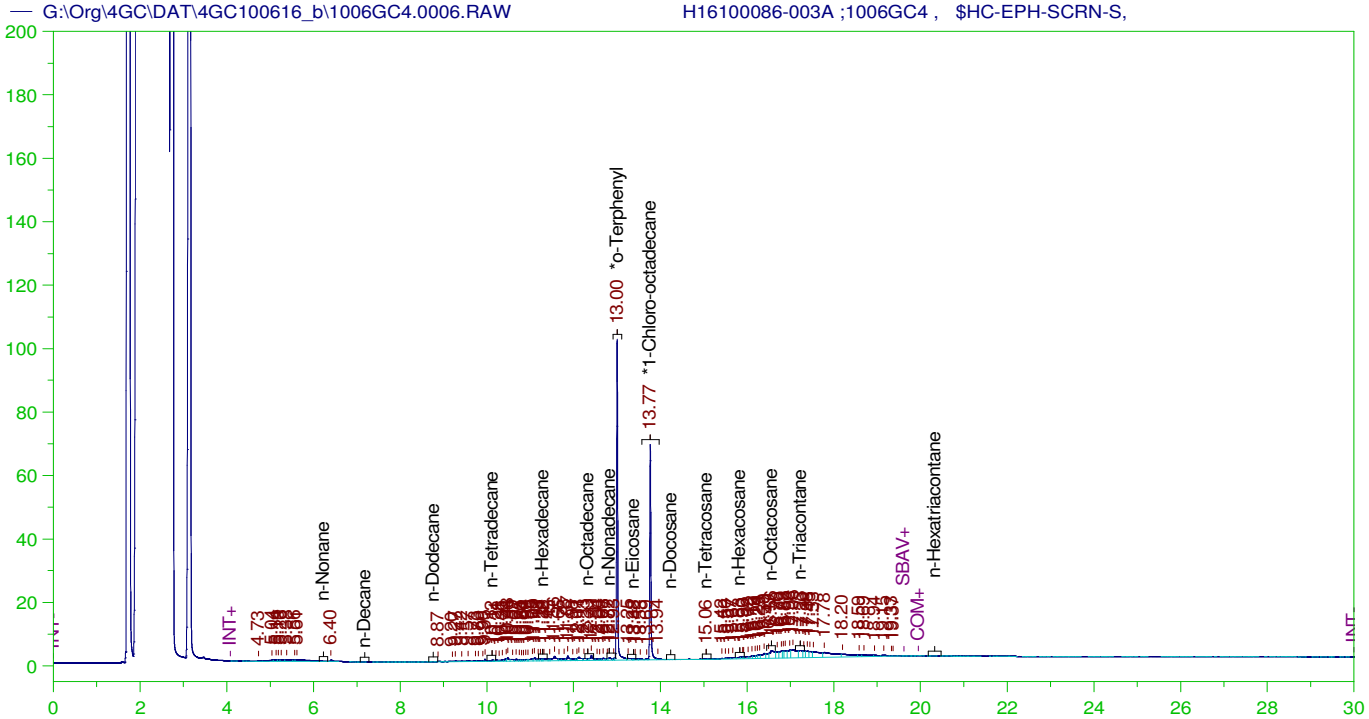
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.998	186026	7.246	6.667	92.01	-
*1-Chloro-octadecane	13.765	137968	7.246	6.335	87.43	-

DRO Area:143064.3 DRO Amount: 5.665271
TEH Area:185392.3 TEH Amount: 7.341441
C9-C18 Area:110548.1 C9-C18 Amount: 4.422288
C19-C36 Area:45172.59 C19-C36 Amount: 1.770935

MCMW2-102-EWTop Batch ID: 34634

— G:\Org\4GC\DAT\4GC100616_b\1006GC4.0006.RAW H16100086-003A ;1006GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100086-003A ;1006GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC100616_b\1006GC4.0006.RAW
Date & Time Acquired: 10/6/2016 10:26:58 PM
Method File: G:\Org\4GC\Methods\1006160002.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 27.03 Dilution: 2 S.A.: 1

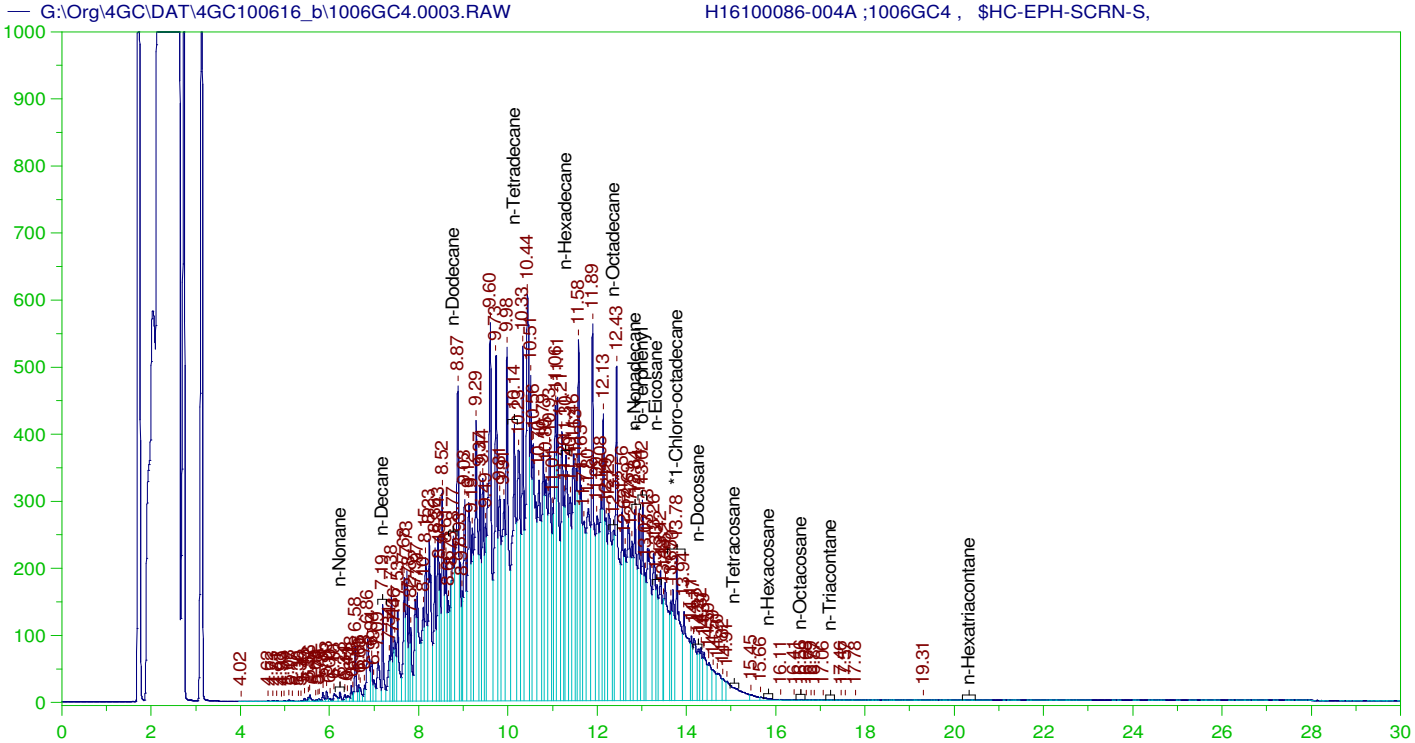
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.998	180654	7.399	6.611	89.35	-
*1-Chloro-octadecane	13.766	133925	7.399	6.279	84.87	-

DRO Area:280908.9 DRO Amount: 11.35843
TEH Area:412673 TEH Amount: 16.68625
C9-C18 Area:114189.6 C9-C18 Amount: 4.664289
C19-C36 Area:264142.4 C19-C36 Amount: 10.57374

MCMW2-103-EGray Batch ID: 34634

— G:\Org\4GC\DAT\4GC100616_b\1006GC4.0003.RAW H16100086-004A ;1006GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100086-004A ;1006GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC100616_b\1006GC4.0003.RAW
Date & Time Acquired: 10/6/2016 8:02:15 PM
Method File: G:\Org\4GC\Methods\1006160003.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 25.09 Dilution: 2 S.A.: 1

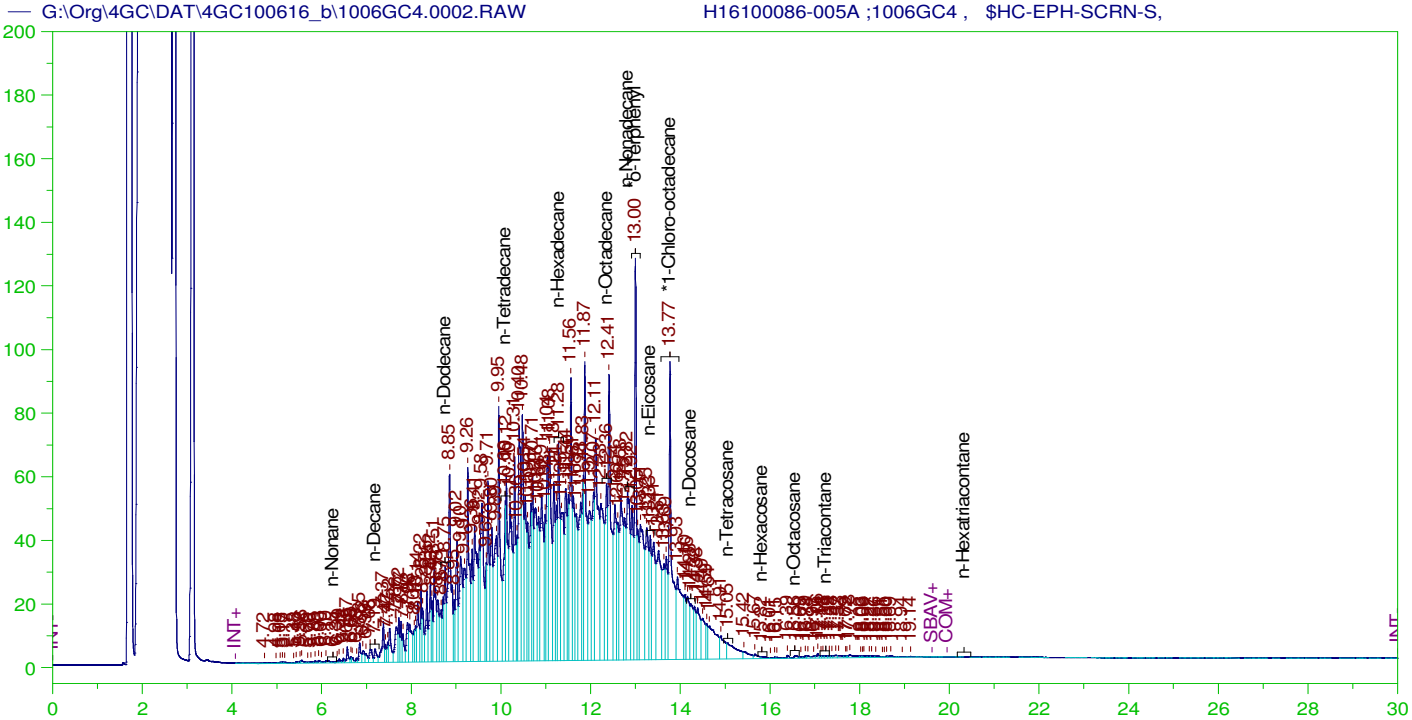
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.016	994321	7.971	39.203	491.8	-
*1-Chloro-octadecane	13.779	1362937	7.971	68.845	863.66	-

DRO Area:9.746102E+07 DRO Amount: 4245.501
TEH Area:9.89175E+07 TEH Amount: 4308.947
C9-C18 Area:8.611795E+07 C9-C18 Amount: 3789.641
C19-C36 Area:1.143797E+07C19-C36 Amount: 493.2701

MCMW2-104-WGray Batch ID: 34634

— G:\Org\4GC\DAT\4GC100616_b\1006GC4.0002.RAW H16100086-005A ;1006GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100086-005A ;1006GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC100616_b\1006GC4.0002.RAW
Date & Time Acquired: 10/6/2016 7:13:52 PM
Method File: G:\Org\4GC\Methods\1006160002.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.07 Dilution: 2 S.A.: 1

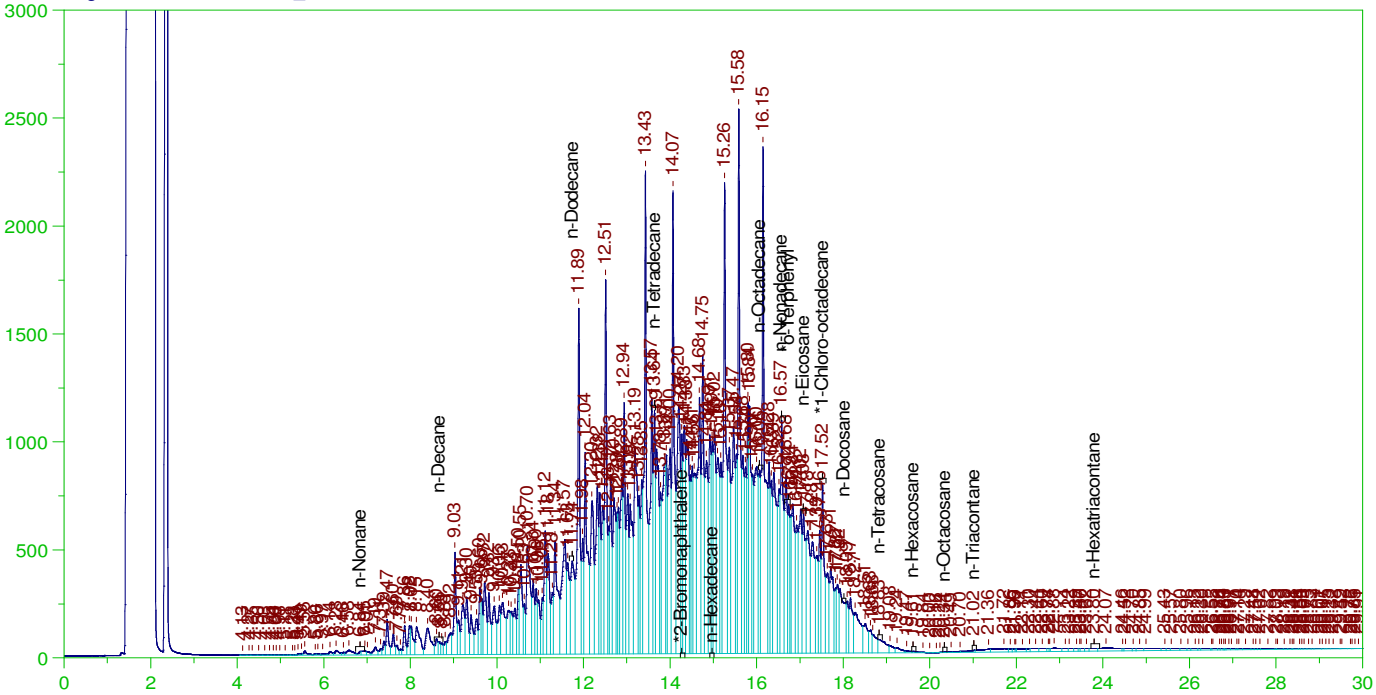
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.	309070	7.672	11.727	152.87	-
*1-Chloro-octadecane	13.766	385848	7.672	18.757	244.5	-

DRO Area:1.445468E+07 DRO Amount: 605.9907
TEH Area:1.460008E+07 TEH Amount: 612.0867
C9-C18 Area:1.187806E+07 C9-C18 Amount: 503.0482
C19-C36 Area:2512472 C19-C36 Amount: 104.279

H16100086-004A Batch ID: 103454

G:\org\HP3\DAT\HP3101116_b\1011HP3.0022.RAW B16100697-004A ;1011HP3 , Arom. $HC-ALI-GRP-S, V22



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B16100697-004A ;1011HP3 , Arom. $HC-ALI-GRP-S, V22
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0022.RAW
Date & Time Acquired: 10/11/2016 11:10:24 PM
Method File: g:\org\HP3\Methods\L3_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AL160411PM.CAL
Sample Weight: 25.09 Dilution: 6 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 29080.81
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29127.51
Mean RF for Total Extractable Hydrocarbons: 29107.49
Rt range for Diesel Range Organics: 8.552999 to 20.401
Rt range for C9 to C18 Aliphatic Hydrocarbons: 6.737 to 16.563
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.588 to 23.923

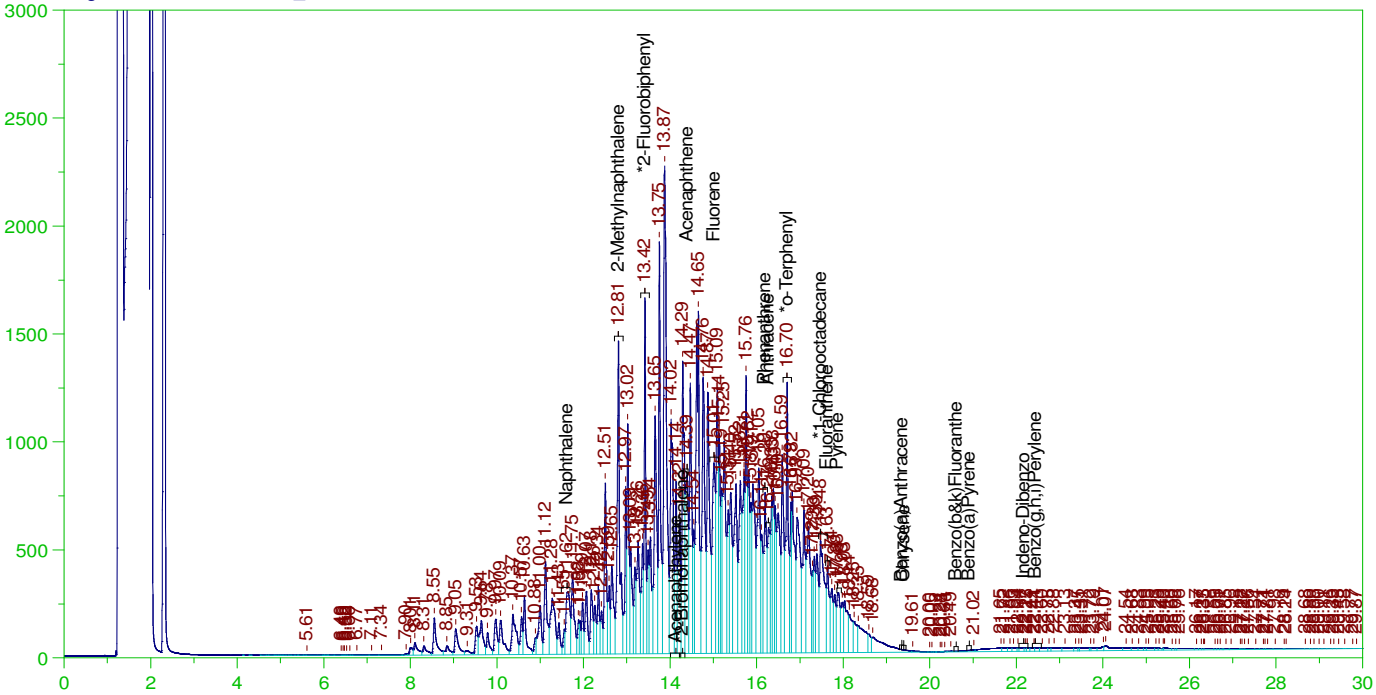
SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.524	7.971	28.784	361.09	-

DRO Area:3.314815E+08 DRO Amount: 2723.36
TEH Area:3.47169E+08 TEH Amount: 2852.244

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:2.918075E+08 C9-C18 Amount: 2399.609
C19-C36 Area:4.79173E+07 C19-C36 Amount: 393.4048

H16100086-004A Batch ID: 103454

G:\org\HP3\DAT\HP3101116_b\1011HP3.0024.RAW B16100697-004A ;1011HP3 , Arom. $HC-ARO-GRP-S, V24



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B16100697-004A ;1011HP3 , Arom. $HC-ARO-GRP-S, V24
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0024.RAW
Date & Time Acquired: 10/12/2016 12:35:21 AM
Method File: g:\org\HP3\Methods\R3_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PM.CAL
Sample Weight: 25.09 Dilution: 6 S.A.: 1

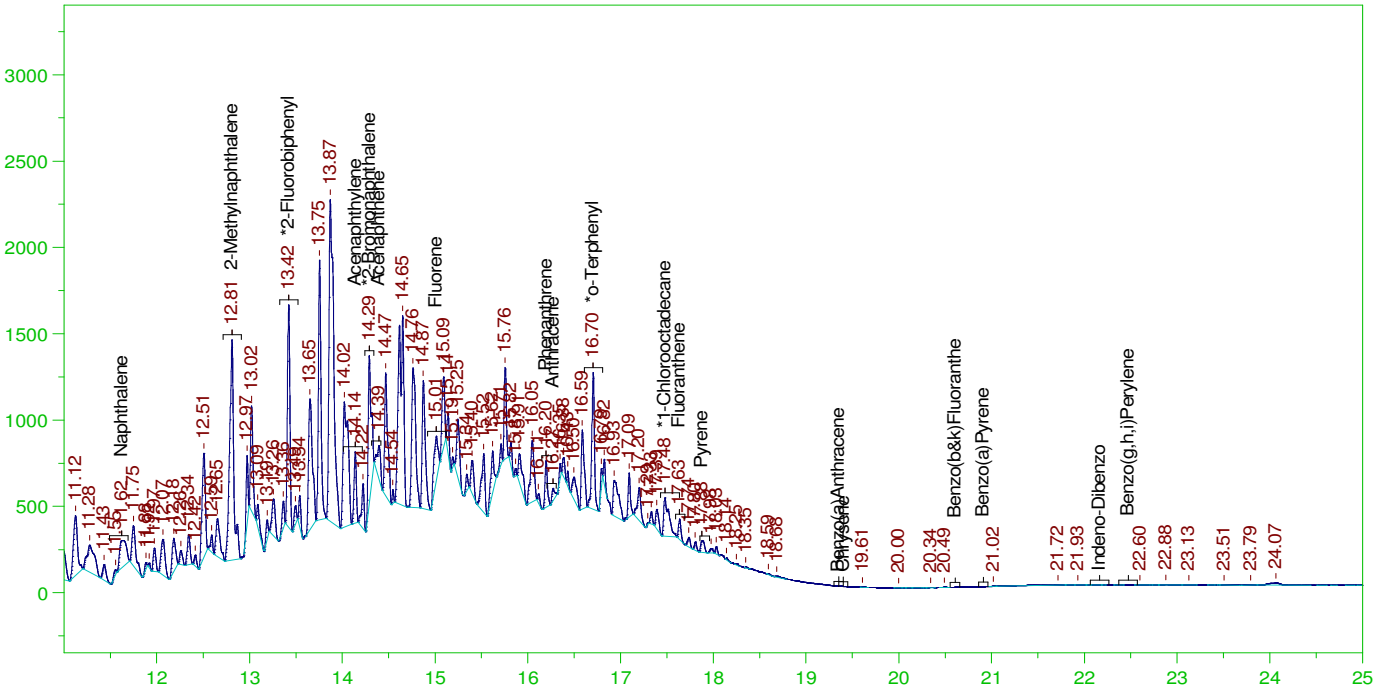
Mean RF EPH Aromatics: 31913.8
Rt range for EPH C11 to C22 Aromatics: 11.492 to 22.572

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.421	7.971	32.627	409.3	-
*2-Bromonaphthalene	14.29	7.971	65.168	817.53	-
*o-Terphenyl	16.703	7.971	36.49	457.76	-
*1-Chlorooctadecane	17.476	7.971	35.79	448.99	-

C11-C22 Aromatics Area:1.999431E+08 C11-C22 Aromatics Amount: 1498.229
EPH Aromatics total Area:2.184634E+08 EPH Aromatics Total Amount: 1637.007

H16100086-004A Batch ID: 103454

G:\org\HP3\DAT\HP3101116_b\1011HP3.0024.RAW B16100697-004A ;1011HP3 , Arom. $HC-ARO-GRP-S, V24



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

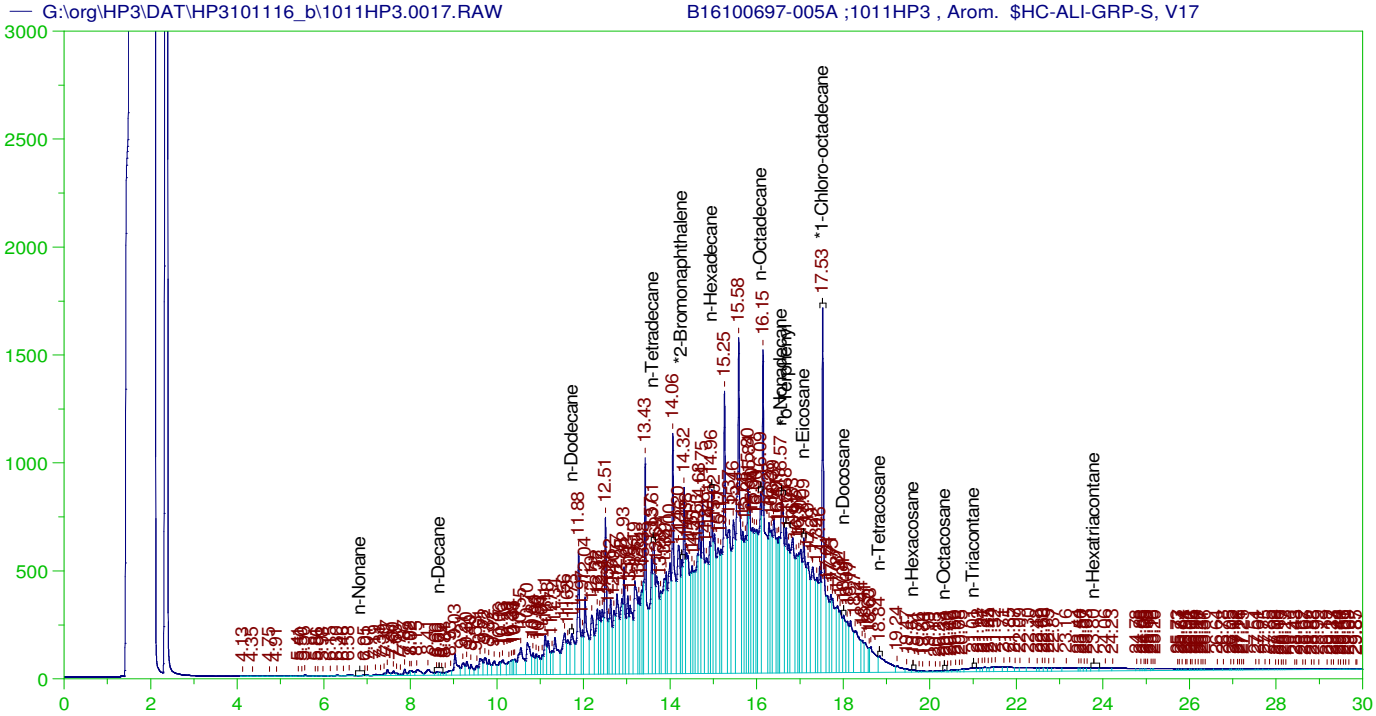
Sample Name: B16100697-004A ;1011HP3 , Arom. $HC-ARO-GRP-S, V24
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0024.RAW
Date & Time Acquired: 10/12/2016 12:35:21 AM
Method File: g:\org\HP3\Methods\RS_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PM.CAL
Sample Weight: 25.09 Dilution: 6 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	11.622	2.699	2.668	785126	5.941	
2-Methylnaphthalene	12.809	1.477	1.481	3925256	30.58	
Acenaphthylene	14.139	.178	.151	738398	5.703	
Acenaphthene	14.394	-.074	-.103	508455	3.434	
Fluorene	15.012	-.729	-.722	864342	6.526	
Phenanthrene	16.197	-1.909	-1.906	493265	3.872	
Anthracene	16.271	-1.966	-1.981	148748	1.075	
Fluoranthene	17.634	-3.352	-3.344	206398	1.533	
Pyrene	17.876	-3.616	-3.585	194998	1.421	
Benzo(a)Anthracene	.	.	.		.239	U
Chrysene	.	.	.		.239	U
Benzo(b&k)Fluoranthe	.	.	.		.478	U
Benzo(a)Pyrene	.	.	.		.239	U
Indeno-Dibenzo	.	.	.		.478	U
Benzo(g,h,i)Perylene	.	.	.		.239	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.421	7.971	18.862	236.63	40-140
*2-Bromonaphthalene	14.29	7.971	26.077	327.14	40-140
*o-Terphenyl	16.703	7.971	11.365	142.58	40-140
*1-Chlorooctadecane	17.476	7.971	7.984	100.17	40-140

H16100086-005A Batch ID: 103454

G:\org\HP3\DAT\HP3101116_b\1011HP3.0017.RAW B16100697-005A ;1011HP3 , Arom. $HC-ALI-GRP-S, V17



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: B16100697-005A ;1011HP3 , Arom. $HC-ALI-GRP-S, V17
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0017.RAW
Date & Time Acquired: 10/11/2016 7:37:48 PM
Method File: g:\org\HP3\Methods\L3_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AL160411PM.CAL
Sample Weight: 26.7 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 29080.81
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 29127.51
Mean RF for Total Extractable Hydrocarbons: 29107.49
Rt range for Diesel Range Organics: 8.552999 to 20.401
Rt range for C9 to C18 Aliphatic Hydrocarbons: 6.737 to 16.563
Rt range for C19 to C36 Aliphatic Hydrocarbons: 16.588 to 23.923

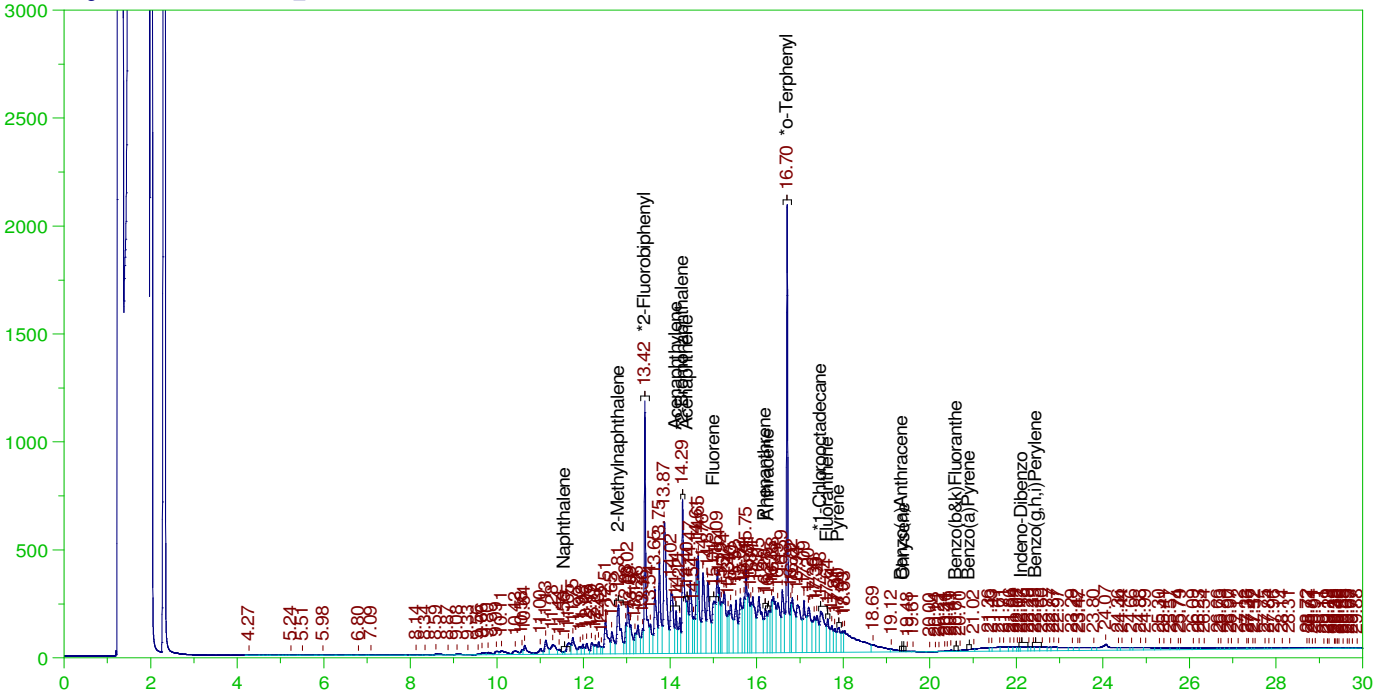
SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane_____	17.527	7.491	14.4	192.23	-

DRO Area:2.010169E+08 DRO Amount: 517.3047
TEH Area:2.115858E+08 TEH Amount: 544.5032

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:1.582219E+08 C9-C18 Amount: 407.5479
C19-C36 Area:4.679118E+07C19-C36 Amount: 120.3315

H16100086-005A Batch ID: 103454

G:\org\HP3\DAT\HP3101116_b\1011HP3.0018.RAW B16100697-005A ;1011HP3 , Arom. $HC-ARO-GRP-S, V18



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: B16100697-005A ;1011HP3 , Arom. $HC-ARO-GRP-S, V18
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0018.RAW
Date & Time Acquired: 10/11/2016 8:20:20 PM
Method File: g:\org\HP3\Methods\R3_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PM.CAL
Sample Weight: 26.7 Dilution: 2 S.A.: 1

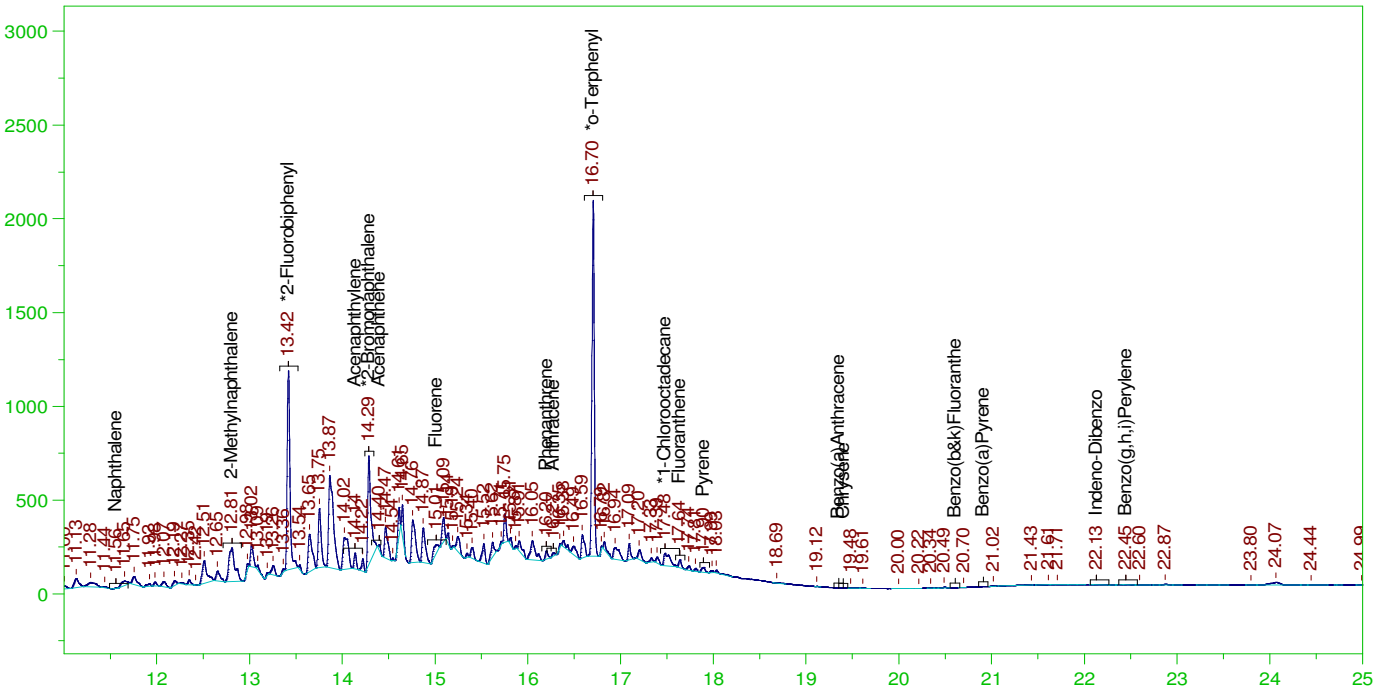
Mean RF EPH Aromatics: 31913.8
Rt range for EPH C11 to C22 Aromatics: 11.492 to 22.572

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.418	7.491	8.073	107.78	-
*2-Bromonaphthalene	14.286	7.491	10.969	146.44	-
*o-Terphenyl	16.703	7.491	10.51	140.3	-
*1-Chlorooctadecane	17.476	7.491	4.395	58.68	-

C11-C22 Aromatics Area:6.21663E+07 C11-C22 Aromatics Amount: 145.9134
EPH Aromatics total Area:6.780893E+07 EPH Aromatics Total Amount: 159.1575

H16100086-005A Batch ID: 103454

— G:\org\HP3\DAT\HP3101116_b\1011HP3.0018.RAW B16100697-005A ;1011HP3 , Arom. $HC-ARO-GRP-S, V18



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

Sample Name: B16100697-005A ;1011HP3 , Arom. $HC-ARO-GRP-S, V18
Raw File: G:\org\HP3\DAT\HP3101116_b\1011HP3.0018.RAW
Date & Time Acquired: 10/11/2016 8:20:20 PM
Method File: g:\org\HP3\Methods\RS_EPH-PM-L%.met
Calibration File: G:\Org\HP3\Cals\AR160411PM.CAL
Sample Weight: 26.7 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	11.559	11.559	11.559	2145	.075	U
2-Methylnaphthalene	12.809	1.477	1.477	813344	1.985	
Acenaphthylene	14.138	.178	.148	152831	.37	
Acenaphthene	14.396	-.074	-.11	46106	.098	
Fluorene	15.011	-.729	-.725	191305	.452	
Phenanthrene	16.2	-1.909	-1.914	87202	.214	
Anthracene	16.273	-1.966	-1.987	38013	.086	
Fluoranthene	17.637	-3.352	-3.351	83819	.195	
Pyrene	17.896	-3.616	-3.61	75310	.172	
Benzo(a)Anthracene	.	.	.		.075	U
Chrysene	.	.	.		.075	U
Benzo(b&k)Fluoranthe	.	.	.		.15	U
Benzo(a)Pyrene	.	.	.		.075	U
Indeno-Dibenzo	22.131	22.131	22.131	1842	.15	U
Benzo(g,h,i)Perylene	22.449	22.449	22.449	668	.075	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.418	7.491	5.506	73.5	40-140
*2-Bromonaphthalene	14.286	7.491	5.713	76.26	40-140
*o-Terphenyl	16.703	7.491	7.379	98.51	40-140
*1-Chlorooctadecane	17.476	7.491	.902	12.04	40-140

Work Order Receipt Checklist

Hydrometrics Inc

H16100086

Login completed by: Tracy L. Lorash

Reviewed by: BL2000\rwilliams

Reviewed Date: 10/10/2016

Date Received: 10/6/2016

Received by: RAT

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	7.6°C On Ice - From Field		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

HL6100086

PROJ. NO.	PROJECT NAME
16048	Meagher County Shop Remediation

SAMPLERS: *(Signature)* JPoell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CON-TAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH (see cover letter)	VPH (see cover letter)							REMARKS
10/6/16	0735	X		MCMW2-100-BASE	02									X	X							48 Hour RUSH
	0745	X		MCMW2-101-N FACE	02									X	X							
	0755	X		MCMW2-102-EWTOP	02									X	X							
	0810	X		MCMW2-103-EGRAY	02									X	X							
10/6/16	0825	X		MCMW2-104-WGRAY	02									X	X							48 Hour RUSH

Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPoell	10/6/16 0835		ENERGY LABS – HELENA	HLN10286	Other hand-deliver Air Bill #
Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Remarks Please forward results to: Janie Poell, Hydrometrics 3020 Bozeman Avenue Helena, Montana 59601 email: jpoell@hydrometrics.com		7.6° no ts cooler/ice no seal
	10/6/16 1020				
Relinquished *(Signature)*	Date / Time	Received for Laboratory by *(Signature)*	Date / Time	Enclosed: ❑ Parameter sheet w/detection limits ❑ QA / AC standard mixing instructions ☒ Cover letter ❑ Other	
	10/6/16 1037	Rebecca Foster	10/6/16 10:37		

HFORM-1 07/11

Return results & electronic copy to:
QA / QC Dept. at address at top of page

Split Samples:
❑ Accepted ❑ Declined

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 6, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples – 48 hour TAT

Enclosed are 5 soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
- If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

As discussed previously, we are requesting a 48-hour rush turnaround time for these samples.

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150 x154 or Mark Walker at 443-4150 x146.

Sincerely,

MWalker for

James Poell
Environmental Scientist

enclosures

K:\project\16048 Meagher County Remediation\Lab\Lab Cover 10-06-16-Soils.doc

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 6, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

*48 Hour RUSH

RE: Meagher County Shop Remediation Soil Samples

Enclosed are 5 soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
  - If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150, Ext. 154.

Sincerely,

James Poell
Environmental Scientist

Enclosures

H:\Files\MTDEQ\16048\116 Lab Cover - Soils.doc\HLN\9/29/2016\034

9/29/2016 11:20 AM

ANALYTICAL SUMMARY REPORT

October 19, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100140 Quote ID: H1313 - EPH/VPH

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 2 samples for Hydrometrics Inc on 10/10/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100140-001	MCMW2-WTP2	10/07/16 15:05	10/10/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100140-002	MCMW2-ETP1	10/07/16 15:30	10/10/16	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100140

Report Date: 10/19/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100140-001
Client Sample ID: MCMW2-WTP2

Report Date: 10/19/16
Collection Date: 10/07/16 15:05
DateReceived: 10/10/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	17.5	wt%		0.2		SW3550C	10/10/16 13:22 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.12	0.08	MA-VPH	10/11/16 14:51 / tjb
Benzene	ND	mg/kg-dry		0.060	0.04	MA-VPH	10/11/16 14:51 / tjb
Toluene	ND	mg/kg-dry		0.060	10	MA-VPH	10/11/16 14:51 / tjb
Ethylbenzene	4.0	mg/kg-dry		0.060	10	MA-VPH	10/11/16 14:51 / tjb
m+p-Xylenes	ND	mg/kg-dry		0.060		MA-VPH	10/11/16 14:51 / tjb
o-Xylene	0.96	mg/kg-dry		0.060		MA-VPH	10/11/16 14:51 / tjb
Xylenes, Total	0.96	mg/kg-dry		0.060	30	MA-VPH	10/11/16 14:51 / tjb
Naphthalene	15	mg/kg-dry	*	0.12	9	MA-VPH	10/11/16 14:51 / tjb
C9 to C10 Aromatics	409	mg/kg-dry	*	2.4	100	MA-VPH	10/11/16 14:51 / tjb
C5 to C8 Aliphatics	61	mg/kg-dry	*	2.4	40	MA-VPH	10/11/16 14:51 / tjb
C9 to C12 Aliphatics	614	mg/kg-dry	*	2.4	90	MA-VPH	10/11/16 14:51 / tjb
Total Purgeable Hydrocarbons	864	mg/kg-dry	*	2.4	100	MA-VPH	10/11/16 14:51 / tjb
Surr: VPH Aromatics Surrogate	94.0	%REC		70-130		MA-VPH	10/11/16 14:51 / tjb
Surr: VPH Aliphatics Surrogate	95.0	%REC		70-130		MA-VPH	10/11/16 14:51 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	12100	mg/kg-dry	*	24	200	SW8015M	10/11/16 18:46 / JRS
Surr: o-Terphenyl	124	%REC		40-140		SW8015M	10/11/16 18:46 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	4860	mg/kg-dry	*	73	200	MA-EPH	10/14/16 10:49 / JRS
C19 to C36 Aliphatics	939	mg/kg-dry		73	20000	MA-EPH	10/14/16 10:49 / JRS
Surr: 1-Chloro-octadecane	86.0	%REC		40-140		MA-EPH	10/14/16 10:49 / JRS
C11 to C22 Aromatics	2820	mg/kg-dry	*	73	400	MA-EPH	10/14/16 11:32 / JRS
Total Extractable Hydrocarbons	8810	mg/kg-dry		73		MA-EPH	10/14/16 11:32 / JRS
Surr: 2-Bromonaphthalene	115	%REC		40-140		MA-EPH	10/14/16 11:32 / JRS
Surr: 2-Fluorobiphenyl	64.0	%REC		40-140		MA-EPH	10/14/16 11:32 / JRS
Surr: o-Terphenyl	136	%REC		40-140		MA-EPH	10/14/16 11:32 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	31	mg/kg-dry		2.4		SW8270C	10/17/16 14:27 / eli-b
Acenaphthene	ND	mg/kg-dry		2.4	200	SW8270C	10/17/16 14:27 / eli-b
Acenaphthylene	ND	mg/kg-dry		2.4		SW8270C	10/17/16 14:27 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100140-001
Client Sample ID: MCMW2-WTP2

Report Date: 10/19/16
Collection Date: 10/07/16 15:05
DateReceived: 10/10/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		2.4	2000	SW8270C	10/17/16 14:27 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		2.4	0.2	SW8270C	10/17/16 14:27 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		2.4	0.02	SW8270C	10/17/16 14:27 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		2.4	0.2	SW8270C	10/17/16 14:27 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		2.4		SW8270C	10/17/16 14:27 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		2.4	2	SW8270C	10/17/16 14:27 / eli-b
Chrysene	ND	mg/kg-dry		2.4	20	SW8270C	10/17/16 14:27 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		2.4	0.02	SW8270C	10/17/16 14:27 / eli-b
Fluoranthene	ND	mg/kg-dry		2.4	300	SW8270C	10/17/16 14:27 / eli-b
Fluorene	4.9	mg/kg-dry		2.4	300	SW8270C	10/17/16 14:27 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		2.4	0.2	SW8270C	10/17/16 14:27 / eli-b
Naphthalene	ND	mg/kg-dry		2.4	4	SW8270C	10/17/16 14:27 / eli-b
Phenanthrene	7.1	mg/kg-dry		2.4		SW8270C	10/17/16 14:27 / eli-b
Pyrene	ND	mg/kg-dry		2.4	200	SW8270C	10/17/16 14:27 / eli-b
Surr: 2-Fluorobiphenyl	74.0	%REC		40-140		SW8270C	10/17/16 14:27 / eli-b
Surr: o-Terphenyl	80.0	%REC		40-140		SW8270C	10/17/16 14:27 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100140-002
Client Sample ID: MCMW2-ETP1

Report Date: 10/19/16
Collection Date: 10/07/16 15:30
DateReceived: 10/10/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	12.6	wt%		0.2		SW3550C	10/10/16 13:22 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.12	0.08	MA-VPH	10/11/16 12:28 / tjb
Benzene	ND	mg/kg-dry		0.058	0.04	MA-VPH	10/11/16 12:28 / tjb
Toluene	ND	mg/kg-dry		0.058	10	MA-VPH	10/11/16 12:28 / tjb
Ethylbenzene	ND	mg/kg-dry		0.058	10	MA-VPH	10/11/16 12:28 / tjb
m+p-Xylenes	ND	mg/kg-dry		0.058		MA-VPH	10/11/16 12:28 / tjb
o-Xylene	ND	mg/kg-dry		0.058		MA-VPH	10/11/16 12:28 / tjb
Xylenes, Total	ND	mg/kg-dry		0.058	30	MA-VPH	10/11/16 12:28 / tjb
Naphthalene	0.41	mg/kg-dry		0.12	9	MA-VPH	10/11/16 12:28 / tjb
C9 to C10 Aromatics	5.4	mg/kg-dry		2.3	100	MA-VPH	10/11/16 12:28 / tjb
C5 to C8 Aliphatics	ND	mg/kg-dry		2.3	40	MA-VPH	10/11/16 12:28 / tjb
C9 to C12 Aliphatics	7.5	mg/kg-dry		2.3	90	MA-VPH	10/11/16 12:28 / tjb
Total Purgeable Hydrocarbons	11	mg/kg-dry		2.3	100	MA-VPH	10/11/16 12:28 / tjb
Surr: VPH Aromatics Surrogate	80.0	%REC		70-130		MA-VPH	10/11/16 12:28 / tjb
Surr: VPH Aliphatics Surrogate	80.0	%REC		70-130		MA-VPH	10/11/16 12:28 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	8000	mg/kg-dry	*	22	200	SW8015M	10/13/16 10:17 / JRS
Surr: o-Terphenyl	93.0	%REC		40-140		SW8015M	10/13/16 10:17 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	ND	mg/kg-dry		56	200	MA-EPH	10/14/16 12:15 / JRS
C19 to C36 Aliphatics	4910	mg/kg-dry		56	20000	MA-EPH	10/14/16 12:15 / JRS
Surr: 1-Chloro-octadecane	80.0	%REC		40-140		MA-EPH	10/14/16 12:15 / JRS
C11 to C22 Aromatics	871	mg/kg-dry	*	56	400	MA-EPH	10/14/16 12:58 / JRS
Total Extractable Hydrocarbons	6160	mg/kg-dry		56		MA-EPH	10/14/16 12:58 / JRS
Surr: 2-Bromonaphthalene	82.0	%REC		40-140		MA-EPH	10/14/16 12:58 / JRS
Surr: 2-Fluorobiphenyl	78.0	%REC		40-140		MA-EPH	10/14/16 12:58 / JRS
Surr: o-Terphenyl	81.0	%REC		40-140		MA-EPH	10/14/16 12:58 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	ND	mg/kg-dry		1.9		SW8270C	10/17/16 14:58 / eli-b
Acenaphthene	ND	mg/kg-dry		1.9	200	SW8270C	10/17/16 14:58 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.9		SW8270C	10/17/16 14:58 / eli-b
Anthracene	ND	mg/kg-dry		1.9	2000	SW8270C	10/17/16 14:58 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.9	0.2	SW8270C	10/17/16 14:58 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100140-002
Client Sample ID: MCMW2-ETP1

Report Date: 10/19/16
Collection Date: 10/07/16 15:30
DateReceived: 10/10/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Benzo(a)pyrene	ND	mg/kg-dry		1.9	0.02	SW8270C	10/17/16 14:58 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.9	0.2	SW8270C	10/17/16 14:58 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.9		SW8270C	10/17/16 14:58 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.9	2	SW8270C	10/17/16 14:58 / eli-b
Chrysene	ND	mg/kg-dry		1.9	20	SW8270C	10/17/16 14:58 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.9	0.02	SW8270C	10/17/16 14:58 / eli-b
Fluoranthene	ND	mg/kg-dry		1.9	300	SW8270C	10/17/16 14:58 / eli-b
Fluorene	ND	mg/kg-dry		1.9	300	SW8270C	10/17/16 14:58 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.9	0.2	SW8270C	10/17/16 14:58 / eli-b
Naphthalene	ND	mg/kg-dry		1.9	4	SW8270C	10/17/16 14:58 / eli-b
Phenanthrene	ND	mg/kg-dry		1.9		SW8270C	10/17/16 14:58 / eli-b
Pyrene	ND	mg/kg-dry		1.9	200	SW8270C	10/17/16 14:58 / eli-b
Surr: 2-Fluorobiphenyl	76.0	%REC		40-140		SW8270C	10/17/16 14:58 / eli-b
Surr: o-Terphenyl	78.0	%REC		40-140		SW8270C	10/17/16 14:58 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/19/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R119504
Lab ID: CCV_1014GC101r-S	Continuing Calibration Verification Standard								10/14/16 09:24
n-Nonane	6.97	mg/kg-dry	0.17	105	75	125			
n-Decane	6.92	mg/kg-dry	0.17	104	75	125			
n-Dodecane	6.72	mg/kg-dry	0.17	101	75	125			
n-Tetradecane	6.67	mg/kg-dry	0.17	100	75	125			
n-Hexadecane	6.68	mg/kg-dry	0.17	100	75	125			
n-Octadecane	6.67	mg/kg-dry	0.17	100	75	125			
n-Nonadecane	6.68	mg/kg-dry	0.17	100	75	125			
n-Eicosane	6.66	mg/kg-dry	0.17	100	75	125			
n-Docosane	6.64	mg/kg-dry	0.17	100	75	125			
n-Tetracosane	6.64	mg/kg-dry	0.17	100	75	125			
n-Hexacosane	6.65	mg/kg-dry	0.17	100	75	125			
n-Octacosane	6.65	mg/kg-dry	0.17	100	75	125			
n-Triacontane	6.67	mg/kg-dry	0.17	100	75	125			
n-Hexatriacontane	6.83	mg/kg-dry	0.17	103	75	125			
Surr: 1-Chloro-octadecane			0.17	102	75	125			
Lab ID: CCV_1014GC102r-S	Continuing Calibration Verification Standard								10/14/16 10:07
Naphthalene	6.39	mg/kg-dry	0.17	96	75	125			
2-MethylNaphthalene	6.33	mg/kg-dry	0.17	95	75	125			
Acenaphthylene	6.32	mg/kg-dry	0.17	95	75	125			
Acenaphthene	6.28	mg/kg-dry	0.17	94	75	125			
Fluorene	6.30	mg/kg-dry	0.17	94	75	125			
Phenanthrene	6.26	mg/kg-dry	0.17	94	75	125			
Anthracene	6.29	mg/kg-dry	0.17	94	75	125			
Fluoranthene	6.24	mg/kg-dry	0.17	94	75	125			
Pyrene	6.24	mg/kg-dry	0.17	94	75	125			
Benzo(a)Anthracene	6.30	mg/kg-dry	0.17	95	75	125			
Chrysene	6.26	mg/kg-dry	0.17	94	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	12.6	mg/kg-dry	0.17	94	75	125			
Benzo(a)Pyrene	6.28	mg/kg-dry	0.17	94	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	12.7	mg/kg-dry	0.17	95	75	125			
Benzo(g,h,I)perylene	6.33	mg/kg-dry	0.17	95	75	125			
Surr: 2-Bromonaphthalene			0.17	95	40	140			
Surr: 2-Fluorobiphenyl			0.17	94	40	140			
Surr: o-Terphenyl			0.17	93	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/19/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34649
Lab ID: LCS-34649	Laboratory Control Sample				Run: GC2_161005A				10/05/16 14:03
2-Methylpentane	2.57	mg/kg-dry	0.10	103	70	130			
n-Butylcyclohexane	2.73	mg/kg-dry	0.10	109	70	130			
n-Decane	2.70	mg/kg-dry	0.10	108	70	130			
n-Pentane	2.45	mg/kg-dry	0.10	98	30	130			
Methyl tert-butyl ether (MTBE)	2.46	mg/kg-dry	0.10	99	70	130			
Benzene	2.55	mg/kg-dry	0.050	102	70	130			
Toluene	2.50	mg/kg-dry	0.050	100	70	130			
Ethylbenzene	2.51	mg/kg-dry	0.050	101	70	130			
m+p-Xylenes	5.29	mg/kg-dry	0.050	106	70	130			
o-Xylene	2.64	mg/kg-dry	0.050	106	70	130			
Naphthalene	2.49	mg/kg-dry	0.10	100	70	130			
Total Purgeable Hydrocarbons	39.1	mg/kg-dry	2.0	104	70	130			
Surr: VPH Aromatics Surrogate			0.050	102	70	130			
Surr: VPH Aliphatics Surrogate			0.050	103	70	130			
Lab ID: MB-34649	Method Blank				Run: GC2_161005A				10/05/16 15:23
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	0.10						
Benzene	ND	mg/kg-dry	0.050						
Toluene	ND	mg/kg-dry	0.050						
Ethylbenzene	ND	mg/kg-dry	0.050						
m+p-Xylenes	ND	mg/kg-dry	0.050						
o-Xylene	ND	mg/kg-dry	0.050						
Naphthalene	ND	mg/kg-dry	0.10						
C9 to C10 Aromatics	ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics	ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics	ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons	ND	mg/kg-dry	2.0						
Xylenes, Total	ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate			0.050	104	70	130			
Surr: VPH Aliphatics Surrogate			0.050	105	70	130			
Lab ID: H16100036-003AMS	Sample Matrix Spike				Run: GC2_161005A				10/05/16 16:24
Methyl tert-butyl ether (MTBE)	2.66	mg/kg-dry	0.11	96	70	130			
Benzene	2.78	mg/kg-dry	0.056	100	70	130			
Toluene	2.77	mg/kg-dry	0.056	100	70	130			
Ethylbenzene	2.64	mg/kg-dry	0.056	95	70	130			
m+p-Xylenes	5.58	mg/kg-dry	0.056	101	70	130			
o-Xylene	2.70	mg/kg-dry	0.056	97	70	130			
Naphthalene	2.65	mg/kg-dry	0.11	96	70	130			
Total Purgeable Hydrocarbons	42.4	mg/kg-dry	2.2	102	70	130			
Surr: VPH Aromatics Surrogate			0.056	100	70	130			
Surr: VPH Aliphatics Surrogate			0.056	100	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/19/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34649
Lab ID: H16100036-003AMSD	Sample Matrix Spike Duplicate				Run: GC2_161005A				10/05/16 16:55
Methyl tert-butyl ether (MTBE)	2.69	mg/kg-dry	0.11	98	70	130	1.0	20	
Benzene	2.81	mg/kg-dry	0.055	102	70	130	1.1	20	
Toluene	2.77	mg/kg-dry	0.055	101	70	130	0.0	20	
Ethylbenzene	2.67	mg/kg-dry	0.055	97	70	130	1.0	20	
m+p-Xylenes	5.65	mg/kg-dry	0.055	103	70	130	1.3	20	
o-Xylene	2.75	mg/kg-dry	0.055	100	70	130	1.5	20	
Naphthalene	2.71	mg/kg-dry	0.11	98	70	130	1.9	20	
Total Purgeable Hydrocarbons	41.9	mg/kg-dry	2.2	102	70	130	1.0	20	
Surr: VPH Aromatics Surrogate			0.055	98	70	130			
Surr: VPH Aliphatics Surrogate			0.055	97	70	130			
Method: MA-VPH									Analytical Run: R119395
Lab ID: CCV_1011GC202r-S	Continuing Calibration Verification Standard								10/11/16 11:03
1,2,4-Trimethylbenzene	2.71	mg/kg-dry	0.10	109	75	125			
2,2,4-Trimethylpentane	2.74	mg/kg-dry	0.10	109	75	125			
2-Methylpentane	2.74	mg/kg-dry	0.10	109	75	125			
n-Butylcyclohexane	2.72	mg/kg-dry	0.10	109	75	125			
n-Decane	2.87	mg/kg-dry	0.10	115	75	125			
n-Pentane	2.72	mg/kg-dry	0.10	109	75	125			
Methyl tert-butyl ether (MTBE)	2.63	mg/kg-dry	0.10	105	75	125			
Benzene	2.72	mg/kg-dry	0.050	109	75	125			
Toluene	2.74	mg/kg-dry	0.050	110	75	125			
Ethylbenzene	2.64	mg/kg-dry	0.050	105	75	125			
m+p-Xylenes	5.49	mg/kg-dry	0.050	110	75	125			
o-Xylene	2.68	mg/kg-dry	0.050	107	75	125			
Naphthalene	2.52	mg/kg-dry	0.10	101	75	125			
Surr: VPH Aromatics Surrogate			0.050	108	70	130			
Surr: VPH Aliphatics Surrogate			0.050	107	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/19/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW3550C									Batch: R119372
Lab ID: H16100140-002ADUP	Sample Duplicate				Run: EXTRACT OV 2_161010A			10/10/16 13:22	
Moisture	12.7	wt%	0.20				0.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/19/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Batch: 34634
Lab ID: MB-34634	Method Blank				Run: HHP2_161005A				10/05/16 14:59
Total Extractable Hydrocarbons	ND	mg/kg-dry	10						
Surr: o-Terphenyl			0.17	97	40	140			
Lab ID: LCS-34634	Laboratory Control Sample				Run: HHP2_161005A				10/05/16 15:48
Total Extractable Hydrocarbons	217.0	mg/kg-dry	10	105	60	140			
Surr: o-Terphenyl			0.17	107	40	140			
Lab ID: H16090596-001AMS	Sample Matrix Spike				Run: HHP2_161005A				10/06/16 01:29
Total Extractable Hydrocarbons	274.2	mg/kg-dry	12	110	60	140			
Surr: o-Terphenyl			0.20	103	40	140			
Lab ID: H16090596-001AMSD	Sample Matrix Spike Duplicate				Run: HHP2_161005A				10/06/16 02:18
Total Extractable Hydrocarbons	275.5	mg/kg-dry	12	110	60	140	0.5	20	
Surr: o-Terphenyl			0.20	103	40	140			
Method: SW8015M									Analytical Run: R119403
Lab ID: CCV_1011GC402r-S	Continuing Calibration Verification Standard								10/11/16 11:30
n-Nonane	6.840	mg/kg-dry		103	75	125			
n-Decane	6.751	mg/kg-dry		101	75	125			
n-Dodecane	6.797	mg/kg-dry		102	75	125			
n-Tetradecane	7.213	mg/kg-dry		108	75	125			
n-Hexadecane	6.693	mg/kg-dry		100	75	125			
n-Octadecane	6.706	mg/kg-dry		101	75	125			
n-Nonadecane	6.737	mg/kg-dry		101	75	125			
n-Eicosane	6.716	mg/kg-dry		101	75	125			
n-Docosane	6.689	mg/kg-dry		100	75	125			
n-Tetracosane	6.717	mg/kg-dry		101	75	125			
n-Hexacosane	6.664	mg/kg-dry		100	75	125			
n-Octacosane	6.677	mg/kg-dry		100	75	125			
n-Triacontane	6.590	mg/kg-dry		99	75	125			
n-Hexatriacontane	6.086	mg/kg-dry		91	75	125			
Surr: o-Terphenyl			0.17	102	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/19/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Analytical Run: R119459
Lab ID: CCV_1013GC401r-S	Continuing Calibration Verification Standard								10/13/16 09:28
n-Nonane	7.223	mg/kg-dry		108	75	125			
n-Decane	7.315	mg/kg-dry		110	75	125			
n-Dodecane	7.301	mg/kg-dry		110	75	125			
n-Tetradecane	7.592	mg/kg-dry		114	75	125			
n-Hexadecane	7.261	mg/kg-dry		109	75	125			
n-Octadecane	7.248	mg/kg-dry		109	75	125			
n-Nonadecane	7.283	mg/kg-dry		109	75	125			
n-Eicosane	7.252	mg/kg-dry		109	75	125			
n-Docosane	7.222	mg/kg-dry		108	75	125			
n-Tetracosane	7.250	mg/kg-dry		109	75	125			
n-Hexacosane	7.192	mg/kg-dry		108	75	125			
n-Octacosane	7.301	mg/kg-dry		110	75	125			
n-Triacontane	7.289	mg/kg-dry		109	75	125			
n-Hexatriacontane	6.973	mg/kg-dry		105	75	125			
Surr: o-Terphenyl			0.17	111	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/19/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100140

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C								Analytical Run: B_R268774	
Lab ID: 17-Oct-16_CCV_2	Continuing Calibration Verification Standard							10/17/16 11:15	
2-Methylnaphthalene	2.27	mg/kg	0.33	91	70	130			
Acenaphthene	2.51	mg/kg	0.33	100	80	120			
Acenaphthylene	2.49	mg/kg	0.33	99	70	130			
Anthracene	2.33	mg/kg	0.33	93	70	130			
Benzo(a)anthracene	2.66	mg/kg	0.33	107	70	130			
Benzo(a)pyrene	2.41	mg/kg	0.33	96	80	120			
Benzo(b)fluoranthene	2.28	mg/kg	0.33	91	70	130			
Benzo(g,h,i)perylene	2.37	mg/kg	0.33	95	70	130			
Benzo(k)fluoranthene	2.23	mg/kg	0.33	89	70	130			
Chrysene	2.30	mg/kg	0.33	92	70	130			
Dibenzo(a,h)anthracene	2.49	mg/kg	0.33	99	70	130			
Fluoranthene	2.43	mg/kg	0.33	97	80	120			
Fluorene	1.98	mg/kg	0.33	79	70	130			
Indeno(1,2,3-cd)pyrene	2.41	mg/kg	0.33	96	70	130			
Naphthalene	2.25	mg/kg	0.33	90	70	130			
o-Terphenyl	2.29	mg/kg	0.33	92	70	130			
Phenanthrene	2.33	mg/kg	0.33	93	70	130			
Pyrene	2.39	mg/kg	0.33	96	70	130			
Surr: 2-Fluorobiphenyl			0.33	101	70	130			

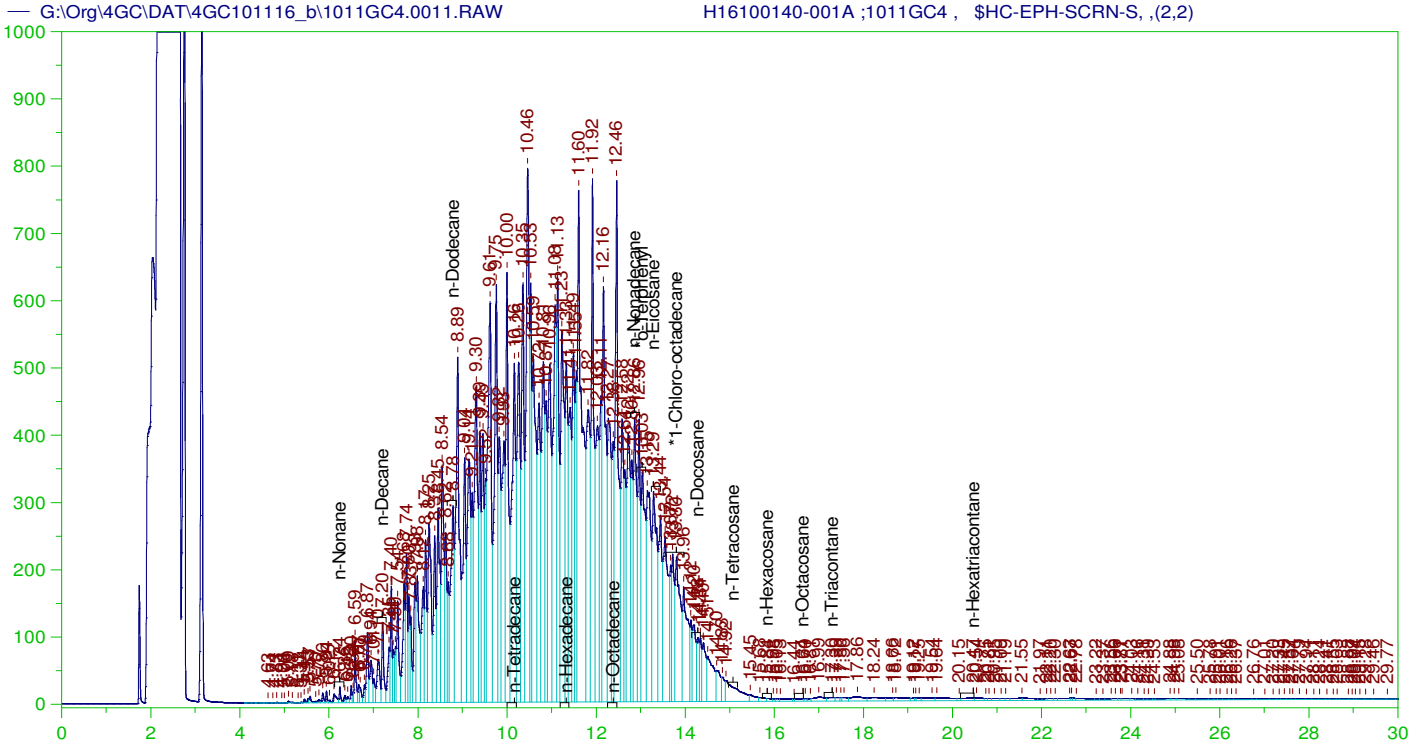
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MCMW2-WTP2 Batch ID: 34634

— G:\Org\4GC\DAT\4GC101116_b\1011GC4.0011.RAW H16100140-001A ;1011GC4 , $HC-EPH-SCRN-S, ,(2,2)



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100140-001A ;1011GC4 , $HC-EPH-SCRN-S, ,(2,2)
Raw File: G:\Org\4GC\DAT\4GC101116_b\1011GC4.0011.RAW
Date & Time Acquired: 10/11/2016 6:46:58 PM
Method File: G:\Org\4GC\Methods\10111611.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 25.3 Dilution: 4 S.A.: 1

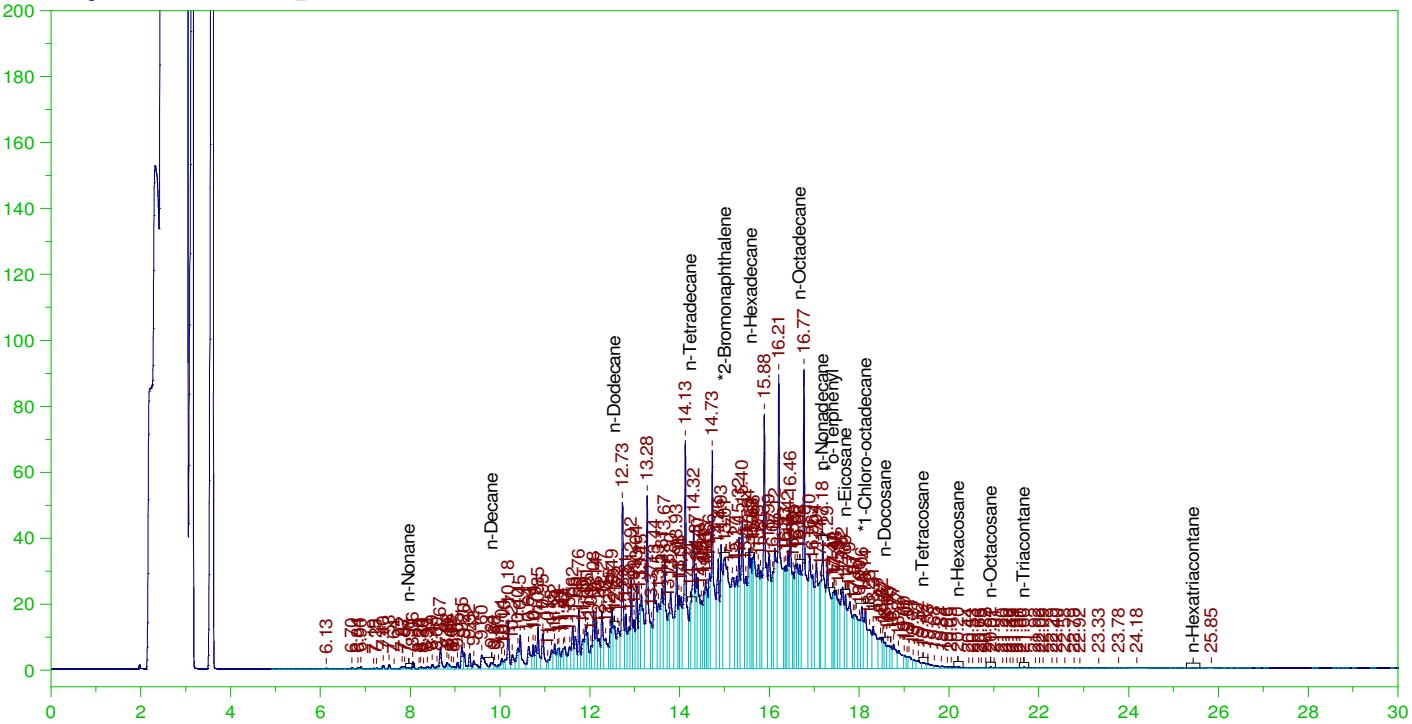
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
*o-Terphenyl	13.035	2102309	7.905	164.397	2079.63
*1-Chloro-octadecane	13.799	1661520	7.905	166.461	2105.73

DRO Area:1.367866E+08 DRO Amount: 11818.21
TEH Area:1.401706E+08 TEH Amount: 12110.59
C9-C18 Area:1.175539E+08 C9-C18 Amount: 10260.1
C19-C36 Area:2.139938E+07C19-C36 Amount: 1830.406

MCMW2-WTP2 Batch ID: 34751

— G:\Org\1GC\DAT\1GC101416_b\1014GC1.0003.RAW H16100140-001A ;1014GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100140-001A ;1014GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0003.RAW
Date & Time Acquired: 10/14/2016 10:49:59 AM
Method File: G:\Org\1GC\Methods\10141603.MET
Calibration File: G:\Org\1GC\Cals\AL082516F.CAL
Sample Weight: 24.7 Dilution: 12 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.66 to 21.03
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.1
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.15 to 25.59

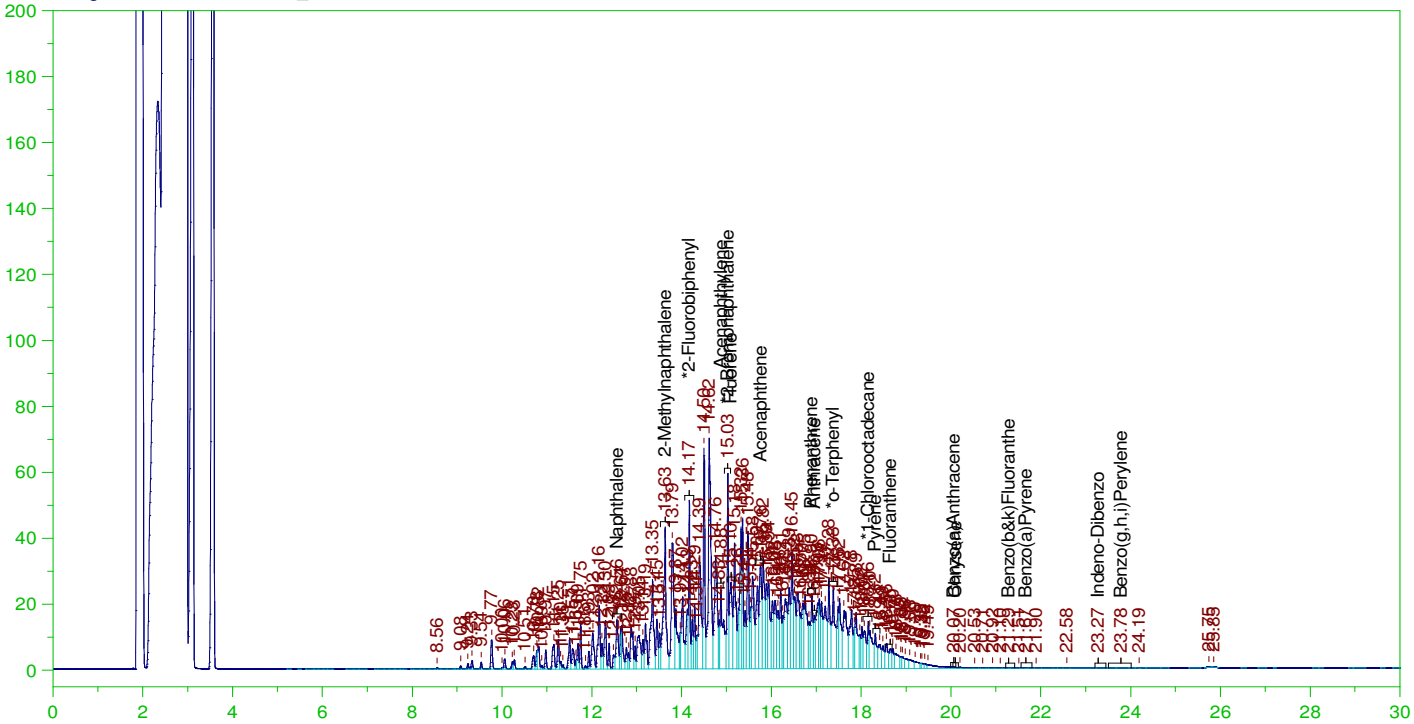
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.138	82508	8.097	53.237	657.48	-

DRO Area:9716582 DRO Amount: 5467.859
TEH Area:1.023705E+07 TEH Amount: 5760.742

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:8469500 C9-C18 Amount: 4863.632
C19-C36 Area:1694082 C19-C36 Amount: 939.1913

MCMW2-WTP2 Batch ID: 34751

— G:\Org\1GC\DAT\1GC101416_b\1014GC1.0004.RAW H16100140-001A ;1014GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100140-001A ;1014GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0004.RAW
Date & Time Acquired: 10/14/2016 11:32:51 AM
Method File: G:\Org\1GC\Methods\10141604.MET
Calibration File: G:\Org\1GC\Cals\AR082416F.CAL
Sample Weight: 24.7 Dilution: 12 S.A.: 1

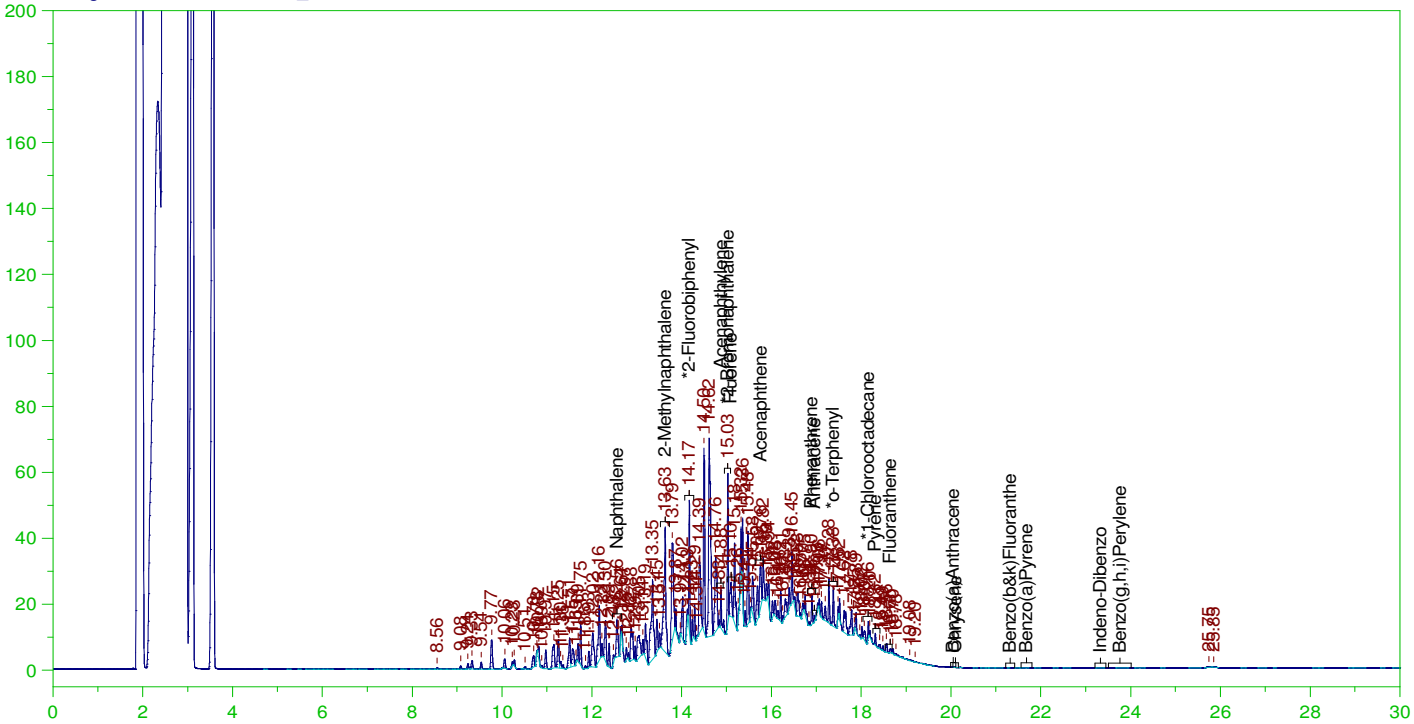
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.46 to 24.01

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.174	100330	8.097	55.063	680.03	-
*2-Bromonaphthalene	15.029	121414	8.097	96.852	1196.12	-
*o-Terphenyl	17.376	122093	8.097	59.462	734.36	-
*1-Chlorooctadecane	18.159	38082	8.097	23.301	287.77	-

C11-C22 Aromatics Area:5718570 C11-C22 Aromatics Amount: 2817.688
EPH Aromatics total Area:6190262 EPH Aromatics Total Amount: 3050.102

MCMW2-WTP2 Batch ID: 34751

G:\Org\1GC\DAT\1GC101416_b\1014GC1.0004.RAW H16100140-001A ;1014GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

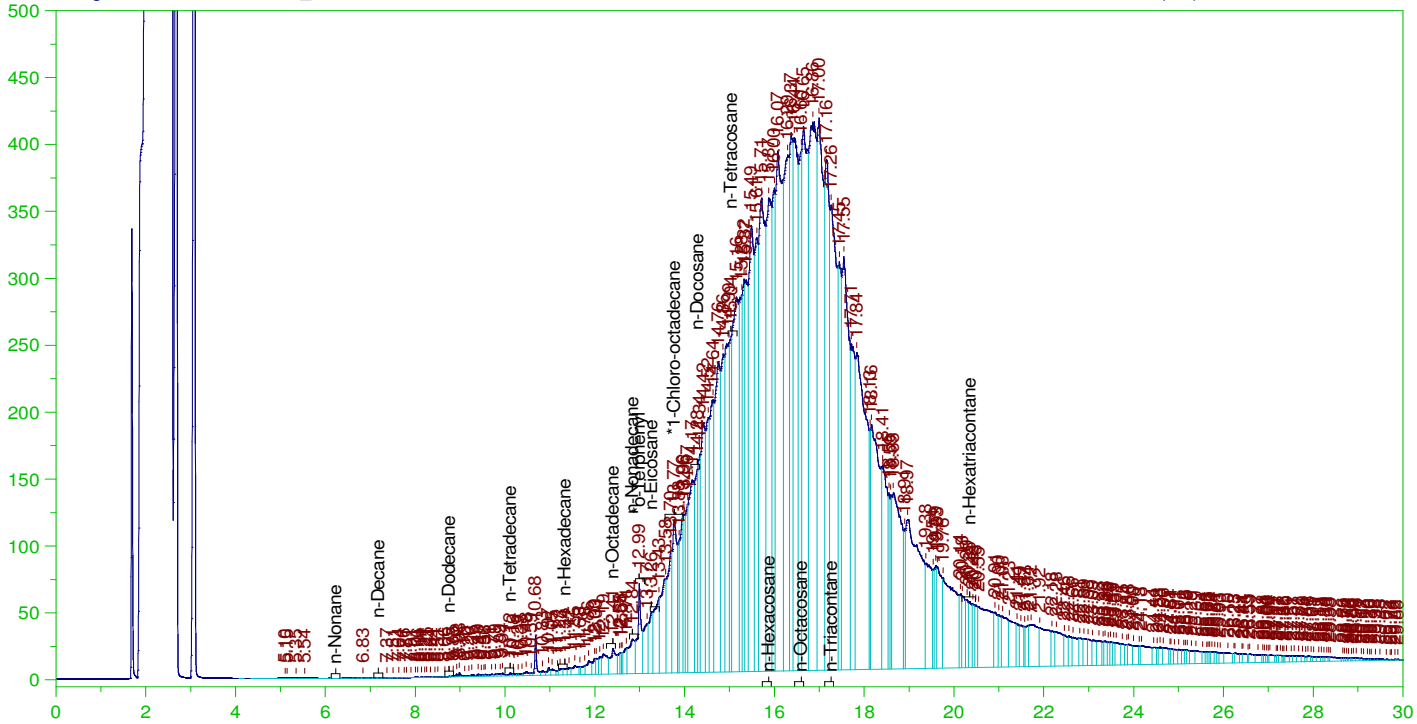
Sample Name: H16100140-001A ;1014GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0004.RAW
Date & Time Acquired: 10/14/2016 11:32:51 AM
Method File: G:\Org\1GC\Methods\AROQC082416F.met
Calibration File: G:\Org\1GC\Cals\AR082416F.CAL
Sample Weight: 24.7 Dilution: 12 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.562	2.46	2.467	28556	14.51	
2-Methylnaphthalene	13.63	1.39	1.399	117501	59.691	
Acenaphthylene	14.875	.16	.154	23896	12.338	
Fluorene	15.098	-.08	-.069	27134	13.09	
Acenaphthene	15.757	-.71	-.727	35272	17.623	
Phenanthrene	16.899	-1.88	-1.87	15576	7.738	
Anthracene	16.956	-1.94	-1.926	2719	1.338	
Pyrene	18.315	-3.32	-3.286	5765	2.805	
Fluoranthene	18.647	-3.59	-3.618	2687	1.292	
Benzo(a)Anthracene	.	.	.		.486	U
Chrysene	.	.	.		.486	U
Benzo(b&k)Fluoranthe	.	.	.		.972	U
Benzo(a)Pyrene	.	.	.		.486	U
Indeno-Dibenzo	.	.	.		.972	U
Benzo(g,h,i)Perylene	.	.	.		.486	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.174	56997	8.097	31.281	386.33	40-140
*2-Bromonaphthalene	15.029	70119	8.097	55.934	690.78	40-140
*o-Terphenyl	17.376	22673	8.097	11.042	136.37	40-140
*1-Chlorooctadecane	18.159	7466	8.097	4.568	56.42	40-140

MCMW2-ETP1 Batch ID: 34634

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0002.RAW H16100140-002A ;1013GC4 , $HC-EPH-SCRN-S, ,(2,2)



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100140-002A ;1013GC4 , $HC-EPH-SCRN-S, ,(2,2)
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0002.RAW
Date & Time Acquired: 10/13/2016 10:17:32 AM
Method File: G:\Org\4GC\Methods\10131602.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.7 Dilution: 4 S.A.: 1

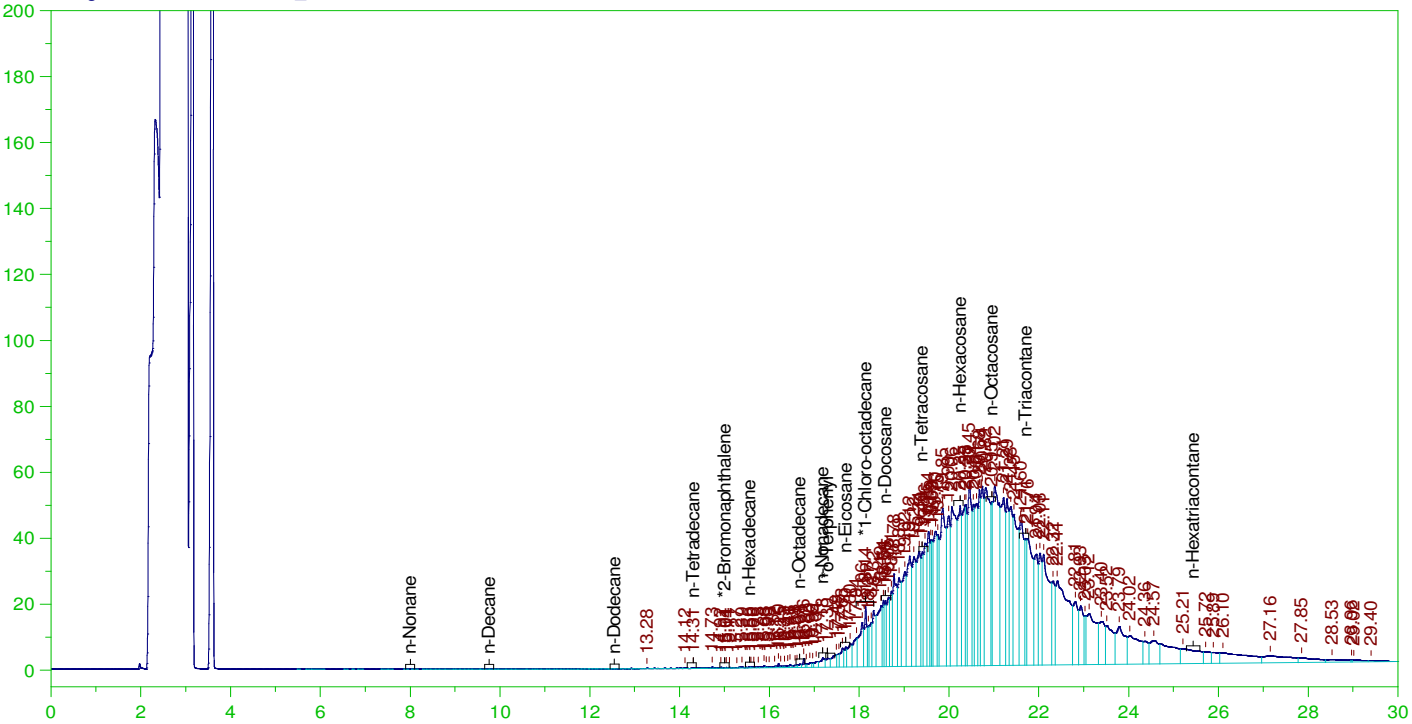
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.993	374272	7.491	27.733	370.23	-
*1-Chloro-octadecane	13.767	761284	7.491	72.271	964.82	-

DRO Area:6.662673E+07 DRO Amount: 5454.638
TEH Area:9.777206E+07 TEH Amount: 8004.463
C9-C18 Area:1507392 C9-C18 Amount: 124.6665
C19-C36 Area:8.842046E+07 C19-C36 Amount: 7166.517

MCMW2-ETP1 Batch ID: 34751

— G:\Org\1GC\DAT\1GC101416_b\1014GC1.0005.RAW H16100140-002A ;1014GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100140-002A ;1014GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0005.RAW
Date & Time Acquired: 10/14/2016 12:15:49 PM
Method File: G:\Org\1GC\Methods\10141605.MET
Calibration File: G:\Org\1GC\Cals\AL082516F.CAL
Sample Weight: 26.7 Dilution: 10 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.66 to 21.03
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.1
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.15 to 25.59

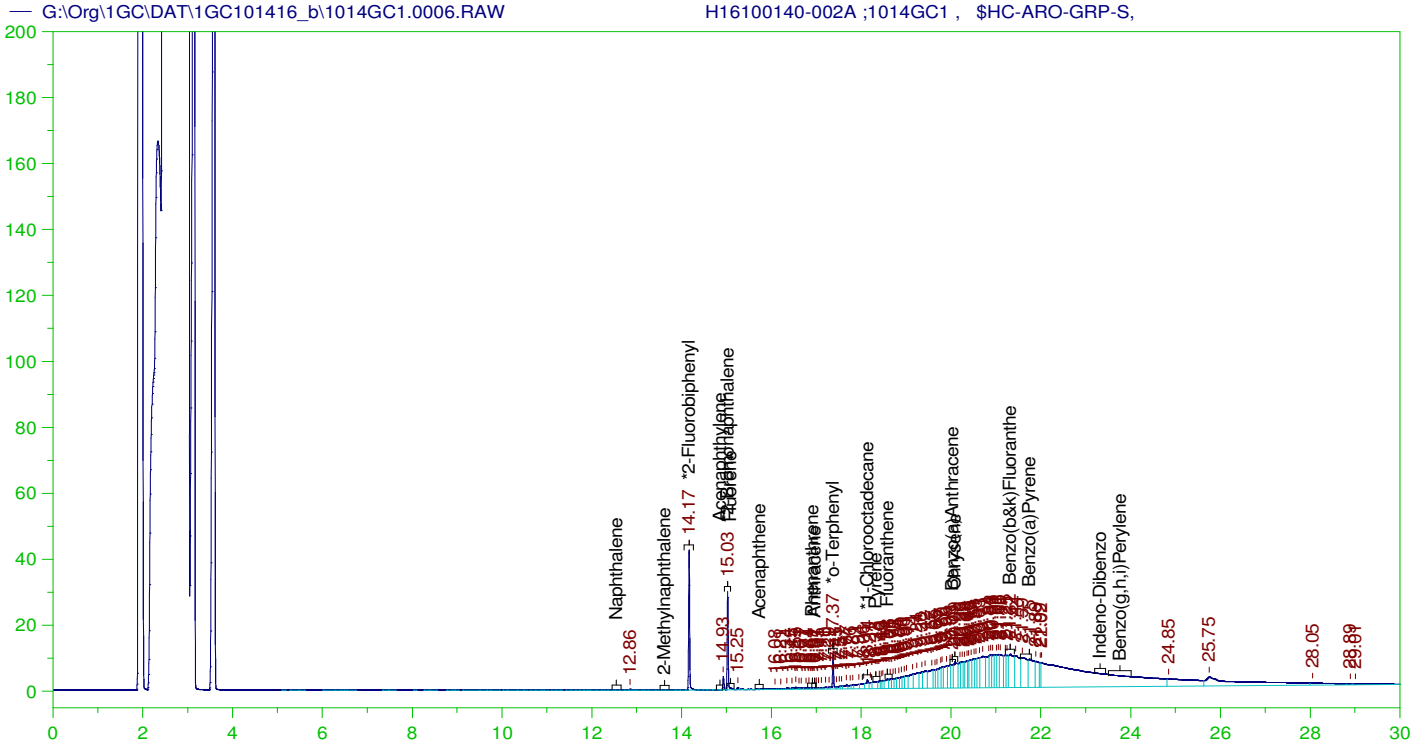
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.143	74907	7.491	37.26	497.43	-

DRO Area:6904051 DRO Amount: 2995.106
TEH Area:1.19379E+07 TEH Amount: 5178.882

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:81917.29 C9-C18 Amount: 36.26461
C19-C36 Area:1.147849E+07C19-C36 Amount: 4905.785

MCMW2-ETP1 Batch ID: 34751

— G:\Org\1GC\DAT\1GC101416_b\1014GC1.0006.RAW H16100140-002A ;1014GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100140-002A ;1014GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0006.RAW
Date & Time Acquired: 10/14/2016 12:58:42 PM
Method File: G:\Org\1GC\Methods\10141606.MET
Calibration File: G:\Org\1GC\Cals\AR082416E.CAL
Sample Weight: 26.7 Dilution: 10 S.A.: 1

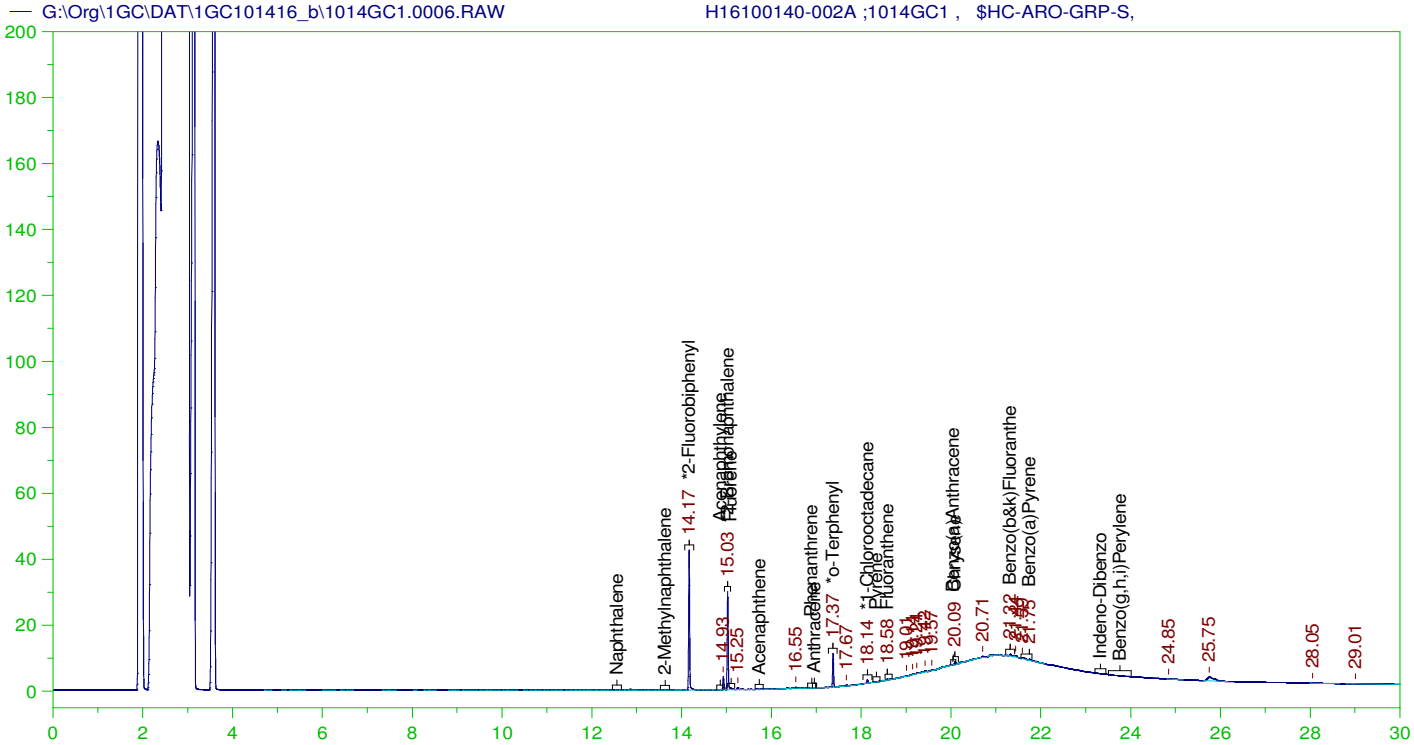
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.01

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.169	69276	7.491	29.31	391.29	-
*2-Bromonaphthalene	15.025	50071	7.491	30.791	411.06	-
*o-Terphenyl	17.371	20562	7.491	7.72	103.06	-
*1-Chlorooctadecane	18.138	12803	7.491	6.039	80.62	-

C11-C22 Aromatics Area:2293164 C11-C22 Aromatics Amount: 871.0538
EPH Aromatics total Area:2579660 EPH Aromatics Total Amount: 979.8788

MCMW2-ETP1 Batch ID: 34751

— G:\Org\1GC\DAT\1GC101416_b\1014GC1.0006.RAW H16100140-002A ;1014GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

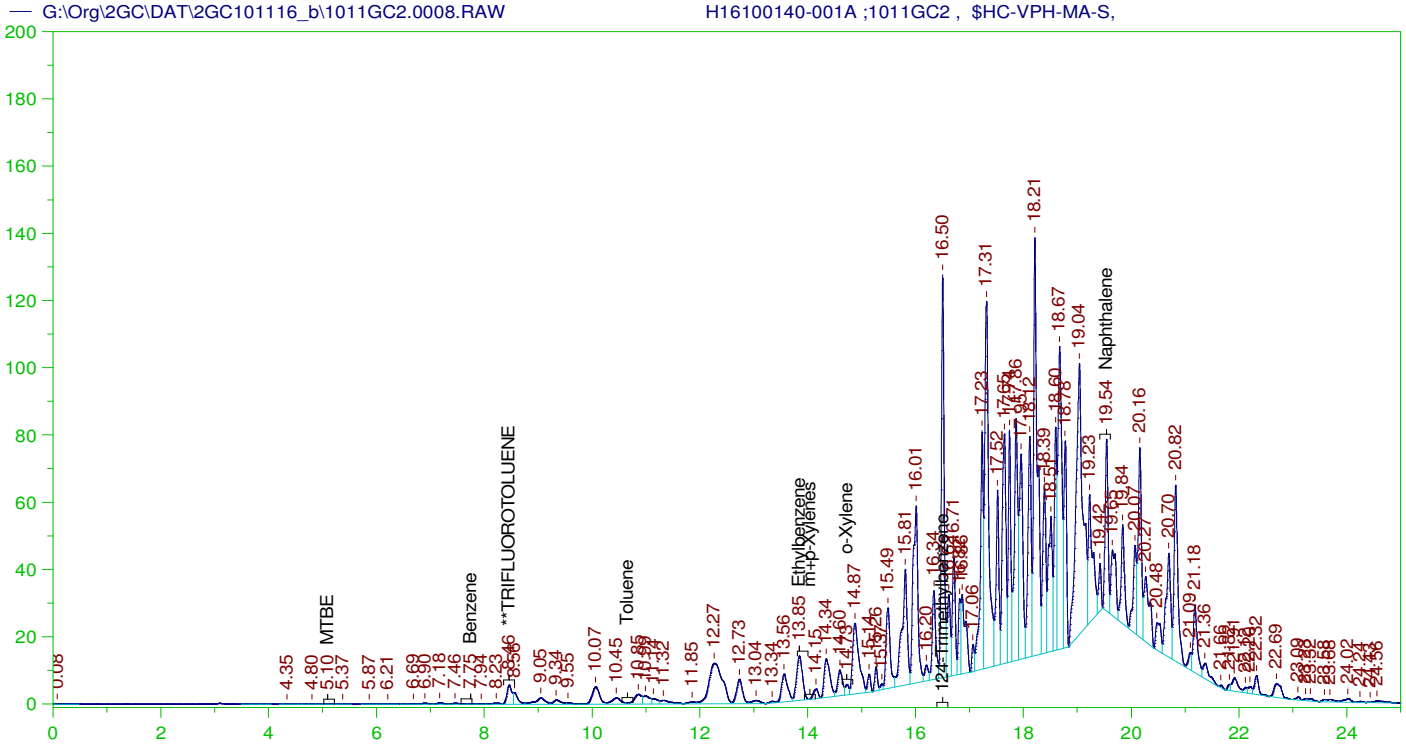
Sample Name: H16100140-002A ;1014GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101416_b\1014GC1.0006.RAW
Date & Time Acquired: 10/14/2016 12:58:42 PM
Method File: G:\Org\1GC\Methods\AROQC082416F.met
Calibration File: G:\Org\1GC\Cals\AR082416F.CAL
Sample Weight: 26.7 Dilution: 10 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	.	.	.		.375	U
2-Methylnaphthalene	.	.	.		.375	U
Acenaphthylene	.	.	.		.375	U
Fluorene	.	.	.		.375	U
Acenaphthene	.	.	.		.375	U
Phenanthrene	.	.	.		.375	U
Anthracene	.	.	.		.375	U
Pyrene	.	.	.		.375	U
Fluoranthene	18.579	-3.59	-3.554	891	.33	J
Benzo(a)Anthracene	.	.	.		.375	U
Chrysene	20.09	-5.08	-5.065	2004	.763	
Benzo(b&k)Fluoranthe	21.323	21.323	21.323	1302	.749	U
Benzo(a)Pyrene	21.747	-6.66	-6.721	1175	.441	
Indeno-Dibenzo	.	.	.		.749	U
Benzo(g,h,i)Perylene	.	.	.		.375	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.169	69021	7.491	29.202	389.85	40-140
*2-Bromonaphthalene	15.025	49676	7.491	30.549	407.82	40-140
*o-Terphenyl	17.371	16104	7.491	6.046	80.72	40-140
*1-Chlorooctadecane	18.138	1836	7.491	.866	11.56	40-140

MCMW2-WTP2 Batch ID: 34649

— G:\Org\2GC\DAT\2GC101116_b\1011GC2.0008.RAW H16100140-001A ;1011GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-001A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2.0008.RAW
Date & Time Acquired: 10/11/2016 2:51:47 PM
Method File: G:\Org\2GC\Methods\10111608$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

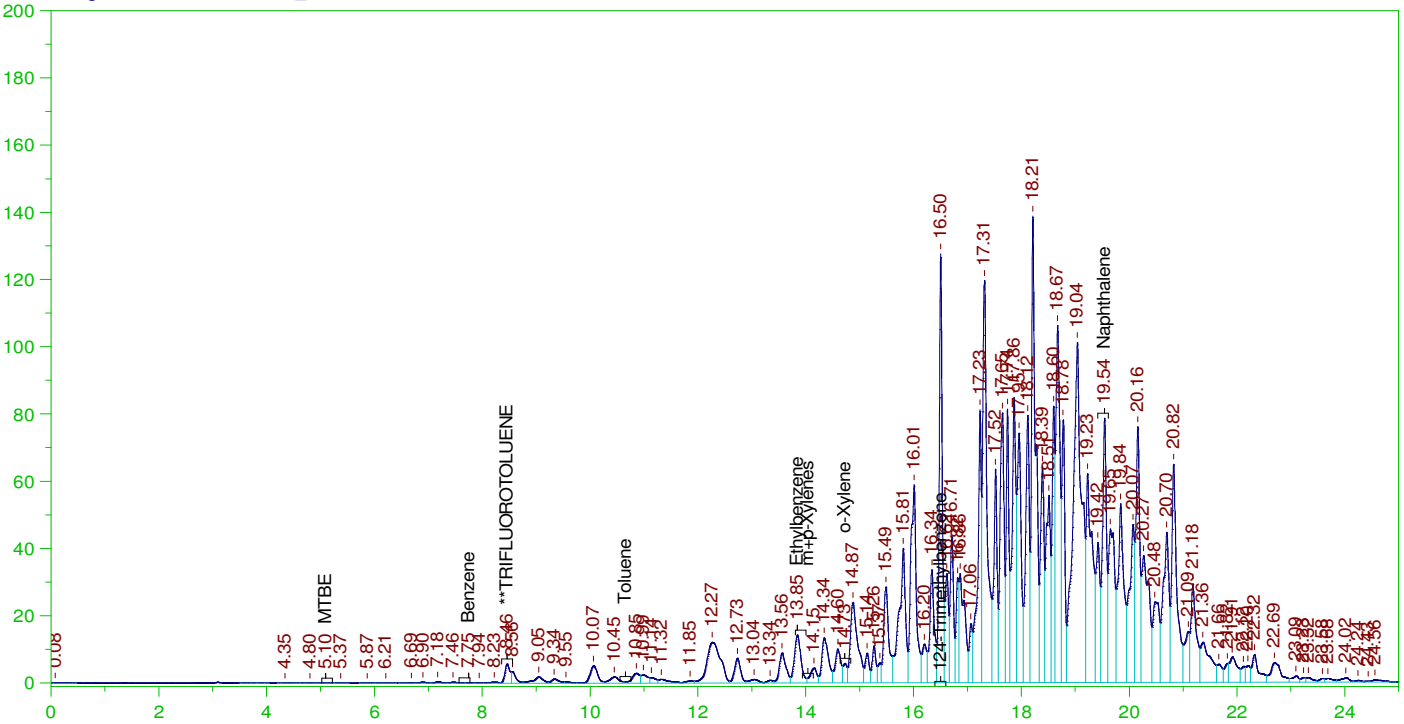
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:7401841 C9-C10 Aromatics Amount: 293.8887

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.098	5.098	5.098	214	.121	U
Benzene	7.752	7.752	7.752	630	.061	U
Toluene	.	.	.		.061	U
Ethylbenzene	13.846	-5.449	-5.384	102642	3.345	
m+p-Xylenes	.	.	.		.121	U
o-Xylene	14.727	-6.279	-6.264	14036	.477	
124-Trimethylbenzene	16.502	-8.037	-8.039	445797	21.306	
Naphthalene	19.541	-11.056	-11.078	195040	14.938	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.462	37248	3.025	2.851	94.23

MCMW2-WTP2 Batch ID: 34649

— G:\Org\2GC\DAT\2GC101116_b\1011GC2.0008.RAW H16100140-001A ;1011GC2 , $HC-VPH-MA-S,



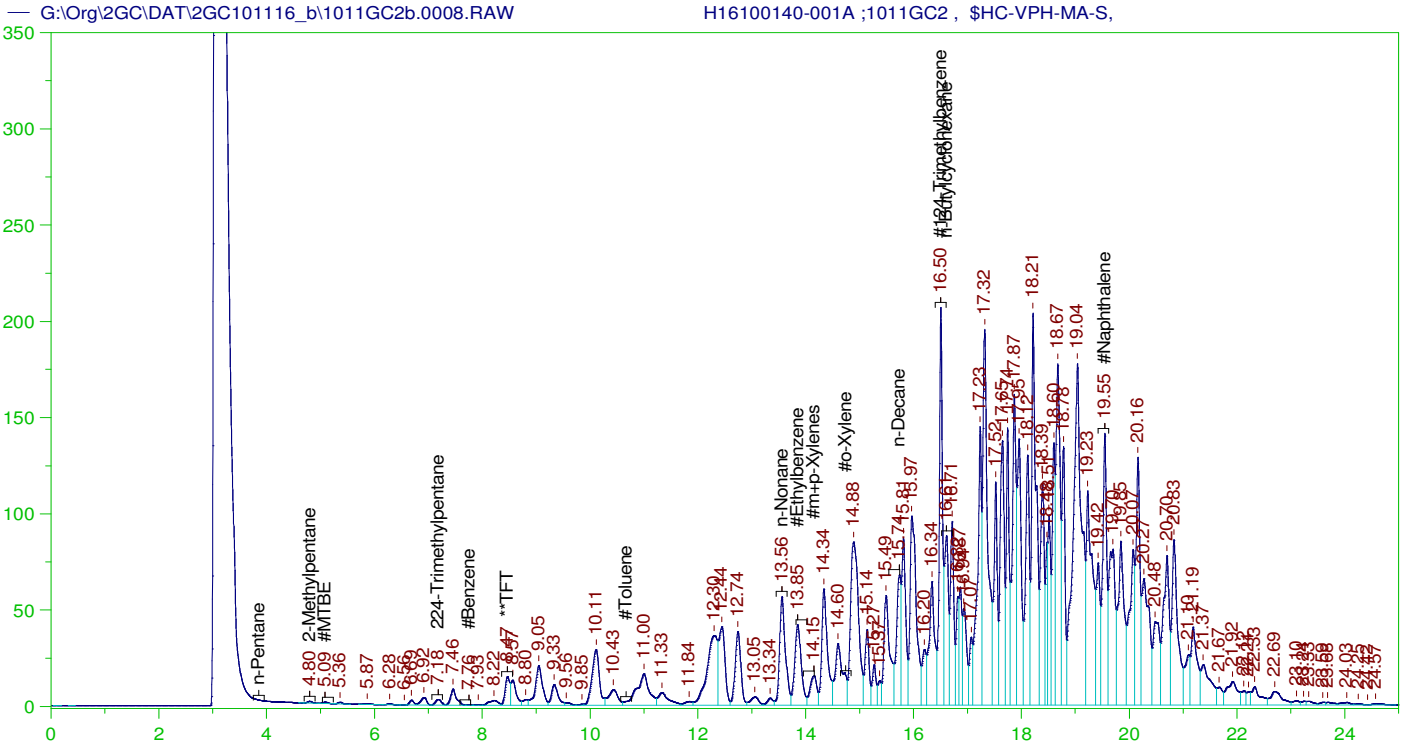
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-001A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2.0008.RAW
Date & Time Acquired: 10/11/2016 2:51:47 PM
Method File: G:\Org\2GC\Methods\10111608.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1.030887E+07 C9-C10 Aromatics Amount: 409.312

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.098	5.098	5.098	214	.121	U
Benzene	7.752	7.752	7.752	630	.061	U
Toluene	.	.	.		.061	U
Ethylbenzene	13.846	-5.449	-5.384	121462	3.958	
m+p-Xylenes	.	.	.		.121	U
o-Xylene	14.727	-6.279	-6.264	28333	.962	
124-Trimethylbenzene	16.502	-8.037	-8.039	512224	24.48	E
Naphthalene	19.541	-11.056	-11.078	415533	31.825	E

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.462	37248	3.025	2.851	94.23



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-001A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2b.0008.RAW
Date & Time Acquired: 10/11/2016 2:51:47 PM
Method File: G:\Org\2GC\Methods\10111608B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

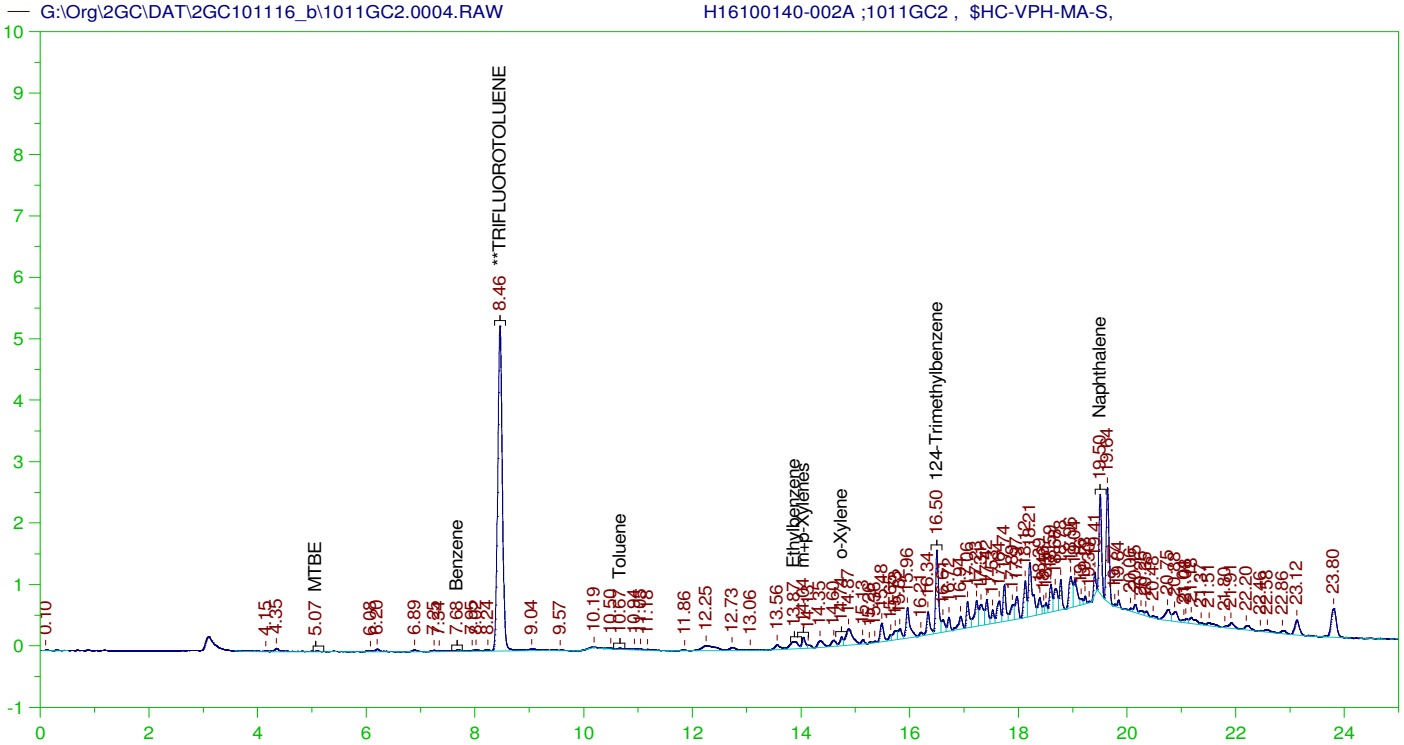
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.468	90788	3.025	2.86	94.54	-

GRO Area:6282026 GRO Amount: 173.2271
TPH Area:3.133231E+07 TPH Amount: 863.9893

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2507331 C5-C8 Amount: 61.393
C9-C12 Area:2.191519E+07 C9-C12 Amount: 1028.113

MCMW2-ETP1 Batch ID: 34649

G:\Org\2GC\DAT\2GC101116_b\1011GC2.0004.RAW H16100140-002A ;1011GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-002A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2.0004.RAW
Date & Time Acquired: 10/11/2016 12:28:38 PM
Method File: G:\Org\2GC\Methods\10111604$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

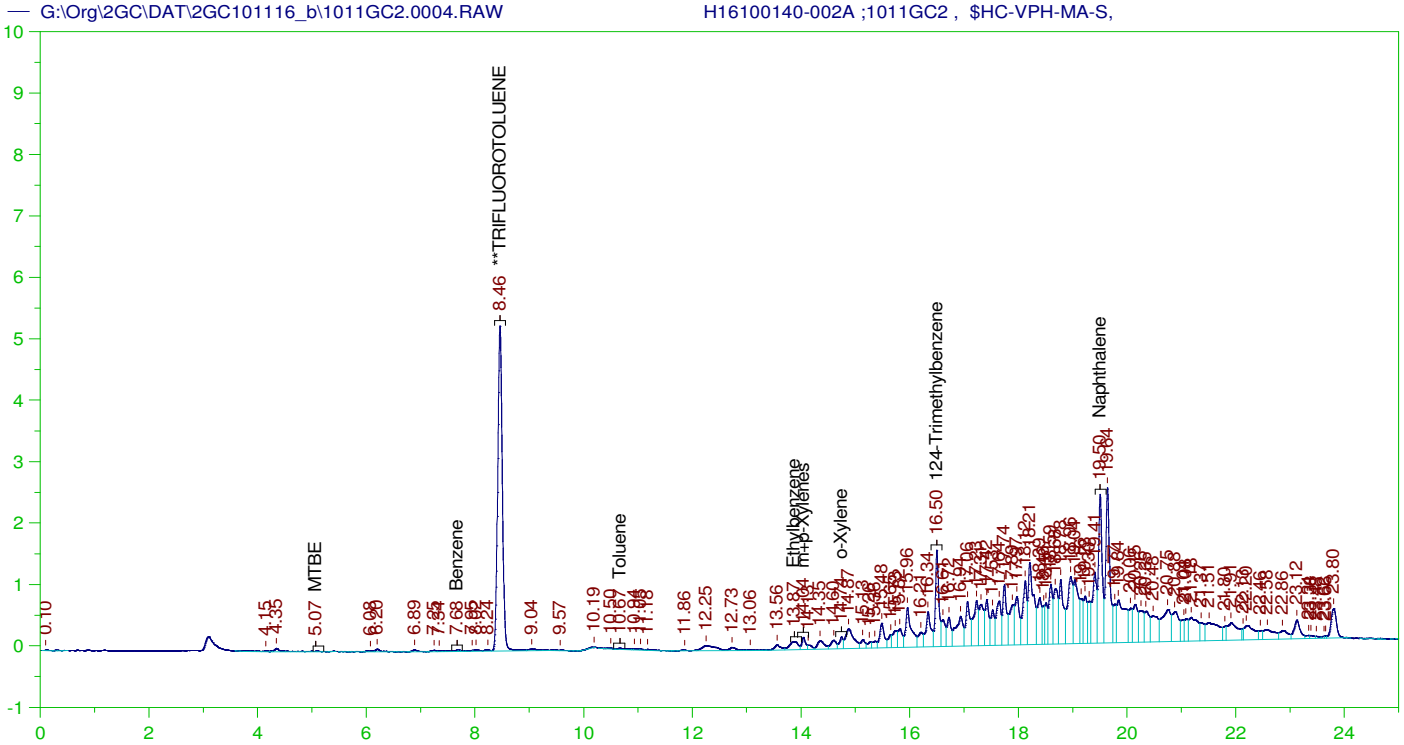
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:53035.16 C9-C10 Aromatics Amount: 2.001333

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.066	5.066	5.066	53	.115	U
Benzene	7.675	7.675	7.675	67	.058	U
Toluene	10.669	10.669	10.669	155	.058	U
Ethylbenzene	13.874	13.874	13.874	1178	.058	U
m+p-Xylenes	14.044	14.044	14.044	867	.115	U
o-Xylene	14.745	14.745	14.745	634	.058	U
124-Trimethylbenzene	16.501	-8.037	-8.04	5040	.229	
Naphthalene	19.504	-11.056	-11.043	5574	.406	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.461	31810	2.875	2.314	80.47

MCMW2-ETP1 Batch ID: 34649

G:\Org\2GC\DAT\2GC101116_b\1011GC2.0004.RAW H16100140-002A ;1011GC2 , $HC-VPH-MA-S,



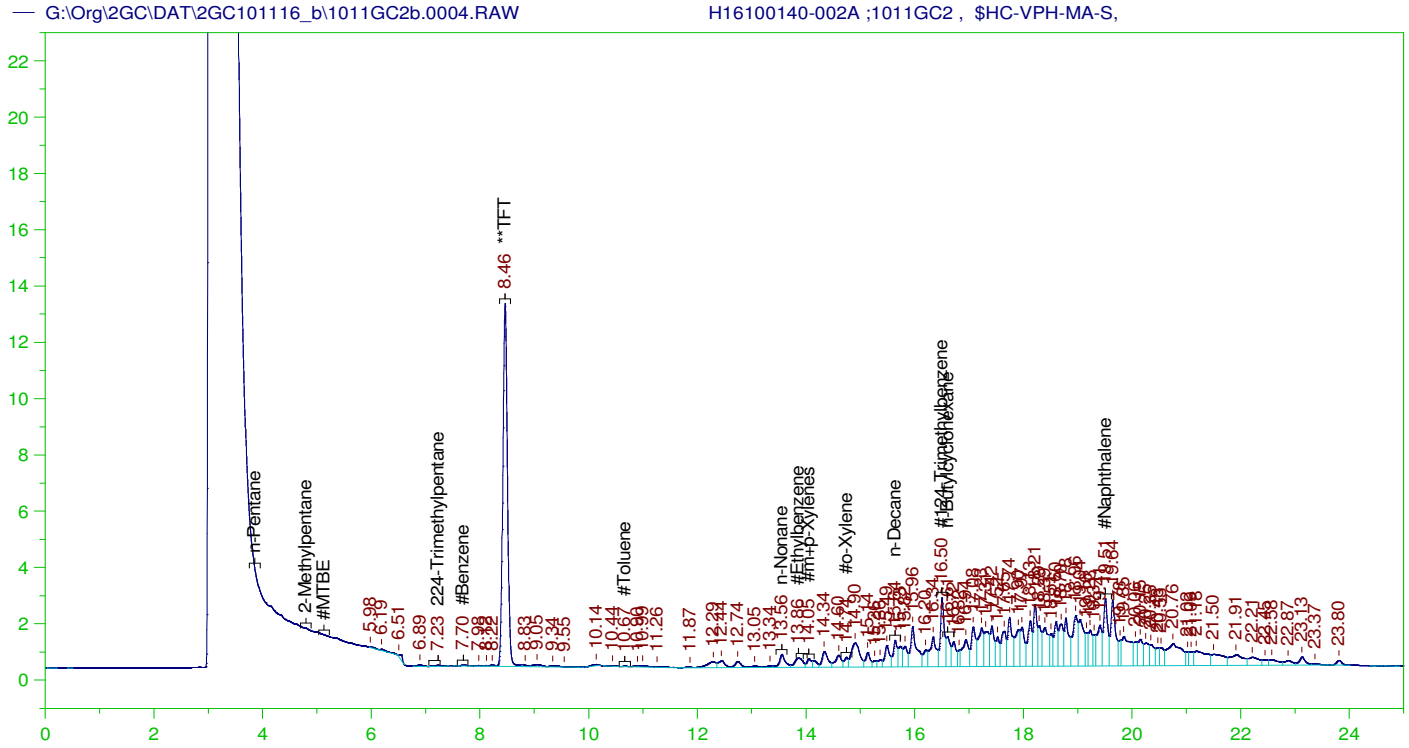
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-002A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2.0004.RAW
Date & Time Acquired: 10/11/2016 12:28:38 PM
Method File: G:\Org\2GC\Methods\10111604.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:141918.1 C9-C10 Aromatics Amount: 5.355417

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.066	5.066	5.066	53	.115	U
Benzene	7.675	7.675	7.675	67	.058	U
Toluene	10.669	10.669	10.669	155	.058	U
Ethylbenzene	13.874	13.874	13.874	1392	.058	U
m+p-Xylenes	14.044	14.044	14.044	1013	.115	U
o-Xylene	14.745	14.745	14.745	942	.058	U
124-Trimethylbenzene	16.501	-8.037	-8.04	6929	.315	
Naphthalene	19.504	-11.056	-11.043	11679	.85	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.461	31810	2.875	2.314	80.47



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100140-002A ;1011GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101116_b\1011GC2b.0004.RAW
Date & Time Acquired: 10/11/2016 12:28:38 PM
Method File: G:\Org\2GC\Methods\10111604B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.464	77188	2.875	2.311	80.38	-

GRO Area:60920.31 GRO Amount: 1.596579
TPH Area:422492.9 TPH Amount: 11.07256

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:14192.4 C5-C8 Amount: 0.3302749
C9-C12 Area:288206.1 C9-C12 Amount: 12.85024

Work Order Receipt Checklist

Hydrometrics Inc

H16100140

Login completed by: Tracy L. Lorash

Date Received: 10/10/2016

Reviewed by: BL2000\rwilliams

Received by: TLL

Reviewed Date: 10/11/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	2.0°C Blue Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

H16100140

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: (Signature) JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH (see cover letter)	VPH (see cover letter)							REMARKS
10/7/16	1505	X		MCMW2-WTP2	02									X	X							5-Day Rush
10/7/16	1530	X		MCMW2-ETP1	02									X	X							5-Day Rush

Relinquished (Signature)	Date / Time	Received by (Signature)	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell	10/8/16 1600	[signature]		HLN10286	Other hand-deliver Air Bill #
Relinquished (Signature)	Date / Time	Received by (Signature)	Remarks Please forward results to: Jamie Pnell, Hydrometrics, 3020 Bozeman Avenue, Helena, Montana 59601 email: jpell@hydrometrics.com		
[signature]	10/10/16 10:21				
Relinquished (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	Enclosed: ❑ Parameter sheet w/detection limits ❑ QA / AC standard mixing instructions ☒ Cover letter ❑ Other	
		[signature]	10/10/16 10:21		

Return results & electronic copy to: 2.0° on blue ice TB hand del.

Split Samples: ❑ Accepted ❑ Declined

HFORM-1 07/11

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 10, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples – Rush 5-Day TAT

Enclosed are two soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
- If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

As discussed previously, we are requesting a Rush 5-Day turnaround time for these samples.

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150 x154 or Mark Walker at 443-4150 x146.

Sincerely,

James Poell
Environmental Scientist

enclosures

K:\project\16048 Meagher County Remediation\Lab\Lab Cover 10-10-16-Soils.doc

ANALYTICAL SUMMARY REPORT

October 24, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100204 Quote ID: H1313 - EPH/VPH

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 3 samples for Hydrometrics Inc on 10/12/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100204-001	MCMW2-105-SGRAY	10/10/16 8:40	10/12/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100204-002	OSWSA-200-SGRAY	10/11/16 9:50	10/12/16	Soil	Same As Above
H16100204-003	OSFFT-201-BASE	10/12/16 10:50	10/12/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100204

Report Date: 10/24/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-001
Client Sample ID: MCMW2-105-SGRAY

Report Date: 10/24/16
Collection Date: 10/10/16 08:40
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.2	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/13/16 22:02 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/13/16 22:02 / tjb
Toluene	ND	mg/kg-dry		0.056	10	MA-VPH	10/13/16 22:02 / tjb
Ethylbenzene	1.2	mg/kg-dry		0.056	10	MA-VPH	10/13/16 22:02 / tjb
m+p-Xylenes	0.30	mg/kg-dry		0.056		MA-VPH	10/13/16 22:02 / tjb
o-Xylene	0.39	mg/kg-dry		0.056		MA-VPH	10/13/16 22:02 / tjb
Xylenes, Total	0.69	mg/kg-dry		0.056	30	MA-VPH	10/13/16 22:02 / tjb
Naphthalene	7.3	mg/kg-dry		0.11	9	MA-VPH	10/13/16 22:02 / tjb
C9 to C10 Aromatics	214	mg/kg-dry	*	2.2	100	MA-VPH	10/13/16 22:02 / tjb
C5 to C8 Aliphatics	8.6	mg/kg-dry		2.2	40	MA-VPH	10/13/16 22:02 / tjb
C9 to C12 Aliphatics	331	mg/kg-dry	*	2.2	90	MA-VPH	10/13/16 22:02 / tjb
Total Purgeable Hydrocarbons	475	mg/kg-dry	*	2.2	100	MA-VPH	10/13/16 22:02 / tjb
Surr: VPH Aromatics Surrogate	91.0	%REC		70-130		MA-VPH	10/13/16 22:02 / tjb
Surr: VPH Aliphatics Surrogate	96.0	%REC		70-130		MA-VPH	10/13/16 22:02 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	5780	mg/kg-dry	*	11	200	SW8015M	10/13/16 17:39 / JRS
Surr: o-Terphenyl	95.0	%REC		40-140		SW8015M	10/13/16 17:39 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	2960	mg/kg-dry	*	45	200	MA-EPH	10/18/16 22:51 / JRS
C19 to C36 Aliphatics	598	mg/kg-dry		45	20000	MA-EPH	10/18/16 22:51 / JRS
Surr: 1-Chloro-octadecane	81.0	%REC		40-140		MA-EPH	10/18/16 22:51 / JRS
C11 to C22 Aromatics	1510	mg/kg-dry	*	45	400	MA-EPH	10/18/16 23:34 / JRS
Total Extractable Hydrocarbons	5110	mg/kg-dry		45		MA-EPH	10/18/16 23:34 / JRS
Surr: 2-Bromonaphthalene	102	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS
Surr: 2-Fluorobiphenyl	64.0	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS
Surr: o-Terphenyl	112	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Acenaphthene	0.96	mg/kg-dry	J	1.5	200	SW8270C	10/21/16 14:50 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-001
Client Sample ID: MCMW2-105-SGRAY

Report Date: 10/24/16
Collection Date: 10/10/16 08:40
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		1.5	2000	SW8270C	10/21/16 14:50 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.5	0.02	SW8270C	10/21/16 14:50 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.5	2	SW8270C	10/21/16 14:50 / eli-b
Chrysene	ND	mg/kg-dry		1.5	20	SW8270C	10/21/16 14:50 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.5	0.02	SW8270C	10/21/16 14:50 / eli-b
Fluoranthene	ND	mg/kg-dry		1.5	300	SW8270C	10/21/16 14:50 / eli-b
Fluorene	2.7	mg/kg-dry		1.5	300	SW8270C	10/21/16 14:50 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Naphthalene	0.92	mg/kg-dry	J	1.5	4	SW8270C	10/21/16 14:50 / eli-b
Phenanthrene	4.0	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Pyrene	ND	mg/kg-dry		1.5	200	SW8270C	10/21/16 14:50 / eli-b
Surr: 2-Fluorobiphenyl	81.0	%REC		40-140		SW8270C	10/21/16 14:50 / eli-b
Surr: o-Terphenyl	83.0	%REC		40-140		SW8270C	10/21/16 14:50 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-002
Client Sample ID: OSWSA-200-SGRAY

Report Date: 10/24/16
Collection Date: 10/11/16 09:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	13.1	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.12	0.08	MA-VPH	10/13/16 20:29 / tjb
Benzene	0.21	mg/kg-dry	*	0.058	0.04	MA-VPH	10/13/16 20:29 / tjb
Toluene	0.11	mg/kg-dry		0.058	10	MA-VPH	10/13/16 20:29 / tjb
Ethylbenzene	3.4	mg/kg-dry		0.058	10	MA-VPH	10/13/16 20:29 / tjb
m+p-Xylenes	6.0	mg/kg-dry		0.058		MA-VPH	10/13/16 20:29 / tjb
o-Xylene	1.2	mg/kg-dry		0.058		MA-VPH	10/13/16 20:29 / tjb
Xylenes, Total	7.2	mg/kg-dry		0.058	30	MA-VPH	10/13/16 20:29 / tjb
Naphthalene	14	mg/kg-dry	*	0.12	9	MA-VPH	10/13/16 20:29 / tjb
C9 to C10 Aromatics	323	mg/kg-dry	*	2.3	100	MA-VPH	10/13/16 20:29 / tjb
C5 to C8 Aliphatics	54	mg/kg-dry	*	2.3	40	MA-VPH	10/13/16 20:29 / tjb
C9 to C12 Aliphatics	496	mg/kg-dry	*	2.3	90	MA-VPH	10/13/16 20:29 / tjb
Total Purgeable Hydrocarbons	700	mg/kg-dry	*	2.3	100	MA-VPH	10/13/16 20:29 / tjb
Surr: VPH Aromatics Surrogate	98.0	%REC		70-130		MA-VPH	10/13/16 20:29 / tjb
Surr: VPH Aliphatics Surrogate	97.0	%REC		70-130		MA-VPH	10/13/16 20:29 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	5500	mg/kg-dry	*	11	200	SW8015M	10/13/16 18:27 / JRS
Surr: o-Terphenyl	96.0	%REC		40-140		SW8015M	10/13/16 18:27 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	2320	mg/kg-dry	*	34	200	MA-EPH	10/19/16 00:16 / JRS
C19 to C36 Aliphatics	439	mg/kg-dry		34	20000	MA-EPH	10/19/16 00:16 / JRS
Surr: 1-Chloro-octadecane	94.0	%REC		40-140		MA-EPH	10/19/16 00:16 / JRS
C11 to C22 Aromatics	1190	mg/kg-dry	*	34	400	MA-EPH	10/19/16 00:58 / JRS
Total Extractable Hydrocarbons	4070	mg/kg-dry		34		MA-EPH	10/19/16 00:58 / JRS
Surr: 2-Bromonaphthalene	102	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS
Surr: 2-Fluorobiphenyl	58.0	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS
Surr: o-Terphenyl	94.0	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	20	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Acenaphthene	0.94	mg/kg-dry	J	1.1	200	SW8270C	10/21/16 15:21 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-002
Client Sample ID: OSWSA-200-SGRAY

Report Date: 10/24/16
Collection Date: 10/11/16 09:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		1.1	2000	SW8270C	10/21/16 15:21 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 15:21 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.1	2	SW8270C	10/21/16 15:21 / eli-b
Chrysene	ND	mg/kg-dry		1.1	20	SW8270C	10/21/16 15:21 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 15:21 / eli-b
Fluoranthene	ND	mg/kg-dry		1.1	300	SW8270C	10/21/16 15:21 / eli-b
Fluorene	2.5	mg/kg-dry		1.1	300	SW8270C	10/21/16 15:21 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Naphthalene	5.0	mg/kg-dry	*	1.1	4	SW8270C	10/21/16 15:21 / eli-b
Phenanthrene	3.8	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Pyrene	ND	mg/kg-dry		1.1	200	SW8270C	10/21/16 15:21 / eli-b
Surr: 2-Fluorobiphenyl	72.0	%REC		40-140		SW8270C	10/21/16 15:21 / eli-b
Surr: o-Terphenyl	73.0	%REC		40-140		SW8270C	10/21/16 15:21 / eli-b

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-003
Client Sample ID: OSFFT-201-BASE

Report Date: 10/24/16
Collection Date: 10/12/16 10:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	16.9	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	D	0.20	0.08	MA-VPH	10/13/16 15:40 / tjb
Benzene	0.17	mg/kg-dry	*	0.060	0.04	MA-VPH	10/13/16 15:40 / tjb
Toluene	2.5	mg/kg-dry		0.060	10	MA-VPH	10/13/16 15:40 / tjb
Ethylbenzene	2.0	mg/kg-dry		0.060	10	MA-VPH	10/13/16 15:40 / tjb
m+p-Xylenes	9.4	mg/kg-dry		0.060		MA-VPH	10/13/16 15:40 / tjb
o-Xylene	3.9	mg/kg-dry		0.060		MA-VPH	10/13/16 15:40 / tjb
Xylenes, Total	13	mg/kg-dry		0.060	30	MA-VPH	10/13/16 15:40 / tjb
Naphthalene	2.9	mg/kg-dry		0.12	9	MA-VPH	10/13/16 15:40 / tjb
C9 to C10 Aromatics	92	mg/kg-dry		2.4	100	MA-VPH	10/13/16 15:40 / tjb
C5 to C8 Aliphatics	58	mg/kg-dry	*	2.4	40	MA-VPH	10/13/16 15:40 / tjb
C9 to C12 Aliphatics	163	mg/kg-dry	*	2.4	90	MA-VPH	10/13/16 15:40 / tjb
Total Purgeable Hydrocarbons	252	mg/kg-dry	*	2.4	100	MA-VPH	10/13/16 15:40 / tjb
Surr: VPH Aromatics Surrogate	115	%REC		70-130		MA-VPH	10/13/16 15:40 / tjb
Surr: VPH Aliphatics Surrogate	119	%REC		70-130		MA-VPH	10/13/16 15:40 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	ND	mg/kg-dry		12	200	SW8015M	10/13/16 19:16 / JRS
Surr: o-Terphenyl	83.0	%REC		40-140		SW8015M	10/13/16 19:16 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: MB-34774-34734	3	Method Blank				Run: HHP_161018A				10/18/16 15:46
C9 to C18 Aliphatics		ND	mg/kg-dry	10						
C19 to C36 Aliphatics		ND	mg/kg-dry	10						
Surr: 1-Chloro-octadecane				0.17	78	40	140			
Lab ID: LCS-34774-34734	17	Laboratory Control Sample				Run: HHP_161018A				10/18/16 17:12
C9 to C18 Aliphatics		27.9	mg/kg-dry	10	70	40	140			
C19 to C36 Aliphatics		47.5	mg/kg-dry	10	89	40	140			
n-Nonane		3.14	mg/kg-dry	0.17	47	30	140			
n-Decane		4.03	mg/kg-dry	0.17	60	40	140			
n-Dodecane		4.54	mg/kg-dry	0.17	68	40	140			
n-Tetradecane		4.84	mg/kg-dry	0.17	73	40	140			
n-Hexadecane		5.17	mg/kg-dry	0.17	78	40	140			
n-Octadecane		5.53	mg/kg-dry	0.17	83	40	140			
n-Nonadecane		5.71	mg/kg-dry	0.17	86	40	140			
n-Eicosane		5.85	mg/kg-dry	0.17	88	40	140			
n-Docosane		5.95	mg/kg-dry	0.17	89	40	140			
n-Tetracosane		6.03	mg/kg-dry	0.17	91	40	140			
n-Hexacosane		6.05	mg/kg-dry	0.17	91	40	140			
n-Octacosane		5.86	mg/kg-dry	0.17	88	40	140			
n-Triacontane		5.99	mg/kg-dry	0.17	90	40	140			
n-Hexatriacontane		5.69	mg/kg-dry	0.17	85	40	140			
Surr: 1-Chloro-octadecane				0.17	71	40	140			
Lab ID: H16100176-013AMS	17	Sample Matrix Spike				Run: HHP_161018A				10/18/16 20:02
C9 to C18 Aliphatics		31.8	mg/kg-dry	12	68	40	140			
C19 to C36 Aliphatics		55.3	mg/kg-dry	12	88	40	140			
n-Nonane		3.47	mg/kg-dry	0.20	44	30	140			
n-Decane		4.53	mg/kg-dry	0.20	58	40	140			
n-Dodecane		5.14	mg/kg-dry	0.20	66	40	140			
n-Tetradecane		5.50	mg/kg-dry	0.20	70	40	140			
n-Hexadecane		5.96	mg/kg-dry	0.20	76	40	140			
n-Octadecane		6.39	mg/kg-dry	0.20	82	40	140			
n-Nonadecane		6.62	mg/kg-dry	0.20	84	40	140			
n-Eicosane		6.78	mg/kg-dry	0.20	86	40	140			
n-Docosane		6.89	mg/kg-dry	0.20	88	40	140			
n-Tetracosane		6.99	mg/kg-dry	0.20	89	40	140			
n-Hexacosane		7.01	mg/kg-dry	0.20	89	40	140			
n-Octacosane		6.83	mg/kg-dry	0.20	87	40	140			
n-Triacontane		6.97	mg/kg-dry	0.20	89	40	140			
n-Hexatriacontane		6.84	mg/kg-dry	0.20	87	40	140			
Surr: 1-Chloro-octadecane				0.20	75	40	140			
Lab ID: H16100176-013AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161018A				10/18/16 21:27
C9 to C18 Aliphatics		32.9	mg/kg-dry	12	70	40	140	3.5	20	
C19 to C36 Aliphatics		54.4	mg/kg-dry	12	87	40	140	1.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34774	
Lab ID: H16100176-013AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161018A			10/18/16 21:27	
n-Nonane		3.60	mg/kg-dry	0.20	46	30	140	3.5	30	
n-Decane		4.59	mg/kg-dry	0.20	59	40	140	1.3	20	
n-Dodecane		5.32	mg/kg-dry	0.20	68	40	140	3.5	20	
n-Tetradecane		5.80	mg/kg-dry	0.20	74	40	140	5.3	20	
n-Hexadecane		6.07	mg/kg-dry	0.20	77	40	140	1.9	20	
n-Octadecane		6.39	mg/kg-dry	0.20	82	40	140	0.0	20	
n-Nonadecane		6.59	mg/kg-dry	0.20	84	40	140	0.5	20	
n-Eicosane		6.72	mg/kg-dry	0.20	86	40	140	0.9	20	
n-Docosane		6.80	mg/kg-dry	0.20	87	40	140	1.4	20	
n-Tetracosane		6.88	mg/kg-dry	0.20	88	40	140	1.7	20	
n-Hexacosane		6.90	mg/kg-dry	0.20	88	40	140	1.7	20	
n-Octacosane		6.71	mg/kg-dry	0.20	86	40	140	1.9	20	
n-Triacontane		6.83	mg/kg-dry	0.20	87	40	140	2.0	20	
n-Hexatriacontane		6.51	mg/kg-dry	0.20	83	40	140	5.0	20	
Surr: 1-Chloro-octadecane				0.20	76	40	140			
Lab ID: MB-34774-34734	20	Method Blank				Run: HHP_161018A			10/18/16 16:29	
C11 to C22 Aromatics		ND	mg/kg-dry	10						
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Naphthalene		ND	mg/kg-dry	0.17						
2-MethylNaphthalene		ND	mg/kg-dry	0.17						
Acenaphthylene		ND	mg/kg-dry	0.17						
Acenaphthene		ND	mg/kg-dry	0.17						
Fluorene		ND	mg/kg-dry	0.17						
Phenanthrene		ND	mg/kg-dry	0.17						
Anthracene		ND	mg/kg-dry	0.17						
Fluoranthene		ND	mg/kg-dry	0.17						
Pyrene		ND	mg/kg-dry	0.17						
Benzo(a)Anthracene		ND	mg/kg-dry	0.17						
Chrysene		ND	mg/kg-dry	0.17						
Benzo(b)Fluoranthene/Benzo(k)Fluorant		ND	mg/kg-dry	0.17						
Benzo(a)Pyrene		ND	mg/kg-dry	0.17						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		ND	mg/kg-dry	0.17						
Benzo(g,h,I)perylene		ND	mg/kg-dry	0.17						
Surr: 2-Bromonaphthalene				0.17	64	40	140			
Surr: 2-Fluorobiphenyl				0.17	68	40	140			
Surr: o-Terphenyl				0.17	72	40	140			
Lab ID: LCS-34774-34734	19	Laboratory Control Sample				Run: HHP_161018A			10/18/16 17:54	
C11 to C22 Aromatics		94.7	mg/kg-dry	10	84	40	140			
Naphthalene		3.96	mg/kg-dry	0.17	59	40	140			
2-MethylNaphthalene		4.27	mg/kg-dry	0.17	64	40	140			
Acenaphthylene		4.87	mg/kg-dry	0.17	73	40	140			
Acenaphthene		5.45	mg/kg-dry	0.17	82	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: LCS-34774-34734	19	Laboratory Control Sample				Run: HHP_161018A				10/18/16 17:54
Fluorene		4.99	mg/kg-dry	0.17	75	40	140			
Phenanthrene		5.21	mg/kg-dry	0.17	78	40	140			
Anthracene		4.61	mg/kg-dry	0.17	69	40	140			
Fluoranthene		5.98	mg/kg-dry	0.17	90	40	140			
Pyrene		5.92	mg/kg-dry	0.17	89	40	140			
Benzo(a)Anthracene		5.07	mg/kg-dry	0.17	76	40	140			
Chrysene		4.99	mg/kg-dry	0.17	75	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.0	mg/kg-dry	0.17	91	40	140			
Benzo(a)Pyrene		5.80	mg/kg-dry	0.17	87	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		11.5	mg/kg-dry	0.17	87	40	140			
Benzo(g,h,I)perylene		5.60	mg/kg-dry	0.17	84	40	140			
Surr: 2-Bromonaphthalene				0.17	74	40	140			
Surr: 2-Fluorobiphenyl				0.17	72	40	140			
Surr: o-Terphenyl				0.17	82	40	140			
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: HHP_161018A				10/18/16 20:44
C11 to C22 Aromatics		110	mg/kg-dry	12	83	40	140			
Naphthalene		5.03	mg/kg-dry	0.20	64	40	140			
2-MethylNaphthalene		5.29	mg/kg-dry	0.20	68	40	140			
Acenaphthylene		5.80	mg/kg-dry	0.20	74	40	140			
Acenaphthene		6.25	mg/kg-dry	0.20	80	40	140			
Fluorene		5.86	mg/kg-dry	0.20	75	40	140			
Phenanthrene		6.00	mg/kg-dry	0.20	77	40	140			
Anthracene		5.36	mg/kg-dry	0.20	68	40	140			
Fluoranthene		6.86	mg/kg-dry	0.20	88	40	140			
Pyrene		6.80	mg/kg-dry	0.20	87	40	140			
Benzo(a)Anthracene		5.86	mg/kg-dry	0.20	75	40	140			
Chrysene		5.82	mg/kg-dry	0.20	74	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		13.9	mg/kg-dry	0.20	90	40	140			
Benzo(a)Pyrene		6.76	mg/kg-dry	0.20	86	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		13.4	mg/kg-dry	0.20	86	40	140			
Benzo(g,h,I)perylene		6.40	mg/kg-dry	0.20	82	40	140			
Surr: 2-Bromonaphthalene				0.20	77	40	140			
Surr: 2-Fluorobiphenyl				0.20	77	40	140			
Surr: o-Terphenyl				0.20	79	40	140			
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161018A				10/18/16 22:09
C11 to C22 Aromatics		104	mg/kg-dry	12	78	40	140	6.0	20	
Naphthalene		4.98	mg/kg-dry	0.20	64	40	140	1.0	40	
2-MethylNaphthalene		5.13	mg/kg-dry	0.20	65	40	140	3.2	20	
Acenaphthylene		5.46	mg/kg-dry	0.20	70	40	140	6.1	20	
Acenaphthene		5.79	mg/kg-dry	0.20	74	40	140	7.7	20	
Fluorene		5.49	mg/kg-dry	0.20	70	40	140	6.6	20	
Phenanthrene		5.61	mg/kg-dry	0.20	72	40	140	6.6	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161018A			10/18/16 22:09	
Anthracene		5.05	mg/kg-dry	0.20	64	40	140	6.0	20	
Fluoranthene		6.50	mg/kg-dry	0.20	83	40	140	5.4	20	
Pyrene		6.38	mg/kg-dry	0.20	81	40	140	6.3	20	
Benzo(a)Anthracene		5.41	mg/kg-dry	0.20	69	40	140	8.0	20	
Chrysene		5.35	mg/kg-dry	0.20	68	40	140	8.4	20	
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.8	mg/kg-dry	0.20	83	40	140	7.9	20	
Benzo(a)Pyrene		6.33	mg/kg-dry	0.20	81	40	140	6.5	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		12.3	mg/kg-dry	0.20	79	40	140	7.9	20	
Benzo(g,h,I)perylene		6.08	mg/kg-dry	0.20	78	40	140	5.2	20	
Surr: 2-Bromonaphthalene				0.20	63	40	140			
Surr: 2-Fluorobiphenyl				0.20	69	40	140			
Surr: o-Terphenyl				0.20	74	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R119587	
Lab ID: CCV_1018GC105r-S	15	Continuing Calibration Verification Standard							10/18/16 14:21	
n-Nonane		7.46	mg/kg-dry	0.17	112	75	125			
n-Decane		7.21	mg/kg-dry	0.17	108	75	125			
n-Dodecane		7.10	mg/kg-dry	0.17	107	75	125			
n-Tetradecane		7.04	mg/kg-dry	0.17	106	75	125			
n-Hexadecane		7.07	mg/kg-dry	0.17	106	75	125			
n-Octadecane		7.09	mg/kg-dry	0.17	106	75	125			
n-Nonadecane		7.10	mg/kg-dry	0.17	106	75	125			
n-Eicosane		7.07	mg/kg-dry	0.17	106	75	125			
n-Docosane		7.09	mg/kg-dry	0.17	106	75	125			
n-Tetracosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Hexacosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Octacosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Triacontane		7.15	mg/kg-dry	0.17	107	75	125			
n-Hexatriacontane		7.35	mg/kg-dry	0.17	110	75	125			
Surr: 1-Chloro-octadecane				0.17	109	75	125			
Lab ID: CCV_1018GC106r-S	18	Continuing Calibration Verification Standard							10/18/16 15:04	
Naphthalene		6.32	mg/kg-dry	0.17	95	75	125			
2-MethylNaphthalene		6.26	mg/kg-dry	0.17	94	75	125			
Acenaphthylene		6.23	mg/kg-dry	0.17	93	75	125			
Acenaphthene		6.21	mg/kg-dry	0.17	93	75	125			
Fluorene		6.22	mg/kg-dry	0.17	93	75	125			
Phenanthrene		6.19	mg/kg-dry	0.17	93	75	125			
Anthracene		6.21	mg/kg-dry	0.17	93	75	125			
Fluoranthene		6.16	mg/kg-dry	0.17	92	75	125			
Pyrene		6.17	mg/kg-dry	0.17	93	75	125			
Benzo(a)Anthracene		6.19	mg/kg-dry	0.17	93	75	125			
Chrysene		6.21	mg/kg-dry	0.17	93	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.4	mg/kg-dry	0.17	93	75	125			
Benzo(a)Pyrene		6.20	mg/kg-dry	0.17	93	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		12.5	mg/kg-dry	0.17	94	75	125			
Benzo(g,h,I)perylene		6.26	mg/kg-dry	0.17	94	75	125			
Surr: 2-Bromonaphthalene				0.17	94	40	140			
Surr: 2-Fluorobiphenyl				0.17	92	40	140			
Surr: o-Terphenyl				0.17	92	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34740
Lab ID: LCS-34740	14	Laboratory Control Sample				Run: GC2_161013A				10/13/16 14:08
2-Methylpentane		2.60	mg/kg-dry	0.10	104	70	130			
n-Butylcyclohexane		2.85	mg/kg-dry	0.10	114	70	130			
n-Decane		2.81	mg/kg-dry	0.10	112	70	130			
n-Pentane		2.43	mg/kg-dry	0.10	97	30	130			
Methyl tert-butyl ether (MTBE)		2.44	mg/kg-dry	0.10	98	70	130			
Benzene		2.60	mg/kg-dry	0.050	104	70	130			
Toluene		2.54	mg/kg-dry	0.050	102	70	130			
Ethylbenzene		2.54	mg/kg-dry	0.050	102	70	130			
m+p-Xylenes		5.40	mg/kg-dry	0.050	108	70	130			
o-Xylene		2.68	mg/kg-dry	0.050	107	70	130			
Naphthalene		2.60	mg/kg-dry	0.10	104	70	130			
Total Purgeable Hydrocarbons		39.9	mg/kg-dry	2.0	106	70	130			
Surr: VPH Aromatics Surrogate				0.050	104	70	130			
Surr: VPH Aliphatics Surrogate				0.050	105	70	130			
Lab ID: MB-34740	14	Method Blank				Run: GC2_161013A				10/13/16 15:09
Methyl tert-butyl ether (MTBE)		ND	mg/kg-dry	0.10						
Benzene		ND	mg/kg-dry	0.050						
Toluene		ND	mg/kg-dry	0.050						
Ethylbenzene		ND	mg/kg-dry	0.050						
m+p-Xylenes		ND	mg/kg-dry	0.050						
o-Xylene		ND	mg/kg-dry	0.050						
Naphthalene		ND	mg/kg-dry	0.10						
C9 to C10 Aromatics		ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics		ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics		ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons		ND	mg/kg-dry	2.0						
Xylenes, Total		ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate				0.050	101	70	130			
Surr: VPH Aliphatics Surrogate				0.050	102	70	130			
Lab ID: H16100204-003AMS	10	Sample Matrix Spike				Run: GC2_161014A				10/14/16 21:29
Methyl tert-butyl ether (MTBE)		2.77	mg/kg-dry	0.24	92	70	130			
Benzene		3.04	mg/kg-dry	0.12	96	70	130			
Toluene		3.71	mg/kg-dry	0.12	39	70	130			S
Ethylbenzene		3.67	mg/kg-dry	0.12	57	70	130			S
m+p-Xylenes		9.24	mg/kg-dry	0.12	-3	70	130			S
o-Xylene		4.34	mg/kg-dry	0.12	13	70	130			S
Naphthalene		3.93	mg/kg-dry	0.24	33	70	130			S
Total Purgeable Hydrocarbons		148	mg/kg-dry	4.8	-232	70	130			S
Surr: VPH Aromatics Surrogate				0.12	87	70	130			
Surr: VPH Aliphatics Surrogate				0.12	91	70	130			
Lab ID: H16100204-003AMSD	10	Sample Matrix Spike Duplicate				Run: GC2_161014A				10/14/16 22:30
Methyl tert-butyl ether (MTBE)		2.95	mg/kg-dry	0.24	98	70	130	6.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34740
Lab ID: H16100204-003AMSD	10	Sample Matrix Spike Duplicate				Run: GC2_161014A			10/14/16 22:30	
Benzene		3.12	mg/kg-dry	0.12	98	70	130	2.4	20	
Toluene		3.31	mg/kg-dry	0.12	26	70	130	11	20	S
Ethylbenzene		3.26	mg/kg-dry	0.12	44	70	130	12	20	S
m+p-Xylenes		7.33	mg/kg-dry	0.12	-35	70	130	23	20	SR
o-Xylene		3.57	mg/kg-dry	0.12	-12	70	130	20	20	S
Naphthalene		3.35	mg/kg-dry	0.24	14	70	130	16	20	S
Total Purgeable Hydrocarbons		80.5	mg/kg-dry	4.8	-382	70	130	59	20	SR
Surr: VPH Aromatics Surrogate				0.12	101	70	130			
Surr: VPH Aliphatics Surrogate				0.12	104	70	130			
Method: MA-VPH										Analytical Run: R119480
Lab ID: CCV_1013GC202r-S	15	Continuing Calibration Verification Standard							10/13/16 13:24	
1,2,4-Trimethylbenzene		2.66	mg/kg-dry	0.10	106	75	125			
2,2,4-Trimethylpentane		2.66	mg/kg-dry	0.10	107	75	125			
2-Methylpentane		2.60	mg/kg-dry	0.10	104	75	125			
n-Butylcyclohexane		2.30	mg/kg-dry	0.10	92	75	125			
n-Decane		2.05	mg/kg-dry	0.10	82	75	125			
n-Pentane		2.59	mg/kg-dry	0.10	103	75	125			
Methyl tert-butyl ether (MTBE)		2.53	mg/kg-dry	0.10	101	75	125			
Benzene		2.52	mg/kg-dry	0.050	101	75	125			
Toluene		2.51	mg/kg-dry	0.050	101	75	125			
Ethylbenzene		2.47	mg/kg-dry	0.050	99	75	125			
m+p-Xylenes		5.15	mg/kg-dry	0.050	103	75	125			
o-Xylene		2.55	mg/kg-dry	0.050	102	75	125			
Naphthalene		2.56	mg/kg-dry	0.10	102	75	125			
Surr: VPH Aromatics Surrogate				0.050	88	70	130			
Surr: VPH Aliphatics Surrogate				0.050	87	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW3550C**								Batch: R119476	
Lab ID:	**H16100204-003ADUP**	Sample Duplicate				Run: EXTRACT OV 2_161013A			10/13/16 09:08	
Moisture		15.7	wt%	0.20				7.6	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M										Batch: 34734
Lab ID: MB-34734	2	Method Blank				Run: HHP2_161013A				10/13/16 13:35
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Surr: o-Terphenyl				0.17	98	40	140			
Lab ID: LCS-34734	2	Laboratory Control Sample				Run: HHP2_161013A				10/13/16 14:24
Total Extractable Hydrocarbons		230.9	mg/kg-dry	10	112	60	140			
Surr: o-Terphenyl				0.17	100	40	140			
Lab ID: H16100176-013AMS	2	Sample Matrix Spike				Run: HHP2_161013A				10/13/16 16:01
Total Extractable Hydrocarbons		285.7	mg/kg-dry	12	118	60	140			
Surr: o-Terphenyl				0.20	109	40	140			
Lab ID: H16100176-013AMSD	2	Sample Matrix Spike Duplicate				Run: HHP2_161013A				10/13/16 16:50
Total Extractable Hydrocarbons		260.9	mg/kg-dry	12	108	60	140	9.1	20	
Surr: o-Terphenyl				0.20	100	40	140			
Method: SW8015M										Analytical Run: R119459
Lab ID: CCV_1013GC404r-S	15	Continuing Calibration Verification Standard								10/13/16 11:55
n-Nonane		7.320	mg/kg-dry		110	75	125			
n-Decane		7.452	mg/kg-dry		112	75	125			
n-Dodecane		7.393	mg/kg-dry		111	75	125			
n-Tetradecane		7.615	mg/kg-dry		114	75	125			
n-Hexadecane		7.391	mg/kg-dry		111	75	125			
n-Octadecane		7.383	mg/kg-dry		111	75	125			
n-Nonadecane		7.416	mg/kg-dry		111	75	125			
n-Eicosane		7.370	mg/kg-dry		111	75	125			
n-Docosane		7.410	mg/kg-dry		111	75	125			
n-Tetracosane		7.436	mg/kg-dry		112	75	125			
n-Hexacosane		7.316	mg/kg-dry		110	75	125			
n-Octacosane		7.577	mg/kg-dry		114	75	125			
n-Triacontane		7.624	mg/kg-dry		114	75	125			
n-Hexatriacontane		6.972	mg/kg-dry		105	75	125			
Surr: o-Terphenyl				0.17	112	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103834	
Lab ID: MB-103834-34774-347	19	Method Blank				Run: SUB-B269096			10/21/16 17:23	
2-Methylnaphthalene		ND	mg/kg	0.33						
Acenaphthene		ND	mg/kg	0.33						
Acenaphthylene		ND	mg/kg	0.33						
Anthracene		ND	mg/kg	0.33						
Benzo(a)anthracene		ND	mg/kg	0.33						
Benzo(a)pyrene		ND	mg/kg	0.33						
Benzo(b)fluoranthene		ND	mg/kg	0.33						
Benzo(g,h,i)perylene		ND	mg/kg	0.33						
Benzo(k)fluoranthene		ND	mg/kg	0.33						
Chrysene		ND	mg/kg	0.33						
Dibenzo(a,h)anthracene		ND	mg/kg	0.33						
Fluoranthene		ND	mg/kg	0.33						
Fluorene		ND	mg/kg	0.33						
Indeno(1,2,3-cd)pyrene		ND	mg/kg	0.33						
Naphthalene		ND	mg/kg	0.33						
Phenanthrene		ND	mg/kg	0.33						
Pyrene		ND	mg/kg	0.33						
Surr: 2-Fluorobiphenyl				0.33	87	40	140			
Surr: o-Terphenyl				0.33	67	40	140			
Lab ID: LCS-103834	19	Laboratory Control Sample				Run: SUB-B269096			10/21/16 17:54	
2-Methylnaphthalene		4.86	mg/kg	0.33	73	40	140			
Acenaphthene		5.81	mg/kg	0.33	87	40	140			
Acenaphthylene		5.41	mg/kg	0.33	81	40	140			
Anthracene		6.13	mg/kg	0.33	92	40	140			
Benzo(a)anthracene		7.11	mg/kg	0.33	107	40	140			
Benzo(a)pyrene		6.13	mg/kg	0.33	92	40	140			
Benzo(b)fluoranthene		5.95	mg/kg	0.33	89	40	140			
Benzo(g,h,i)perylene		6.68	mg/kg	0.33	100	40	140			
Benzo(k)fluoranthene		6.60	mg/kg	0.33	99	40	140			
Chrysene		6.64	mg/kg	0.33	99	40	140			
Dibenzo(a,h)anthracene		5.69	mg/kg	0.33	85	40	140			
Fluoranthene		6.79	mg/kg	0.33	102	40	140			
Fluorene		5.90	mg/kg	0.33	88	40	140			
Indeno(1,2,3-cd)pyrene		6.64	mg/kg	0.33	100	40	140			
Naphthalene		4.28	mg/kg	0.33	64	40	140			
Phenanthrene		6.22	mg/kg	0.33	93	40	140			
Pyrene		6.55	mg/kg	0.33	98	40	140			
Surr: 2-Fluorobiphenyl				0.33	81	40	140			
Surr: o-Terphenyl				0.33	88	40	140			
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 18:55	
2-Methylnaphthalene		5.74	mg/kg-dry	0.39	73	40	140	0.0	40	
Acenaphthene		6.12	mg/kg-dry	0.39	78	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103834	
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 18:55	
Acenaphthylene		6.43	mg/kg-dry	0.39	82	40	140	0.0	40	
Anthracene		6.79	mg/kg-dry	0.39	87	40	140	0.0	40	
Benzo(a)anthracene		8.00	mg/kg-dry	0.39	102	40	140	0.0	40	
Benzo(a)pyrene		7.17	mg/kg-dry	0.39	91	40	140	0.0	40	
Benzo(b)fluoranthene		6.80	mg/kg-dry	0.39	87	40	140	0.0	40	
Benzo(g,h,i)perylene		7.41	mg/kg-dry	0.39	94	40	140	0.0	40	
Benzo(k)fluoranthene		7.51	mg/kg-dry	0.39	96	40	140	0.0	40	
Chrysene		7.68	mg/kg-dry	0.39	98	40	140	0.0	40	
Dibenzo(a,h)anthracene		6.65	mg/kg-dry	0.39	85	40	140	0.0	40	
Fluoranthene		7.55	mg/kg-dry	0.39	96	40	140	0.0	40	
Fluorene		6.82	mg/kg-dry	0.39	87	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene		7.35	mg/kg-dry	0.39	94	40	140	0.0	40	
Naphthalene		5.20	mg/kg-dry	0.39	66	40	140	0.0	40	
Phenanthrene		6.85	mg/kg-dry	0.39	87	40	140	0.0	40	
Pyrene		7.23	mg/kg-dry	0.39	92	40	140	0.0	40	
Surr: 2-Fluorobiphenyl				0.39	87	40	140			
Surr: o-Terphenyl				0.39	80	40	140			
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 19:25	
2-Methylnaphthalene		5.29	mg/kg-dry	0.39	67	40	140	8.0	40	
Acenaphthene		5.60	mg/kg-dry	0.39	71	40	140	9.0	40	
Acenaphthylene		5.91	mg/kg-dry	0.39	75	40	140	8.4	40	
Anthracene		6.20	mg/kg-dry	0.39	79	40	140	9.1	40	
Benzo(a)anthracene		7.25	mg/kg-dry	0.39	92	40	140	9.8	40	
Benzo(a)pyrene		6.39	mg/kg-dry	0.39	81	40	140	12	40	
Benzo(b)fluoranthene		6.09	mg/kg-dry	0.39	78	40	140	11	40	
Benzo(g,h,i)perylene		6.86	mg/kg-dry	0.39	87	40	140	7.7	40	
Benzo(k)fluoranthene		6.66	mg/kg-dry	0.39	85	40	140	12	40	
Chrysene		6.81	mg/kg-dry	0.39	87	40	140	12	40	
Dibenzo(a,h)anthracene		5.81	mg/kg-dry	0.39	74	40	140	13	40	
Fluoranthene		6.76	mg/kg-dry	0.39	86	40	140	11	40	
Fluorene		6.05	mg/kg-dry	0.39	77	40	140	12	40	
Indeno(1,2,3-cd)pyrene		6.56	mg/kg-dry	0.39	84	40	140	11	40	
Naphthalene		4.88	mg/kg-dry	0.39	62	40	140	6.4	40	
Phenanthrene		6.32	mg/kg-dry	0.39	81	40	140	8.1	40	
Pyrene		6.62	mg/kg-dry	0.39	84	40	140	8.8	40	
Surr: 2-Fluorobiphenyl				0.39	73	40	140			
Surr: o-Terphenyl				0.39	71	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Analytical Run: B_R269096	
Lab ID: 21-Oct-16_CCV_2	21	Continuing Calibration Verification Standard							10/21/16 12:17	
2-Methylnaphthalene		2.41	mg/kg	0.33	97	70	130			
Acenaphthene		2.37	mg/kg	0.33	95	80	120			
Acenaphthylene		2.50	mg/kg	0.33	100	70	130			
Anthracene		2.39	mg/kg	0.33	96	70	130			
Benzo(a)anthracene		2.57	mg/kg	0.33	103	70	130			
Benzo(a)pyrene		2.31	mg/kg	0.33	92	80	120			
Benzo(b)fluoranthene		2.26	mg/kg	0.33	90	70	130			
Benzo(g,h,i)perylene		2.55	mg/kg	0.33	102	70	130			
Benzo(k)fluoranthene		2.58	mg/kg	0.33	103	70	130			
Chrysene		2.50	mg/kg	0.33	100	70	130			
Dibenzo(a,h)anthracene		2.28	mg/kg	0.33	91	70	130			
Fluoranthene		2.56	mg/kg	0.33	102	80	120			
Fluorene		2.42	mg/kg	0.33	97	70	130			
Indeno(1,2,3-cd)pyrene		2.46	mg/kg	0.33	98	70	130			
Naphthalene		2.50	mg/kg	0.33	100	70	130			
Phenanthrene		2.28	mg/kg	0.33	91	70	130			
Pyrene		2.52	mg/kg	0.33	101	70	130			
Surr: 2-Fluorobiphenyl				0.33	94	70	130			
Surr: Nitrobenzene-d5				0.33	92	70	130			
Surr: o-Terphenyl				0.33	99	70	130			
Surr: Terphenyl-d14				0.33	102	70	130			

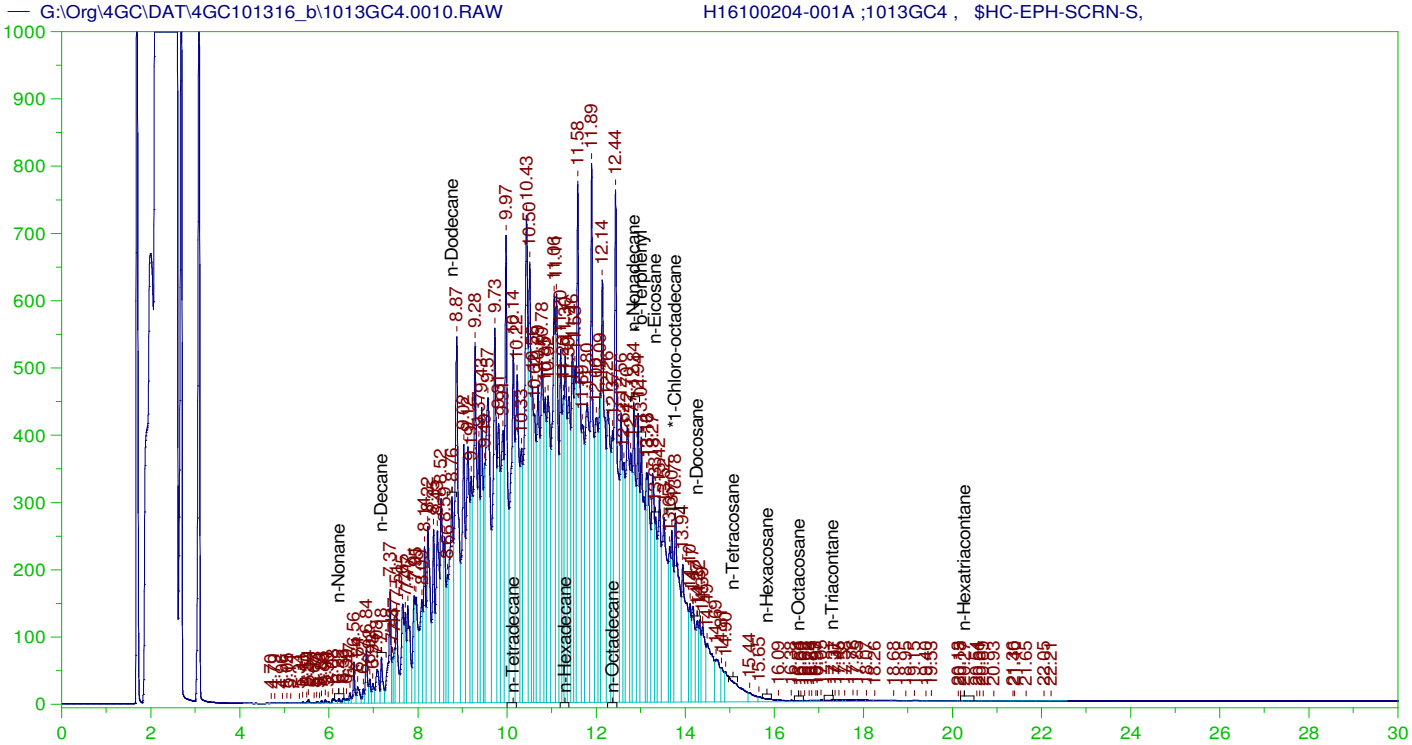
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MCMW2-105-SGRAY Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0010.RAW H16100204-001A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-001A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0010.RAW
Date & Time Acquired: 10/13/2016 5:39:03 PM
Method File: G:\Org\4GC\Methods\10131610.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.9 Dilution: 2 S.A.: 1

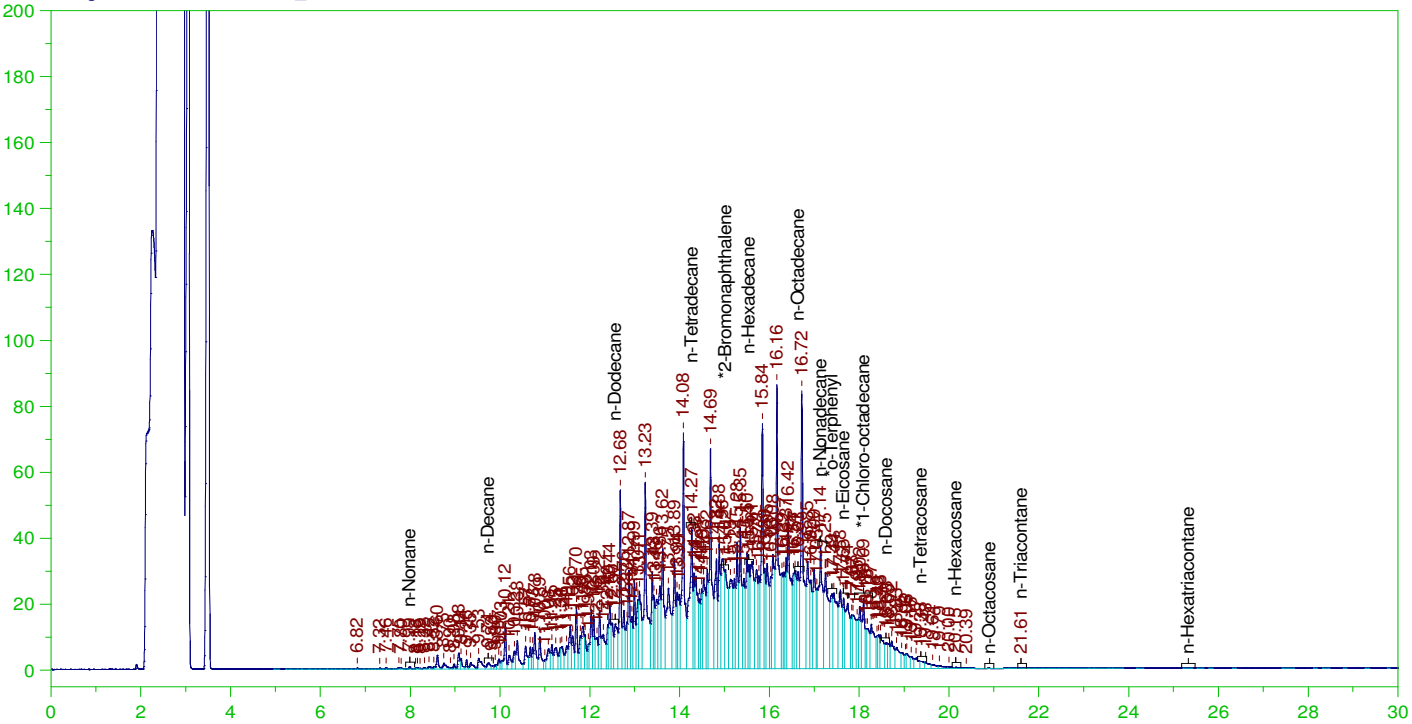
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
*o-Terphenyl	13.012	2288433	7.435	84.154	1131.87
*1-Chloro-octadecane	13.777	2005395	7.435	94.481	1270.77

DRO Area:1.40767E+08 DRO Amount: 5719.359
TEH Area:1.423295E+08 TEH Amount: 5782.843
C9-C18 Area:1.184878E+08 C9-C18 Amount: 4863.247
C19-C36 Area:2.185958E+07C19-C36 Amount: 879.2778

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0017.RAW H16100204-001A ;1018GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100204-001A ;1018GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0017.RAW
Date & Time Acquired: 10/18/2016 10:51:51 PM
Method File: G:\Org\1GC\Methods\10181617.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

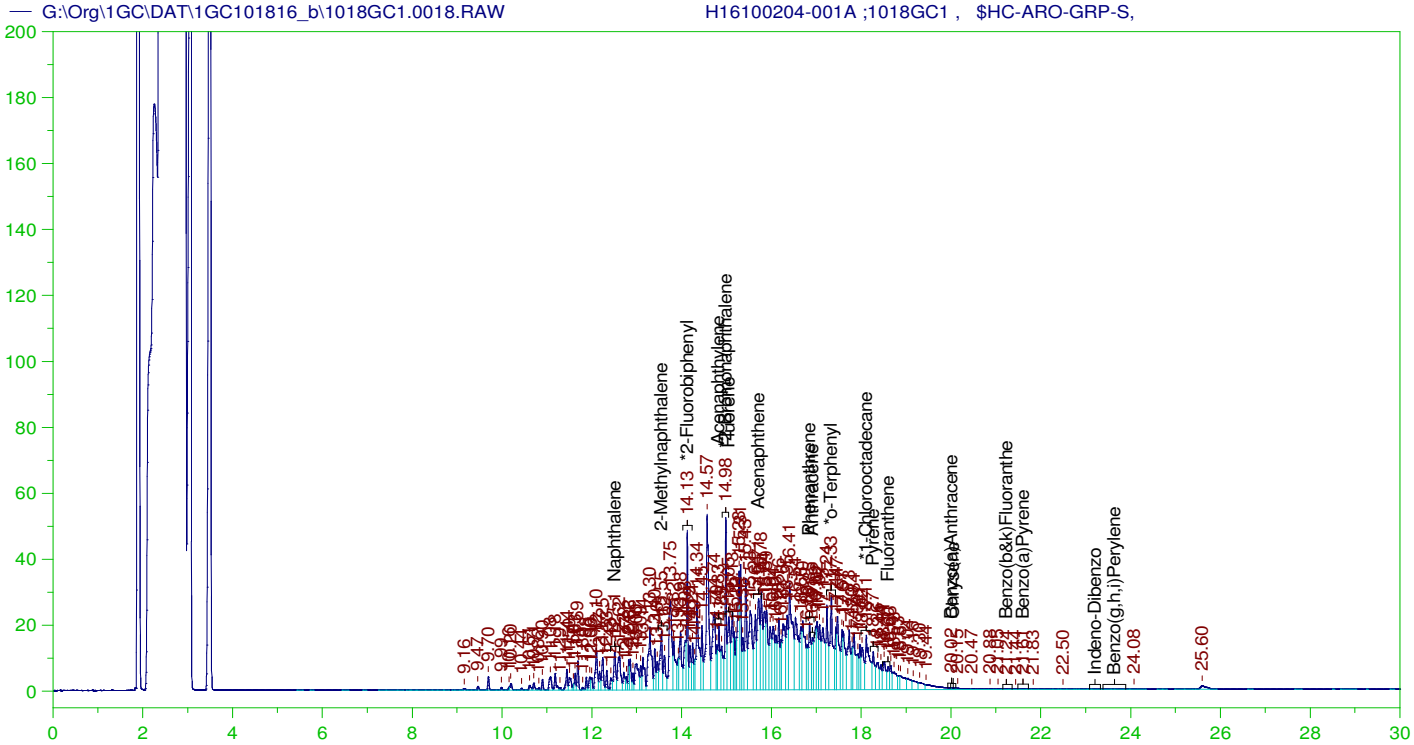
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.094	81929	7.435	32.36	435.25	-

DRO Area:9842603 DRO Amount: 3390.527
TEH Area:1.02002E+07 TEH Amount: 3513.709

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:8428599 C9-C18 Amount: 2962.865
C19-C36 Area:1762071 C19-C36 Amount: 597.9933

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW
Date & Time Acquired: 10/18/2016 11:34:10 PM
Method File: G:\Org\1GC\Methods\10181618.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

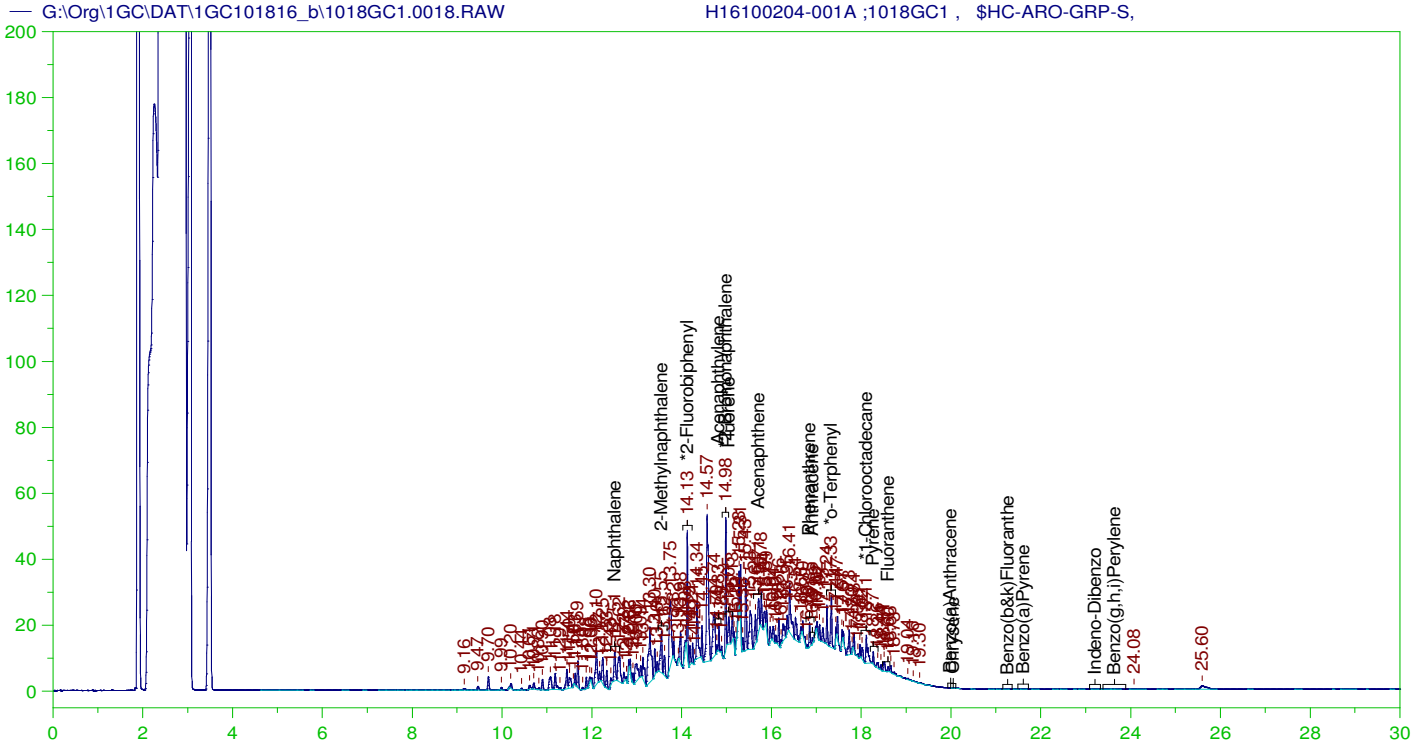
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.126	97207	7.435	32.657	439.24	-
*2-Bromonaphthalene	14.982	107127	7.435	52.311	703.58	-
*o-Terphenyl	17.33	124731	7.435	37.186	500.15	-
*1-Chlorooctadecane	18.112	106063	7.435	39.726	534.31	-

C11-C22 Aromatics Area:5005681 C11-C22 Aromatics Amount: 1509.809
EPH Aromatics total Area:5292241 EPH Aromatics Total Amount: 1596.241

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

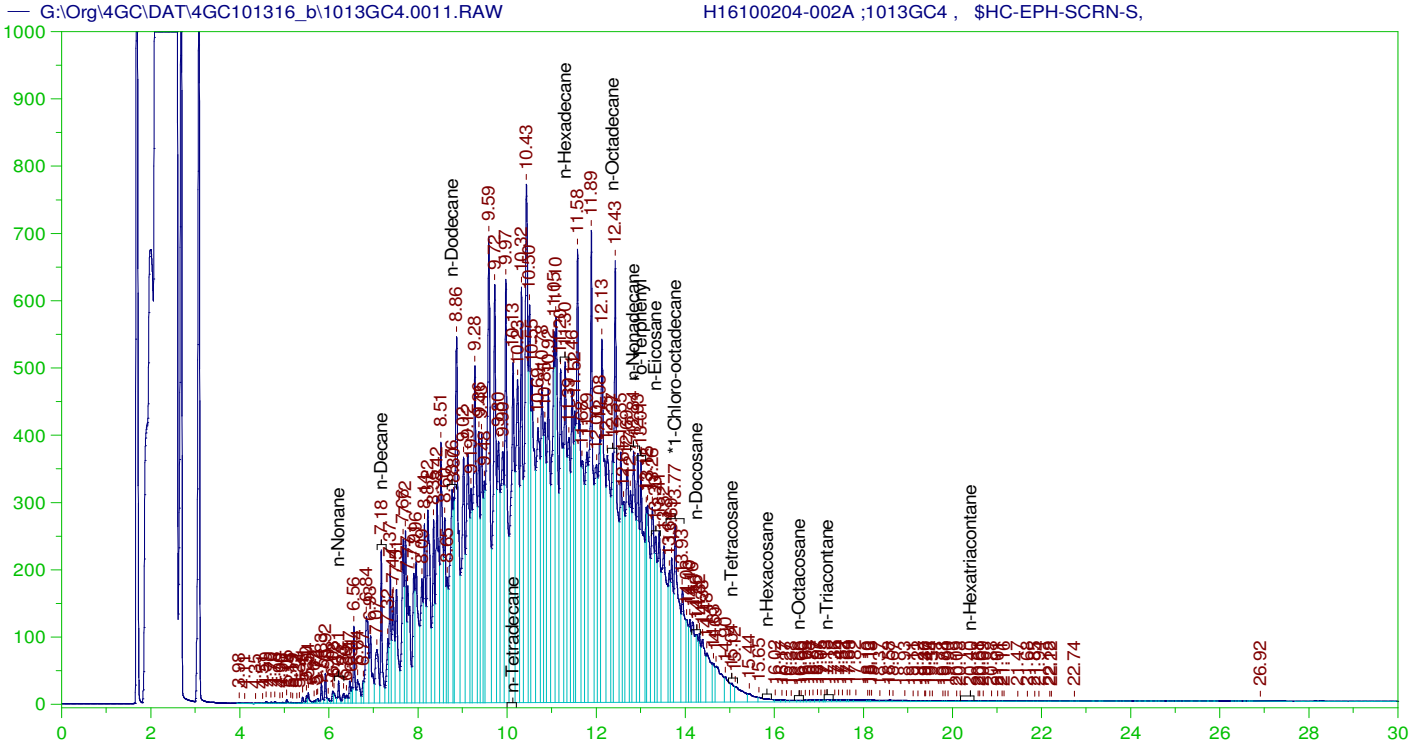
Sample Name: H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW
Date & Time Acquired: 10/18/2016 11:34:10 PM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.51	2.46	2.472	22873	7.114	
2-Methylnaphthalene	13.551	1.4	1.431	33584	10.444	
Acenaphthylene	14.828	.17	.154	10451	3.303	
Fluorene	15.052	-.07	-.07	19962	5.895	
Acenaphthene	15.712	-.71	-.731	26329	8.053	
Phenanthrene	16.852	-1.88	-1.87	12503	3.802	
Anthracene	16.91	-1.93	-1.928	2479	.746	
Pyrene	18.267	-3.31	-3.285	6427	1.914	
Fluoranthene	18.6	-3.58	-3.618	3360	.989	
Benzo(a)Anthracene	.	.	.		.297	U
Chrysene	.	.	.		.297	U
Benzo(b&k)Fluoranthe	.	.	.		.595	U
Benzo(a)Pyrene	.	.	.		.297	U
Indeno-Dibenzo	.	.	.		.595	U
Benzo(g,h,i)Perylene	.	.	.		.297	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.126	56204	7.435	18.882	253.97	40-140
*2-Bromonaphthalene	14.982	62274	7.435	30.409	409.	40-140
*o-Terphenyl	17.33	27968	7.435	8.338	112.15	40-140
*1-Chlorooctadecane	18.112	26063	7.435	9.762	131.3	40-140

OSWSA-200-SGRAY Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0011.RAW H16100204-002A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-002A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0011.RAW
Date & Time Acquired: 10/13/2016 6:27:33 PM
Method File: G:\Org\4GC\Methods\10131611.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.2 Dilution: 2 S.A.: 1

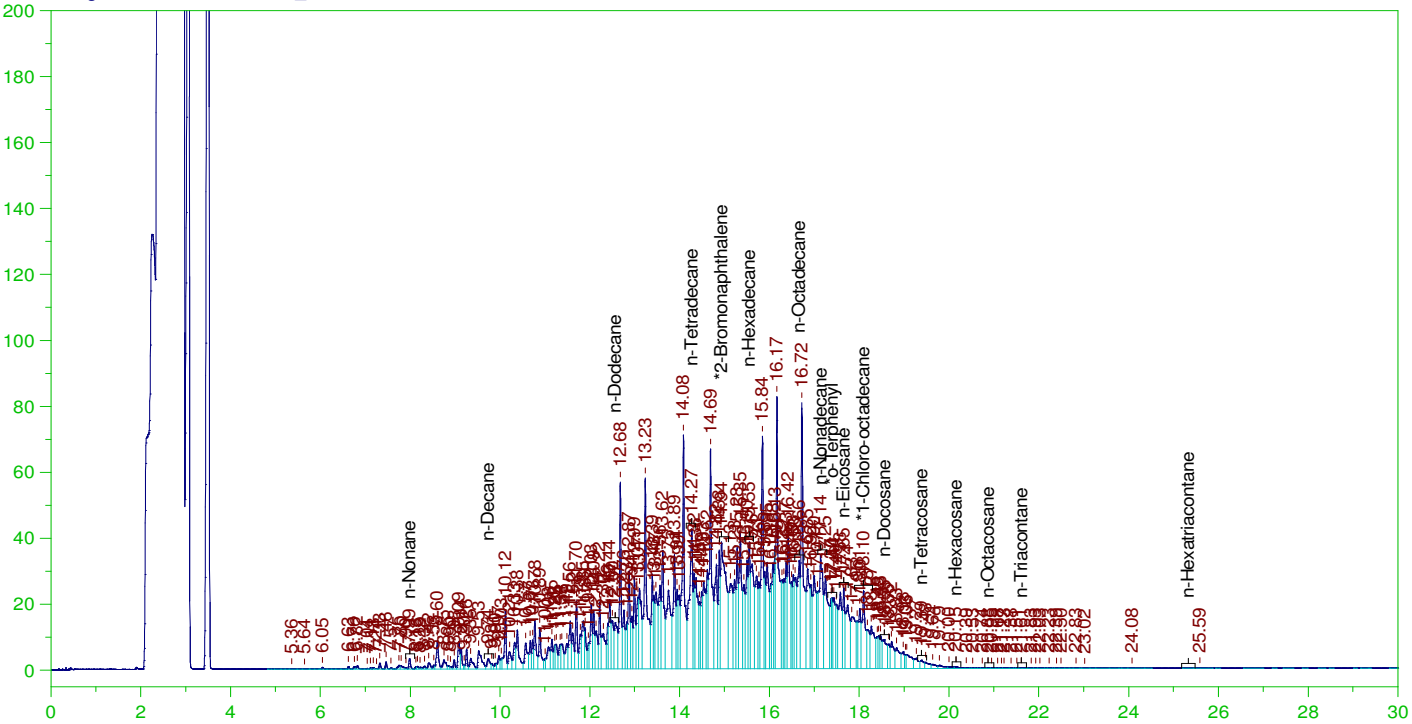
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.008	1965993	7.634	74.228	972.39	-
*1-Chloro-octadecane	13.773	1772095	7.634	85.72	1122.94	

DRO Area:1.285835E+08 DRO Amount: 5363.926
TEH Area:1.317714E+08 TEH Amount: 5496.908
C9-C18 Area:1.129518E+08 C9-C18 Amount: 4759.887
C19-C36 Area:1.682436E+07C19-C36 Amount: 694.8224

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0019.RAW H16100204-002A ;1018GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100204-002A ;1018GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0019.RAW
Date & Time Acquired: 10/19/2016 12:16:34 AM
Method File: G:\Org\1GC\Methods\10181619.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

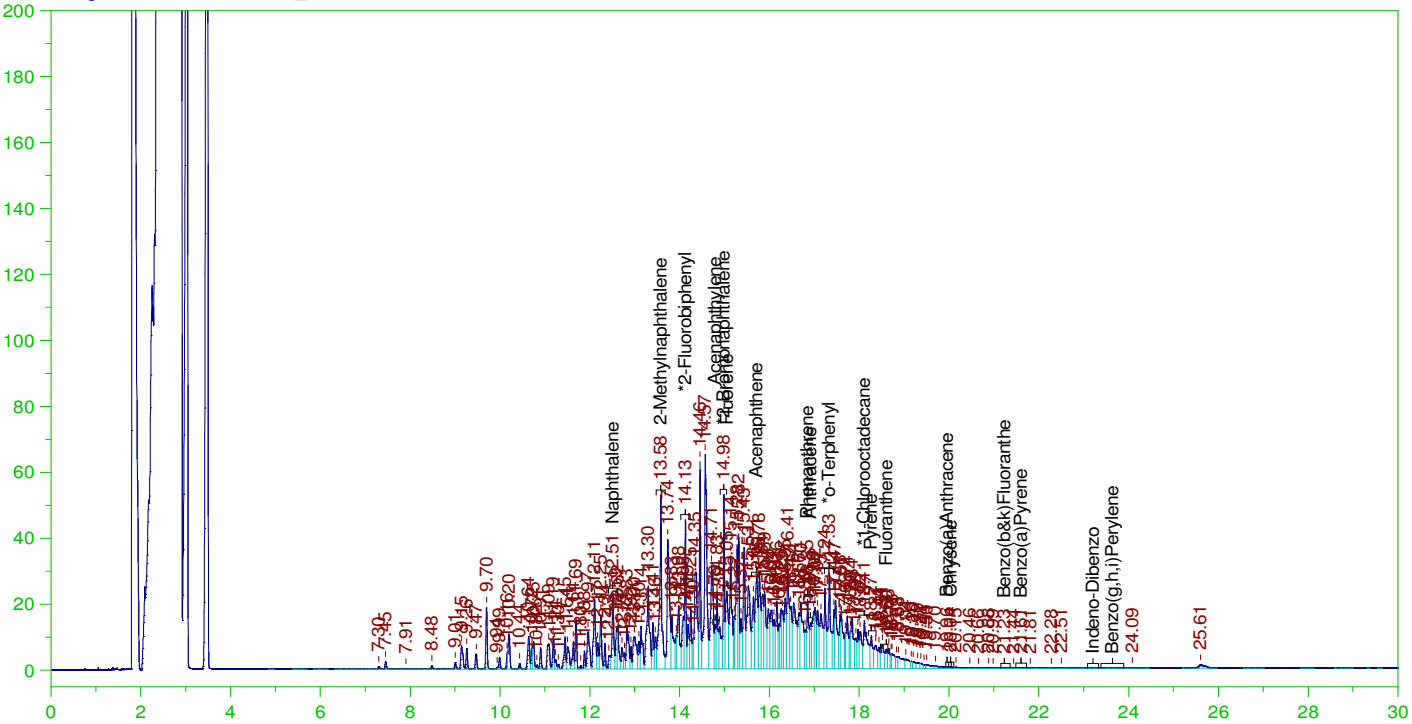
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.095	115709	7.634	35.193	461.03	-

DRO Area:9671389 DRO Amount: 2565.419
TEH Area:1.029686E+07 TEH Amount: 2731.332

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:8575465 C9-C18 Amount: 2321.274
C19-C36 Area:1680784 C19-C36 Amount: 439.2351

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW
Date & Time Acquired: 10/19/2016 12:58:55 AM
Method File: G:\Org\1GC\Methods\10181620.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

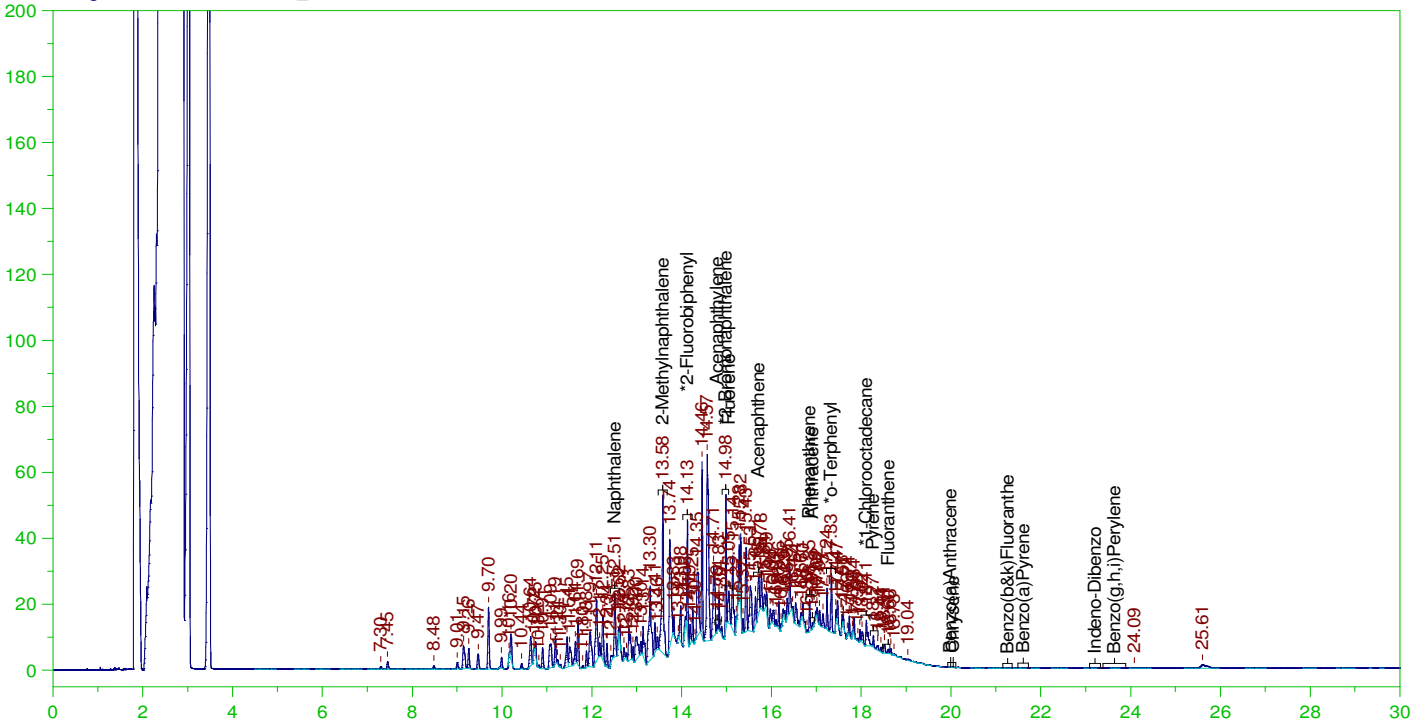
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.129	91975	7.634	23.794	311.7	-
*2-Bromonaphthalene	14.985	105994	7.634	39.855	522.1	-
*o-Terphenyl	17.332	112380	7.634	25.799	337.97	-
*1-Chlorooctadecane	18.113	93727	7.634	27.033	354.13	-

C11-C22 Aromatics Area:5141862 C11-C22 Aromatics Amount: 1194.24
EPH Aromatics total Area:5768514 EPH Aromatics Total Amount: 1339.785

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

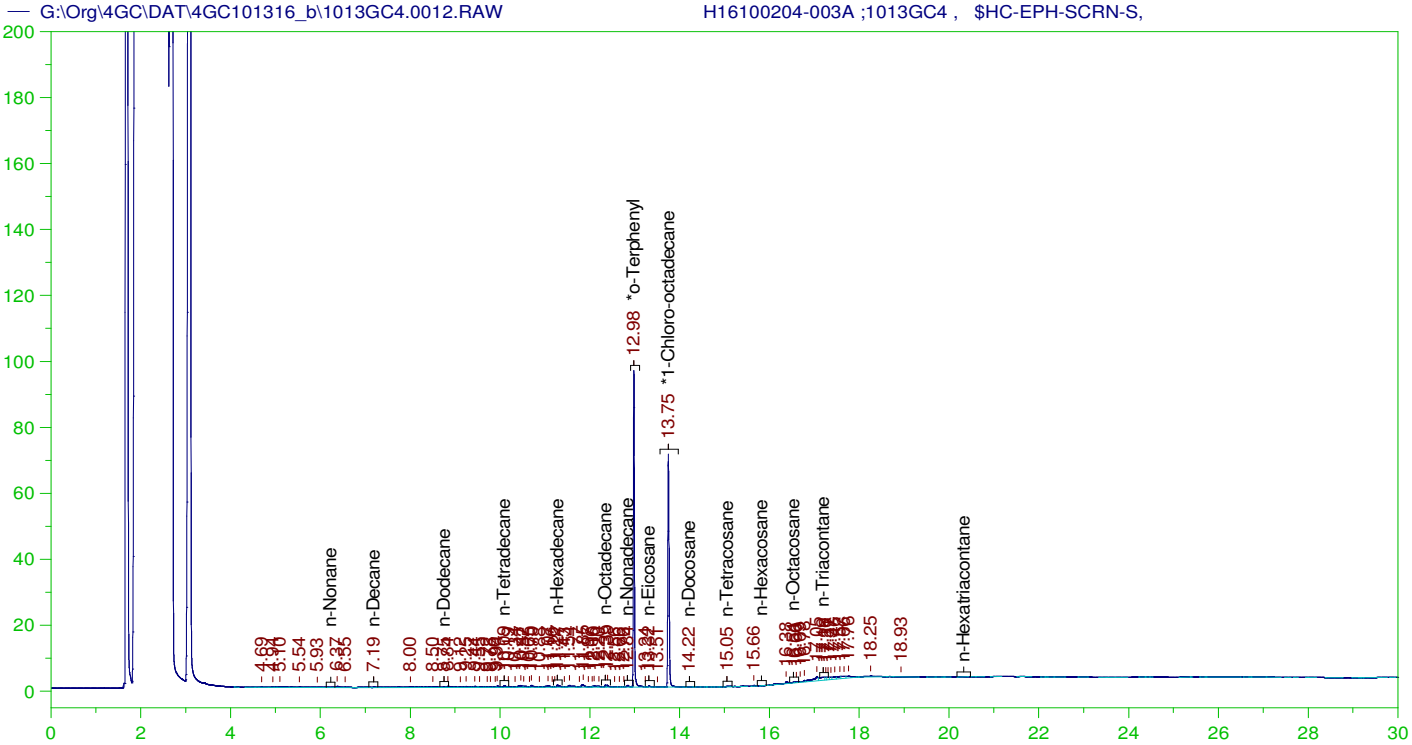
Sample Name: H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW
Date & Time Acquired: 10/19/2016 12:58:55 AM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.512	2.46	2.473	42450	10.167	
2-Methylnaphthalene	13.585	1.4	1.4	130505	31.251	
Acenaphthylene	14.792	.17	.193	2111	.514	
Fluorene	15.054	-.07	-.069	26050	5.924	
Acenaphthene	15.714	-.71	-.729	29791	7.016	
Phenanthrene	16.853	-1.88	-1.868	15362	3.597	
Anthracene	16.912	-1.93	-1.927	2450	.568	
Pyrene	18.269	-3.31	-3.284	5686	1.304	
Fluoranthene	18.604	-3.58	-3.619	2707	.614	
Benzo(a)Anthracene	.	.	.		.229	U
Chrysene	.	.	.		.229	U
Benzo(b&k)Fluoranthe	.	.	.		.458	U
Benzo(a)Pyrene	.	.	.		.229	U
Indeno-Dibenzo	.	.	.		.458	U
Benzo(g,h,i)Perylene	.	.	.		.229	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.129	51036	7.634	13.203	172.96	40-140
*2-Bromonaphthalene	14.985	62317	7.634	23.432	306.96	40-140
*o-Terphenyl	17.332	31095	7.634	7.139	93.51	40-140
*1-Chlorooctadecane	18.113	24396	7.634	7.036	92.17	40-140

OSFFT-201-BASE Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0012.RAW H16100204-003A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-003A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0012.RAW
Date & Time Acquired: 10/13/2016 7:16:05 PM
Method File: G:\Org\4GC\Methods\SR010816AB.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 25 Dilution: 2 S.A.: 1

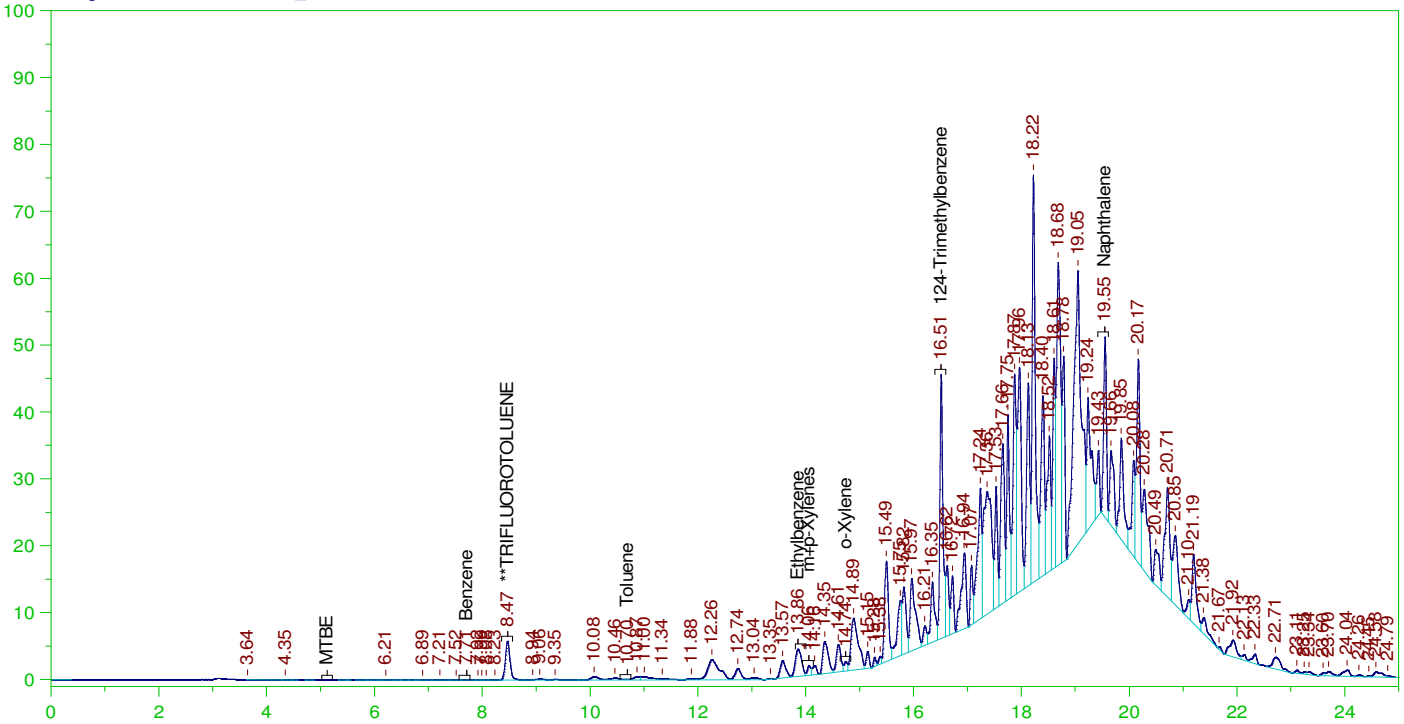
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.983	168479	8.	6.666	83.33	-
*1-Chloro-octadecane	13.752	132739	8.	6.729	84.11	-

DRO Area:100749.5 DRO Amount: 4.404552
TEH Area:139731.2 TEH Amount: 6.108745
C9-C18 Area:66677.31 C9-C18 Amount: 2.944714
C19-C36 Area:61896.22 C19-C36 Amount: 2.678926

MCMW2-105-SGRAY Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW H16100204-001A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

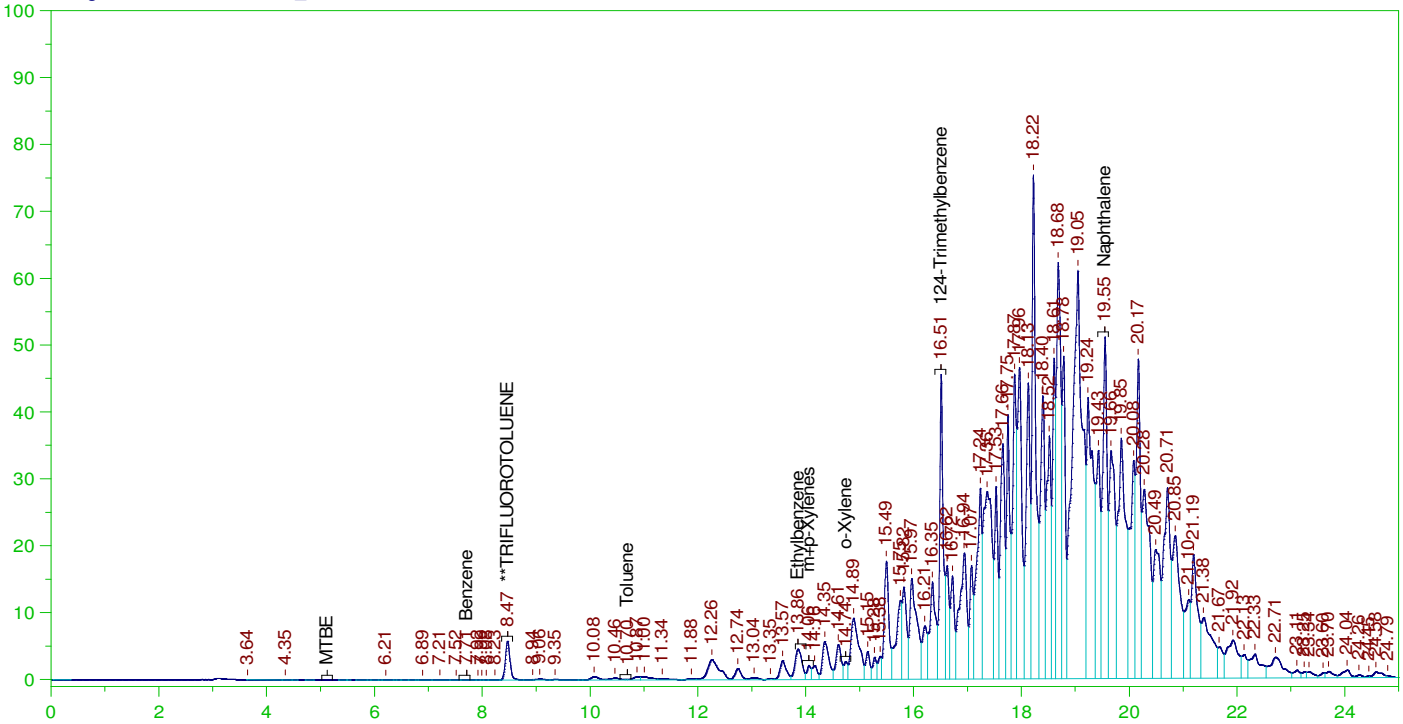
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:3249777 C9-C10 Aromatics Amount: 118.368

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.714	7.714	7.714	294	.056	U
Toluene	10.695	10.695	10.695	227	.056	U
Ethylbenzene	13.859	-5.449	-5.389	34036	1.017	
m+p-Xylenes	14.058	-5.579	-5.588	6814	.184	
o-Xylene	14.742	-6.279	-6.272	6161	.192	
124-Trimethylbenzene	16.511	-8.037	-8.041	159877	7.009	
Naphthalene	19.55	-11.056	-11.08	103911	7.301	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.47	35986	2.775	2.526	91.04

MCMW2-105-SGRAY Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW H16100204-001A ;1013GC2 , $HC-VPH-MA-S,



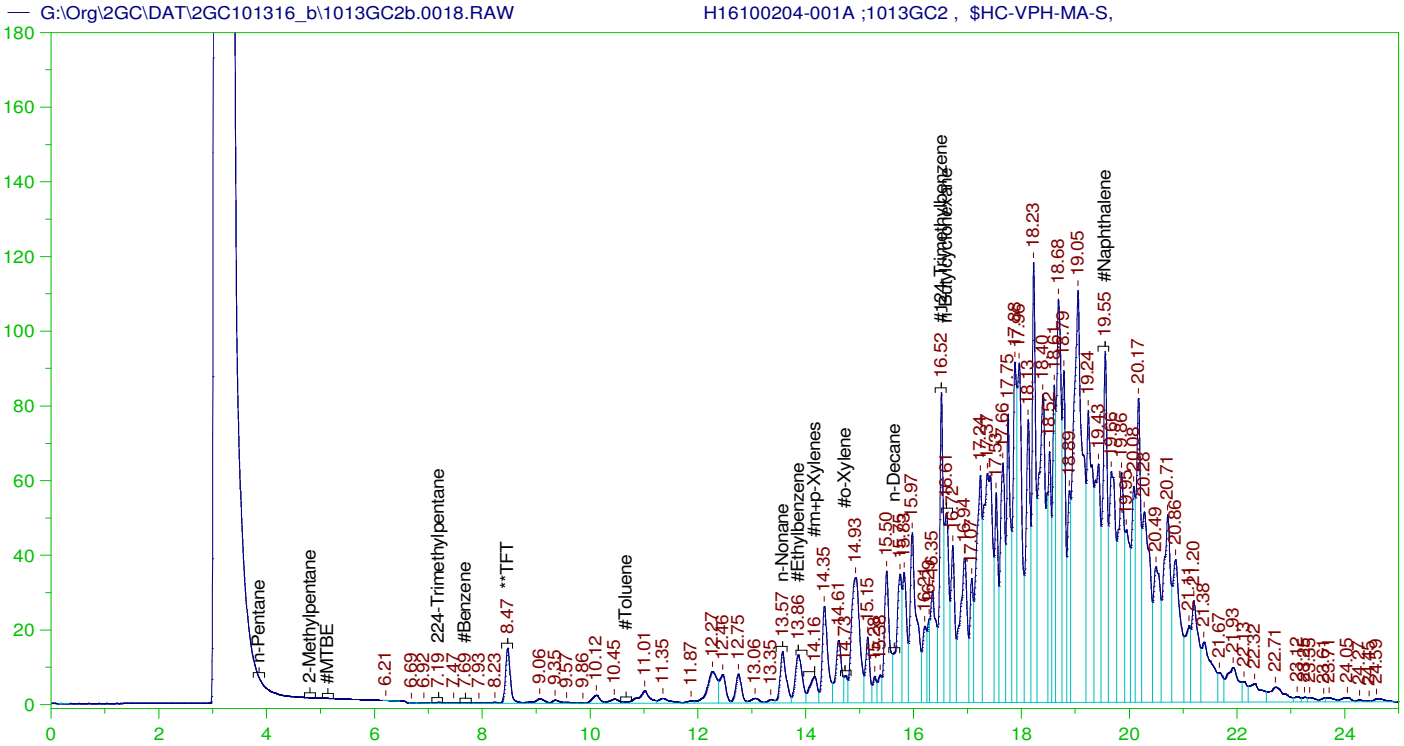
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:5863996 C9-C10 Aromatics Amount: 213.5868

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.714	7.714	7.714	294	.056	U
Toluene	10.695	10.695	10.695	227	.056	U
Ethylbenzene	13.859	-5.449	-5.389	41707	1.247	
m+p-Xylenes	14.058	-5.579	-5.588	10921	.295	
o-Xylene	14.742	-6.279	-6.272	12659	.394	
124-Trimethylbenzene	16.511	-8.037	-8.041	212239	9.305	
Naphthalene	19.55	-11.056	-11.08	301940	21.214	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.47	35986	2.775	2.526	91.04



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

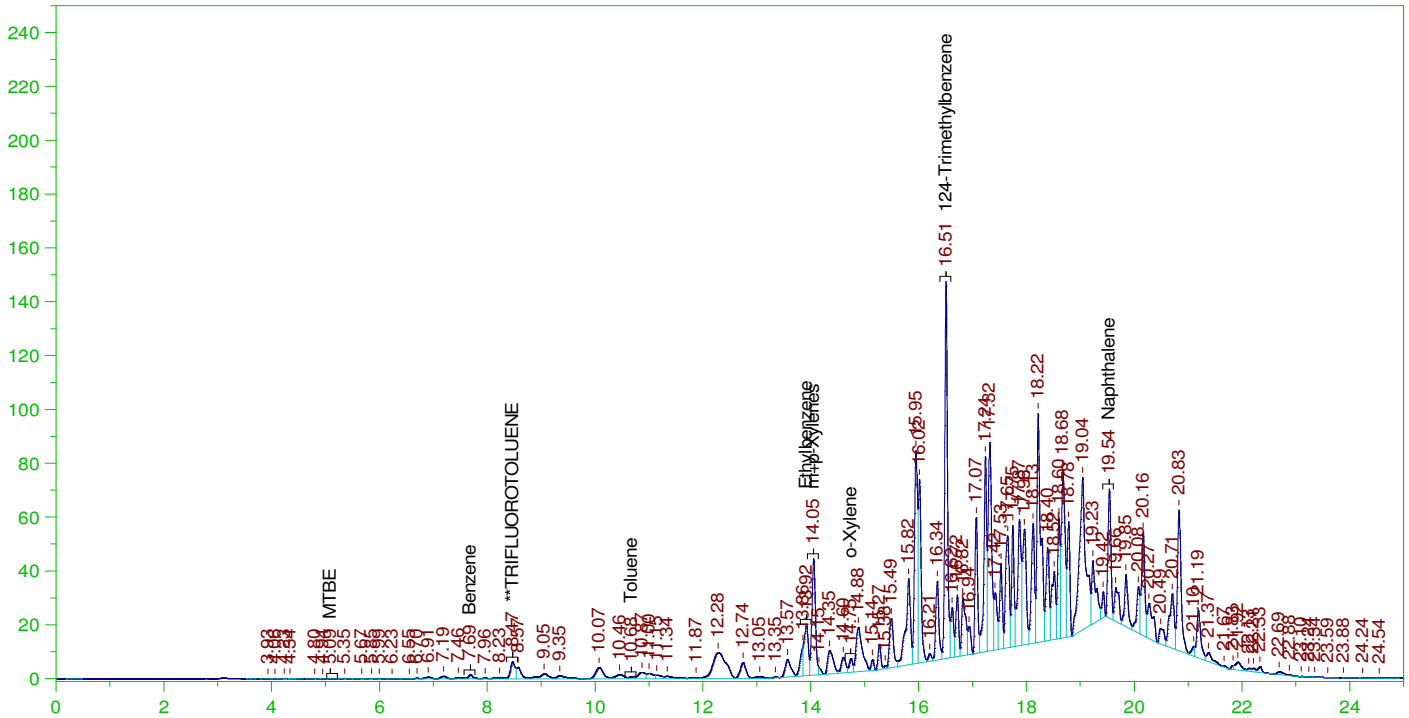
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.473	92131	2.775	2.662	95.94	-

GRO Area:1806650 GRO Amount: 45.70119
TPH Area:1.87955E+07 TPH Amount: 475.4528

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:382747.4 C5-C8 Amount: 8.597202
C9-C12 Area:1.269559E+07 C9-C12 Amount: 546.369

OSWSA-200-SGRAY Batch ID: 34740

G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW H16100204-002A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

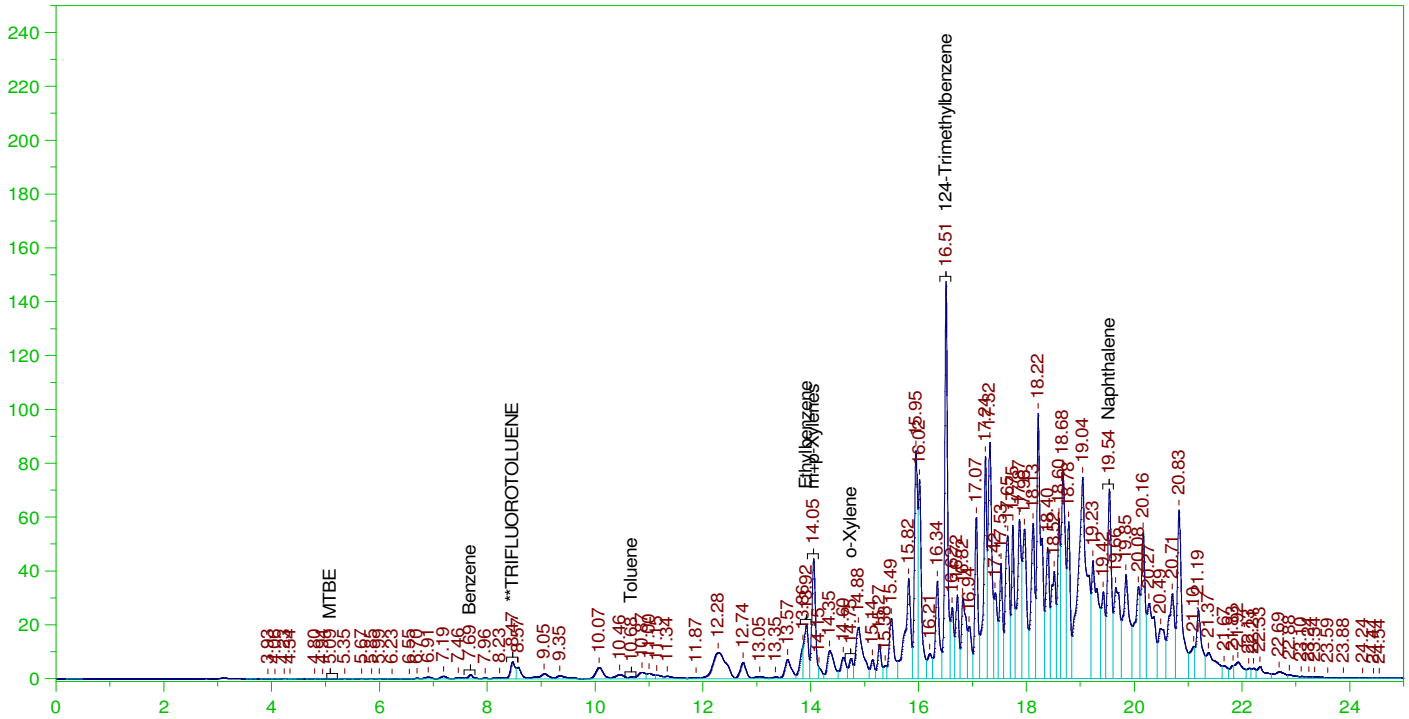
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:5879897 C9-C10 Aromatics Amount: 221.8837

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.093	5.093	5.093	438	.115	U
Benzene	7.687	.789	.784	9057	.208	
Toluene	10.675	-2.196	-2.204	3797	.104	
Ethylbenzene	13.919	-5.449	-5.448	101544	3.145	
m+p-Xylenes	14.053	-5.579	-5.582	202210	5.661	
o-Xylene	14.746	-6.279	-6.275	22921	.74	
124-Trimethylbenzene	16.509	-8.037	-8.038	504936	22.935	
Naphthalene	19.536	-11.056	-11.065	187630	13.658	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.471	38819	2.875	2.823	98.21

OSWSA-200-SGRAY Batch ID: 34740

G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW H16100204-002A ;1013GC2 , $HC-VPH-MA-S,



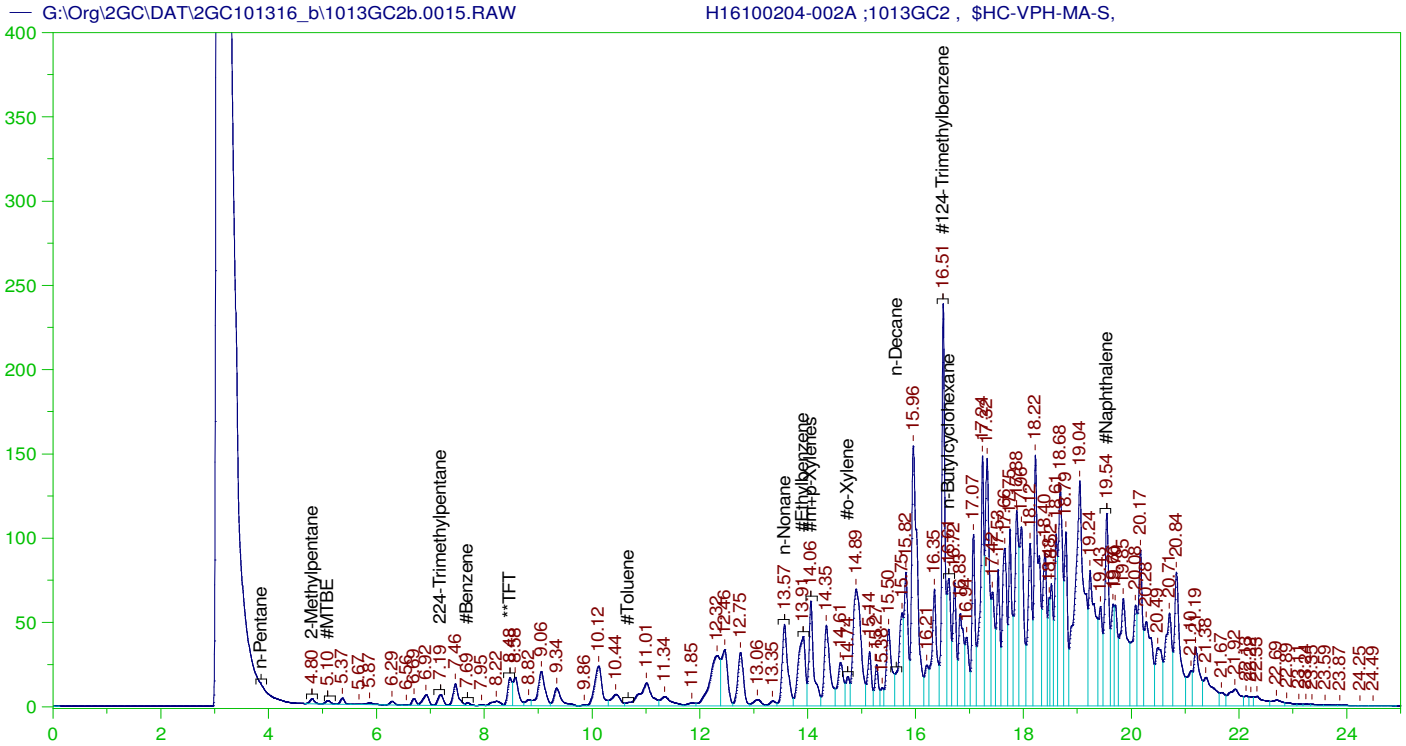
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:8570609 C9-C10 Aromatics Amount: 323.4203

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.093	5.093	5.093	438	.115	U
Benzene	7.687	.789	.784	9057	.208	
Toluene	10.675	-2.196	-2.204	3965	.108	
Ethylbenzene	13.919	-5.449	-5.448	109129	3.38	
m+p-Xylenes	14.053	-5.579	-5.582	214443	6.003	
o-Xylene	14.746	-6.279	-6.275	37911	1.224	
124-Trimethylbenzene	16.509	-8.037	-8.038	571146	25.943	E
Naphthalene	19.536	-11.056	-11.065	375963	27.367	E

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.471	38819	2.875	2.823	98.21



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

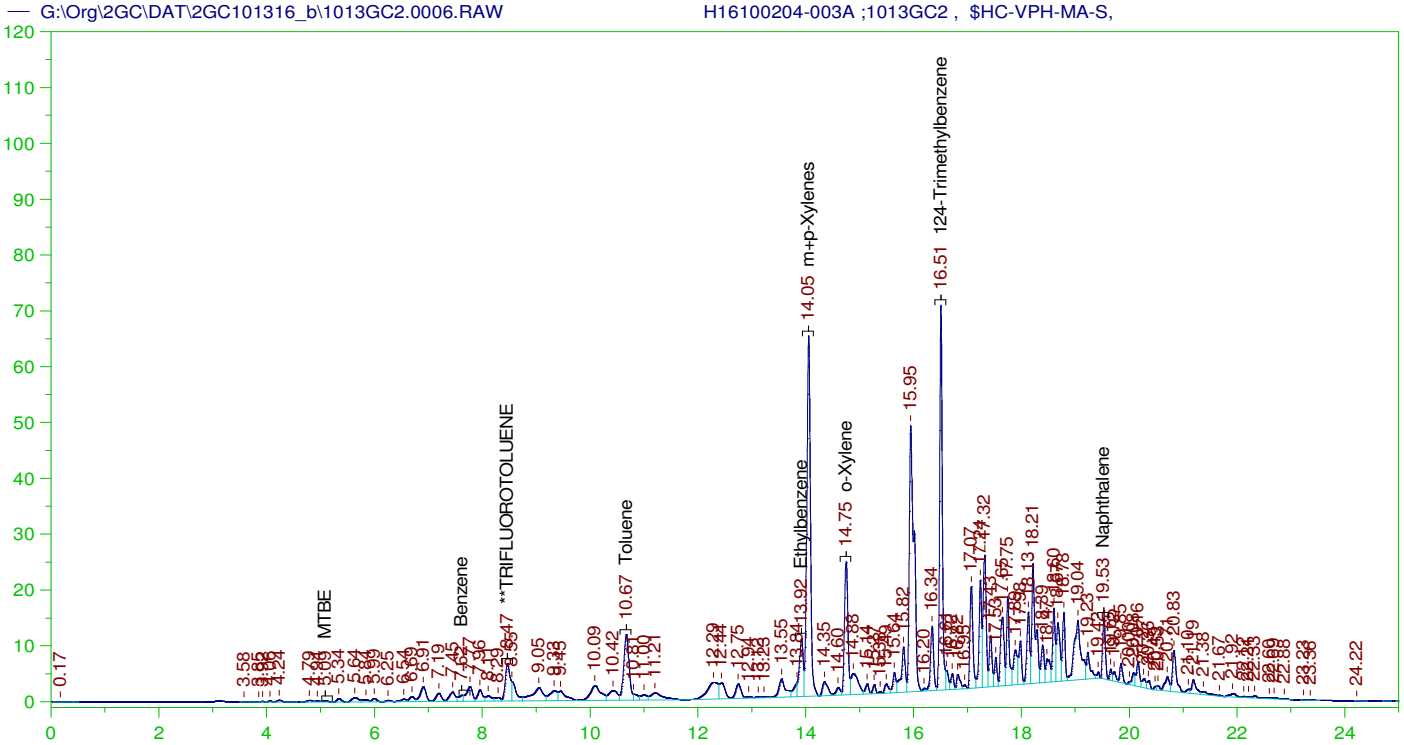
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.477	92673	2.875	2.775	96.5	-

GRO Area:5482874 GRO Amount: 143.6933
TPH Area:2.669071E+07 TPH Amount: 699.5012

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2349487 C5-C8 Amount: 54.6755
C9-C12 Area:1.861134E+07 C9-C12 Amount: 829.8233

OSFFT-201-BASE Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW H16100204-003A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

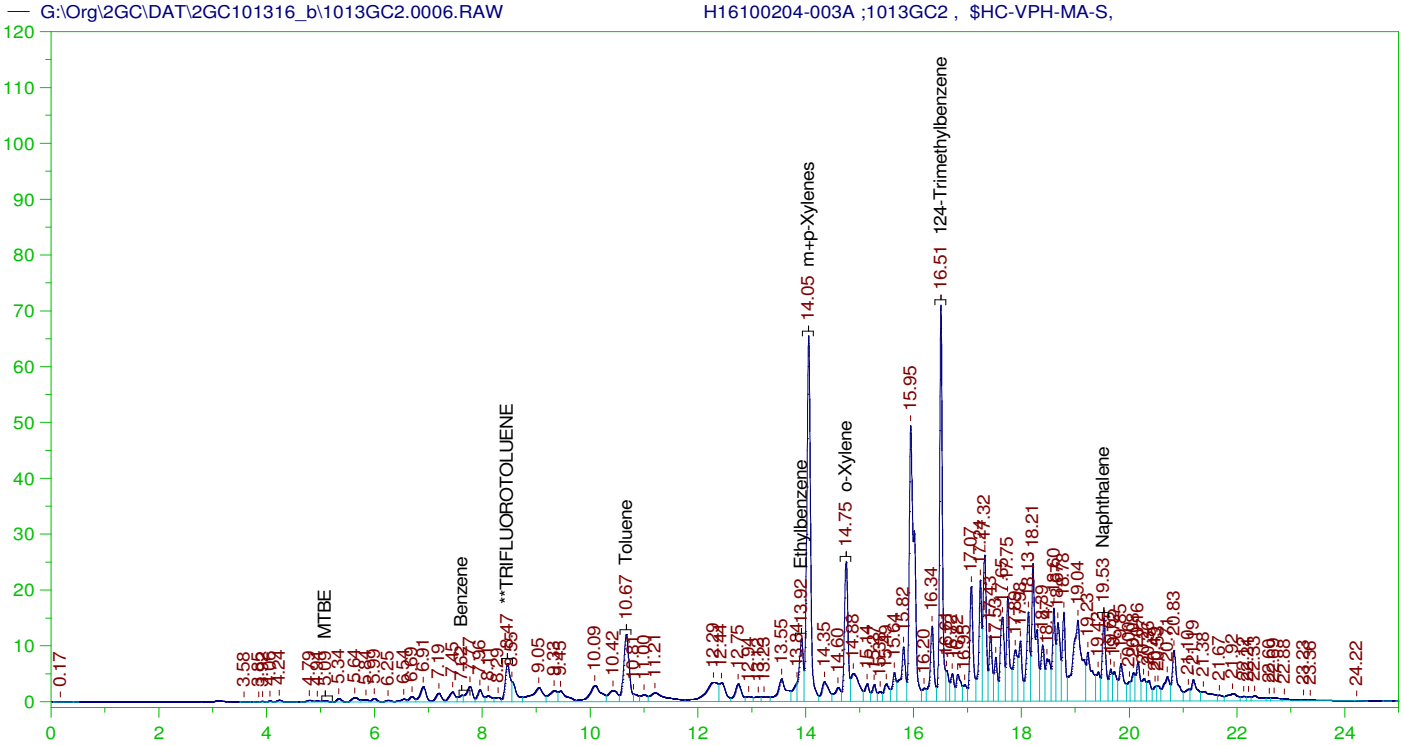
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1646327 C9-C10 Aromatics Amount: 65.36711

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.089	3.34	3.38	1659	.135	
Benzene	7.62	.789	.848	6350	.154	
Toluene	10.673	-2.196	-2.204	83370	2.399	
Ethylbenzene	13.921	-5.449	-5.452	52590	1.714	
m+p-Xylenes	14.053	-5.579	-5.584	303156	8.929	
o-Xylene	14.749	-6.279	-6.28	103664	3.52	
124-Trimethylbenzene	16.506	-8.037	-8.038	241896	11.561	
Naphthalene	19.527	-11.056	-11.059	38363	2.938	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.469	43615	3.025	3.338	110.34

OSFFT-201-BASE Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW H16100204-003A ;1013GC2 , $HC-VPH-MA-S,



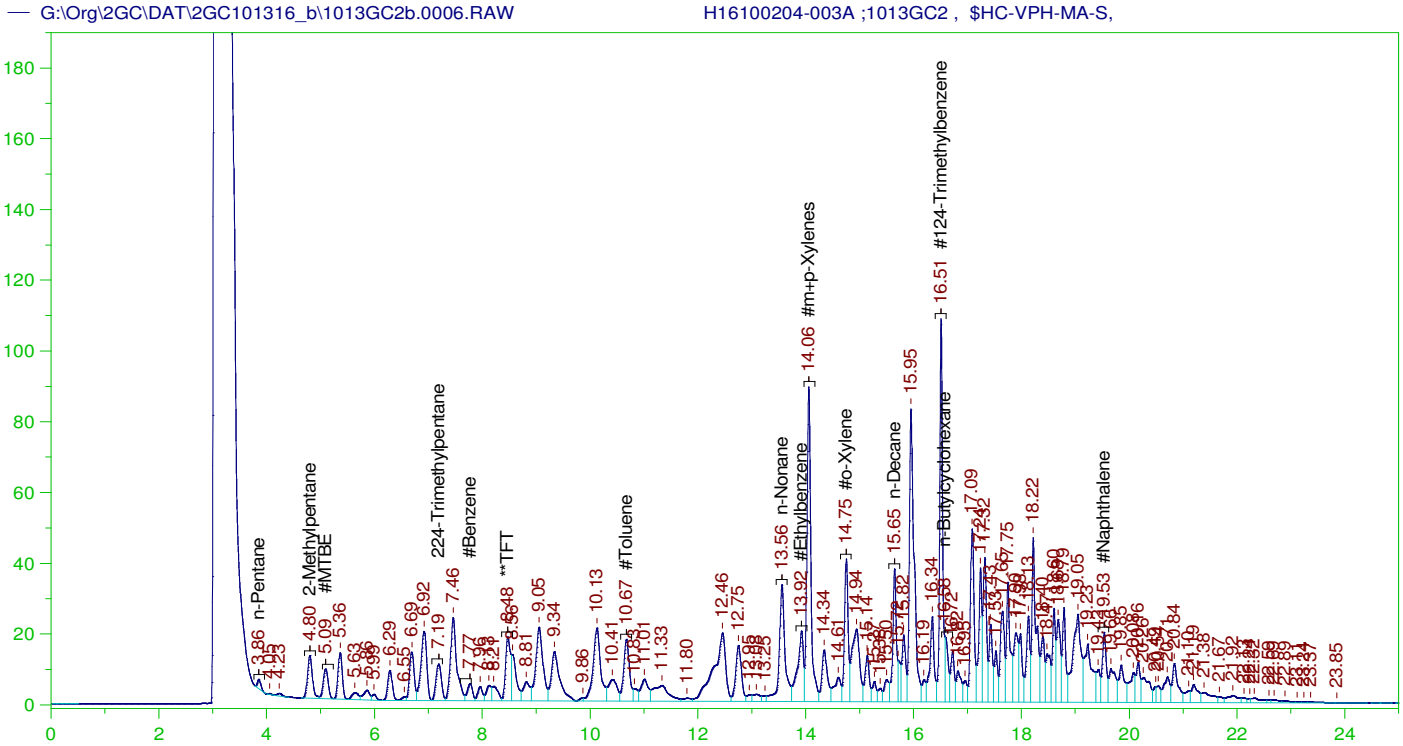
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2323195 C9-C10 Aromatics Amount: 92.24203

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.089	3.34	3.38	1678	~~.137~~	<0.2 tjb 10/14/16
Benzene	7.62	.789	.848	7099	.172	
Toluene	10.673	-2.196	-2.204	87615	2.521	
Ethylbenzene	13.921	-5.449	-5.452	59859	1.951	
m+p-Xylenes	14.053	-5.579	-5.584	319368	9.407	
o-Xylene	14.749	-6.279	-6.28	116044	3.941	
124-Trimethylbenzene	16.506	-8.037	-8.038	262092	12.526	
Naphthalene	19.527	-11.056	-11.059	72064	5.519	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.469	45393	3.025	3.474	114.84



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.475	114539	3.025	3.608	119.28	-

GRO Area:4281891 GRO Amount: 118.0733
TPH Area:9150031 TPH Amount: 252.3124

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2485411 C5-C8 Amount: 60.85629
C9-C12 Area:5775926 C9-C12 Amount: 270.9675

Work Order Receipt Checklist

Hydrometrics Inc

H16100204

Login completed by: Tracy L. Lorash

Date Received: 10/12/2016

Reviewed by: BL2000\rwilliams

Received by: TLL

Reviewed Date: 10/13/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.1°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

HL6100204

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: *(Signature)* JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH	VPH							REMARKS
10/10/16	0840	X		MCMW2-105-SGRAY	02									X	X							~~Normal Turnaround~~
10/11/16	0950	X		OSWSA-200-SGRAY	02									X	X							5-Day Rush
10/12/16	1050	X		OSFFT-201-BASE	02									X	X							48-Hour RUSH

Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell				HLN10286	Other hand-deliver Air Bill #
Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Remarks Please forward results to: Jamie Poell, Hydrometrics 3020 Bozeman Avenue Helena, Montana 59601 email: jpoell@hydrometrics.com		
	10/12/16 16:03				
Relinquished *(Signature)*	Date / Time	Received for Laboratory by *(Signature)*	Date / Time	Enclosed: ☐ Parameter sheet w/detection limits ☐ QA / AC standard mixing instructions ☒ Cover letter ☐ Other	
			10/12/16 16:03		

3.1° on ice hand del.

Split Samples: ☐ Accepted ☐ Declined

HFORM-1 07/11

Return results & electronic copy to:

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 12, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples

Enclosed are three soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
  - If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150, Ext. 154.

Sincerely,

James Poell
Environmental Scientist

Enclosures

Analysis Schedule:

Sample	Lab Analysis Schedule
MCMW2-105-SGRAY	Normal Turnaround
OSWSA-200-SGRAY	5-Day RUSH
OSFFT-201-BASE	48-Hour RUSH

H:\Files\MTDEQ\16048\I16 Lab Cover - Soils.doc\HLN\9/29/2016\034

9/29/2016 11:20 AM

APPENDIX H

OLD SHOP AREA
EXCAVATED SOIL ANALYTICAL RESULTS

ANALYTICAL SUMMARY REPORT

October 24, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100204 Quote ID: H1313 - EPH/VPH

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 3 samples for Hydrometrics Inc on 10/12/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100204-001	MCMW2-105-SGRAY	10/10/16 8:40	10/12/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100204-002	OSWSA-200-SGRAY	10/11/16 9:50	10/12/16	Soil	Same As Above
H16100204-003	OSFFT-201-BASE	10/12/16 10:50	10/12/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100204

Report Date: 10/24/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-001
Client Sample ID: MCMW2-105-SGRAY

Report Date: 10/24/16
Collection Date: 10/10/16 08:40
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.2	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/13/16 22:02 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/13/16 22:02 / tjb
Toluene	ND	mg/kg-dry		0.056	10	MA-VPH	10/13/16 22:02 / tjb
Ethylbenzene	1.2	mg/kg-dry		0.056	10	MA-VPH	10/13/16 22:02 / tjb
m+p-Xylenes	0.30	mg/kg-dry		0.056		MA-VPH	10/13/16 22:02 / tjb
o-Xylene	0.39	mg/kg-dry		0.056		MA-VPH	10/13/16 22:02 / tjb
Xylenes, Total	0.69	mg/kg-dry		0.056	30	MA-VPH	10/13/16 22:02 / tjb
Naphthalene	7.3	mg/kg-dry		0.11	9	MA-VPH	10/13/16 22:02 / tjb
C9 to C10 Aromatics	214	mg/kg-dry	*	2.2	100	MA-VPH	10/13/16 22:02 / tjb
C5 to C8 Aliphatics	8.6	mg/kg-dry		2.2	40	MA-VPH	10/13/16 22:02 / tjb
C9 to C12 Aliphatics	331	mg/kg-dry	*	2.2	90	MA-VPH	10/13/16 22:02 / tjb
Total Purgeable Hydrocarbons	475	mg/kg-dry	*	2.2	100	MA-VPH	10/13/16 22:02 / tjb
Surr: VPH Aromatics Surrogate	91.0	%REC		70-130		MA-VPH	10/13/16 22:02 / tjb
Surr: VPH Aliphatics Surrogate	96.0	%REC		70-130		MA-VPH	10/13/16 22:02 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	5780	mg/kg-dry	*	11	200	SW8015M	10/13/16 17:39 / JRS
Surr: o-Terphenyl	95.0	%REC		40-140		SW8015M	10/13/16 17:39 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	2960	mg/kg-dry	*	45	200	MA-EPH	10/18/16 22:51 / JRS
C19 to C36 Aliphatics	598	mg/kg-dry		45	20000	MA-EPH	10/18/16 22:51 / JRS
Surr: 1-Chloro-octadecane	81.0	%REC		40-140		MA-EPH	10/18/16 22:51 / JRS
C11 to C22 Aromatics	1510	mg/kg-dry	*	45	400	MA-EPH	10/18/16 23:34 / JRS
Total Extractable Hydrocarbons	5110	mg/kg-dry		45		MA-EPH	10/18/16 23:34 / JRS
Surr: 2-Bromonaphthalene	102	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS
Surr: 2-Fluorobiphenyl	64.0	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS
Surr: o-Terphenyl	112	%REC		40-140		MA-EPH	10/18/16 23:34 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Acenaphthene	0.96	mg/kg-dry	J	1.5	200	SW8270C	10/21/16 14:50 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-001
Client Sample ID: MCMW2-105-SGRAY

Report Date: 10/24/16
Collection Date: 10/10/16 08:40
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		1.5	2000	SW8270C	10/21/16 14:50 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.5	0.02	SW8270C	10/21/16 14:50 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.5	2	SW8270C	10/21/16 14:50 / eli-b
Chrysene	ND	mg/kg-dry		1.5	20	SW8270C	10/21/16 14:50 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.5	0.02	SW8270C	10/21/16 14:50 / eli-b
Fluoranthene	ND	mg/kg-dry		1.5	300	SW8270C	10/21/16 14:50 / eli-b
Fluorene	2.7	mg/kg-dry		1.5	300	SW8270C	10/21/16 14:50 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.5	0.2	SW8270C	10/21/16 14:50 / eli-b
Naphthalene	0.92	mg/kg-dry	J	1.5	4	SW8270C	10/21/16 14:50 / eli-b
Phenanthrene	4.0	mg/kg-dry		1.5		SW8270C	10/21/16 14:50 / eli-b
Pyrene	ND	mg/kg-dry		1.5	200	SW8270C	10/21/16 14:50 / eli-b
Surr: 2-Fluorobiphenyl	81.0	%REC		40-140		SW8270C	10/21/16 14:50 / eli-b
Surr: o-Terphenyl	83.0	%REC		40-140		SW8270C	10/21/16 14:50 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-002
Client Sample ID: OSWSA-200-SGRAY

Report Date: 10/24/16
Collection Date: 10/11/16 09:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	13.1	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.12	0.08	MA-VPH	10/13/16 20:29 / tjb
Benzene	0.21	mg/kg-dry	*	0.058	0.04	MA-VPH	10/13/16 20:29 / tjb
Toluene	0.11	mg/kg-dry		0.058	10	MA-VPH	10/13/16 20:29 / tjb
Ethylbenzene	3.4	mg/kg-dry		0.058	10	MA-VPH	10/13/16 20:29 / tjb
m+p-Xylenes	6.0	mg/kg-dry		0.058		MA-VPH	10/13/16 20:29 / tjb
o-Xylene	1.2	mg/kg-dry		0.058		MA-VPH	10/13/16 20:29 / tjb
Xylenes, Total	7.2	mg/kg-dry		0.058	30	MA-VPH	10/13/16 20:29 / tjb
Naphthalene	14	mg/kg-dry	*	0.12	9	MA-VPH	10/13/16 20:29 / tjb
C9 to C10 Aromatics	323	mg/kg-dry	*	2.3	100	MA-VPH	10/13/16 20:29 / tjb
C5 to C8 Aliphatics	54	mg/kg-dry	*	2.3	40	MA-VPH	10/13/16 20:29 / tjb
C9 to C12 Aliphatics	496	mg/kg-dry	*	2.3	90	MA-VPH	10/13/16 20:29 / tjb
Total Purgeable Hydrocarbons	700	mg/kg-dry	*	2.3	100	MA-VPH	10/13/16 20:29 / tjb
Surr: VPH Aromatics Surrogate	98.0	%REC		70-130		MA-VPH	10/13/16 20:29 / tjb
Surr: VPH Aliphatics Surrogate	97.0	%REC		70-130		MA-VPH	10/13/16 20:29 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	5500	mg/kg-dry	*	11	200	SW8015M	10/13/16 18:27 / JRS
Surr: o-Terphenyl	96.0	%REC		40-140		SW8015M	10/13/16 18:27 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	2320	mg/kg-dry	*	34	200	MA-EPH	10/19/16 00:16 / JRS
C19 to C36 Aliphatics	439	mg/kg-dry		34	20000	MA-EPH	10/19/16 00:16 / JRS
Surr: 1-Chloro-octadecane	94.0	%REC		40-140		MA-EPH	10/19/16 00:16 / JRS
C11 to C22 Aromatics	1190	mg/kg-dry	*	34	400	MA-EPH	10/19/16 00:58 / JRS
Total Extractable Hydrocarbons	4070	mg/kg-dry		34		MA-EPH	10/19/16 00:58 / JRS
Surr: 2-Bromonaphthalene	102	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS
Surr: 2-Fluorobiphenyl	58.0	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS
Surr: o-Terphenyl	94.0	%REC		40-140		MA-EPH	10/19/16 00:58 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	20	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Acenaphthene	0.94	mg/kg-dry	J	1.1	200	SW8270C	10/21/16 15:21 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-002
Client Sample ID: OSWSA-200-SGRAY

Report Date: 10/24/16
Collection Date: 10/11/16 09:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		1.1	2000	SW8270C	10/21/16 15:21 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 15:21 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.1	2	SW8270C	10/21/16 15:21 / eli-b
Chrysene	ND	mg/kg-dry		1.1	20	SW8270C	10/21/16 15:21 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 15:21 / eli-b
Fluoranthene	ND	mg/kg-dry		1.1	300	SW8270C	10/21/16 15:21 / eli-b
Fluorene	2.5	mg/kg-dry		1.1	300	SW8270C	10/21/16 15:21 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 15:21 / eli-b
Naphthalene	5.0	mg/kg-dry	*	1.1	4	SW8270C	10/21/16 15:21 / eli-b
Phenanthrene	3.8	mg/kg-dry		1.1		SW8270C	10/21/16 15:21 / eli-b
Pyrene	ND	mg/kg-dry		1.1	200	SW8270C	10/21/16 15:21 / eli-b
Surr: 2-Fluorobiphenyl	72.0	%REC		40-140		SW8270C	10/21/16 15:21 / eli-b
Surr: o-Terphenyl	73.0	%REC		40-140		SW8270C	10/21/16 15:21 / eli-b

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100204-003
Client Sample ID: OSFFT-201-BASE

Report Date: 10/24/16
Collection Date: 10/12/16 10:50
DateReceived: 10/12/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	16.9	wt%		0.2		SW3550C	10/13/16 09:08 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	D	0.20	0.08	MA-VPH	10/13/16 15:40 / tjb
Benzene	0.17	mg/kg-dry	*	0.060	0.04	MA-VPH	10/13/16 15:40 / tjb
Toluene	2.5	mg/kg-dry		0.060	10	MA-VPH	10/13/16 15:40 / tjb
Ethylbenzene	2.0	mg/kg-dry		0.060	10	MA-VPH	10/13/16 15:40 / tjb
m+p-Xylenes	9.4	mg/kg-dry		0.060		MA-VPH	10/13/16 15:40 / tjb
o-Xylene	3.9	mg/kg-dry		0.060		MA-VPH	10/13/16 15:40 / tjb
Xylenes, Total	13	mg/kg-dry		0.060	30	MA-VPH	10/13/16 15:40 / tjb
Naphthalene	2.9	mg/kg-dry		0.12	9	MA-VPH	10/13/16 15:40 / tjb
C9 to C10 Aromatics	92	mg/kg-dry		2.4	100	MA-VPH	10/13/16 15:40 / tjb
C5 to C8 Aliphatics	58	mg/kg-dry	*	2.4	40	MA-VPH	10/13/16 15:40 / tjb
C9 to C12 Aliphatics	163	mg/kg-dry	*	2.4	90	MA-VPH	10/13/16 15:40 / tjb
Total Purgeable Hydrocarbons	252	mg/kg-dry	*	2.4	100	MA-VPH	10/13/16 15:40 / tjb
Surr: VPH Aromatics Surrogate	115	%REC		70-130		MA-VPH	10/13/16 15:40 / tjb
Surr: VPH Aliphatics Surrogate	119	%REC		70-130		MA-VPH	10/13/16 15:40 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	ND	mg/kg-dry		12	200	SW8015M	10/13/16 19:16 / JRS
Surr: o-Terphenyl	83.0	%REC		40-140		SW8015M	10/13/16 19:16 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: MB-34774-34734	3	Method Blank				Run: HHP_161018A				10/18/16 15:46
C9 to C18 Aliphatics		ND	mg/kg-dry	10						
C19 to C36 Aliphatics		ND	mg/kg-dry	10						
Surr: 1-Chloro-octadecane				0.17	78	40	140			
Lab ID: LCS-34774-34734	17	Laboratory Control Sample				Run: HHP_161018A				10/18/16 17:12
C9 to C18 Aliphatics		27.9	mg/kg-dry	10	70	40	140			
C19 to C36 Aliphatics		47.5	mg/kg-dry	10	89	40	140			
n-Nonane		3.14	mg/kg-dry	0.17	47	30	140			
n-Decane		4.03	mg/kg-dry	0.17	60	40	140			
n-Dodecane		4.54	mg/kg-dry	0.17	68	40	140			
n-Tetradecane		4.84	mg/kg-dry	0.17	73	40	140			
n-Hexadecane		5.17	mg/kg-dry	0.17	78	40	140			
n-Octadecane		5.53	mg/kg-dry	0.17	83	40	140			
n-Nonadecane		5.71	mg/kg-dry	0.17	86	40	140			
n-Eicosane		5.85	mg/kg-dry	0.17	88	40	140			
n-Docosane		5.95	mg/kg-dry	0.17	89	40	140			
n-Tetracosane		6.03	mg/kg-dry	0.17	91	40	140			
n-Hexacosane		6.05	mg/kg-dry	0.17	91	40	140			
n-Octacosane		5.86	mg/kg-dry	0.17	88	40	140			
n-Triacontane		5.99	mg/kg-dry	0.17	90	40	140			
n-Hexatriacontane		5.69	mg/kg-dry	0.17	85	40	140			
Surr: 1-Chloro-octadecane				0.17	71	40	140			
Lab ID: H16100176-013AMS	17	Sample Matrix Spike				Run: HHP_161018A				10/18/16 20:02
C9 to C18 Aliphatics		31.8	mg/kg-dry	12	68	40	140			
C19 to C36 Aliphatics		55.3	mg/kg-dry	12	88	40	140			
n-Nonane		3.47	mg/kg-dry	0.20	44	30	140			
n-Decane		4.53	mg/kg-dry	0.20	58	40	140			
n-Dodecane		5.14	mg/kg-dry	0.20	66	40	140			
n-Tetradecane		5.50	mg/kg-dry	0.20	70	40	140			
n-Hexadecane		5.96	mg/kg-dry	0.20	76	40	140			
n-Octadecane		6.39	mg/kg-dry	0.20	82	40	140			
n-Nonadecane		6.62	mg/kg-dry	0.20	84	40	140			
n-Eicosane		6.78	mg/kg-dry	0.20	86	40	140			
n-Docosane		6.89	mg/kg-dry	0.20	88	40	140			
n-Tetracosane		6.99	mg/kg-dry	0.20	89	40	140			
n-Hexacosane		7.01	mg/kg-dry	0.20	89	40	140			
n-Octacosane		6.83	mg/kg-dry	0.20	87	40	140			
n-Triacontane		6.97	mg/kg-dry	0.20	89	40	140			
n-Hexatriacontane		6.84	mg/kg-dry	0.20	87	40	140			
Surr: 1-Chloro-octadecane				0.20	75	40	140			
Lab ID: H16100176-013AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161018A				10/18/16 21:27
C9 to C18 Aliphatics		32.9	mg/kg-dry	12	70	40	140	3.5	20	
C19 to C36 Aliphatics		54.4	mg/kg-dry	12	87	40	140	1.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34774	
Lab ID: H16100176-013AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161018A			10/18/16 21:27	
n-Nonane		3.60	mg/kg-dry	0.20	46	30	140	3.5	30	
n-Decane		4.59	mg/kg-dry	0.20	59	40	140	1.3	20	
n-Dodecane		5.32	mg/kg-dry	0.20	68	40	140	3.5	20	
n-Tetradecane		5.80	mg/kg-dry	0.20	74	40	140	5.3	20	
n-Hexadecane		6.07	mg/kg-dry	0.20	77	40	140	1.9	20	
n-Octadecane		6.39	mg/kg-dry	0.20	82	40	140	0.0	20	
n-Nonadecane		6.59	mg/kg-dry	0.20	84	40	140	0.5	20	
n-Eicosane		6.72	mg/kg-dry	0.20	86	40	140	0.9	20	
n-Docosane		6.80	mg/kg-dry	0.20	87	40	140	1.4	20	
n-Tetracosane		6.88	mg/kg-dry	0.20	88	40	140	1.7	20	
n-Hexacosane		6.90	mg/kg-dry	0.20	88	40	140	1.7	20	
n-Octacosane		6.71	mg/kg-dry	0.20	86	40	140	1.9	20	
n-Triacontane		6.83	mg/kg-dry	0.20	87	40	140	2.0	20	
n-Hexatriacontane		6.51	mg/kg-dry	0.20	83	40	140	5.0	20	
Surr: 1-Chloro-octadecane				0.20	76	40	140			
Lab ID: MB-34774-34734	20	Method Blank				Run: HHP_161018A			10/18/16 16:29	
C11 to C22 Aromatics		ND	mg/kg-dry	10						
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Naphthalene		ND	mg/kg-dry	0.17						
2-MethylNaphthalene		ND	mg/kg-dry	0.17						
Acenaphthylene		ND	mg/kg-dry	0.17						
Acenaphthene		ND	mg/kg-dry	0.17						
Fluorene		ND	mg/kg-dry	0.17						
Phenanthrene		ND	mg/kg-dry	0.17						
Anthracene		ND	mg/kg-dry	0.17						
Fluoranthene		ND	mg/kg-dry	0.17						
Pyrene		ND	mg/kg-dry	0.17						
Benzo(a)Anthracene		ND	mg/kg-dry	0.17						
Chrysene		ND	mg/kg-dry	0.17						
Benzo(b)Fluoranthene/Benzo(k)Fluorant		ND	mg/kg-dry	0.17						
Benzo(a)Pyrene		ND	mg/kg-dry	0.17						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		ND	mg/kg-dry	0.17						
Benzo(g,h,I)perylene		ND	mg/kg-dry	0.17						
Surr: 2-Bromonaphthalene				0.17	64	40	140			
Surr: 2-Fluorobiphenyl				0.17	68	40	140			
Surr: o-Terphenyl				0.17	72	40	140			
Lab ID: LCS-34774-34734	19	Laboratory Control Sample				Run: HHP_161018A			10/18/16 17:54	
C11 to C22 Aromatics		94.7	mg/kg-dry	10	84	40	140			
Naphthalene		3.96	mg/kg-dry	0.17	59	40	140			
2-MethylNaphthalene		4.27	mg/kg-dry	0.17	64	40	140			
Acenaphthylene		4.87	mg/kg-dry	0.17	73	40	140			
Acenaphthene		5.45	mg/kg-dry	0.17	82	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: LCS-34774-34734	19	Laboratory Control Sample				Run: HHP_161018A				10/18/16 17:54
Fluorene		4.99	mg/kg-dry	0.17	75	40	140			
Phenanthrene		5.21	mg/kg-dry	0.17	78	40	140			
Anthracene		4.61	mg/kg-dry	0.17	69	40	140			
Fluoranthene		5.98	mg/kg-dry	0.17	90	40	140			
Pyrene		5.92	mg/kg-dry	0.17	89	40	140			
Benzo(a)Anthracene		5.07	mg/kg-dry	0.17	76	40	140			
Chrysene		4.99	mg/kg-dry	0.17	75	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.0	mg/kg-dry	0.17	91	40	140			
Benzo(a)Pyrene		5.80	mg/kg-dry	0.17	87	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		11.5	mg/kg-dry	0.17	87	40	140			
Benzo(g,h,I)perylene		5.60	mg/kg-dry	0.17	84	40	140			
Surr: 2-Bromonaphthalene				0.17	74	40	140			
Surr: 2-Fluorobiphenyl				0.17	72	40	140			
Surr: o-Terphenyl				0.17	82	40	140			
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: HHP_161018A				10/18/16 20:44
C11 to C22 Aromatics		110	mg/kg-dry	12	83	40	140			
Naphthalene		5.03	mg/kg-dry	0.20	64	40	140			
2-MethylNaphthalene		5.29	mg/kg-dry	0.20	68	40	140			
Acenaphthylene		5.80	mg/kg-dry	0.20	74	40	140			
Acenaphthene		6.25	mg/kg-dry	0.20	80	40	140			
Fluorene		5.86	mg/kg-dry	0.20	75	40	140			
Phenanthrene		6.00	mg/kg-dry	0.20	77	40	140			
Anthracene		5.36	mg/kg-dry	0.20	68	40	140			
Fluoranthene		6.86	mg/kg-dry	0.20	88	40	140			
Pyrene		6.80	mg/kg-dry	0.20	87	40	140			
Benzo(a)Anthracene		5.86	mg/kg-dry	0.20	75	40	140			
Chrysene		5.82	mg/kg-dry	0.20	74	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		13.9	mg/kg-dry	0.20	90	40	140			
Benzo(a)Pyrene		6.76	mg/kg-dry	0.20	86	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		13.4	mg/kg-dry	0.20	86	40	140			
Benzo(g,h,I)perylene		6.40	mg/kg-dry	0.20	82	40	140			
Surr: 2-Bromonaphthalene				0.20	77	40	140			
Surr: 2-Fluorobiphenyl				0.20	77	40	140			
Surr: o-Terphenyl				0.20	79	40	140			
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161018A				10/18/16 22:09
C11 to C22 Aromatics		104	mg/kg-dry	12	78	40	140	6.0	20	
Naphthalene		4.98	mg/kg-dry	0.20	64	40	140	1.0	40	
2-MethylNaphthalene		5.13	mg/kg-dry	0.20	65	40	140	3.2	20	
Acenaphthylene		5.46	mg/kg-dry	0.20	70	40	140	6.1	20	
Acenaphthene		5.79	mg/kg-dry	0.20	74	40	140	7.7	20	
Fluorene		5.49	mg/kg-dry	0.20	70	40	140	6.6	20	
Phenanthrene		5.61	mg/kg-dry	0.20	72	40	140	6.6	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34774
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161018A			10/18/16 22:09	
Anthracene		5.05	mg/kg-dry	0.20	64	40	140	6.0	20	
Fluoranthene		6.50	mg/kg-dry	0.20	83	40	140	5.4	20	
Pyrene		6.38	mg/kg-dry	0.20	81	40	140	6.3	20	
Benzo(a)Anthracene		5.41	mg/kg-dry	0.20	69	40	140	8.0	20	
Chrysene		5.35	mg/kg-dry	0.20	68	40	140	8.4	20	
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.8	mg/kg-dry	0.20	83	40	140	7.9	20	
Benzo(a)Pyrene		6.33	mg/kg-dry	0.20	81	40	140	6.5	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		12.3	mg/kg-dry	0.20	79	40	140	7.9	20	
Benzo(g,h,I)perylene		6.08	mg/kg-dry	0.20	78	40	140	5.2	20	
Surr: 2-Bromonaphthalene				0.20	63	40	140			
Surr: 2-Fluorobiphenyl				0.20	69	40	140			
Surr: o-Terphenyl				0.20	74	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R119587	
Lab ID: CCV_1018GC105r-S	15	Continuing Calibration Verification Standard							10/18/16 14:21	
n-Nonane		7.46	mg/kg-dry	0.17	112	75	125			
n-Decane		7.21	mg/kg-dry	0.17	108	75	125			
n-Dodecane		7.10	mg/kg-dry	0.17	107	75	125			
n-Tetradecane		7.04	mg/kg-dry	0.17	106	75	125			
n-Hexadecane		7.07	mg/kg-dry	0.17	106	75	125			
n-Octadecane		7.09	mg/kg-dry	0.17	106	75	125			
n-Nonadecane		7.10	mg/kg-dry	0.17	106	75	125			
n-Eicosane		7.07	mg/kg-dry	0.17	106	75	125			
n-Docosane		7.09	mg/kg-dry	0.17	106	75	125			
n-Tetracosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Hexacosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Octacosane		7.04	mg/kg-dry	0.17	106	75	125			
n-Triacontane		7.15	mg/kg-dry	0.17	107	75	125			
n-Hexatriacontane		7.35	mg/kg-dry	0.17	110	75	125			
Surr: 1-Chloro-octadecane				0.17	109	75	125			
Lab ID: CCV_1018GC106r-S	18	Continuing Calibration Verification Standard							10/18/16 15:04	
Naphthalene		6.32	mg/kg-dry	0.17	95	75	125			
2-MethylNaphthalene		6.26	mg/kg-dry	0.17	94	75	125			
Acenaphthylene		6.23	mg/kg-dry	0.17	93	75	125			
Acenaphthene		6.21	mg/kg-dry	0.17	93	75	125			
Fluorene		6.22	mg/kg-dry	0.17	93	75	125			
Phenanthrene		6.19	mg/kg-dry	0.17	93	75	125			
Anthracene		6.21	mg/kg-dry	0.17	93	75	125			
Fluoranthene		6.16	mg/kg-dry	0.17	92	75	125			
Pyrene		6.17	mg/kg-dry	0.17	93	75	125			
Benzo(a)Anthracene		6.19	mg/kg-dry	0.17	93	75	125			
Chrysene		6.21	mg/kg-dry	0.17	93	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.4	mg/kg-dry	0.17	93	75	125			
Benzo(a)Pyrene		6.20	mg/kg-dry	0.17	93	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		12.5	mg/kg-dry	0.17	94	75	125			
Benzo(g,h,I)perylene		6.26	mg/kg-dry	0.17	94	75	125			
Surr: 2-Bromonaphthalene				0.17	94	40	140			
Surr: 2-Fluorobiphenyl				0.17	92	40	140			
Surr: o-Terphenyl				0.17	92	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34740
Lab ID: LCS-34740	14	Laboratory Control Sample				Run: GC2_161013A				10/13/16 14:08
2-Methylpentane		2.60	mg/kg-dry	0.10	104	70	130			
n-Butylcyclohexane		2.85	mg/kg-dry	0.10	114	70	130			
n-Decane		2.81	mg/kg-dry	0.10	112	70	130			
n-Pentane		2.43	mg/kg-dry	0.10	97	30	130			
Methyl tert-butyl ether (MTBE)		2.44	mg/kg-dry	0.10	98	70	130			
Benzene		2.60	mg/kg-dry	0.050	104	70	130			
Toluene		2.54	mg/kg-dry	0.050	102	70	130			
Ethylbenzene		2.54	mg/kg-dry	0.050	102	70	130			
m+p-Xylenes		5.40	mg/kg-dry	0.050	108	70	130			
o-Xylene		2.68	mg/kg-dry	0.050	107	70	130			
Naphthalene		2.60	mg/kg-dry	0.10	104	70	130			
Total Purgeable Hydrocarbons		39.9	mg/kg-dry	2.0	106	70	130			
Surr: VPH Aromatics Surrogate				0.050	104	70	130			
Surr: VPH Aliphatics Surrogate				0.050	105	70	130			
Lab ID: MB-34740	14	Method Blank				Run: GC2_161013A				10/13/16 15:09
Methyl tert-butyl ether (MTBE)		ND	mg/kg-dry	0.10						
Benzene		ND	mg/kg-dry	0.050						
Toluene		ND	mg/kg-dry	0.050						
Ethylbenzene		ND	mg/kg-dry	0.050						
m+p-Xylenes		ND	mg/kg-dry	0.050						
o-Xylene		ND	mg/kg-dry	0.050						
Naphthalene		ND	mg/kg-dry	0.10						
C9 to C10 Aromatics		ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics		ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics		ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons		ND	mg/kg-dry	2.0						
Xylenes, Total		ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate				0.050	101	70	130			
Surr: VPH Aliphatics Surrogate				0.050	102	70	130			
Lab ID: H16100204-003AMS	10	Sample Matrix Spike				Run: GC2_161014A				10/14/16 21:29
Methyl tert-butyl ether (MTBE)		2.77	mg/kg-dry	0.24	92	70	130			
Benzene		3.04	mg/kg-dry	0.12	96	70	130			
Toluene		3.71	mg/kg-dry	0.12	39	70	130			S
Ethylbenzene		3.67	mg/kg-dry	0.12	57	70	130			S
m+p-Xylenes		9.24	mg/kg-dry	0.12	-3	70	130			S
o-Xylene		4.34	mg/kg-dry	0.12	13	70	130			S
Naphthalene		3.93	mg/kg-dry	0.24	33	70	130			S
Total Purgeable Hydrocarbons		148	mg/kg-dry	4.8	-232	70	130			S
Surr: VPH Aromatics Surrogate				0.12	87	70	130			
Surr: VPH Aliphatics Surrogate				0.12	91	70	130			
Lab ID: H16100204-003AMSD	10	Sample Matrix Spike Duplicate				Run: GC2_161014A				10/14/16 22:30
Methyl tert-butyl ether (MTBE)		2.95	mg/kg-dry	0.24	98	70	130	6.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34740
Lab ID: H16100204-003AMSD	10	Sample Matrix Spike Duplicate				Run: GC2_161014A			10/14/16 22:30	
Benzene		3.12	mg/kg-dry	0.12	98	70	130	2.4	20	
Toluene		3.31	mg/kg-dry	0.12	26	70	130	11	20	S
Ethylbenzene		3.26	mg/kg-dry	0.12	44	70	130	12	20	S
m+p-Xylenes		7.33	mg/kg-dry	0.12	-35	70	130	23	20	SR
o-Xylene		3.57	mg/kg-dry	0.12	-12	70	130	20	20	S
Naphthalene		3.35	mg/kg-dry	0.24	14	70	130	16	20	S
Total Purgeable Hydrocarbons		80.5	mg/kg-dry	4.8	-382	70	130	59	20	SR
Surr: VPH Aromatics Surrogate				0.12	101	70	130			
Surr: VPH Aliphatics Surrogate				0.12	104	70	130			
Method: MA-VPH										Analytical Run: R119480
Lab ID: CCV_1013GC202r-S	15	Continuing Calibration Verification Standard							10/13/16 13:24	
1,2,4-Trimethylbenzene		2.66	mg/kg-dry	0.10	106	75	125			
2,2,4-Trimethylpentane		2.66	mg/kg-dry	0.10	107	75	125			
2-Methylpentane		2.60	mg/kg-dry	0.10	104	75	125			
n-Butylcyclohexane		2.30	mg/kg-dry	0.10	92	75	125			
n-Decane		2.05	mg/kg-dry	0.10	82	75	125			
n-Pentane		2.59	mg/kg-dry	0.10	103	75	125			
Methyl tert-butyl ether (MTBE)		2.53	mg/kg-dry	0.10	101	75	125			
Benzene		2.52	mg/kg-dry	0.050	101	75	125			
Toluene		2.51	mg/kg-dry	0.050	101	75	125			
Ethylbenzene		2.47	mg/kg-dry	0.050	99	75	125			
m+p-Xylenes		5.15	mg/kg-dry	0.050	103	75	125			
o-Xylene		2.55	mg/kg-dry	0.050	102	75	125			
Naphthalene		2.56	mg/kg-dry	0.10	102	75	125			
Surr: VPH Aromatics Surrogate				0.050	88	70	130			
Surr: VPH Aliphatics Surrogate				0.050	87	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW3550C**								Batch: R119476	
Lab ID:	**H16100204-003ADUP**	Sample Duplicate				Run: EXTRACT OV 2_161013A			10/13/16 09:08	
Moisture		15.7	wt%	0.20				7.6	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M										Batch: 34734
Lab ID: MB-34734	2	Method Blank				Run: HHP2_161013A				10/13/16 13:35
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Surr: o-Terphenyl				0.17	98	40	140			
Lab ID: LCS-34734	2	Laboratory Control Sample				Run: HHP2_161013A				10/13/16 14:24
Total Extractable Hydrocarbons		230.9	mg/kg-dry	10	112	60	140			
Surr: o-Terphenyl				0.17	100	40	140			
Lab ID: H16100176-013AMS	2	Sample Matrix Spike				Run: HHP2_161013A				10/13/16 16:01
Total Extractable Hydrocarbons		285.7	mg/kg-dry	12	118	60	140			
Surr: o-Terphenyl				0.20	109	40	140			
Lab ID: H16100176-013AMSD	2	Sample Matrix Spike Duplicate				Run: HHP2_161013A				10/13/16 16:50
Total Extractable Hydrocarbons		260.9	mg/kg-dry	12	108	60	140	9.1	20	
Surr: o-Terphenyl				0.20	100	40	140			
Method: SW8015M										Analytical Run: R119459
Lab ID: CCV_1013GC404r-S	15	Continuing Calibration Verification Standard								10/13/16 11:55
n-Nonane		7.320	mg/kg-dry		110	75	125			
n-Decane		7.452	mg/kg-dry		112	75	125			
n-Dodecane		7.393	mg/kg-dry		111	75	125			
n-Tetradecane		7.615	mg/kg-dry		114	75	125			
n-Hexadecane		7.391	mg/kg-dry		111	75	125			
n-Octadecane		7.383	mg/kg-dry		111	75	125			
n-Nonadecane		7.416	mg/kg-dry		111	75	125			
n-Eicosane		7.370	mg/kg-dry		111	75	125			
n-Docosane		7.410	mg/kg-dry		111	75	125			
n-Tetracosane		7.436	mg/kg-dry		112	75	125			
n-Hexacosane		7.316	mg/kg-dry		110	75	125			
n-Octacosane		7.577	mg/kg-dry		114	75	125			
n-Triacontane		7.624	mg/kg-dry		114	75	125			
n-Hexatriacontane		6.972	mg/kg-dry		105	75	125			
Surr: o-Terphenyl				0.17	112	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103834	
Lab ID: MB-103834-34774-347	19	Method Blank				Run: SUB-B269096			10/21/16 17:23	
2-Methylnaphthalene		ND	mg/kg	0.33						
Acenaphthene		ND	mg/kg	0.33						
Acenaphthylene		ND	mg/kg	0.33						
Anthracene		ND	mg/kg	0.33						
Benzo(a)anthracene		ND	mg/kg	0.33						
Benzo(a)pyrene		ND	mg/kg	0.33						
Benzo(b)fluoranthene		ND	mg/kg	0.33						
Benzo(g,h,i)perylene		ND	mg/kg	0.33						
Benzo(k)fluoranthene		ND	mg/kg	0.33						
Chrysene		ND	mg/kg	0.33						
Dibenzo(a,h)anthracene		ND	mg/kg	0.33						
Fluoranthene		ND	mg/kg	0.33						
Fluorene		ND	mg/kg	0.33						
Indeno(1,2,3-cd)pyrene		ND	mg/kg	0.33						
Naphthalene		ND	mg/kg	0.33						
Phenanthrene		ND	mg/kg	0.33						
Pyrene		ND	mg/kg	0.33						
Surr: 2-Fluorobiphenyl				0.33	87	40	140			
Surr: o-Terphenyl				0.33	67	40	140			
Lab ID: LCS-103834	19	Laboratory Control Sample				Run: SUB-B269096			10/21/16 17:54	
2-Methylnaphthalene		4.86	mg/kg	0.33	73	40	140			
Acenaphthene		5.81	mg/kg	0.33	87	40	140			
Acenaphthylene		5.41	mg/kg	0.33	81	40	140			
Anthracene		6.13	mg/kg	0.33	92	40	140			
Benzo(a)anthracene		7.11	mg/kg	0.33	107	40	140			
Benzo(a)pyrene		6.13	mg/kg	0.33	92	40	140			
Benzo(b)fluoranthene		5.95	mg/kg	0.33	89	40	140			
Benzo(g,h,i)perylene		6.68	mg/kg	0.33	100	40	140			
Benzo(k)fluoranthene		6.60	mg/kg	0.33	99	40	140			
Chrysene		6.64	mg/kg	0.33	99	40	140			
Dibenzo(a,h)anthracene		5.69	mg/kg	0.33	85	40	140			
Fluoranthene		6.79	mg/kg	0.33	102	40	140			
Fluorene		5.90	mg/kg	0.33	88	40	140			
Indeno(1,2,3-cd)pyrene		6.64	mg/kg	0.33	100	40	140			
Naphthalene		4.28	mg/kg	0.33	64	40	140			
Phenanthrene		6.22	mg/kg	0.33	93	40	140			
Pyrene		6.55	mg/kg	0.33	98	40	140			
Surr: 2-Fluorobiphenyl				0.33	81	40	140			
Surr: o-Terphenyl				0.33	88	40	140			
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 18:55	
2-Methylnaphthalene		5.74	mg/kg-dry	0.39	73	40	140	0.0	40	
Acenaphthene		6.12	mg/kg-dry	0.39	78	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103834	
Lab ID: H16100176-013AMS	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 18:55	
Acenaphthylene		6.43	mg/kg-dry	0.39	82	40	140	0.0	40	
Anthracene		6.79	mg/kg-dry	0.39	87	40	140	0.0	40	
Benzo(a)anthracene		8.00	mg/kg-dry	0.39	102	40	140	0.0	40	
Benzo(a)pyrene		7.17	mg/kg-dry	0.39	91	40	140	0.0	40	
Benzo(b)fluoranthene		6.80	mg/kg-dry	0.39	87	40	140	0.0	40	
Benzo(g,h,i)perylene		7.41	mg/kg-dry	0.39	94	40	140	0.0	40	
Benzo(k)fluoranthene		7.51	mg/kg-dry	0.39	96	40	140	0.0	40	
Chrysene		7.68	mg/kg-dry	0.39	98	40	140	0.0	40	
Dibenzo(a,h)anthracene		6.65	mg/kg-dry	0.39	85	40	140	0.0	40	
Fluoranthene		7.55	mg/kg-dry	0.39	96	40	140	0.0	40	
Fluorene		6.82	mg/kg-dry	0.39	87	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene		7.35	mg/kg-dry	0.39	94	40	140	0.0	40	
Naphthalene		5.20	mg/kg-dry	0.39	66	40	140	0.0	40	
Phenanthrene		6.85	mg/kg-dry	0.39	87	40	140	0.0	40	
Pyrene		7.23	mg/kg-dry	0.39	92	40	140	0.0	40	
Surr: 2-Fluorobiphenyl				0.39	87	40	140			
Surr: o-Terphenyl				0.39	80	40	140			
Lab ID: H16100176-013AMSD	19	Sample Matrix Spike				Run: SUB-B269096			10/21/16 19:25	
2-Methylnaphthalene		5.29	mg/kg-dry	0.39	67	40	140	8.0	40	
Acenaphthene		5.60	mg/kg-dry	0.39	71	40	140	9.0	40	
Acenaphthylene		5.91	mg/kg-dry	0.39	75	40	140	8.4	40	
Anthracene		6.20	mg/kg-dry	0.39	79	40	140	9.1	40	
Benzo(a)anthracene		7.25	mg/kg-dry	0.39	92	40	140	9.8	40	
Benzo(a)pyrene		6.39	mg/kg-dry	0.39	81	40	140	12	40	
Benzo(b)fluoranthene		6.09	mg/kg-dry	0.39	78	40	140	11	40	
Benzo(g,h,i)perylene		6.86	mg/kg-dry	0.39	87	40	140	7.7	40	
Benzo(k)fluoranthene		6.66	mg/kg-dry	0.39	85	40	140	12	40	
Chrysene		6.81	mg/kg-dry	0.39	87	40	140	12	40	
Dibenzo(a,h)anthracene		5.81	mg/kg-dry	0.39	74	40	140	13	40	
Fluoranthene		6.76	mg/kg-dry	0.39	86	40	140	11	40	
Fluorene		6.05	mg/kg-dry	0.39	77	40	140	12	40	
Indeno(1,2,3-cd)pyrene		6.56	mg/kg-dry	0.39	84	40	140	11	40	
Naphthalene		4.88	mg/kg-dry	0.39	62	40	140	6.4	40	
Phenanthrene		6.32	mg/kg-dry	0.39	81	40	140	8.1	40	
Pyrene		6.62	mg/kg-dry	0.39	84	40	140	8.8	40	
Surr: 2-Fluorobiphenyl				0.39	73	40	140			
Surr: o-Terphenyl				0.39	71	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100204

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Analytical Run: B_R269096	
Lab ID: 21-Oct-16_CCV_2	21	Continuing Calibration Verification Standard							10/21/16 12:17	
2-Methylnaphthalene		2.41	mg/kg	0.33	97	70	130			
Acenaphthene		2.37	mg/kg	0.33	95	80	120			
Acenaphthylene		2.50	mg/kg	0.33	100	70	130			
Anthracene		2.39	mg/kg	0.33	96	70	130			
Benzo(a)anthracene		2.57	mg/kg	0.33	103	70	130			
Benzo(a)pyrene		2.31	mg/kg	0.33	92	80	120			
Benzo(b)fluoranthene		2.26	mg/kg	0.33	90	70	130			
Benzo(g,h,i)perylene		2.55	mg/kg	0.33	102	70	130			
Benzo(k)fluoranthene		2.58	mg/kg	0.33	103	70	130			
Chrysene		2.50	mg/kg	0.33	100	70	130			
Dibenzo(a,h)anthracene		2.28	mg/kg	0.33	91	70	130			
Fluoranthene		2.56	mg/kg	0.33	102	80	120			
Fluorene		2.42	mg/kg	0.33	97	70	130			
Indeno(1,2,3-cd)pyrene		2.46	mg/kg	0.33	98	70	130			
Naphthalene		2.50	mg/kg	0.33	100	70	130			
Phenanthrene		2.28	mg/kg	0.33	91	70	130			
Pyrene		2.52	mg/kg	0.33	101	70	130			
Surr: 2-Fluorobiphenyl				0.33	94	70	130			
Surr: Nitrobenzene-d5				0.33	92	70	130			
Surr: o-Terphenyl				0.33	99	70	130			
Surr: Terphenyl-d14				0.33	102	70	130			

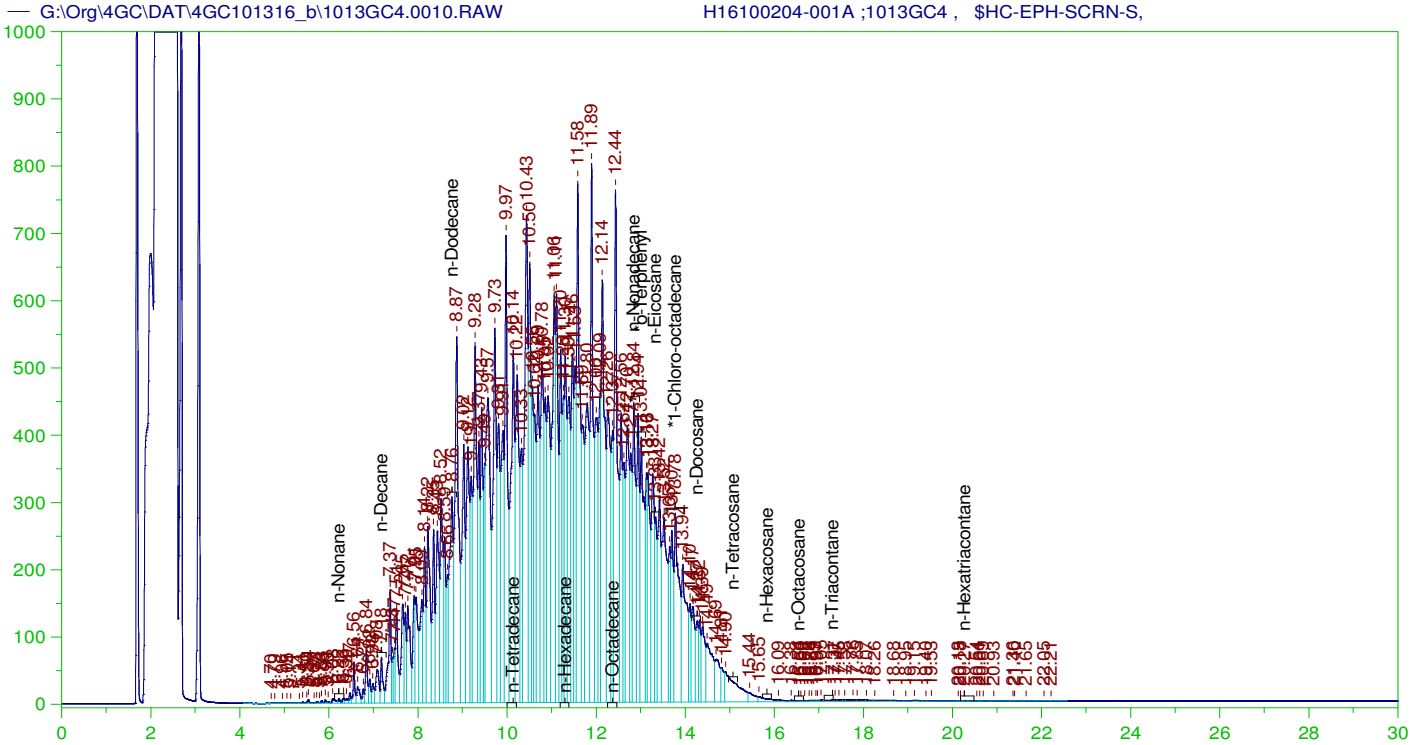
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MCMW2-105-SGRAY Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0010.RAW H16100204-001A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-001A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0010.RAW
Date & Time Acquired: 10/13/2016 5:39:03 PM
Method File: G:\Org\4GC\Methods\10131610.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.9 Dilution: 2 S.A.: 1

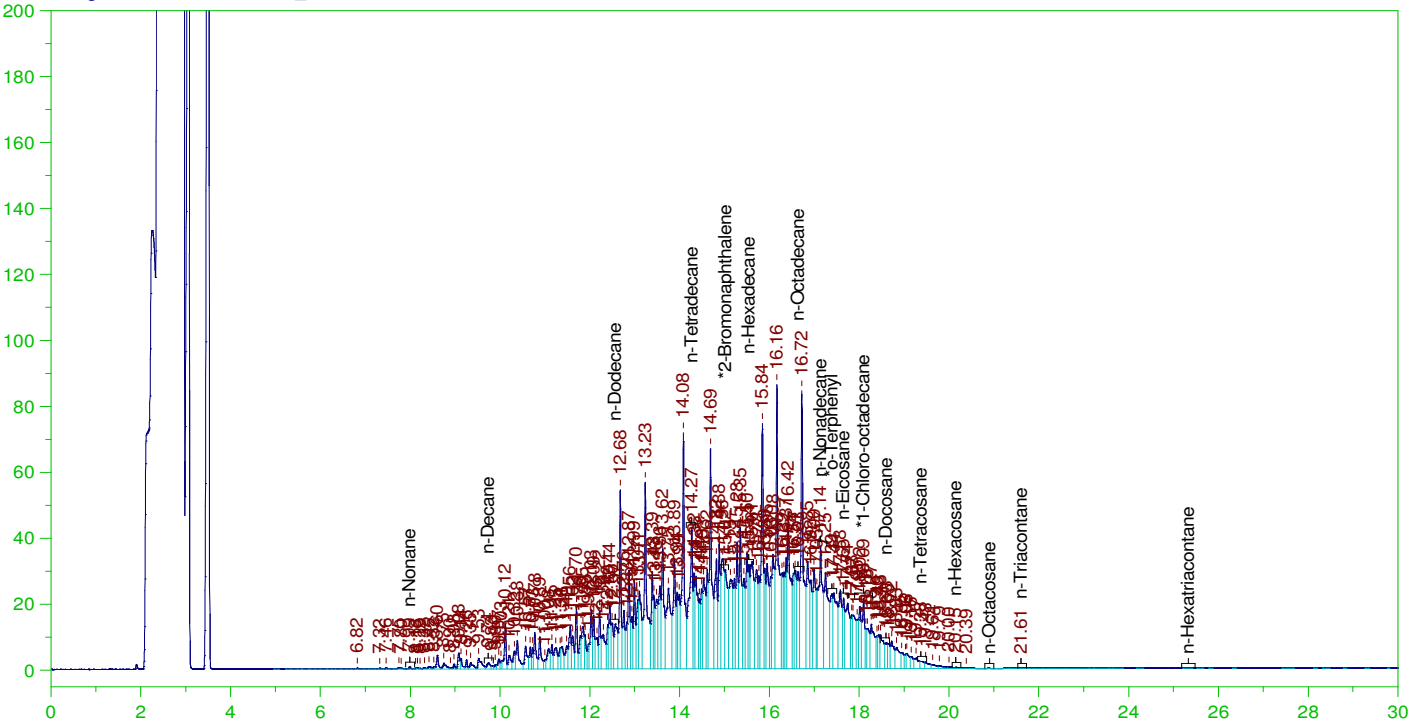
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
*o-Terphenyl	13.012	2288433	7.435	84.154	1131.87
*1-Chloro-octadecane	13.777	2005395	7.435	94.481	1270.77

DRO Area:1.40767E+08 DRO Amount: 5719.359
TEH Area:1.423295E+08 TEH Amount: 5782.843
C9-C18 Area:1.184878E+08 C9-C18 Amount: 4863.247
C19-C36 Area:2.185958E+07C19-C36 Amount: 879.2778

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0017.RAW H16100204-001A ;1018GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100204-001A ;1018GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0017.RAW
Date & Time Acquired: 10/18/2016 10:51:51 PM
Method File: G:\Org\1GC\Methods\10181617.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

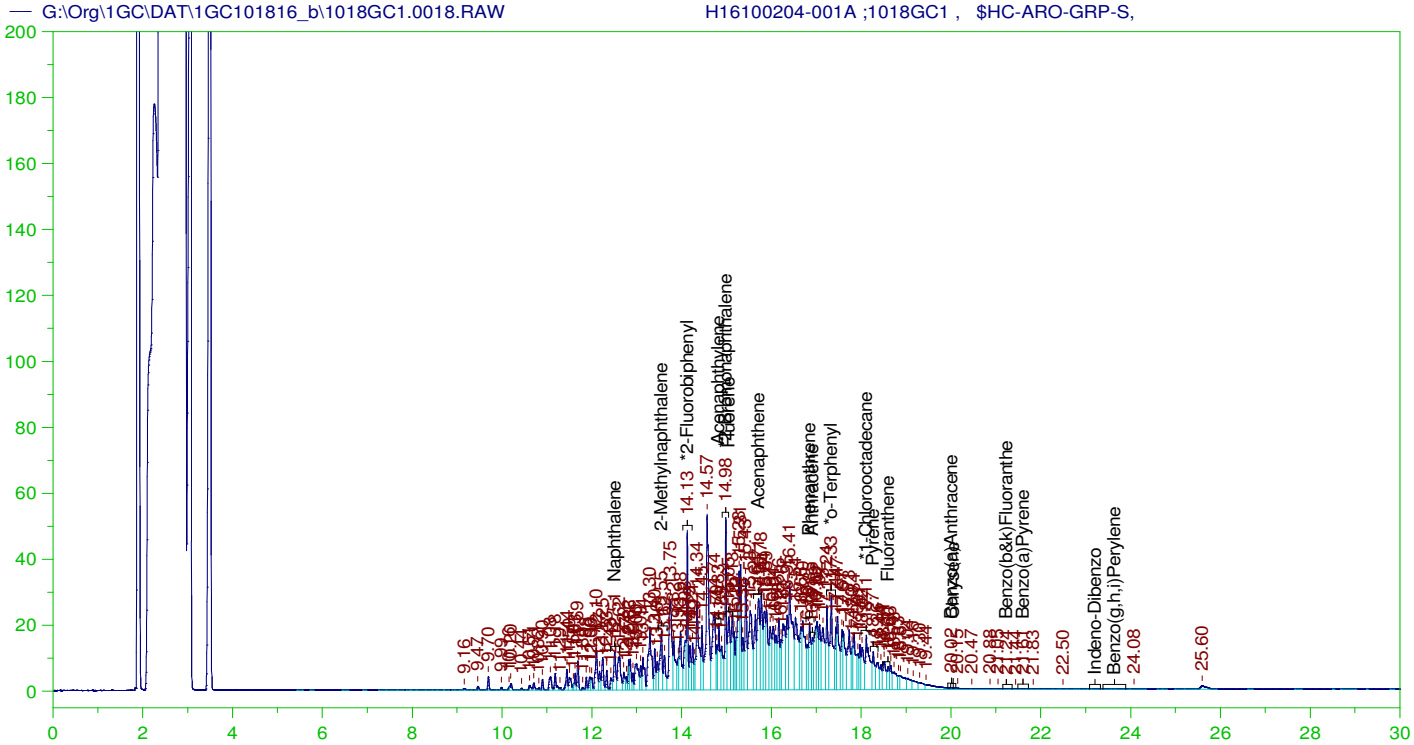
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.094	81929	7.435	32.36	435.25	-

DRO Area:9842603 DRO Amount: 3390.527
TEH Area:1.02002E+07 TEH Amount: 3513.709

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:8428599 C9-C18 Amount: 2962.865
C19-C36 Area:1762071 C19-C36 Amount: 597.9933

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW
Date & Time Acquired: 10/18/2016 11:34:10 PM
Method File: G:\Org\1GC\Methods\10181618.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

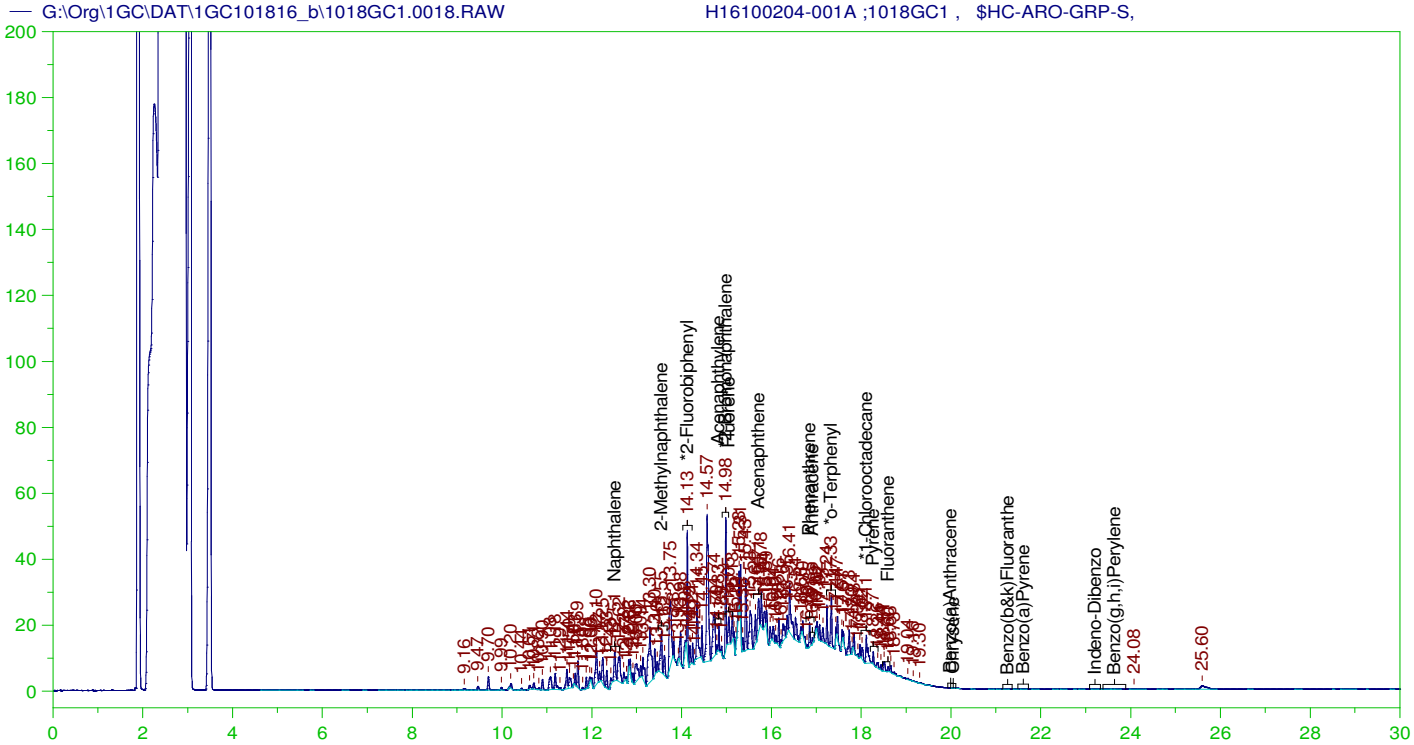
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.126	97207	7.435	32.657	439.24	-
*2-Bromonaphthalene	14.982	107127	7.435	52.311	703.58	-
*o-Terphenyl	17.33	124731	7.435	37.186	500.15	-
*1-Chlorooctadecane	18.112	106063	7.435	39.726	534.31	-

C11-C22 Aromatics Area:5005681 C11-C22 Aromatics Amount: 1509.809
EPH Aromatics total Area:5292241 EPH Aromatics Total Amount: 1596.241

MCMW2-105-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

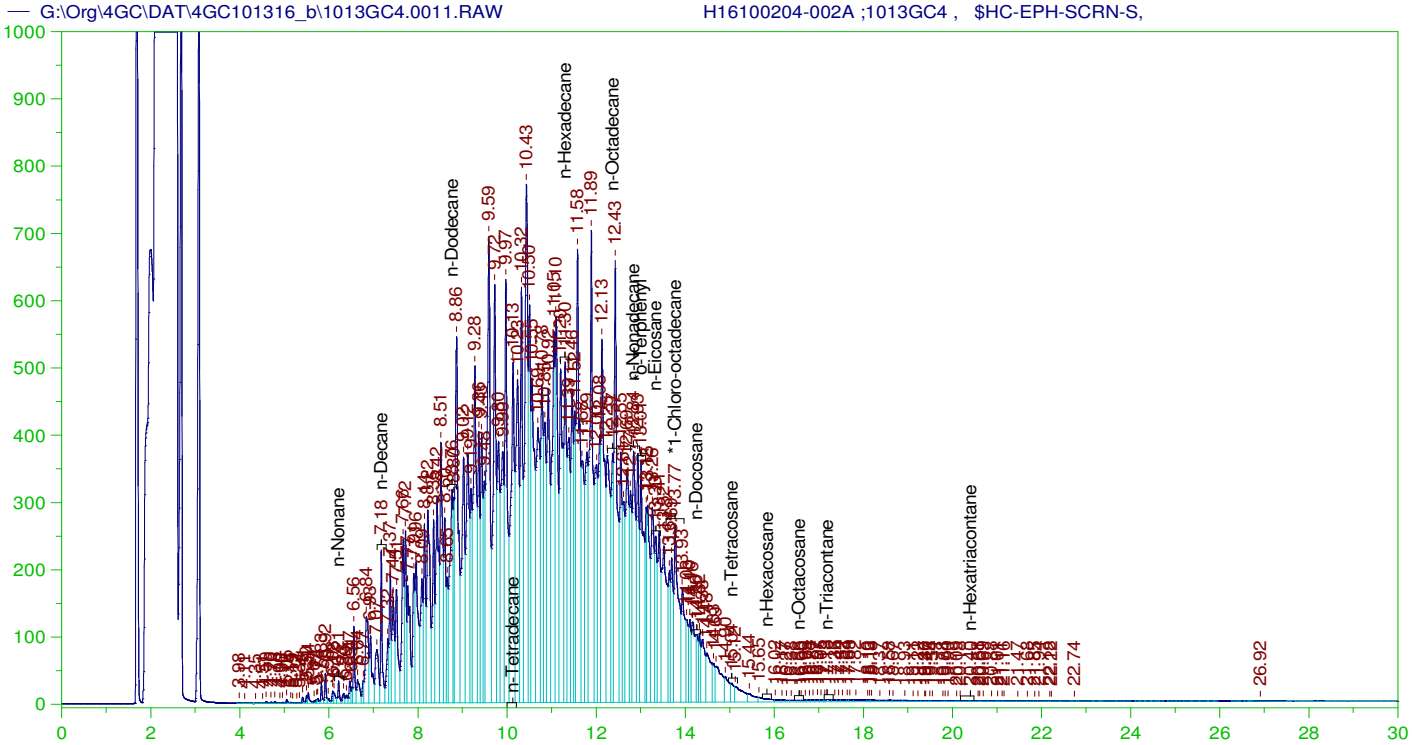
Sample Name: H16100204-001A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0018.RAW
Date & Time Acquired: 10/18/2016 11:34:10 PM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.9 Dilution: 8 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.51	2.46	2.472	22873	7.114	
2-Methylnaphthalene	13.551	1.4	1.431	33584	10.444	
Acenaphthylene	14.828	.17	.154	10451	3.303	
Fluorene	15.052	-.07	-.07	19962	5.895	
Acenaphthene	15.712	-.71	-.731	26329	8.053	
Phenanthrene	16.852	-1.88	-1.87	12503	3.802	
Anthracene	16.91	-1.93	-1.928	2479	.746	
Pyrene	18.267	-3.31	-3.285	6427	1.914	
Fluoranthene	18.6	-3.58	-3.618	3360	.989	
Benzo(a)Anthracene	.	.	.		.297	U
Chrysene	.	.	.		.297	U
Benzo(b&k)Fluoranthe	.	.	.		.595	U
Benzo(a)Pyrene	.	.	.		.297	U
Indeno-Dibenzo	.	.	.		.595	U
Benzo(g,h,i)Perylene	.	.	.		.297	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.126	56204	7.435	18.882	253.97	40-140
*2-Bromonaphthalene	14.982	62274	7.435	30.409	409.	40-140
*o-Terphenyl	17.33	27968	7.435	8.338	112.15	40-140
*1-Chlorooctadecane	18.112	26063	7.435	9.762	131.3	40-140

OSWSA-200-SGRAY Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0011.RAW H16100204-002A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-002A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0011.RAW
Date & Time Acquired: 10/13/2016 6:27:33 PM
Method File: G:\Org\4GC\Methods\10131611.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 26.2 Dilution: 2 S.A.: 1

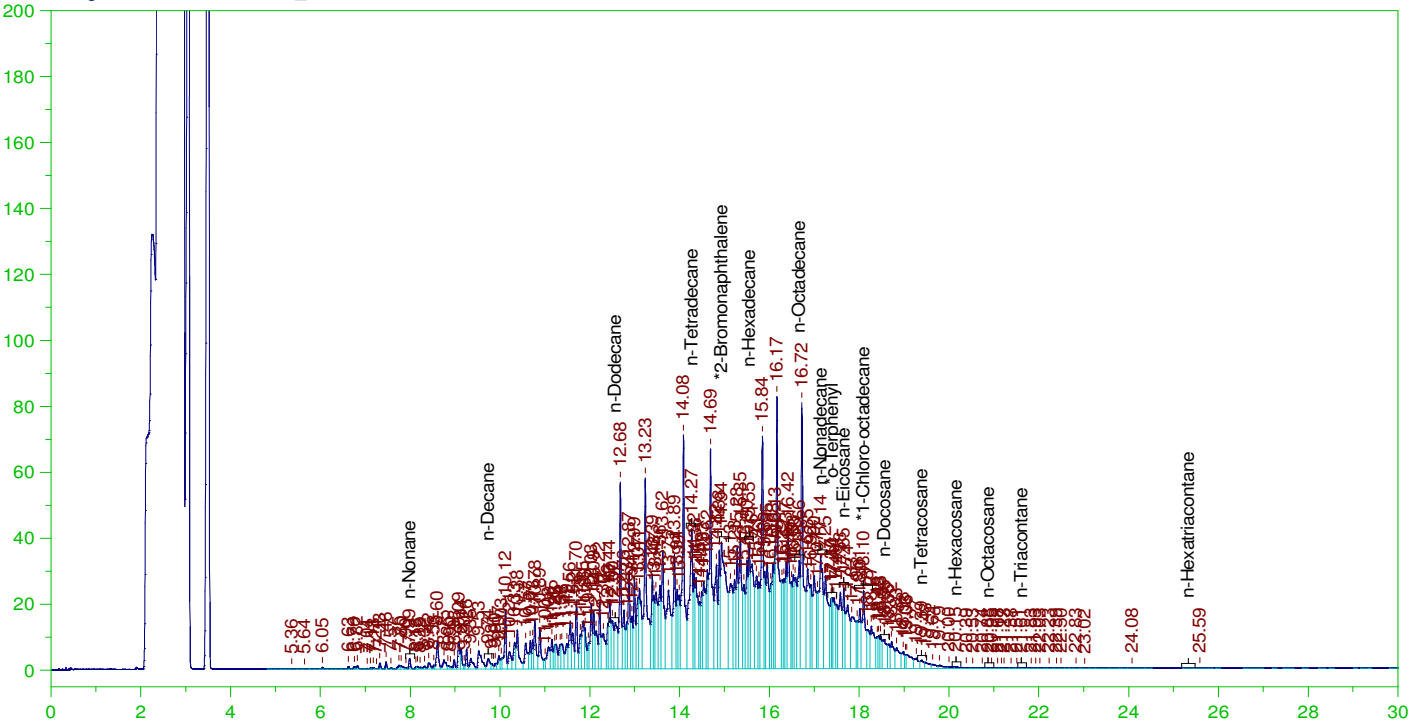
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.008	1965993	7.634	74.228	972.39	-
*1-Chloro-octadecane	13.773	1772095	7.634	85.72	1122.94	

DRO Area:1.285835E+08 DRO Amount: 5363.926
TEH Area:1.317714E+08 TEH Amount: 5496.908
C9-C18 Area:1.129518E+08 C9-C18 Amount: 4759.887
C19-C36 Area:1.682436E+07C19-C36 Amount: 694.8224

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0019.RAW H16100204-002A ;1018GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100204-002A ;1018GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0019.RAW
Date & Time Acquired: 10/19/2016 12:16:34 AM
Method File: G:\Org\1GC\Methods\10181619.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

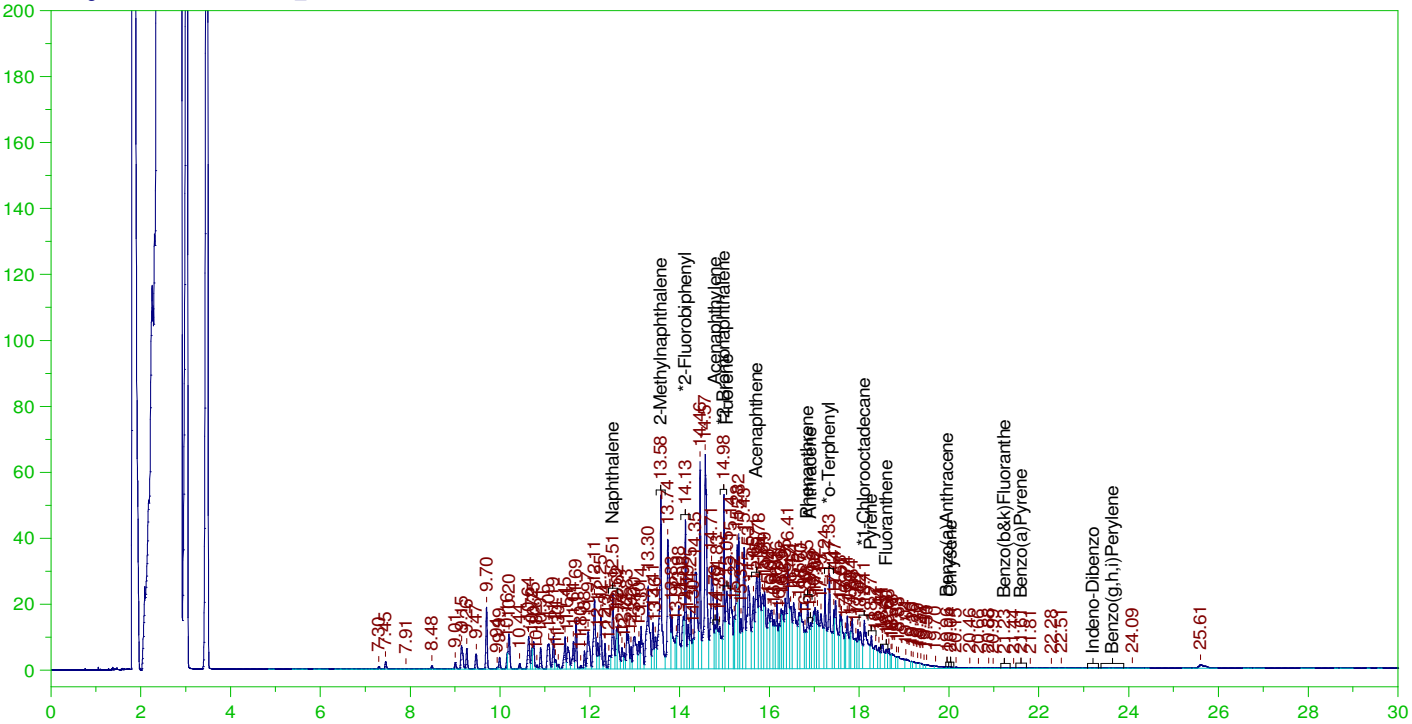
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.095	115709	7.634	35.193	461.03	-

DRO Area:9671389 DRO Amount: 2565.419
TEH Area:1.029686E+07 TEH Amount: 2731.332

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:8575465 C9-C18 Amount: 2321.274
C19-C36 Area:1680784 C19-C36 Amount: 439.2351

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW
Date & Time Acquired: 10/19/2016 12:58:55 AM
Method File: G:\Org\1GC\Methods\10181620.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

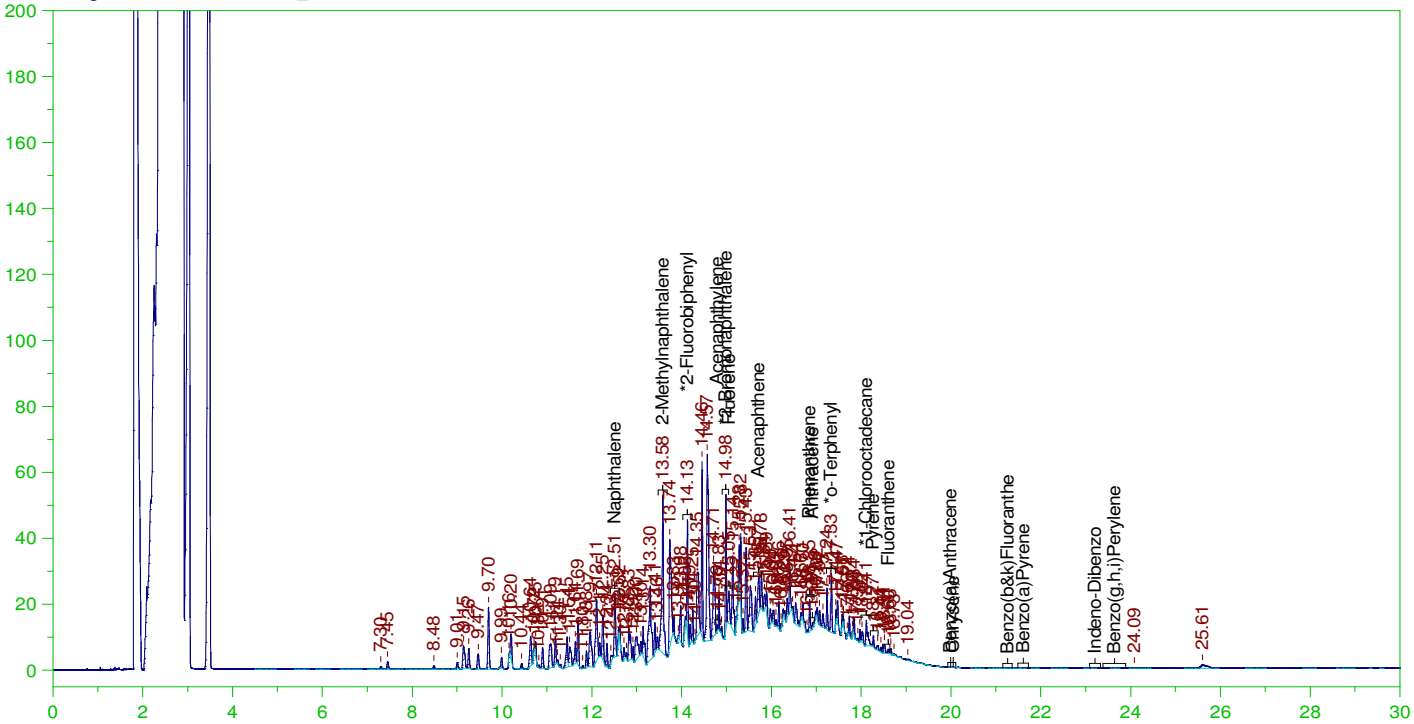
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.129	91975	7.634	23.794	311.7	-
*2-Bromonaphthalene	14.985	105994	7.634	39.855	522.1	-
*o-Terphenyl	17.332	112380	7.634	25.799	337.97	-
*1-Chlorooctadecane	18.113	93727	7.634	27.033	354.13	-

C11-C22 Aromatics Area:5141862 C11-C22 Aromatics Amount: 1194.24
EPH Aromatics total Area:5768514 EPH Aromatics Total Amount: 1339.785

OSWSA-200-SGRAY Batch ID: 34774

— G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

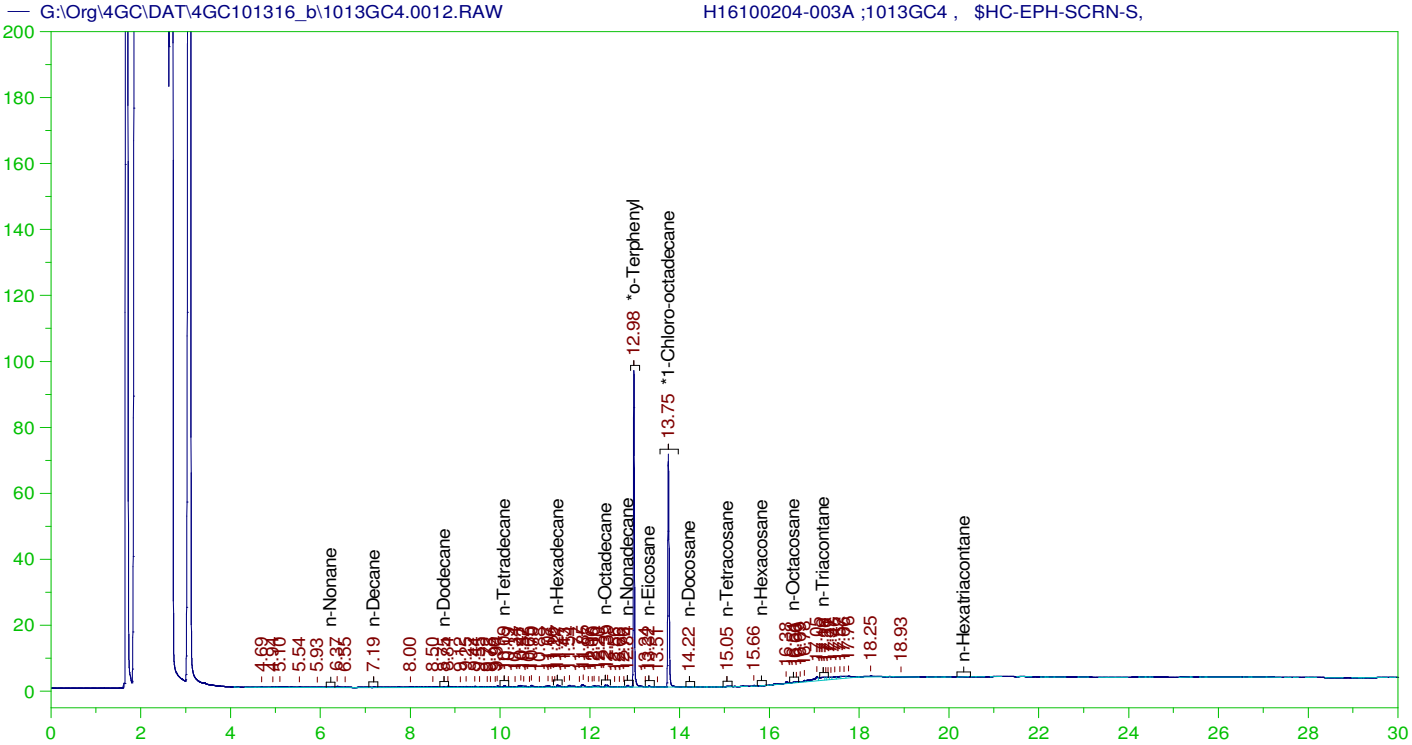
Sample Name: H16100204-002A ;1018GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC101816_b\1018GC1.0020.RAW
Date & Time Acquired: 10/19/2016 12:58:55 AM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.2 Dilution: 6 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.512	2.46	2.473	42450	10.167	
2-Methylnaphthalene	13.585	1.4	1.4	130505	31.251	
Acenaphthylene	14.792	.17	.193	2111	.514	
Fluorene	15.054	-.07	-.069	26050	5.924	
Acenaphthene	15.714	-.71	-.729	29791	7.016	
Phenanthrene	16.853	-1.88	-1.868	15362	3.597	
Anthracene	16.912	-1.93	-1.927	2450	.568	
Pyrene	18.269	-3.31	-3.284	5686	1.304	
Fluoranthene	18.604	-3.58	-3.619	2707	.614	
Benzo(a)Anthracene	.	.	.		.229	U
Chrysene	.	.	.		.229	U
Benzo(b&k)Fluoranthe	.	.	.		.458	U
Benzo(a)Pyrene	.	.	.		.229	U
Indeno-Dibenzo	.	.	.		.458	U
Benzo(g,h,i)Perylene	.	.	.		.229	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.129	51036	7.634	13.203	172.96	40-140
*2-Bromonaphthalene	14.985	62317	7.634	23.432	306.96	40-140
*o-Terphenyl	17.332	31095	7.634	7.139	93.51	40-140
*1-Chlorooctadecane	18.113	24396	7.634	7.036	92.17	40-140

OSFFT-201-BASE Batch ID: 34734

— G:\Org\4GC\DAT\4GC101316_b\1013GC4.0012.RAW H16100204-003A ;1013GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100204-003A ;1013GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101316_b\1013GC4.0012.RAW
Date & Time Acquired: 10/13/2016 7:16:05 PM
Method File: G:\Org\4GC\Methods\SR010816AB.MET
Calibration File: G:\Org\4GC\Cals\SC010816AB.CAL
Sample Weight: 25 Dilution: 2 S.A.: 1

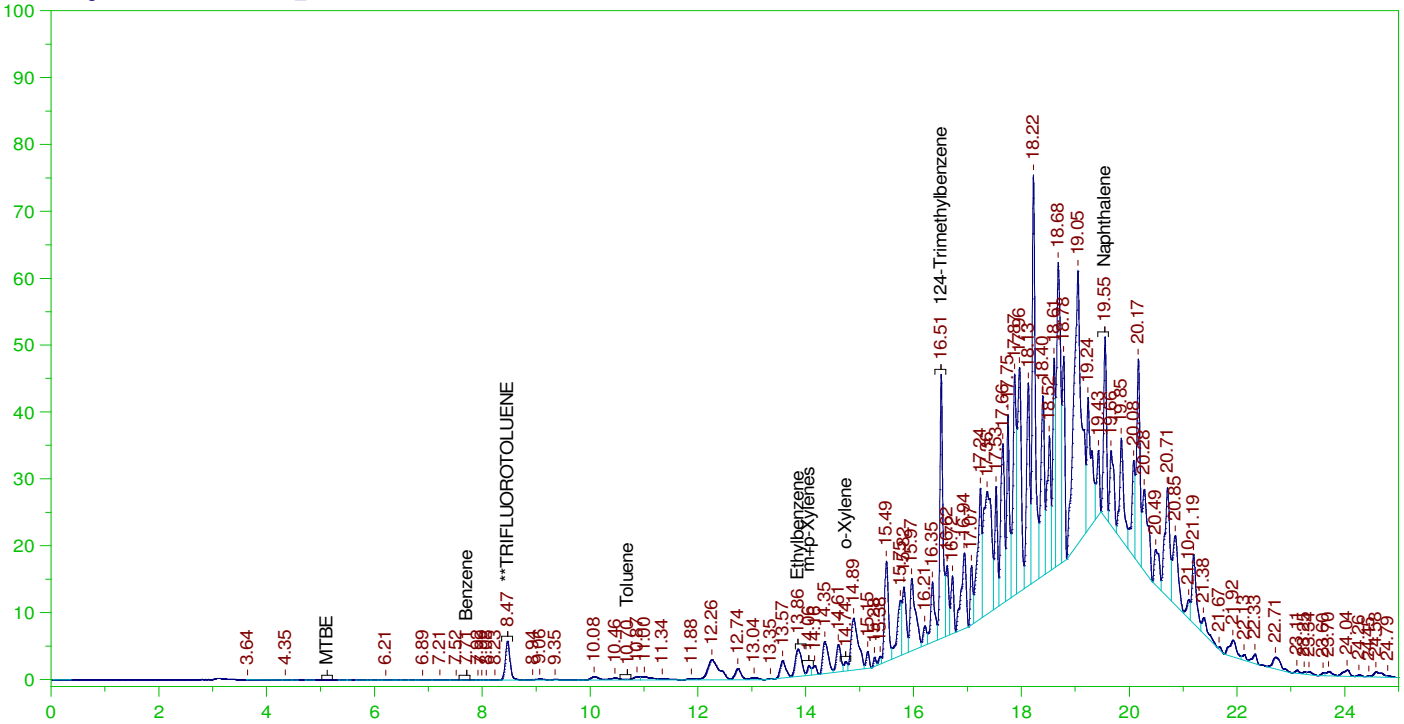
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.08 to 17.32
Rt range for C9 to C18 Hydrocarbons: 6.13 to 12.91
Rt range for C19 to C36 Hydrocarbons: 12.96 to 20.48

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.983	168479	8.	6.666	83.33	-
*1-Chloro-octadecane	13.752	132739	8.	6.729	84.11	-

DRO Area:100749.5 DRO Amount: 4.404552
TEH Area:139731.2 TEH Amount: 6.108745
C9-C18 Area:66677.31 C9-C18 Amount: 2.944714
C19-C36 Area:61896.22 C19-C36 Amount: 2.678926

MCMW2-105-SGRAY Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW H16100204-001A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

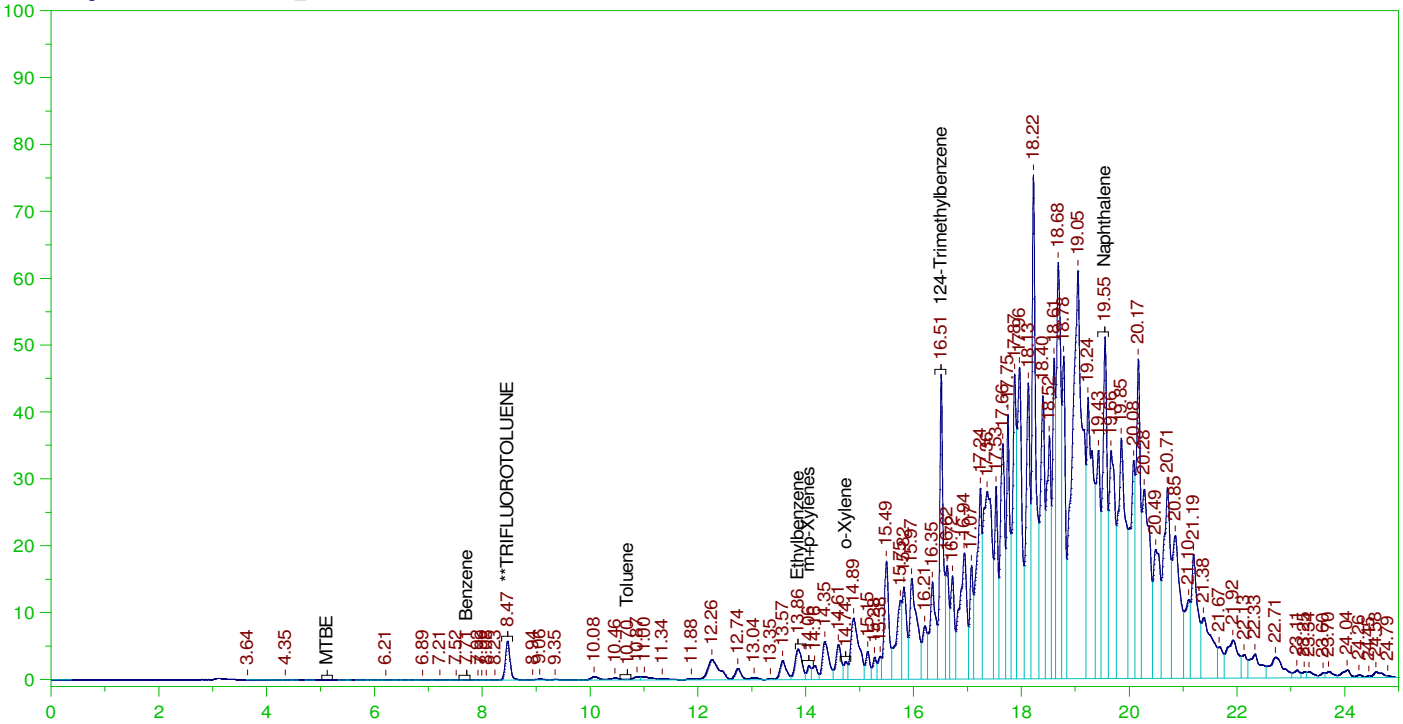
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:3249777 C9-C10 Aromatics Amount: 118.368

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.714	7.714	7.714	294	.056	U
Toluene	10.695	10.695	10.695	227	.056	U
Ethylbenzene	13.859	-5.449	-5.389	34036	1.017	
m+p-Xylenes	14.058	-5.579	-5.588	6814	.184	
o-Xylene	14.742	-6.279	-6.272	6161	.192	
124-Trimethylbenzene	16.511	-8.037	-8.041	159877	7.009	
Naphthalene	19.55	-11.056	-11.08	103911	7.301	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.47	35986	2.775	2.526	91.04

MCMW2-105-SGRAY Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW H16100204-001A ;1013GC2 , $HC-VPH-MA-S,



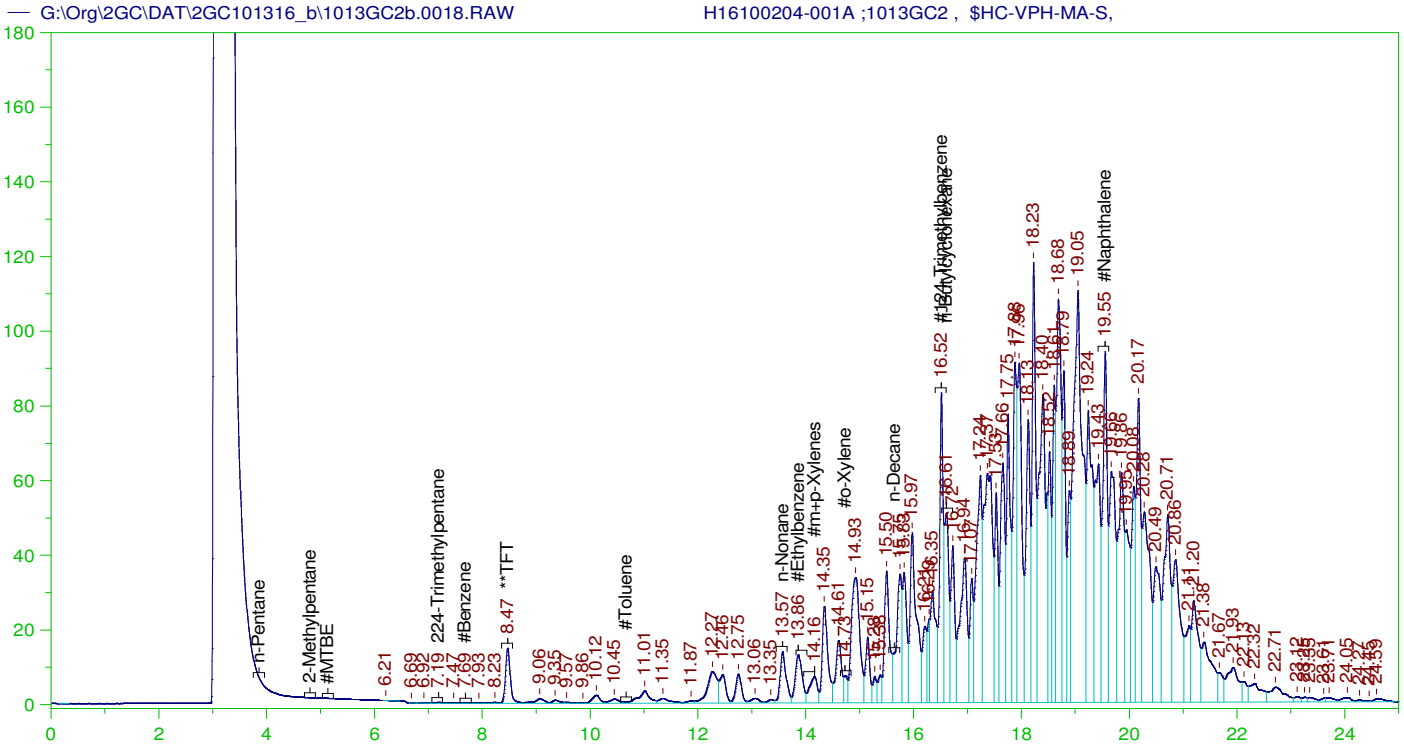
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:5863996 C9-C10 Aromatics Amount: 213.5868

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.714	7.714	7.714	294	.056	U
Toluene	10.695	10.695	10.695	227	.056	U
Ethylbenzene	13.859	-5.449	-5.389	41707	1.247	
m+p-Xylenes	14.058	-5.579	-5.588	10921	.295	
o-Xylene	14.742	-6.279	-6.272	12659	.394	
124-Trimethylbenzene	16.511	-8.037	-8.041	212239	9.305	
Naphthalene	19.55	-11.056	-11.08	301940	21.214	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.47	35986	2.775	2.526	91.04



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-001A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0018.RAW
Date & Time Acquired: 10/13/2016 10:02:04 PM
Method File: G:\Org\2GC\Methods\10131618B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

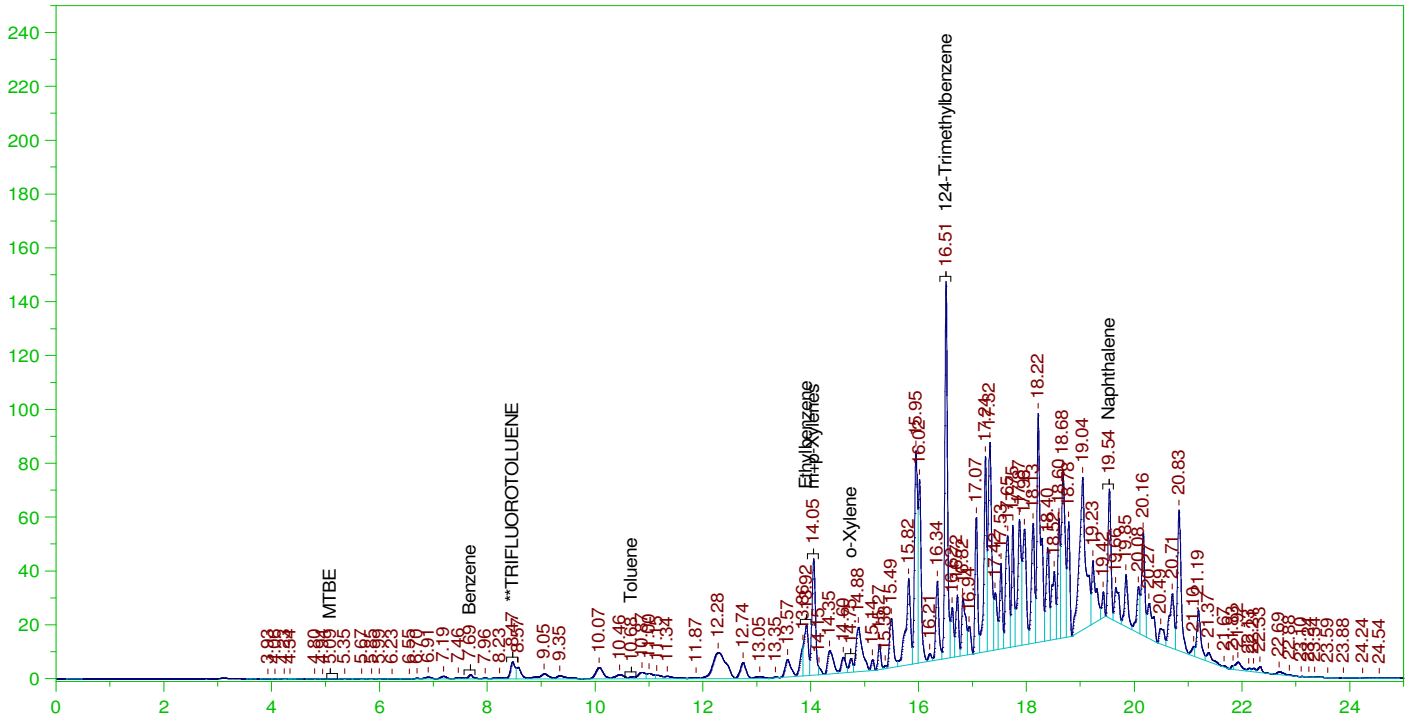
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.473	92131	2.775	2.662	95.94	-

GRO Area:1806650 GRO Amount: 45.70119
TPH Area:1.87955E+07 TPH Amount: 475.4528

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:382747.4 C5-C8 Amount: 8.597202
C9-C12 Area:1.269559E+07 C9-C12 Amount: 546.369

OSWSA-200-SGRAY Batch ID: 34740

G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW H16100204-002A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

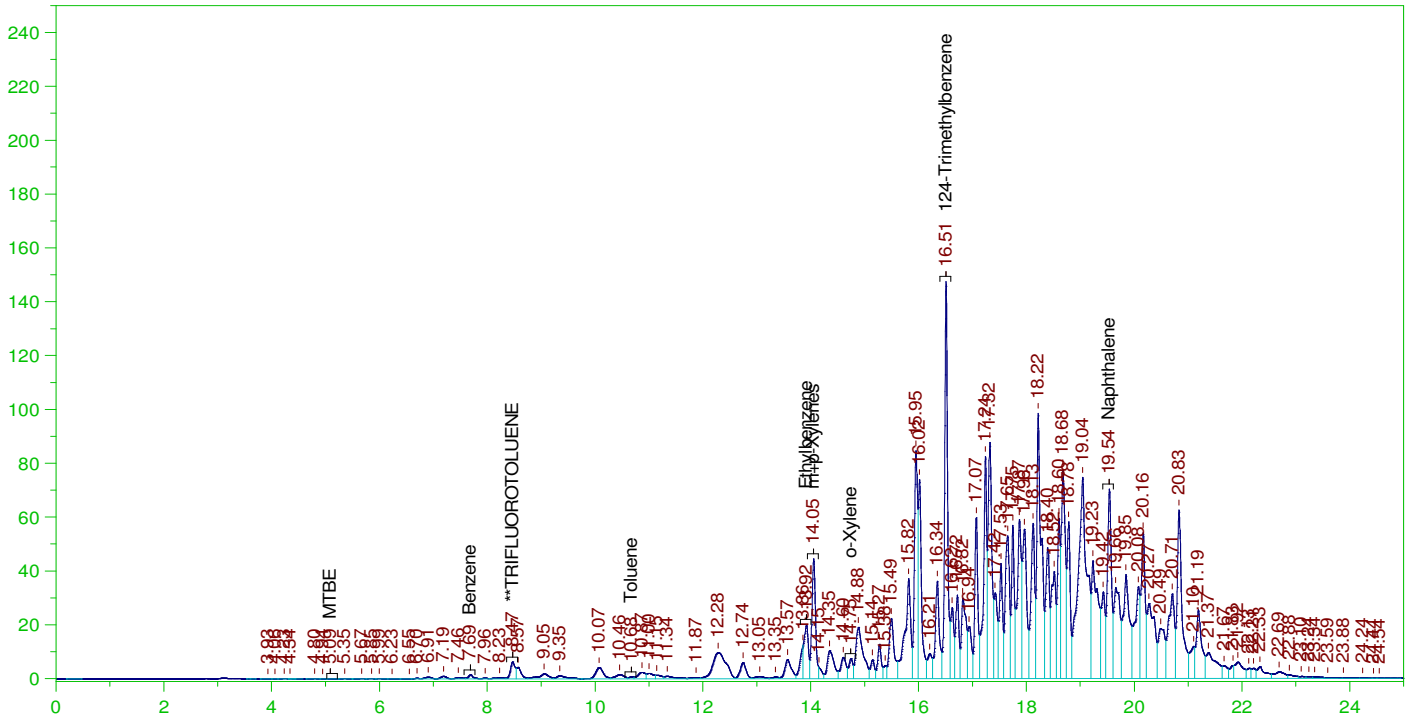
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:5879897 C9-C10 Aromatics Amount: 221.8837

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.093	5.093	5.093	438	.115	U
Benzene	7.687	.789	.784	9057	.208	
Toluene	10.675	-2.196	-2.204	3797	.104	
Ethylbenzene	13.919	-5.449	-5.448	101544	3.145	
m+p-Xylenes	14.053	-5.579	-5.582	202210	5.661	
o-Xylene	14.746	-6.279	-6.275	22921	.74	
124-Trimethylbenzene	16.509	-8.037	-8.038	504936	22.935	
Naphthalene	19.536	-11.056	-11.065	187630	13.658	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.471	38819	2.875	2.823	98.21

OSWSA-200-SGRAY Batch ID: 34740

G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW H16100204-002A ;1013GC2 , $HC-VPH-MA-S,



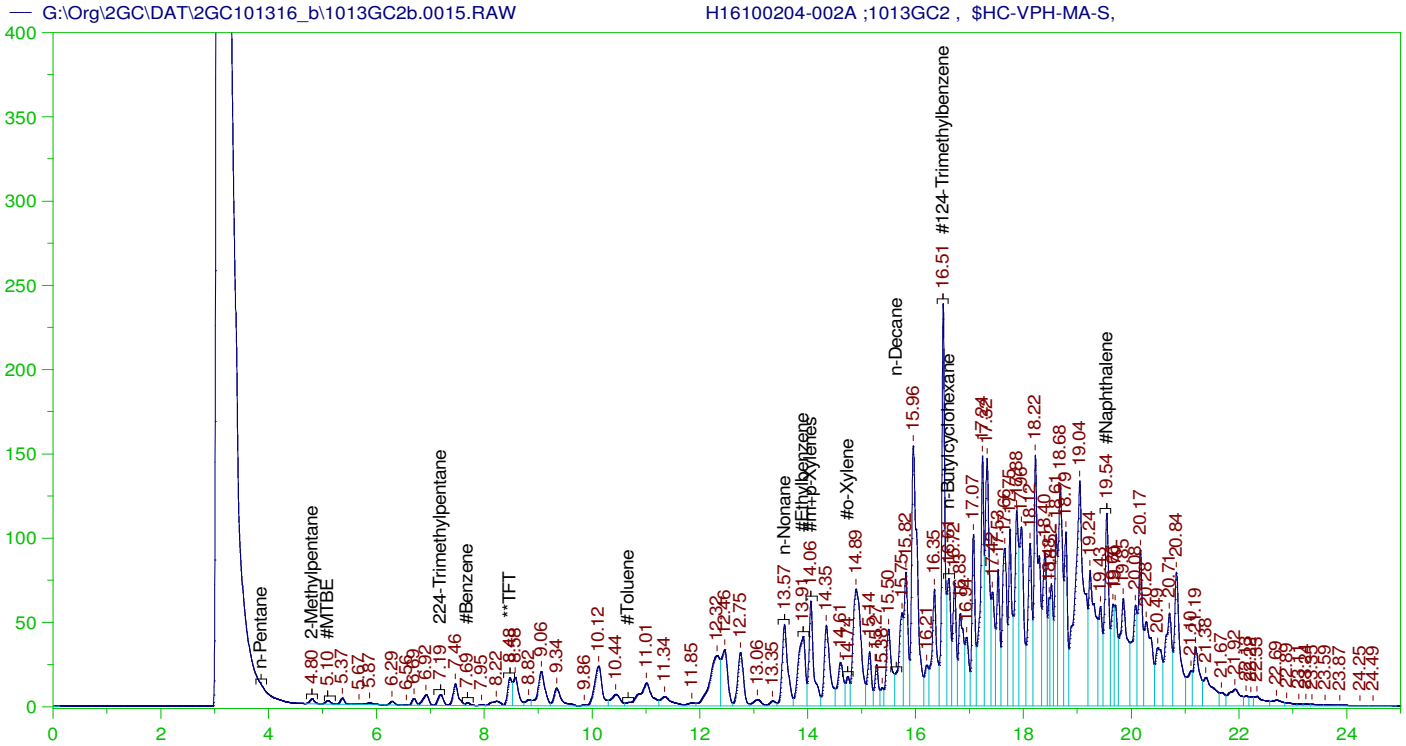
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:8570609 C9-C10 Aromatics Amount: 323.4203

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.093	5.093	5.093	438	.115	U
Benzene	7.687	.789	.784	9057	.208	
Toluene	10.675	-2.196	-2.204	3965	.108	
Ethylbenzene	13.919	-5.449	-5.448	109129	3.38	
m+p-Xylenes	14.053	-5.579	-5.582	214443	6.003	
o-Xylene	14.746	-6.279	-6.275	37911	1.224	
124-Trimethylbenzene	16.509	-8.037	-8.038	571146	25.943	E
Naphthalene	19.536	-11.056	-11.065	375963	27.367	E

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.471	38819	2.875	2.823	98.21



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-002A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0015.RAW
Date & Time Acquired: 10/13/2016 8:29:33 PM
Method File: G:\Org\2GC\Methods\10131615B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.15 S.A.: 1.15

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

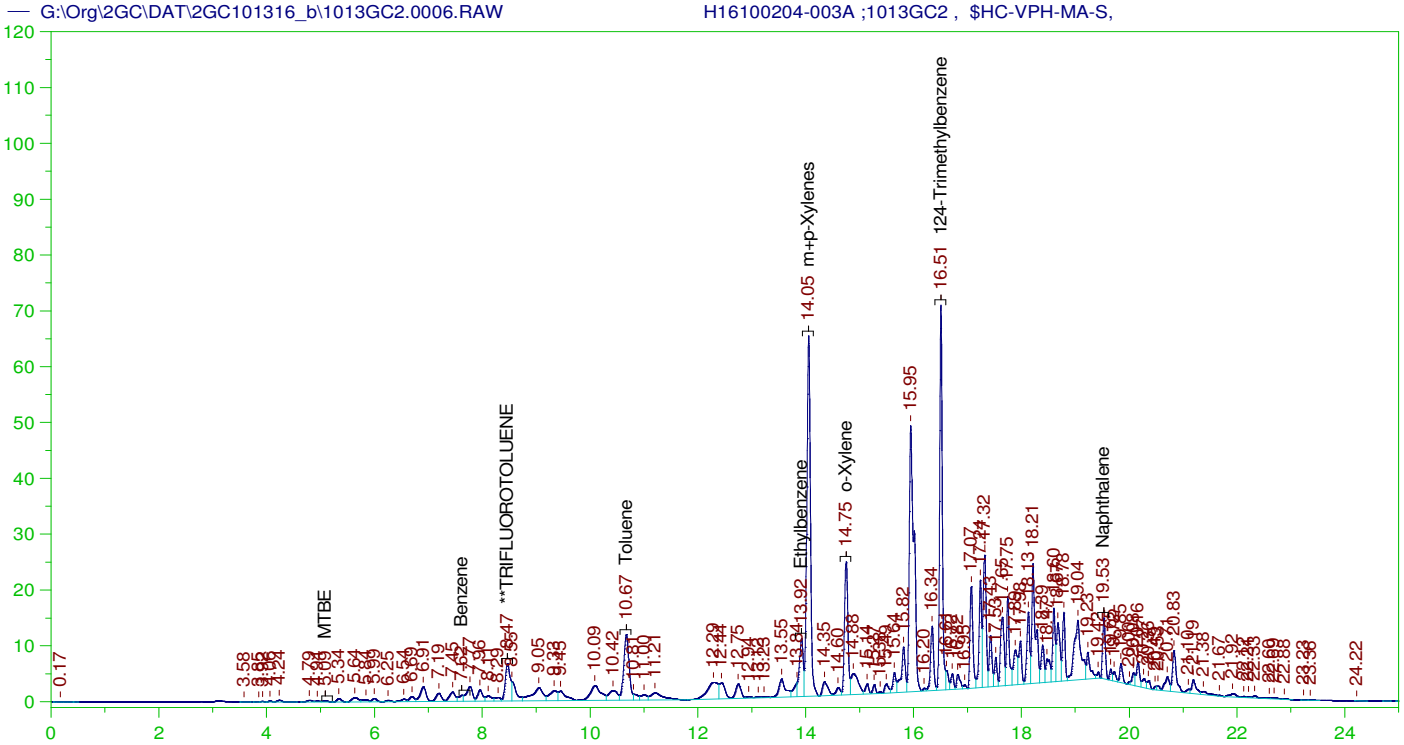
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.477	92673	2.875	2.775	96.5	-

GRO Area:5482874 GRO Amount: 143.6933
TPH Area:2.669071E+07 TPH Amount: 699.5012

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2349487 C5-C8 Amount: 54.6755
C9-C12 Area:1.861134E+07 C9-C12 Amount: 829.8233

OSFFT-201-BASE Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW H16100204-003A ;1013GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

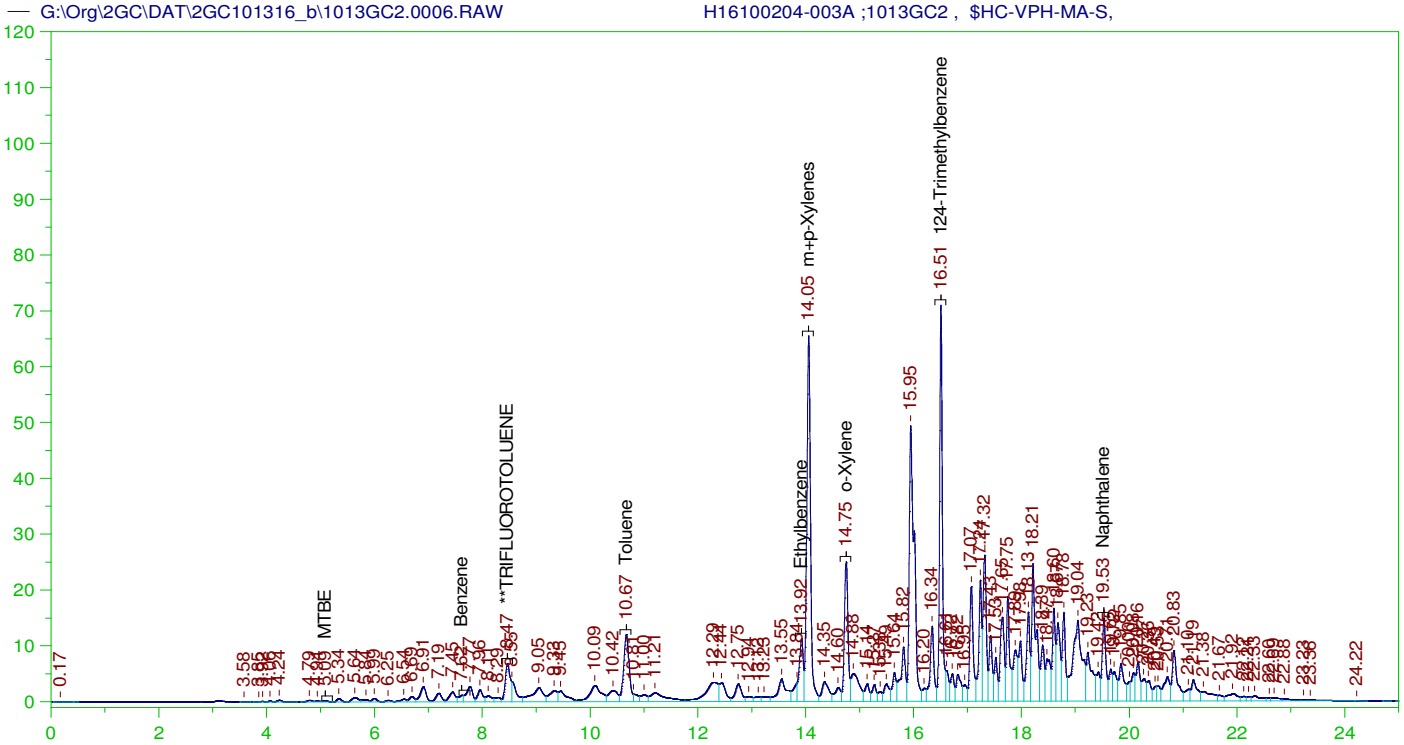
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1646327 C9-C10 Aromatics Amount: 65.36711

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.089	3.34	3.38	1659	.135	
Benzene	7.62	.789	.848	6350	.154	
Toluene	10.673	-2.196	-2.204	83370	2.399	
Ethylbenzene	13.921	-5.449	-5.452	52590	1.714	
m+p-Xylenes	14.053	-5.579	-5.584	303156	8.929	
o-Xylene	14.749	-6.279	-6.28	103664	3.52	
124-Trimethylbenzene	16.506	-8.037	-8.038	241896	11.561	
Naphthalene	19.527	-11.056	-11.059	38363	2.938	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.469	43615	3.025	3.338	110.34

OSFFT-201-BASE Batch ID: 34740

— G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW H16100204-003A ;1013GC2 , $HC-VPH-MA-S,



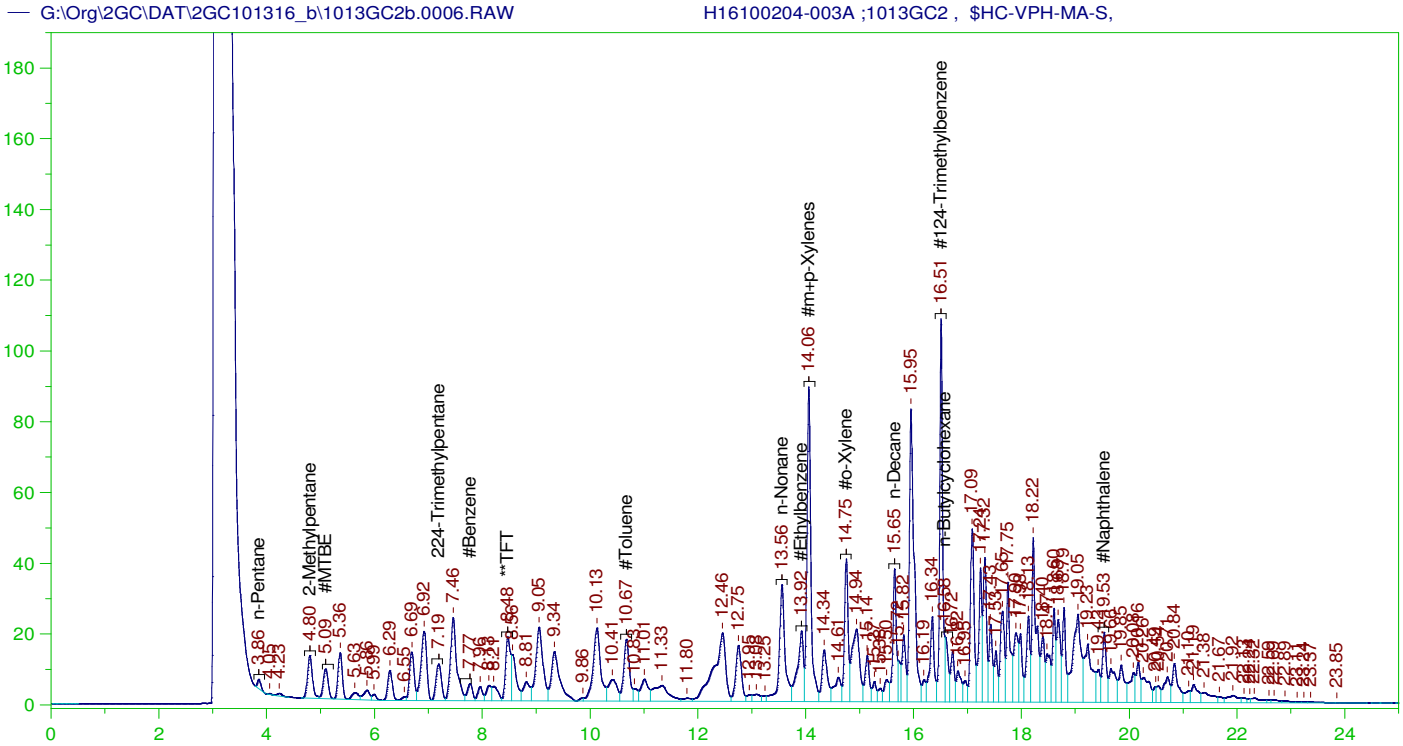
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2323195 C9-C10 Aromatics Amount: 92.24203

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.089	3.34	3.38	1678	~~.137~~	<0.2 tjb 10/14/16
Benzene	7.62	.789	.848	7099	.172	
Toluene	10.673	-2.196	-2.204	87615	2.521	
Ethylbenzene	13.921	-5.449	-5.452	59859	1.951	
m+p-Xylenes	14.053	-5.579	-5.584	319368	9.407	
o-Xylene	14.749	-6.279	-6.28	116044	3.941	
124-Trimethylbenzene	16.506	-8.037	-8.038	262092	12.526	
Naphthalene	19.527	-11.056	-11.059	72064	5.519	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.469	45393	3.025	3.474	114.84



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100204-003A ;1013GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC101316_b\1013GC2b.0006.RAW
Date & Time Acquired: 10/13/2016 3:40:39 PM
Method File: G:\Org\2GC\Methods\10131606B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.21 S.A.: 1.21

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.475	114539	3.025	3.608	119.28	-

GRO Area:4281891 GRO Amount: 118.0733
TPH Area:9150031 TPH Amount: 252.3124

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2485411 C5-C8 Amount: 60.85629
C9-C12 Area:5775926 C9-C12 Amount: 270.9675

Work Order Receipt Checklist

Hydrometrics Inc

H16100204

Login completed by: Tracy L. Lorash

Date Received: 10/12/2016

Reviewed by: BL2000\rwilliams

Received by: TLL

Reviewed Date: 10/13/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.1°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

HL6100204

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: *(Signature)* JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH	VPH							REMARKS
10/10/16	0840	X		MCMW2-105-SGRAY	02									X	X							~~Normal Turnaround~~
10/11/16	0950	X		OSWSA-200-SGRAY	02									X	X							5-Day Rush
10/12/16	1050	X		OSFFT-201-BASE	02									X	X							48-Hour RUSH

Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell				HLN10286	Other hand-deliver Air Bill #
Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Remarks Please forward results to: Jamie Poell, Hydrometrics 3020 Bozeman Avenue Helena, Montana 59601 email: jpoell@hydrometrics.com		
	10/12/16 16:03				
Relinquished *(Signature)*	Date / Time	Received for Laboratory by *(Signature)*	Date / Time	Enclosed: ☐ Parameter sheet w/detection limits ☐ QA / AC standard mixing instructions ☒ Cover letter ☐ Other	
			10/12/16 16:03		

3.1° on ice hand del.

Split Samples: ☐ Accepted ☐ Declined

HFORM-1 07/11

Return results & electronic copy to:

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 12, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples

Enclosed are three soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
  - If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150, Ext. 154.

Sincerely,

James Poell
Environmental Scientist

Enclosures

Analysis Schedule:

Sample	Lab Analysis Schedule
MCMW2-105-SGRAY	Normal Turnaround
OSWSA-200-SGRAY	5-Day RUSH
OSFFT-201-BASE	48-Hour RUSH

H:\Files\MTDEQ\16048\I16 Lab Cover - Soils.doc\HLN\9/29/2016\034

9/29/2016 11:20 AM

ANALYTICAL SUMMARY REPORT

October 24, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100312 Quote ID: H1313 - EPH/VPH

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 3 samples for Hydrometrics Inc on 10/19/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100312-001	OS-202-NGRAY	10/17/16 14:30	10/19/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100312-002	OS-203-EGRAY	10/18/16 10:15	10/19/16	Soil	Same As Above
H16100312-003	OS-204-SGRAY	10/18/16 15:00	10/19/16	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100312

Report Date: 10/24/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-001
Client Sample ID: OS-202-NGRAY

Report Date: 10/24/16
Collection Date: 10/17/16 14:30
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	11.5	wt%		0.2		SW3550C	10/19/16 11:46 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/19/16 17:33 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/19/16 17:33 / tjb
Toluene	0.19	mg/kg-dry		0.056	10	MA-VPH	10/19/16 17:33 / tjb
Ethylbenzene	2.0	mg/kg-dry		0.056	10	MA-VPH	10/19/16 17:33 / tjb
m+p-Xylenes	0.43	mg/kg-dry		0.056		MA-VPH	10/19/16 17:33 / tjb
o-Xylene	0.35	mg/kg-dry		0.056		MA-VPH	10/19/16 17:33 / tjb
Xylenes, Total	0.78	mg/kg-dry		0.056	30	MA-VPH	10/19/16 17:33 / tjb
Naphthalene	0.38	mg/kg-dry		0.11	9	MA-VPH	10/19/16 17:33 / tjb
C9 to C10 Aromatics	122	mg/kg-dry	*	2.3	100	MA-VPH	10/19/16 17:33 / tjb
C5 to C8 Aliphatics	47	mg/kg-dry	*	2.3	40	MA-VPH	10/19/16 17:33 / tjb
C9 to C12 Aliphatics	208	mg/kg-dry	*	2.3	90	MA-VPH	10/19/16 17:33 / tjb
Total Purgeable Hydrocarbons	306	mg/kg-dry	*	2.3	100	MA-VPH	10/19/16 17:33 / tjb
Surr: VPH Aromatics Surrogate	103	%REC		70-130		MA-VPH	10/19/16 17:33 / tjb
Surr: VPH Aliphatics Surrogate	133	%REC	S	70-130		MA-VPH	10/19/16 17:33 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- S=The Surrogate recovery was outside QC advisory limits due to positive sample matrix interference.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	793	mg/kg-dry	*	11	200	SW8015M	10/19/16 15:19 / JRS
Surr: o-Terphenyl	105	%REC		40-140		SW8015M	10/19/16 15:19 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	317	mg/kg-dry	*	11	200	MA-EPH	10/21/16 15:56 / JRS
C19 to C36 Aliphatics	52	mg/kg-dry		11	20000	MA-EPH	10/21/16 15:56 / JRS
Surr: 1-Chloro-octadecane	82.0	%REC		40-140		MA-EPH	10/21/16 15:56 / JRS
C11 to C22 Aromatics	146	mg/kg-dry		11	400	MA-EPH	10/21/16 16:38 / JRS
Total Extractable Hydrocarbons	555	mg/kg-dry		11		MA-EPH	10/21/16 16:38 / JRS
Surr: 2-Bromonaphthalene	77.0	%REC		40-140		MA-EPH	10/21/16 16:38 / JRS
Surr: 2-Fluorobiphenyl	66.0	%REC		40-140		MA-EPH	10/21/16 16:38 / JRS
Surr: o-Terphenyl	78.0	%REC		40-140		MA-EPH	10/21/16 16:38 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	2.1	mg/kg-dry		0.37		SW8270C	10/21/16 13:18 / eli-b
Acenaphthene	ND	mg/kg-dry		0.37	200	SW8270C	10/21/16 13:18 / eli-b
Acenaphthylene	ND	mg/kg-dry		0.37		SW8270C	10/21/16 13:18 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-001
Client Sample ID: OS-202-NGRAY

Report Date: 10/24/16
Collection Date: 10/17/16 14:30
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		0.37	2000	SW8270C	10/21/16 13:18 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:18 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		0.37	0.02	SW8270C	10/21/16 13:18 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:18 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		0.37		SW8270C	10/21/16 13:18 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		0.37	2	SW8270C	10/21/16 13:18 / eli-b
Chrysene	ND	mg/kg-dry		0.37	20	SW8270C	10/21/16 13:18 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		0.37	0.02	SW8270C	10/21/16 13:18 / eli-b
Fluoranthene	ND	mg/kg-dry		0.37	300	SW8270C	10/21/16 13:18 / eli-b
Fluorene	0.19	mg/kg-dry	J	0.37	300	SW8270C	10/21/16 13:18 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:18 / eli-b
Naphthalene	0.42	mg/kg-dry		0.37	4	SW8270C	10/21/16 13:18 / eli-b
Phenanthrene	0.34	mg/kg-dry	J	0.37		SW8270C	10/21/16 13:18 / eli-b
Pyrene	ND	mg/kg-dry		0.37	200	SW8270C	10/21/16 13:18 / eli-b
Surr: 2-Fluorobiphenyl	69.0	%REC		40-140		SW8270C	10/21/16 13:18 / eli-b
Surr: o-Terphenyl	76.0	%REC		40-140		SW8270C	10/21/16 13:18 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-002
Client Sample ID: OS-203-EGRAY

Report Date: 10/24/16
Collection Date: 10/18/16 10:15
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.5	wt%		0.2		SW3550C	10/19/16 11:46 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/19/16 19:16 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/19/16 19:16 / tjb
Toluene	ND	mg/kg-dry		0.056	10	MA-VPH	10/19/16 19:16 / tjb
Ethylbenzene	1.1	mg/kg-dry		0.056	10	MA-VPH	10/19/16 19:16 / tjb
m+p-Xylenes	0.75	mg/kg-dry		0.056		MA-VPH	10/19/16 19:16 / tjb
o-Xylene	0.38	mg/kg-dry		0.056		MA-VPH	10/19/16 19:16 / tjb
Xylenes, Total	1.1	mg/kg-dry		0.056	30	MA-VPH	10/19/16 19:16 / tjb
Naphthalene	4.1	mg/kg-dry		0.11	9	MA-VPH	10/19/16 19:16 / tjb
C9 to C10 Aromatics	109	mg/kg-dry	*	2.2	100	MA-VPH	10/19/16 19:16 / tjb
C5 to C8 Aliphatics	15	mg/kg-dry		2.2	40	MA-VPH	10/19/16 19:16 / tjb
C9 to C12 Aliphatics	180	mg/kg-dry	*	2.2	90	MA-VPH	10/19/16 19:16 / tjb
Total Purgeable Hydrocarbons	293	mg/kg-dry	*	2.2	100	MA-VPH	10/19/16 19:16 / tjb
Surr: VPH Aromatics Surrogate	89.0	%REC		70-130		MA-VPH	10/19/16 19:16 / tjb
Surr: VPH Aliphatics Surrogate	113	%REC		70-130		MA-VPH	10/19/16 19:16 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	2350	mg/kg-dry	*	11	200	SW8015M	10/19/16 16:07 / JRS
Surr: o-Terphenyl	116	%REC		40-140		SW8015M	10/19/16 16:07 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	915	mg/kg-dry	*	17	200	MA-EPH	10/21/16 17:21 / JRS
C19 to C36 Aliphatics	187	mg/kg-dry		17	20000	MA-EPH	10/21/16 17:21 / JRS
Surr: 1-Chloro-octadecane	88.0	%REC		40-140		MA-EPH	10/21/16 17:21 / JRS
C11 to C22 Aromatics	513	mg/kg-dry	*	17	400	MA-EPH	10/21/16 18:04 / JRS
Total Extractable Hydrocarbons	1660	mg/kg-dry		17		MA-EPH	10/21/16 18:04 / JRS
Surr: 2-Bromonaphthalene	100	%REC		40-140		MA-EPH	10/21/16 18:04 / JRS
Surr: 2-Fluorobiphenyl	66.0	%REC		40-140		MA-EPH	10/21/16 18:04 / JRS
Surr: o-Terphenyl	96.0	%REC		40-140		MA-EPH	10/21/16 18:04 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	4.9	mg/kg-dry		0.37		SW8270C	10/21/16 13:49 / eli-b
Acenaphthene	0.27	mg/kg-dry	J	0.37	200	SW8270C	10/21/16 13:49 / eli-b
Acenaphthylene	ND	mg/kg-dry		0.37		SW8270C	10/21/16 13:49 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-002
Client Sample ID: OS-203-EGRAY

Report Date: 10/24/16
Collection Date: 10/18/16 10:15
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		0.37	2000	SW8270C	10/21/16 13:49 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:49 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		0.37	0.02	SW8270C	10/21/16 13:49 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:49 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		0.37		SW8270C	10/21/16 13:49 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		0.37	2	SW8270C	10/21/16 13:49 / eli-b
Chrysene	ND	mg/kg-dry		0.37	20	SW8270C	10/21/16 13:49 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		0.37	0.02	SW8270C	10/21/16 13:49 / eli-b
Fluoranthene	ND	mg/kg-dry		0.37	300	SW8270C	10/21/16 13:49 / eli-b
Fluorene	0.99	mg/kg-dry		0.37	300	SW8270C	10/21/16 13:49 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		0.37	0.2	SW8270C	10/21/16 13:49 / eli-b
Naphthalene	1.2	mg/kg-dry		0.37	4	SW8270C	10/21/16 13:49 / eli-b
Phenanthrene	1.0	mg/kg-dry		0.37		SW8270C	10/21/16 13:49 / eli-b
Pyrene	ND	mg/kg-dry		0.37	200	SW8270C	10/21/16 13:49 / eli-b
Surr: 2-Fluorobiphenyl	96.0	%REC		40-140		SW8270C	10/21/16 13:49 / eli-b
Surr: o-Terphenyl	59.0	%REC		40-140		SW8270C	10/21/16 13:49 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-003
Client Sample ID: OS-204-SGRAY

Report Date: 10/24/16
Collection Date: 10/18/16 15:00
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.6	wt%		0.2		SW3550C	10/19/16 11:46 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	10/19/16 21:00 / tjb
Benzene	ND	mg/kg-dry		0.056	0.04	MA-VPH	10/19/16 21:00 / tjb
Toluene	0.12	mg/kg-dry		0.056	10	MA-VPH	10/19/16 21:00 / tjb
Ethylbenzene	1.1	mg/kg-dry		0.056	10	MA-VPH	10/19/16 21:00 / tjb
m+p-Xylenes	3.0	mg/kg-dry		0.056		MA-VPH	10/19/16 21:00 / tjb
o-Xylene	1.7	mg/kg-dry		0.056		MA-VPH	10/19/16 21:00 / tjb
Xylenes, Total	4.7	mg/kg-dry		0.056	30	MA-VPH	10/19/16 21:00 / tjb
Naphthalene	7.0	mg/kg-dry		0.11	9	MA-VPH	10/19/16 21:00 / tjb
C9 to C10 Aromatics	185	mg/kg-dry	*	2.2	100	MA-VPH	10/19/16 21:00 / tjb
C5 to C8 Aliphatics	25	mg/kg-dry		2.2	40	MA-VPH	10/19/16 21:00 / tjb
C9 to C12 Aliphatics	345	mg/kg-dry	*	2.2	90	MA-VPH	10/19/16 21:00 / tjb
Total Purgeable Hydrocarbons	522	mg/kg-dry	*	2.2	100	MA-VPH	10/19/16 21:00 / tjb
Surr: VPH Aromatics Surrogate	91.0	%REC		70-130		MA-VPH	10/19/16 21:00 / tjb
Surr: VPH Aliphatics Surrogate	121	%REC		70-130		MA-VPH	10/19/16 21:00 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	4680	mg/kg-dry	*	11	200	SW8015M	10/19/16 16:56 / JRS
Surr: o-Terphenyl	114	%REC		40-140		SW8015M	10/19/16 16:56 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	1820	mg/kg-dry	*	33	200	MA-EPH	10/21/16 18:46 / JRS
C19 to C36 Aliphatics	387	mg/kg-dry		33	20000	MA-EPH	10/21/16 18:46 / JRS
Surr: 1-Chloro-octadecane	106	%REC		40-140		MA-EPH	10/21/16 18:46 / JRS
C11 to C22 Aromatics	954	mg/kg-dry	*	33	400	MA-EPH	10/21/16 19:29 / JRS
Total Extractable Hydrocarbons	3230	mg/kg-dry		33		MA-EPH	10/21/16 19:29 / JRS
Surr: 2-Bromonaphthalene	95.0	%REC		40-140		MA-EPH	10/21/16 19:29 / JRS
Surr: 2-Fluorobiphenyl	62.0	%REC		40-140		MA-EPH	10/21/16 19:29 / JRS
Surr: o-Terphenyl	103	%REC		40-140		MA-EPH	10/21/16 19:29 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	13	mg/kg-dry		1.1		SW8270C	10/21/16 14:19 / eli-b
Acenaphthene	0.66	mg/kg-dry	J	1.1	200	SW8270C	10/21/16 14:19 / eli-b
Acenaphthylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 14:19 / eli-b

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100312-003
Client Sample ID: OS-204-SGRAY

Report Date: 10/24/16
Collection Date: 10/18/16 15:00
DateReceived: 10/19/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	2.9	mg/kg-dry		1.1	2000	SW8270C	10/21/16 14:19 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 14:19 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 14:19 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 14:19 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		1.1		SW8270C	10/21/16 14:19 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		1.1	2	SW8270C	10/21/16 14:19 / eli-b
Chrysene	ND	mg/kg-dry		1.1	20	SW8270C	10/21/16 14:19 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		1.1	0.02	SW8270C	10/21/16 14:19 / eli-b
Fluoranthene	ND	mg/kg-dry		1.1	300	SW8270C	10/21/16 14:19 / eli-b
Fluorene	1.8	mg/kg-dry		1.1	300	SW8270C	10/21/16 14:19 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		1.1	0.2	SW8270C	10/21/16 14:19 / eli-b
Naphthalene	3.1	mg/kg-dry		1.1	4	SW8270C	10/21/16 14:19 / eli-b
Phenanthrene	2.8	mg/kg-dry		1.1		SW8270C	10/21/16 14:19 / eli-b
Pyrene	ND	mg/kg-dry		1.1	200	SW8270C	10/21/16 14:19 / eli-b
Surr: 2-Fluorobiphenyl	102	%REC		40-140		SW8270C	10/21/16 14:19 / eli-b
Surr: o-Terphenyl	91.0	%REC		40-140		SW8270C	10/21/16 14:19 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34837
Lab ID: MB-34837-34803	Method Blank				Run: HHP_161021A				10/21/16 13:04
C9 to C18 Aliphatics	ND	mg/kg-dry	10						
C19 to C36 Aliphatics	ND	mg/kg-dry	10						
Surr: 1-Chloro-octadecane			0.17	77	40	140			
Lab ID: LCS-34837-34803	Laboratory Control Sample				Run: HHP_161021A				10/21/16 14:30
C9 to C18 Aliphatics	23.7	mg/kg-dry	10	59	40	140			
C19 to C36 Aliphatics	46.3	mg/kg-dry	10	87	40	140			
n-Nonane	2.09	mg/kg-dry	0.17	31	30	140			
n-Decane	2.87	mg/kg-dry	0.17	43	40	140			
n-Dodecane	3.52	mg/kg-dry	0.17	53	40	140			
n-Tetradecane	4.20	mg/kg-dry	0.17	63	40	140			
n-Hexadecane	4.94	mg/kg-dry	0.17	74	40	140			
n-Octadecane	5.38	mg/kg-dry	0.17	80	40	140			
n-Nonadecane	5.52	mg/kg-dry	0.17	83	40	140			
n-Eicosane	5.68	mg/kg-dry	0.17	84	40	140			
n-Docosane	5.79	mg/kg-dry	0.17	86	40	140			
n-Tetracosane	5.87	mg/kg-dry	0.17	87	40	140			
n-Hexacosane	5.89	mg/kg-dry	0.17	88	40	140			
n-Octacosane	5.71	mg/kg-dry	0.17	86	40	140			
n-Triacontane	5.83	mg/kg-dry	0.17	88	40	140			
n-Hexatriacontane	5.61	mg/kg-dry	0.17	84	40	140			
Surr: 1-Chloro-octadecane			0.17	76	40	140			
Lab ID: H16100312-003AMS	Sample Matrix Spike				Run: HHP_161021A				10/21/16 20:12
C9 to C18 Aliphatics	1710	mg/kg-dry	33	-241	40	140			S
C19 to C36 Aliphatics	420	mg/kg-dry	33	55	40	140			
n-Nonane	5.07	mg/kg-dry	0.55	69	30	140			
n-Decane	6.78	mg/kg-dry	0.55	93	40	140			
n-Dodecane	6.36	mg/kg-dry	0.55	87	40	140			
n-Tetradecane	16.2	mg/kg-dry	0.55	222	40	140			S
n-Hexadecane	8.40	mg/kg-dry	0.55	115	40	140			
n-Octadecane	8.09	mg/kg-dry	0.55	111	40	140			
n-Nonadecane	5.93	mg/kg-dry	0.55	81	40	140			
n-Eicosane	8.72	mg/kg-dry	0.55	120	40	140			
n-Docosane	7.30	mg/kg-dry	0.55	100	40	140			
n-Tetracosane	7.01	mg/kg-dry	0.55	96	40	140			
n-Hexacosane	6.84	mg/kg-dry	0.55	94	40	140			
n-Octacosane	6.57	mg/kg-dry	0.55	90	40	140			
n-Triacontane	6.71	mg/kg-dry	0.55	92	40	140			
n-Hexatriacontane	5.79	mg/kg-dry	0.55	79	40	140			
Surr: 1-Chloro-octadecane			0.55	103	40	140			
Lab ID: H16100312-003AMSD	Sample Matrix Spike Duplicate				Run: HHP_161021A				10/21/16 21:37
C9 to C18 Aliphatics	1730	mg/kg-dry	33	-204	40	140	1.0	20	S

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/24/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34837
Lab ID: H16100312-003AMSD	Sample Matrix Spike Duplicate				Run: HHP_161021A				10/21/16 21:37
C19 to C36 Aliphatics	417	mg/kg-dry	33	51	40	140	0.7	20	
n-Nonane	5.05	mg/kg-dry	0.55	69	30	140	0.3	30	
n-Decane	6.52	mg/kg-dry	0.55	89	40	140	4.0	20	
n-Dodecane	6.84	mg/kg-dry	0.55	94	40	140	7.3	20	
n-Tetradecane	16.7	mg/kg-dry	0.55	229	40	140	2.8	20	S
n-Hexadecane	13.4	mg/kg-dry	0.55	184	40	140	46	20	SR
n-Octadecane	8.25	mg/kg-dry	0.55	113	40	140	2.0	20	
n-Nonadecane	6.22	mg/kg-dry	0.55	85	40	140	4.8	20	
n-Eicosane	8.98	mg/kg-dry	0.55	123	40	140	2.9	20	
n-Docosane	7.44	mg/kg-dry	0.55	102	40	140	1.9	20	
n-Tetracosane	7.10	mg/kg-dry	0.55	97	40	140	1.3	20	
n-Hexacosane	6.99	mg/kg-dry	0.55	96	40	140	2.3	20	
n-Octacosane	6.64	mg/kg-dry	0.55	91	40	140	1.1	20	
n-Triacontane	6.89	mg/kg-dry	0.55	94	40	140	2.6	20	
n-Hexatriacontane	5.75	mg/kg-dry	0.55	79	40	140	0.7	20	
Surr: 1-Chloro-octadecane			0.55	106	40	140			
Lab ID: MB-34837-34803	Method Blank				Run: HHP_161021A				10/21/16 13:47
C11 to C22 Aromatics	ND	mg/kg-dry	10						
Total Extractable Hydrocarbons	ND	mg/kg-dry	10						
Naphthalene	ND	mg/kg-dry	0.17						
2-MethylNaphthalene	ND	mg/kg-dry	0.17						
Acenaphthylene	ND	mg/kg-dry	0.17						
Acenaphthene	ND	mg/kg-dry	0.17						
Fluorene	ND	mg/kg-dry	0.17						
Phenanthrene	ND	mg/kg-dry	0.17						
Anthracene	ND	mg/kg-dry	0.17						
Fluoranthene	ND	mg/kg-dry	0.17						
Pyrene	ND	mg/kg-dry	0.17						
Benzo(a)Anthracene	ND	mg/kg-dry	0.17						
Chrysene	ND	mg/kg-dry	0.17						
Benzo(b)Fluoranthene/Benzo(k)Fluoran	ND	mg/kg-dry	0.17						
Benzo(a)Pyrene	ND	mg/kg-dry	0.17						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	ND	mg/kg-dry	0.17						
Benzo(g,h,I)perylene	ND	mg/kg-dry	0.17						
Surr: 2-Bromonaphthalene			0.17	67	40	140			
Surr: 2-Fluorobiphenyl			0.17	68	40	140			
Surr: o-Terphenyl			0.17	69	40	140			
Lab ID: LCS-34837-34803	Laboratory Control Sample				Run: HHP_161021A				10/21/16 15:13
C11 to C22 Aromatics	86.3	mg/kg-dry	10	76	40	140			
Naphthalene	3.33	mg/kg-dry	0.17	50	40	140			
2-MethylNaphthalene	3.61	mg/kg-dry	0.17	54	40	140			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34837
Lab ID: LCS-34837-34803	Laboratory Control Sample				Run: HHP_161021A				10/21/16 15:13
Acenaphthylene	4.02	mg/kg-dry	0.17	60	40	140			
Acenaphthene	4.53	mg/kg-dry	0.17	68	40	140			
Fluorene	4.10	mg/kg-dry	0.17	62	40	140			
Phenanthrene	4.56	mg/kg-dry	0.17	68	40	140			
Anthracene	4.08	mg/kg-dry	0.17	61	40	140			
Fluoranthene	5.57	mg/kg-dry	0.17	84	40	140			
Pyrene	5.49	mg/kg-dry	0.17	82	40	140			
Benzo(a)Anthracene	4.76	mg/kg-dry	0.17	71	40	140			
Chrysene	4.78	mg/kg-dry	0.17	72	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	11.3	mg/kg-dry	0.17	86	40	140			
Benzo(a)Pyrene	5.45	mg/kg-dry	0.17	82	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	11.0	mg/kg-dry	0.17	83	40	140			
Benzo(g,h,I)perylene	5.39	mg/kg-dry	0.17	81	40	140			
Surr: 2-Bromonaphthalene			0.17	67	40	140			
Surr: 2-Fluorobiphenyl			0.17	70	40	140			
Surr: o-Terphenyl			0.17	75	40	140			
Lab ID: H16100312-003AMS	Sample Matrix Spike				Run: HHP_161021A				10/21/16 20:55
C11 to C22 Aromatics	1060	mg/kg-dry	33	88	40	140			
Naphthalene	12.5	mg/kg-dry	0.55	75	40	140			
2-MethylNaphthalene	27.0	mg/kg-dry	0.55	80	40	140			
Acenaphthylene	9.15	mg/kg-dry	0.55	119	40	140			
Acenaphthene	9.35	mg/kg-dry	0.55	55	40	140			
Fluorene	10.0	mg/kg-dry	0.55	79	40	140			
Phenanthrene	7.98	mg/kg-dry	0.55	74	40	140			
Anthracene	5.45	mg/kg-dry	0.55	69	40	140			
Fluoranthene	6.99	mg/kg-dry	0.55	80	40	140			
Pyrene	7.45	mg/kg-dry	0.55	88	40	140			
Benzo(a)Anthracene	5.47	mg/kg-dry	0.55	75	40	140			
Chrysene	5.46	mg/kg-dry	0.55	75	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	13.1	mg/kg-dry	0.55	91	40	140			
Benzo(a)Pyrene	6.49	mg/kg-dry	0.55	89	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	12.7	mg/kg-dry	0.55	88	40	140			
Benzo(g,h,I)perylene	6.23	mg/kg-dry	0.55	85	40	140			
Surr: 2-Bromonaphthalene			0.55	99	40	140			
Surr: 2-Fluorobiphenyl			0.55	66	40	140			
Surr: o-Terphenyl			0.55	107	40	140			
Lab ID: H16100312-003AMSD	Sample Matrix Spike Duplicate				Run: HHP_161021A				10/21/16 22:20
C11 to C22 Aromatics	1000	mg/kg-dry	33	39	40	140	5.9	20	S
Naphthalene	11.5	mg/kg-dry	0.55	62	40	140	8.0	40	
2-MethylNaphthalene	25.3	mg/kg-dry	0.55	58	40	140	6.1	20	
Acenaphthylene	8.91	mg/kg-dry	0.55	115	40	140	2.6	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34837
Lab ID: H16100312-003AMSD	Sample Matrix Spike Duplicate				Run: HHP_161021A			10/21/16 22:20	
Acenaphthene	9.12	mg/kg-dry	0.55	52	40	140	2.4	20	
Fluorene	9.70	mg/kg-dry	0.55	75	40	140	3.4	20	
Phenanthrene	7.95	mg/kg-dry	0.55	74	40	140	0.4	20	
Anthracene	5.46	mg/kg-dry	0.55	69	40	140	0.1	20	
Fluoranthene	5.78	mg/kg-dry	0.55	63	40	140	19	20	
Pyrene	7.37	mg/kg-dry	0.55	87	40	140	1.1	20	
Benzo(a)Anthracene	5.53	mg/kg-dry	0.55	76	40	140	1.1	20	
Chrysene	5.48	mg/kg-dry	0.55	75	40	140	0.3	20	
Benzo(b)Fluoranthene/Benzo(k)Fluoran	13.2	mg/kg-dry	0.55	92	40	140	0.9	20	
Benzo(a)Pyrene	6.51	mg/kg-dry	0.55	89	40	140	0.3	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	12.8	mg/kg-dry	0.55	89	40	140	1.0	20	
Benzo(g,h,I)perylene	6.29	mg/kg-dry	0.55	86	40	140	1.0	20	
Surr: 2-Bromonaphthalene			0.55	95	40	140			
Surr: 2-Fluorobiphenyl			0.55	63	40	140			
Surr: o-Terphenyl			0.55	104	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R119734
Lab ID: CCV_1021GC103r-S	Continuing Calibration Verification Standard								10/21/16 11:39
n-Nonane	6.72	mg/kg-dry	0.17	101	75	125			
n-Decane	6.68	mg/kg-dry	0.17	100	75	125			
n-Dodecane	6.62	mg/kg-dry	0.17	99	75	125			
n-Tetradecane	6.56	mg/kg-dry	0.17	98	75	125			
n-Hexadecane	6.56	mg/kg-dry	0.17	98	75	125			
n-Octadecane	6.55	mg/kg-dry	0.17	98	75	125			
n-Nonadecane	6.53	mg/kg-dry	0.17	98	75	125			
n-Eicosane	6.54	mg/kg-dry	0.17	98	75	125			
n-Docosane	6.52	mg/kg-dry	0.17	98	75	125			
n-Tetracosane	6.52	mg/kg-dry	0.17	98	75	125			
n-Hexacosane	6.52	mg/kg-dry	0.17	98	75	125			
n-Octacosane	6.51	mg/kg-dry	0.17	98	75	125			
n-Triacontane	6.53	mg/kg-dry	0.17	98	75	125			
n-Hexatriacontane	6.60	mg/kg-dry	0.17	99	75	125			
Surr: 1-Chloro-octadecane			0.17	100	75	125			
Lab ID: CCV_1021GC104r-S	Continuing Calibration Verification Standard								10/21/16 12:21
Naphthalene	6.54	mg/kg-dry	0.17	98	75	125			
2-MethylNaphthalene	6.51	mg/kg-dry	0.17	98	75	125			
Acenaphthylene	6.51	mg/kg-dry	0.17	98	75	125			
Acenaphthene	6.46	mg/kg-dry	0.17	97	75	125			
Fluorene	6.47	mg/kg-dry	0.17	97	75	125			
Phenanthrene	6.46	mg/kg-dry	0.17	97	75	125			
Anthracene	6.45	mg/kg-dry	0.17	97	75	125			
Fluoranthene	6.40	mg/kg-dry	0.17	96	75	125			
Pyrene	6.43	mg/kg-dry	0.17	96	75	125			
Benzo(a)Anthracene	6.48	mg/kg-dry	0.17	97	75	125			
Chrysene	6.44	mg/kg-dry	0.17	97	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluoran	12.9	mg/kg-dry	0.17	97	75	125			
Benzo(a)Pyrene	6.44	mg/kg-dry	0.17	97	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd	12.9	mg/kg-dry	0.17	97	75	125			
Benzo(g,h,I)perylene	6.47	mg/kg-dry	0.17	97	75	125			
Surr: 2-Bromonaphthalene			0.17	98	40	140			
Surr: 2-Fluorobiphenyl			0.17	96	40	140			
Surr: o-Terphenyl			0.17	96	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34773
Lab ID: LCS-34773	Laboratory Control Sample				Run: GC2_161018A				10/18/16 13:32
2-Methylpentane	2.61	mg/kg-dry	0.10	105	70	130			
n-Butylcyclohexane	2.66	mg/kg-dry	0.10	107	70	130			
n-Decane	2.60	mg/kg-dry	0.10	104	70	130			
n-Pentane	2.49	mg/kg-dry	0.10	100	30	130			
Methyl tert-butyl ether (MTBE)	2.44	mg/kg-dry	0.10	98	70	130			
Benzene	2.57	mg/kg-dry	0.050	103	70	130			
Toluene	2.52	mg/kg-dry	0.050	101	70	130			
Ethylbenzene	2.52	mg/kg-dry	0.050	101	70	130			
m+p-Xylenes	5.35	mg/kg-dry	0.050	107	70	130			
o-Xylene	2.67	mg/kg-dry	0.050	107	70	130			
Naphthalene	2.54	mg/kg-dry	0.10	102	70	130			
Total Purgeable Hydrocarbons	39.4	mg/kg-dry	2.0	105	70	130			
Surr: VPH Aromatics Surrogate			0.050	106	70	130			
Surr: VPH Aliphatics Surrogate			0.050	107	70	130			
Lab ID: MB-34773	Method Blank				Run: GC2_161018A				10/18/16 14:33
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry	0.10						
Benzene	ND	mg/kg-dry	0.050						
Toluene	ND	mg/kg-dry	0.050						
Ethylbenzene	ND	mg/kg-dry	0.050						
m+p-Xylenes	ND	mg/kg-dry	0.050						
o-Xylene	ND	mg/kg-dry	0.050						
Naphthalene	ND	mg/kg-dry	0.10						
C9 to C10 Aromatics	ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics	ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics	ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons	ND	mg/kg-dry	2.0						
Xylenes, Total	ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate			0.050	100	70	130			
Surr: VPH Aliphatics Surrogate			0.050	101	70	130			
Lab ID: H16100251-025AMS	Sample Matrix Spike				Run: GC3_161018A				10/18/16 17:47
Methyl tert-butyl ether (MTBE)	5.21	mg/kg-dry	1.2	97	70	130			
Benzene	18.6	mg/kg-dry	0.61	202	70	130			S
Toluene	116	mg/kg-dry	0.61	831	70	130			S
Ethylbenzene	71.3	mg/kg-dry	0.61	465	70	130			S
m+p-Xylenes	220	mg/kg-dry	0.61	453	70	130			S
o-Xylene	80.6	mg/kg-dry	0.61	407	70	130			S
Naphthalene	29.0	mg/kg-dry	1.2	149	70	130			S
Total Purgeable Hydrocarbons	3440	mg/kg-dry	25	1430	70	130			S
Surr: VPH Aromatics Surrogate			0.61	707	70	130			S
Surr: VPH Aliphatics Surrogate			0.61	1430	70	130			S

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: 34773
Lab ID: H16100251-025AMSD	Sample Matrix Spike Duplicate				Run: GC3_161018A				10/18/16 18:56
Methyl tert-butyl ether (MTBE)	5.18	mg/kg-dry	1.2	96	70	130	0.6	20	
Benzene	18.1	mg/kg-dry	0.61	184	70	130	3.1	20	S
Toluene	113	mg/kg-dry	0.61	711	70	130	3.2	20	S
Ethylbenzene	69.2	mg/kg-dry	0.61	398	70	130	2.9	20	S
m+p-Xylenes	215	mg/kg-dry	0.61	358	70	130	2.7	20	S
o-Xylene	78.2	mg/kg-dry	0.61	330	70	130	3.0	20	S
Naphthalene	29.0	mg/kg-dry	1.2	151	70	130	0.2	20	S
Total Purgeable Hydrocarbons	3380	mg/kg-dry	25	1290	70	130	1.9	20	S
Surr: VPH Aromatics Surrogate			0.61	704	70	130			S
Surr: VPH Aliphatics Surrogate			0.61	1420	70	130			S
Method: MA-VPH									Analytical Run: R119630
Lab ID: CCV_1019GC303r-S	Continuing Calibration Verification Standard								10/19/16 10:33
1,2,4-Trimethylbenzene	2.50	mg/kg-dry	0.10	100	75	125			
2,2,4-Trimethylpentane	2.56	mg/kg-dry	0.10	102	75	125			
2-Methylpentane	2.51	mg/kg-dry	0.10	100	75	125			
n-Butylcyclohexane	2.11	mg/kg-dry	0.10	85	75	125			
n-Decane	2.02	mg/kg-dry	0.10	81	75	125			
n-Pentane	2.43	mg/kg-dry	0.10	97	75	125			
Methyl tert-butyl ether (MTBE)	2.14	mg/kg-dry	0.10	86	75	125			
Benzene	2.31	mg/kg-dry	0.050	92	75	125			
Toluene	2.36	mg/kg-dry	0.050	94	75	125			
Ethylbenzene	2.52	mg/kg-dry	0.050	101	75	125			
m+p-Xylenes	4.99	mg/kg-dry	0.050	100	75	125			
o-Xylene	2.52	mg/kg-dry	0.050	101	75	125			
Naphthalene	2.43	mg/kg-dry	0.10	97	75	125			
Surr: VPH Aromatics Surrogate			0.050	95	70	130			
Surr: VPH Aliphatics Surrogate			0.050	104	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW3550C									Batch: R119620
Lab ID: H16100312-003ADUP	Sample Duplicate				Run: EXTRACT OV 2_161019A			10/19/16 11:46	
Moisture	10.8	wt%	0.20				1.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Report Date: 10/24/16
Project: 16048 Meagher County Shop Remediation
Work Order: H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M									Batch: 34803
Lab ID: MB-34803	Method Blank				Run: HHP2_161019A				10/19/16 13:41
Total Extractable Hydrocarbons	ND	mg/kg-dry	10						
Surr: o-Terphenyl			0.17	94	40	140			
Lab ID: LCS-34803	Laboratory Control Sample				Run: HHP2_161019A				10/19/16 14:30
Total Extractable Hydrocarbons	220.5	mg/kg-dry	10	107	60	140			
Surr: o-Terphenyl			0.17	103	40	140			
Lab ID: H16100312-003AMS	Sample Matrix Spike				Run: HHP2_161019A				10/19/16 17:45
Total Extractable Hydrocarbons	4989	mg/kg-dry	11	136	60	140			
Surr: o-Terphenyl			0.18	124	40	140			
Lab ID: H16100312-003AMSD	Sample Matrix Spike Duplicate				Run: HHP2_161019A				10/19/16 18:34
Total Extractable Hydrocarbons	4507	mg/kg-dry	11	-78	60	140	10	20	S
Surr: o-Terphenyl			0.18	109	40	140			
Method: SW8015M									Analytical Run: R119625
Lab ID: CCV_1019GC402r-S	Continuing Calibration Verification Standard								10/19/16 12:52
n-Nonane	7.997	mg/kg-dry		120	75	125			
n-Decane	7.972	mg/kg-dry		120	75	125			
n-Dodecane	7.989	mg/kg-dry		120	75	125			
n-Tetradecane	8.287	mg/kg-dry		124	75	125			
n-Hexadecane	7.896	mg/kg-dry		118	75	125			
n-Octadecane	7.935	mg/kg-dry		119	75	125			
n-Nonadecane	7.986	mg/kg-dry		120	75	125			
n-Eicosane	7.953	mg/kg-dry		119	75	125			
n-Docosane	7.950	mg/kg-dry		119	75	125			
n-Tetracosane	7.984	mg/kg-dry		120	75	125			
n-Hexacosane	7.916	mg/kg-dry		119	75	125			
n-Octacosane	7.929	mg/kg-dry		119	75	125			
n-Triacontane	7.828	mg/kg-dry		117	75	125			
n-Hexatriacontane	7.597	mg/kg-dry		114	75	125			
Surr: o-Terphenyl			0.17	121	75	125			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_103833
Lab ID: MB-103833-34837-34803	Method Blank				Run: SUB-B269096				10/21/16 12:48
2-Methylnaphthalene	ND	mg/kg	0.33						
Acenaphthene	ND	mg/kg	0.33						
Acenaphthylene	ND	mg/kg	0.33						
Anthracene	ND	mg/kg	0.33						
Benzo(a)anthracene	ND	mg/kg	0.33						
Benzo(a)pyrene	ND	mg/kg	0.33						
Benzo(b)fluoranthene	ND	mg/kg	0.33						
Benzo(g,h,i)perylene	ND	mg/kg	0.33						
Benzo(k)fluoranthene	ND	mg/kg	0.33						
Chrysene	ND	mg/kg	0.33						
Dibenzo(a,h)anthracene	ND	mg/kg	0.33						
Fluoranthene	ND	mg/kg	0.33						
Fluorene	ND	mg/kg	0.33						
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.33						
Naphthalene	ND	mg/kg	0.33						
Phenanthrene	ND	mg/kg	0.33						
Pyrene	ND	mg/kg	0.33						
Surr: 2-Fluorobiphenyl			0.33	76	40	140			
Surr: o-Terphenyl			0.33	59	40	140			
Lab ID: LCS-103833	Laboratory Control Sample				Run: SUB-B269096				10/21/16 15:51
2-Methylnaphthalene	3.80	mg/kg	0.33	57	40	140			
Acenaphthene	4.42	mg/kg	0.33	66	40	140			
Acenaphthylene	4.39	mg/kg	0.33	66	40	140			
Anthracene	5.43	mg/kg	0.33	81	40	140			
Benzo(a)anthracene	6.18	mg/kg	0.33	93	40	140			
Benzo(a)pyrene	5.67	mg/kg	0.33	85	40	140			
Benzo(b)fluoranthene	5.67	mg/kg	0.33	85	40	140			
Benzo(g,h,i)perylene	6.28	mg/kg	0.33	94	40	140			
Benzo(k)fluoranthene	6.38	mg/kg	0.33	96	40	140			
Chrysene	6.48	mg/kg	0.33	97	40	140			
Dibenzo(a,h)anthracene	5.54	mg/kg	0.33	83	40	140			
Fluoranthene	6.44	mg/kg	0.33	97	40	140			
Fluorene	4.87	mg/kg	0.33	73	40	140			
Indeno(1,2,3-cd)pyrene	6.07	mg/kg	0.33	91	40	140			
Naphthalene	3.40	mg/kg	0.33	51	40	140			
Phenanthrene	5.53	mg/kg	0.33	83	40	140			
Pyrene	6.16	mg/kg	0.33	92	40	140			
Surr: 2-Fluorobiphenyl			0.33	77	40	140			
Surr: o-Terphenyl			0.33	78	40	140			
Lab ID: H16100312-003AMS	Sample Matrix Spike				Run: SUB-B269096				10/21/16 16:22
2-Methylnaphthalene	19.2	mg/kg-dry	1.1	89	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C								Batch: B_103833	
Lab ID: H16100312-003AMS	Sample Matrix Spike				Run: SUB-B269096			10/21/16 16:22	
Acenaphthene	7.43	mg/kg-dry	1.1	93	40	140	0.0	40	
Acenaphthylene	7.02	mg/kg-dry	1.1	96	40	140	0.0	40	
Anthracene	7.12	mg/kg-dry	1.1	58	40	140	0.0	40	
Benzo(a)anthracene	7.82	mg/kg-dry	1.1	107	40	140	0.0	40	
Benzo(a)pyrene	7.08	mg/kg-dry	1.1	97	40	140	0.0	40	
Benzo(b)fluoranthene	7.20	mg/kg-dry	1.1	99	40	140	0.0	40	
Benzo(g,h,i)perylene	7.06	mg/kg-dry	1.1	97	40	140	0.0	40	
Benzo(k)fluoranthene	7.24	mg/kg-dry	1.1	99	40	140	0.0	40	
Chrysene	6.96	mg/kg-dry	1.1	95	40	140	0.0	40	
Dibenzo(a,h)anthracene	6.26	mg/kg-dry	1.1	86	40	140	0.0	40	
Fluoranthene	7.53	mg/kg-dry	1.1	103	40	140	0.0	40	
Fluorene	9.01	mg/kg-dry	1.1	98	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene	7.26	mg/kg-dry	1.1	99	40	140	0.0	40	
Naphthalene	8.85	mg/kg-dry	1.1	79	40	140	0.0	40	
Phenanthrene	9.20	mg/kg-dry	1.1	88	40	140	0.0	40	
Pyrene	7.26	mg/kg-dry	1.1	99	40	140	0.0	40	
Surr: 2-Fluorobiphenyl			1.1	83	40	140			
Surr: o-Terphenyl			1.1	93	40	140			
Lab ID: H16100312-003AMSD	Sample Matrix Spike				Run: SUB-B269096			10/21/16 16:52	
2-Methylnaphthalene	16.0	mg/kg-dry	1.1	45	40	140	18	40	
Acenaphthene	6.80	mg/kg-dry	1.1	84	40	140	8.8	40	
Acenaphthylene	6.37	mg/kg-dry	1.1	87	40	140	9.7	40	
Anthracene	6.46	mg/kg-dry	1.1	49	40	140	9.7	40	
Benzo(a)anthracene	7.23	mg/kg-dry	1.1	99	40	140	7.8	40	
Benzo(a)pyrene	6.72	mg/kg-dry	1.1	92	40	140	5.1	40	
Benzo(b)fluoranthene	6.99	mg/kg-dry	1.1	96	40	140	3.0	40	
Benzo(g,h,i)perylene	7.14	mg/kg-dry	1.1	98	40	140	1.1	40	
Benzo(k)fluoranthene	7.22	mg/kg-dry	1.1	99	40	140	0.3	40	
Chrysene	6.98	mg/kg-dry	1.1	96	40	140	0.3	40	
Dibenzo(a,h)anthracene	6.35	mg/kg-dry	1.1	87	40	140	1.5	40	
Fluoranthene	6.27	mg/kg-dry	1.1	86	40	140	18	40	
Fluorene	8.66	mg/kg-dry	1.1	93	40	140	4.0	40	
Indeno(1,2,3-cd)pyrene	6.96	mg/kg-dry	1.1	95	40	140	4.2	40	
Naphthalene	7.40	mg/kg-dry	1.1	59	40	140	18	40	
Phenanthrene	8.29	mg/kg-dry	1.1	75	40	140	10	40	
Pyrene	4.72	mg/kg-dry	1.1	65	40	140	42	40	R
Surr: 2-Fluorobiphenyl			1.1	73	40	140			
Surr: o-Terphenyl			1.1	85	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 10/24/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100312

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C								Analytical Run: B_R269096	
Lab ID: 21-Oct-16_CCV_2	Continuing Calibration Verification Standard							10/21/16 12:17	
2-Methylnaphthalene	2.41	mg/kg	0.33	97	70	130			
Acenaphthene	2.37	mg/kg	0.33	95	80	120			
Acenaphthylene	2.50	mg/kg	0.33	100	70	130			
Anthracene	2.39	mg/kg	0.33	96	70	130			
Benzo(a)anthracene	2.57	mg/kg	0.33	103	70	130			
Benzo(a)pyrene	2.31	mg/kg	0.33	92	80	120			
Benzo(b)fluoranthene	2.26	mg/kg	0.33	90	70	130			
Benzo(g,h,i)perylene	2.55	mg/kg	0.33	102	70	130			
Benzo(k)fluoranthene	2.58	mg/kg	0.33	103	70	130			
Chrysene	2.50	mg/kg	0.33	100	70	130			
Dibenzo(a,h)anthracene	2.28	mg/kg	0.33	91	70	130			
Fluoranthene	2.56	mg/kg	0.33	102	80	120			
Fluorene	2.42	mg/kg	0.33	97	70	130			
Indeno(1,2,3-cd)pyrene	2.46	mg/kg	0.33	98	70	130			
Naphthalene	2.50	mg/kg	0.33	100	70	130			
Phenanthrene	2.28	mg/kg	0.33	91	70	130			
Pyrene	2.52	mg/kg	0.33	101	70	130			
Surr: 2-Fluorobiphenyl			0.33	94	70	130			
Surr: Nitrobenzene-d5			0.33	92	70	130			
Surr: o-Terphenyl			0.33	99	70	130			
Surr: Terphenyl-d14			0.33	102	70	130			

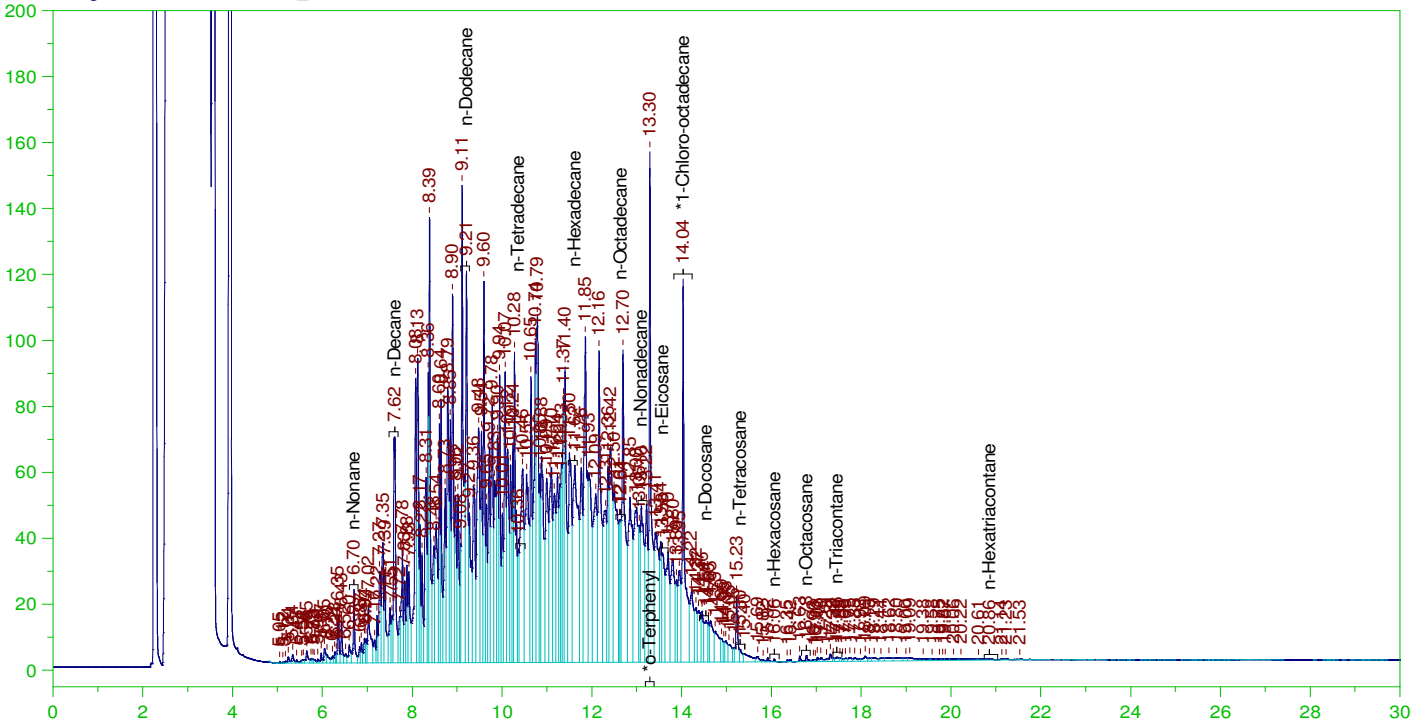
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

OS-202-NGRAY Batch ID: 34803

— G:\Org\4GC\DAT\4GC101916_b\1019GC4.0005.RAW H16100312-001A ;1019GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100312-001A ;1019GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101916_b\1019GC4.0005.RAW
Date & Time Acquired: 10/19/2016 3:19:18 PM
Method File: G:\Org\4GC\Methods\10191605.MET
Calibration File: G:\Org\4GC\Cals\SC010816AC_3.CAL
Sample Weight: 26.8 Dilution: 2 S.A.: 1

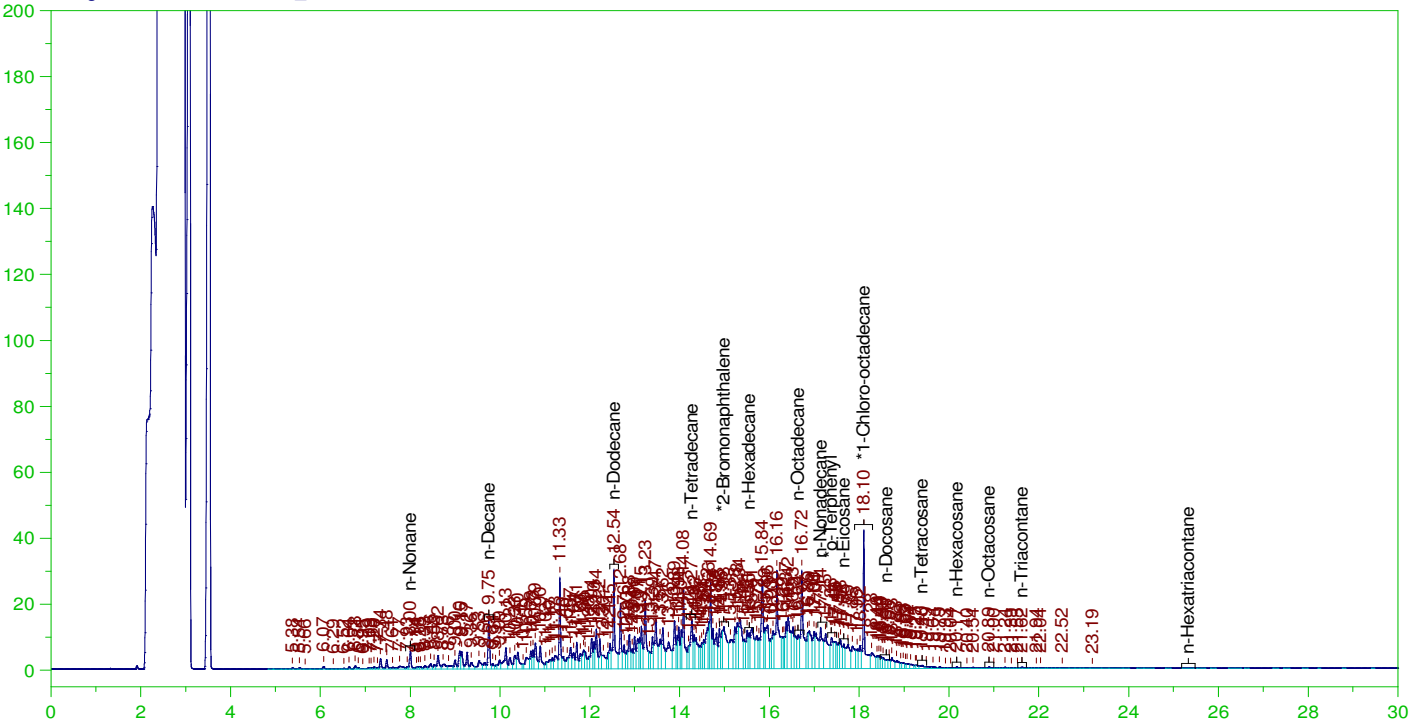
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.49 to 17.57
Rt range for C9 to C18 Hydrocarbons: 6.6 to 13.19
Rt range for C19 to C36 Hydrocarbons: 13.24 to 21.04

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.296	473372	7.463	17.473	234.13	-
*1-Chloro-octadecane	14.036	405592	7.463	19.18	257.01	-

DRO Area:1.863438E+07 DRO Amount: 759.9393
TEH Area:1.945291E+07 TEH Amount: 793.3203
C9-C18 Area:1.707684E+07 C9-C18 Amount: 703.522
C19-C36 Area:1991732 C19-C36 Amount: 80.4142

OS-202-NGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0009.RAW H16100312-001A ;1021GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100312-001A ;1021GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0009.RAW
Date & Time Acquired: 10/21/2016 3:56:03 PM
Method File: G:\Org\1GC\Methods\AL082516G.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 26.8 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

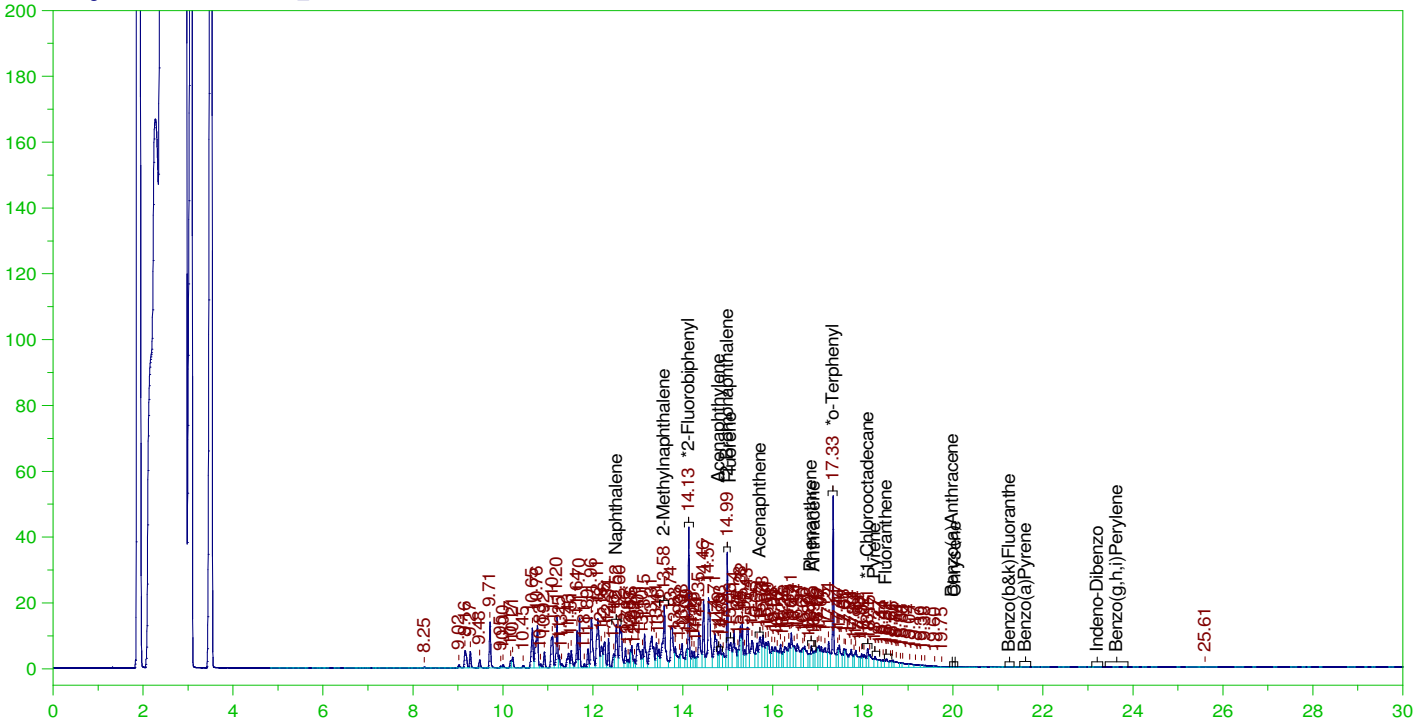
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.1	113373	7.463	11.237	150.57	-

DRO Area:3909248 DRO Amount: 337.9154
TEH Area:4253433 TEH Amount: 367.6667

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:3589518 C9-C18 Amount: 316.6285
C19-C36 Area:609779.6 C19-C36 Amount: 51.92821

OS-202-NGRAY Batch ID: 34837

G:\Org\1GC\DAT\1GC102116_b\1021GC1.0010.RAW H16100312-001A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100312-001A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0010.RAW
Date & Time Acquired: 10/21/2016 4:38:42 PM
Method File: G:\Org\1GC\Methods\AR082416G.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.8 Dilution: 2 S.A.: 1

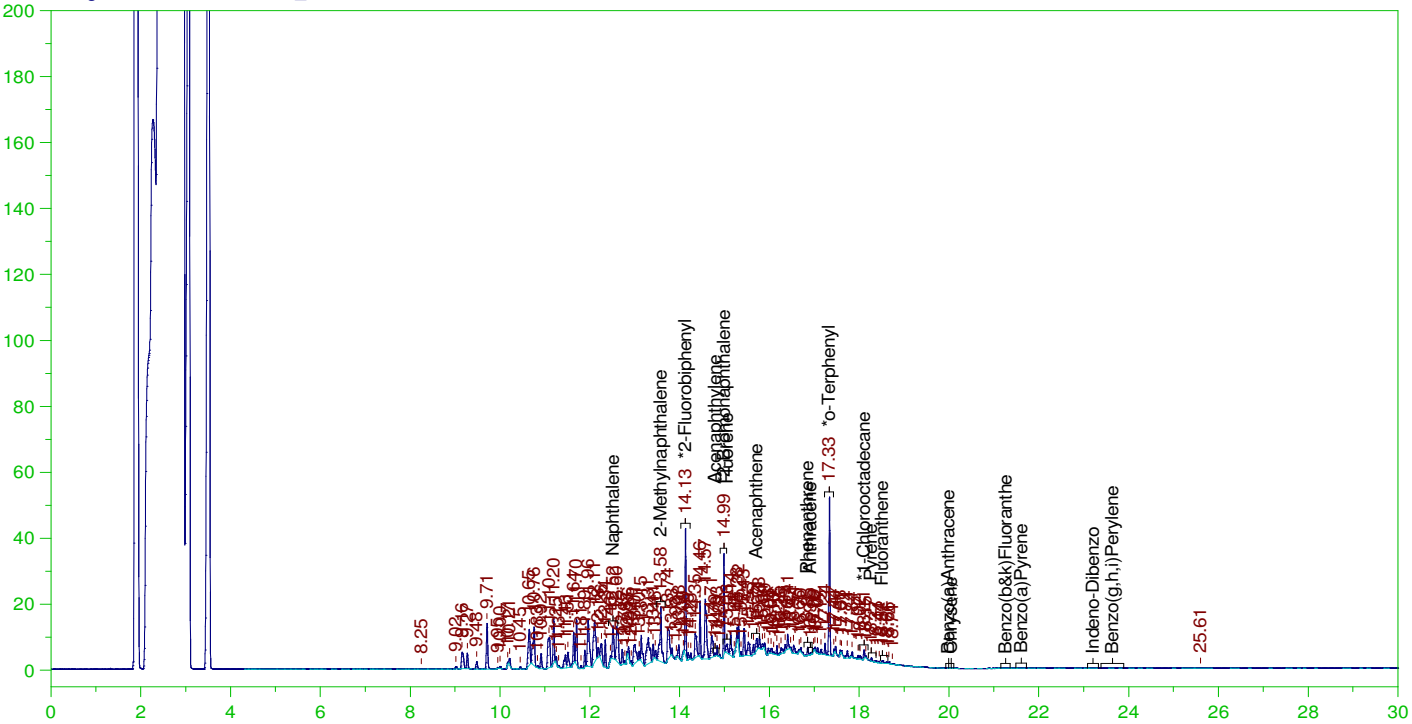
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.131	75692	7.463	6.381	85.51	-
*2-Bromonaphthalene	14.985	63238	7.463	7.749	103.83	-
*o-Terphenyl	17.335	107772	7.463	8.062	108.04	-
*1-Chlorooctadecane	18.108	17285	7.463	1.625	21.77	-

C11-C22 Aromatics Area:1928663 C11-C22 Aromatics Amount: 145.973
EPH Aromatics total Area:2469978 EPH Aromatics Total Amount: 186.9431

OS-202-NGRAY Batch ID: 34837

G:\Org\1GC\DAT\1GC102116_b\1021GC1.0010.RAW H16100312-001A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

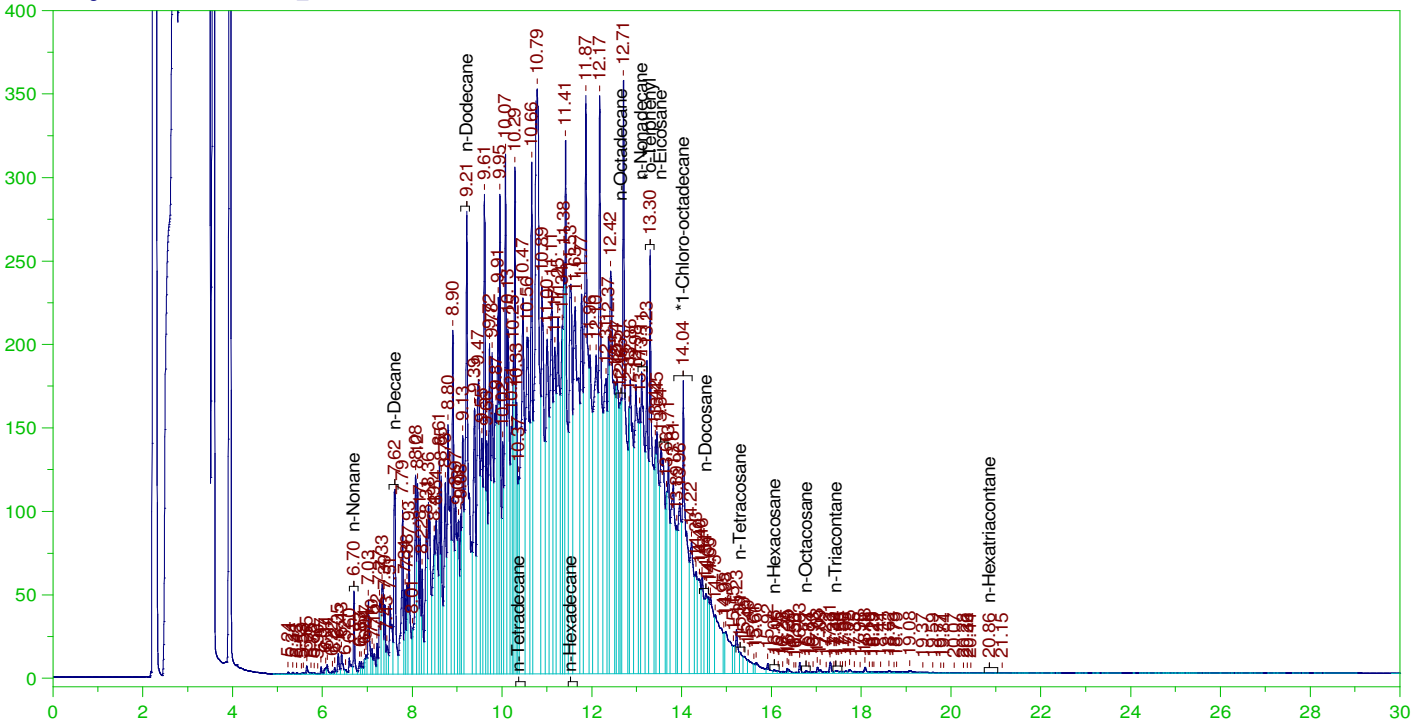
Sample Name: H16100312-001A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0010.RAW
Date & Time Acquired: 10/21/2016 4:38:42 PM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 26.8 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.516	2.46	2.469	25063	1.956	
2-Methylnaphthalene	13.584	1.4	1.401	49002	3.824	
Acenaphthylene	14.792	.17	.193	1038	.082	
Fluorene	15.056	-.07	-.071	7094	.526	
Acenaphthene	15.715	-.71	-.73	9400	.721	
Phenanthrene	16.854	-1.88	-1.869	4312	.329	
Anthracene	16.913	-1.93	-1.928	834	.063	J
Pyrene	18.272	-3.31	-3.286	1879	.14	
Fluoranthene	18.517	-3.58	-3.532	2169	.16	
Benzo(a)Anthracene	.	.	.		.075	U
Chrysene	.	.	.		.075	U
Benzo(b&k)Fluoranthe	.	.	.		.149	U
Benzo(a)Pyrene	.	.	.		.075	U
Indeno-Dibenzo	.	.	.		.149	U
Benzo(g,h,i)Perylene	.	.	.		.075	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.131	58541	7.463	4.935	66.13	40-140
*2-Bromonaphthalene	14.985	46836	7.463	5.739	76.9	40-140
*o-Terphenyl	17.335	77543	7.463	5.801	77.73	40-140
*1-Chlorooctadecane	18.108	5237	7.463	.492	6.6	40-140

OS-203-EGRAY Batch ID: 34803

— G:\Org\4GC\DAT\4GC101916_b\1019GC4.0006.RAW H16100312-002A ;1019GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100312-002A ;1019GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101916_b\1019GC4.0006.RAW
Date & Time Acquired: 10/19/2016 4:07:58 PM
Method File: G:\Org\4GC\Methods\10191606.MET
Calibration File: G:\Org\4GC\Cals\SC010816AC_3.CAL
Sample Weight: 27.2 Dilution: 2 S.A.: 1

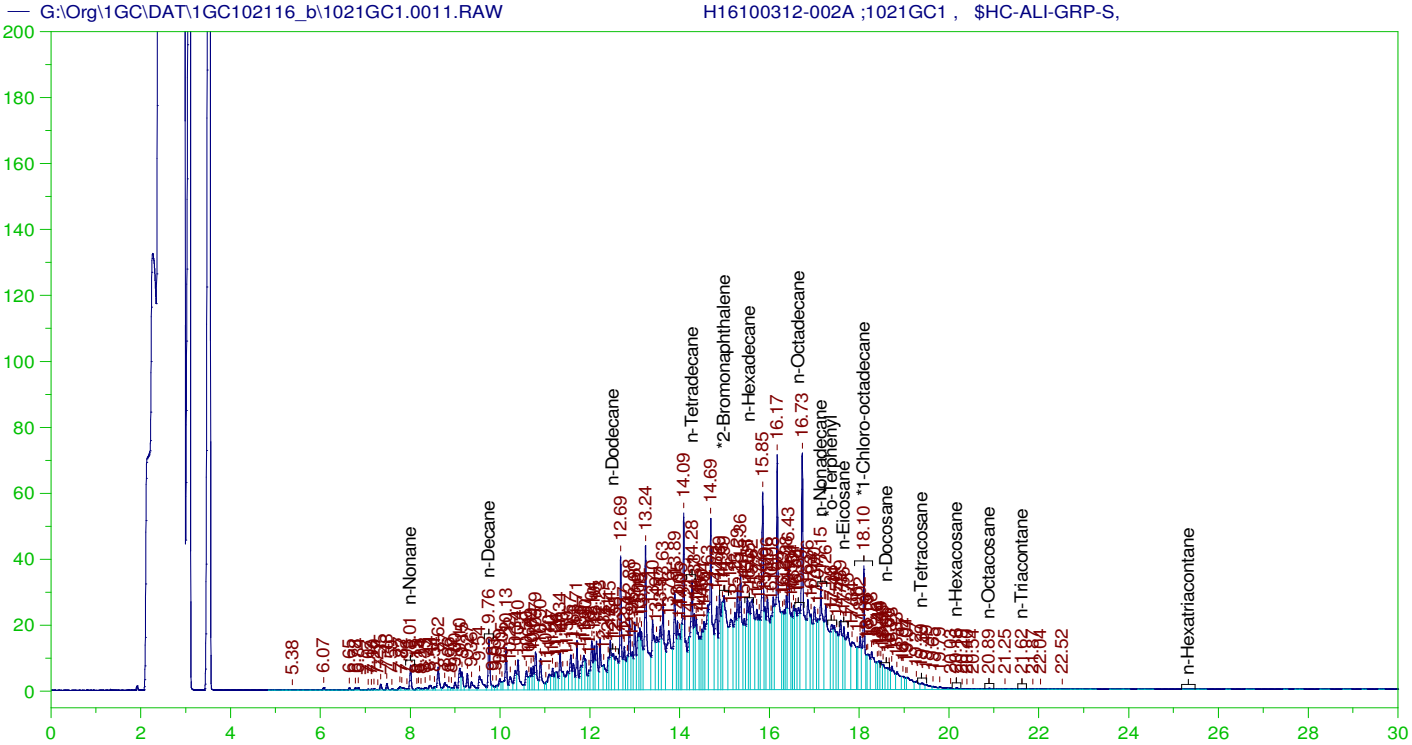
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.49 to 17.57
Rt range for C9 to C18 Hydrocarbons: 6.6 to 13.19
Rt range for C19 to C36 Hydrocarbons: 13.24 to 21.04

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.303	1136736	7.353	41.341	562.24	-
*1-Chloro-octadecane	14.04	1034429	7.353	48.198	655.49	-

DRO Area:5.73257E+07 DRO Amount: 2303.452
TEH Area:5.847299E+07 TEH Amount: 2349.552
C9-C18 Area:5.047228E+07 C9-C18 Amount: 2048.75
C19-C36 Area:7053605 C19-C36 Amount: 280.5943

OS-203-EGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0011.RAW H16100312-002A ;1021GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100312-002A ;1021GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0011.RAW
Date & Time Acquired: 10/21/2016 5:21:33 PM
Method File: G:\Org\1GC\Methods\10211611.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 27.2 Dilution: 3 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

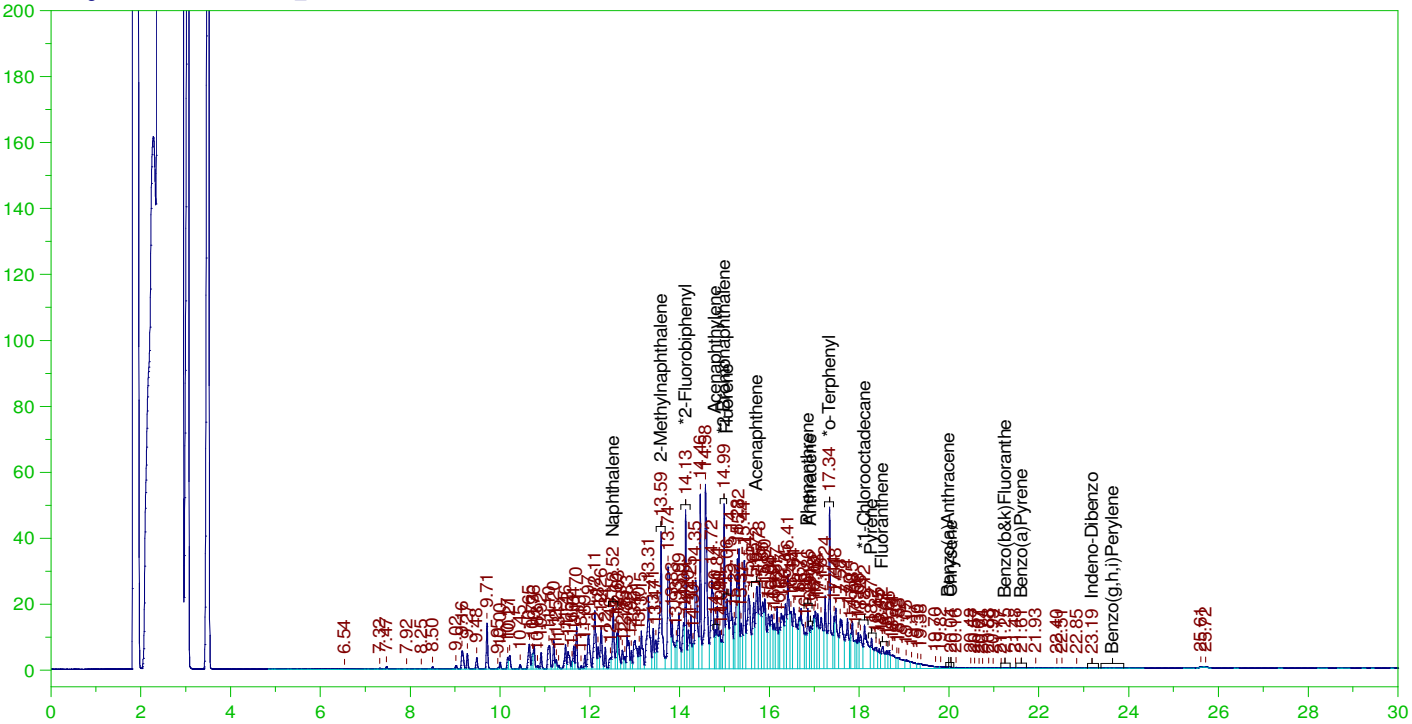
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.102	109682	7.353	16.067	218.51	-

DRO Area:8069354 DRO Amount: 1030.886
TEH Area:8540755 TEH Amount: 1091.109

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:7019904 C9-C18 Amount: 915.1709
C19-C36 Area:1485030 C19-C36 Amount: 186.9057

OS-203-EGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0012.RAW H16100312-002A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100312-002A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0012.RAW
Date & Time Acquired: 10/21/2016 6:04:15 PM
Method File: G:\Org\1GC\Methods\10211612.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 27.2 Dilution: 3 S.A.: 1

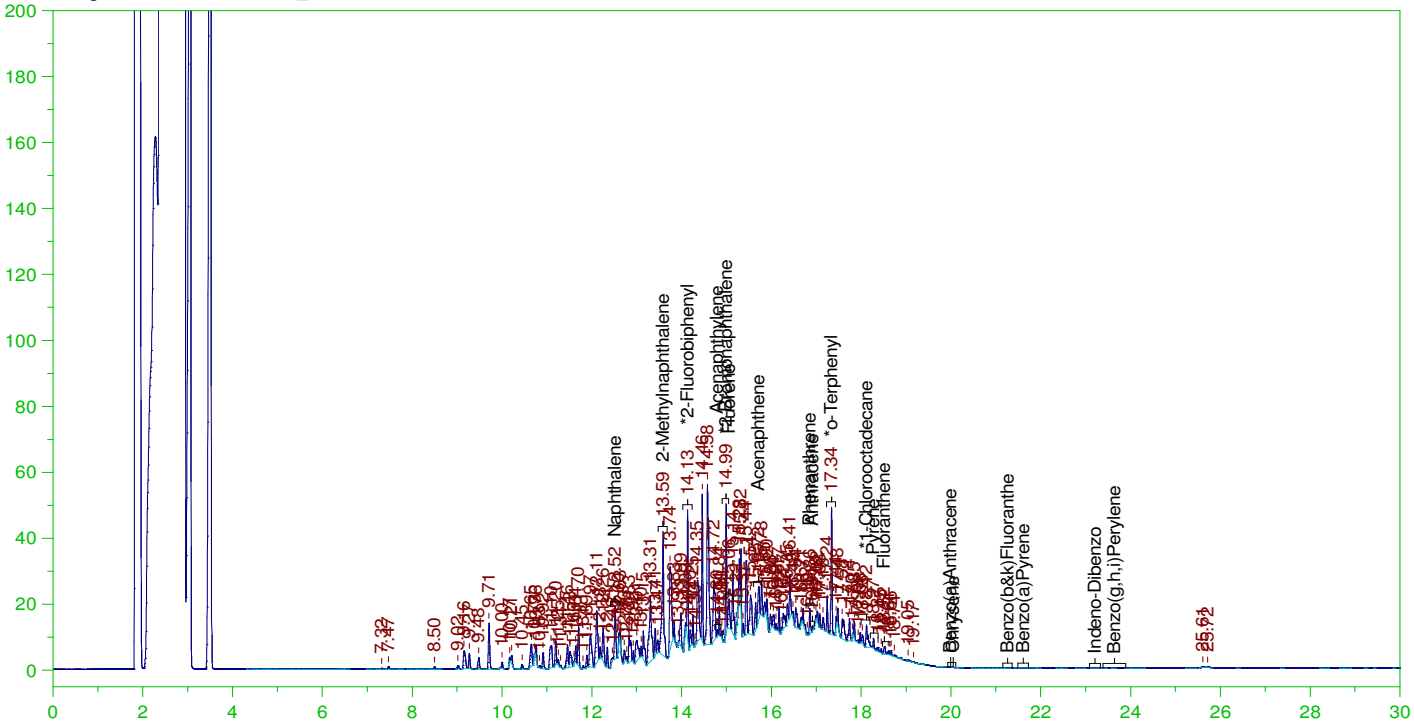
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.134	93774	7.353	11.684	158.9	-
*2-Bromonaphthalene	14.989	99372	7.353	17.996	244.74	-
*o-Terphenyl	17.337	143382	7.353	15.853	215.6	-
*1-Chlorooctadecane	18.117	86745	7.353	12.05	163.87	-

C11-C22 Aromatics Area:4585570 C11-C22 Aromatics Amount: 512.9402
EPH Aromatics total Area:5073382 EPH Aromatics Total Amount: 567.5067

OS-203-EGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0012.RAW H16100312-002A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

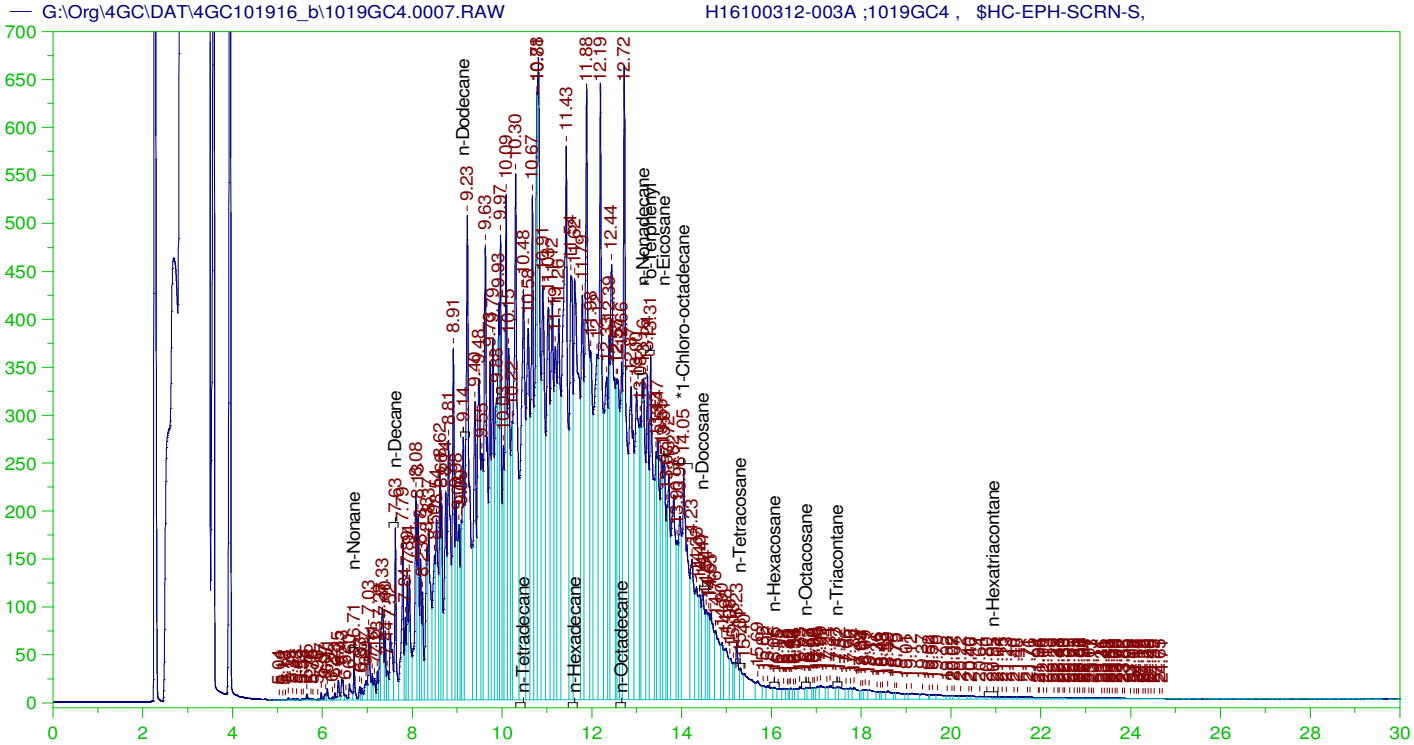
Sample Name: H16100312-002A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0012.RAW
Date & Time Acquired: 10/21/2016 6:04:15 PM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 27.2 Dilution: 3 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.52	2.46	2.47	35574	4.104	
2-Methylnaphthalene	13.589	1.4	1.4	106687	12.304	
Acenaphthylene	14.796	.17	.194	2156	.253	
Fluorene	15.059	-.07	-.069	23339	2.556	
Acenaphthene	15.718	-.71	-.729	27176	3.083	
Phenanthrene	16.857	-1.88	-1.868	12884	1.453	
Anthracene	16.915	-1.93	-1.926	2103	.235	
Pyrene	18.273	-3.31	-3.284	5351	.591	
Fluoranthene	18.518	-3.58	-3.529	5675	.62	
Benzo(a)Anthracene	.	.	.		.11	U
Chrysene	.	.	.		.11	U
Benzo(b&k)Fluoranthe	.	.	.		.221	U
Benzo(a)Pyrene	.	.	.		.11	U
Indeno-Dibenzo	.	.	.		.221	U
Benzo(g,h,i)Perylene	.	.	.		.11	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.134	58193	7.353	7.251	98.61	40-140
*2-Bromonaphthalene	14.989	60806	7.353	11.012	149.76	40-140
*o-Terphenyl	17.337	63635	7.353	7.036	95.69	40-140
*1-Chlorooctadecane	18.117	21501	7.353	2.987	40.62	40-140

OS-204-SGRAY Batch ID: 34803

— G:\Org\4GC\DAT\4GC101916_b\1019GC4.0007.RAW H16100312-003A ;1019GC4 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100312-003A ;1019GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC101916_b\1019GC4.0007.RAW
Date & Time Acquired: 10/19/2016 4:56:48 PM
Method File: G:\Org\4GC\Methods\10191607.MET
Calibration File: G:\Org\4GC\Cals\SC010816AC_3.CAL
Sample Weight: 27.4 Dilution: 2 S.A.: 1

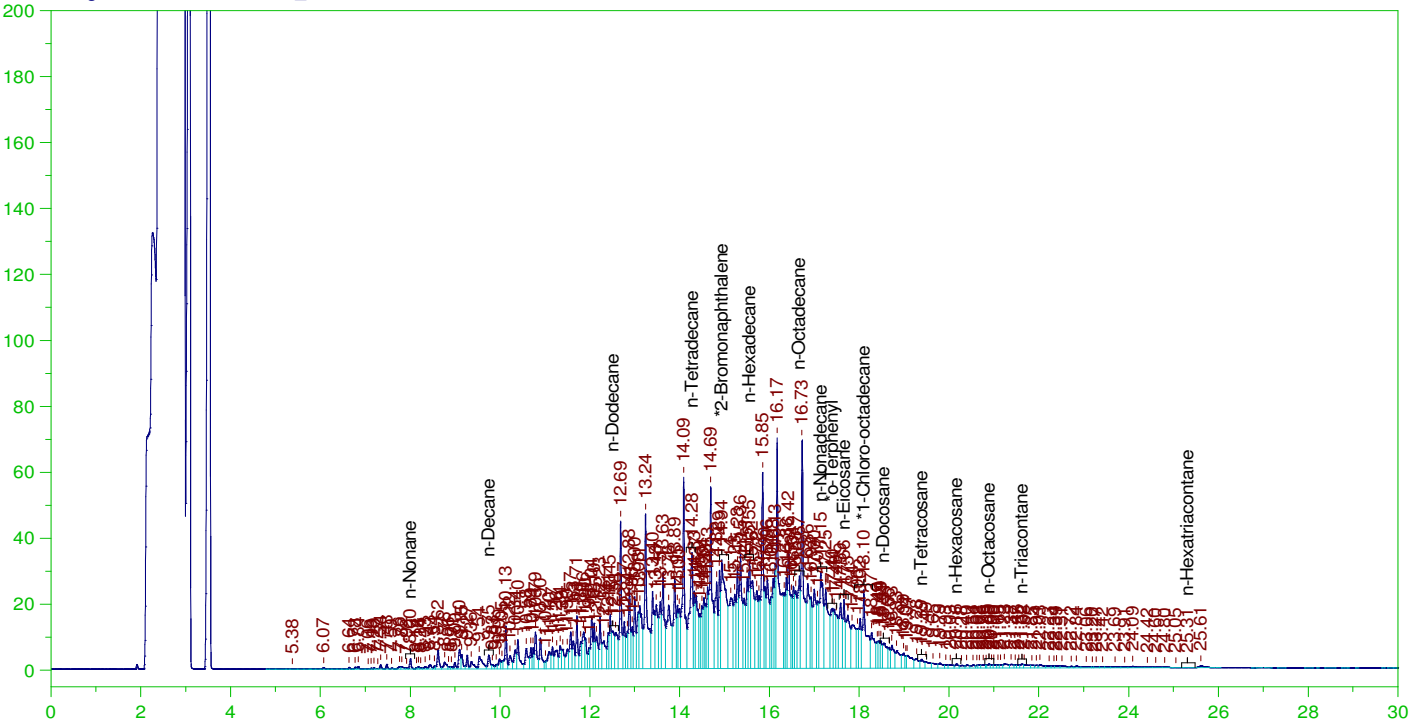
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.49 to 17.57
Rt range for C9 to C18 Hydrocarbons: 6.6 to 13.19
Rt range for C19 to C36 Hydrocarbons: 13.24 to 21.04

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.313	1832431	7.299	66.155	906.33	-
*1-Chloro-octadecane	14.048	1930106	7.299	89.275	1223.06	

DRO Area:1.142424E+08 DRO Amount: 4556.963
TEH Area:1.173793E+08 TEH Amount: 4682.091
C9-C18 Area:9.791306E+07 C9-C18 Amount: 3945.437
C19-C36 Area:1.754089E+07C19-C36 Amount: 692.6879

OS-204-SGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0013.RAW H16100312-003A ;1021GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100312-003A ;1021GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0013.RAW
Date & Time Acquired: 10/21/2016 6:46:52 PM
Method File: G:\Org\1GC\Methods\10211613.MET
Calibration File: G:\Org\1GC\Cals\AL082516G.CAL
Sample Weight: 27.4 Dilution: 6 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.65 to 21
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.9 to 17.08
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.13 to 25.48

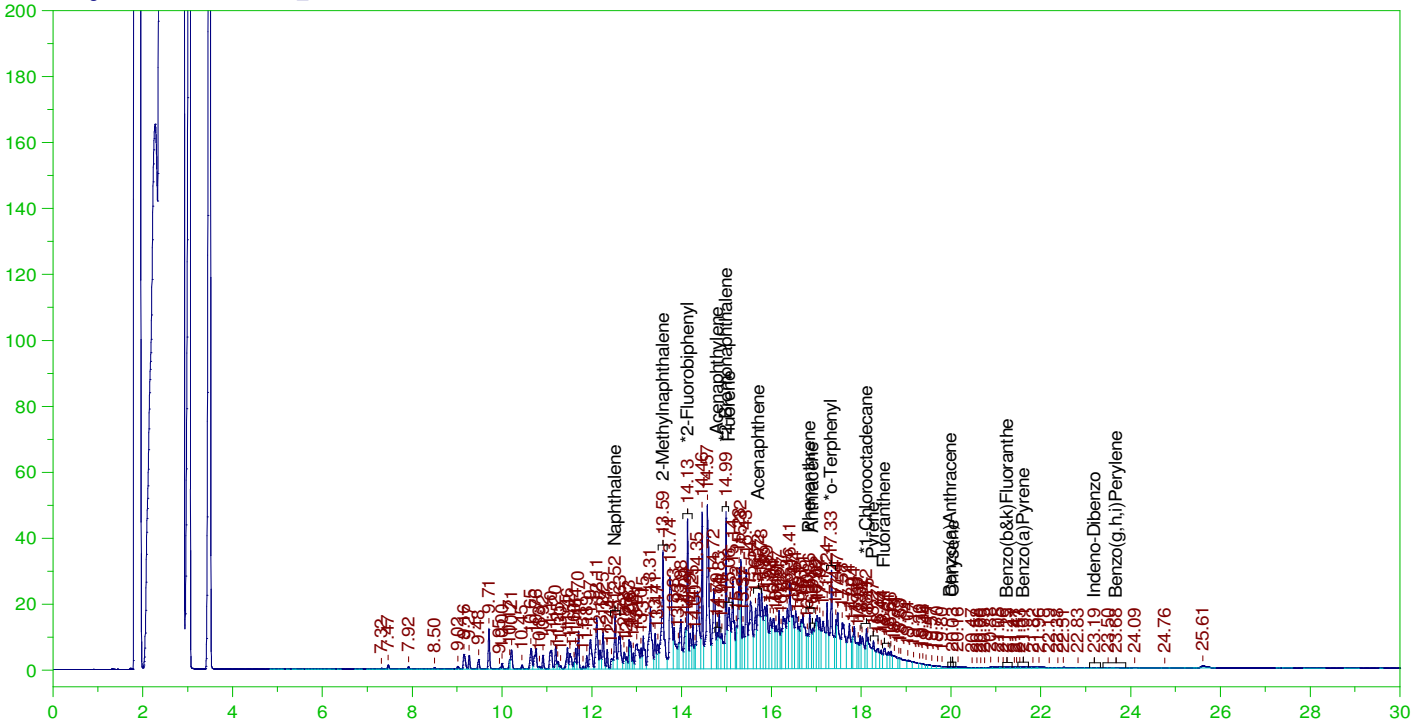
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.101	141932	7.299	41.278	565.51	-

DRO Area:7973193 DRO Amount: 2022.332
TEH Area:8607164 TEH Amount: 2183.133

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:7021913 C9-C18 Amount: 1817.502
C19-C36 Area:1550225 C19-C36 Amount: 387.3741

OS-204-SGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0014.RAW H16100312-003A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100312-003A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0014.RAW
Date & Time Acquired: 10/21/2016 7:29:37 PM
Method File: G:\Org\1GC\Methods\10211614.MET
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 27.4 Dilution: 6 S.A.: 1

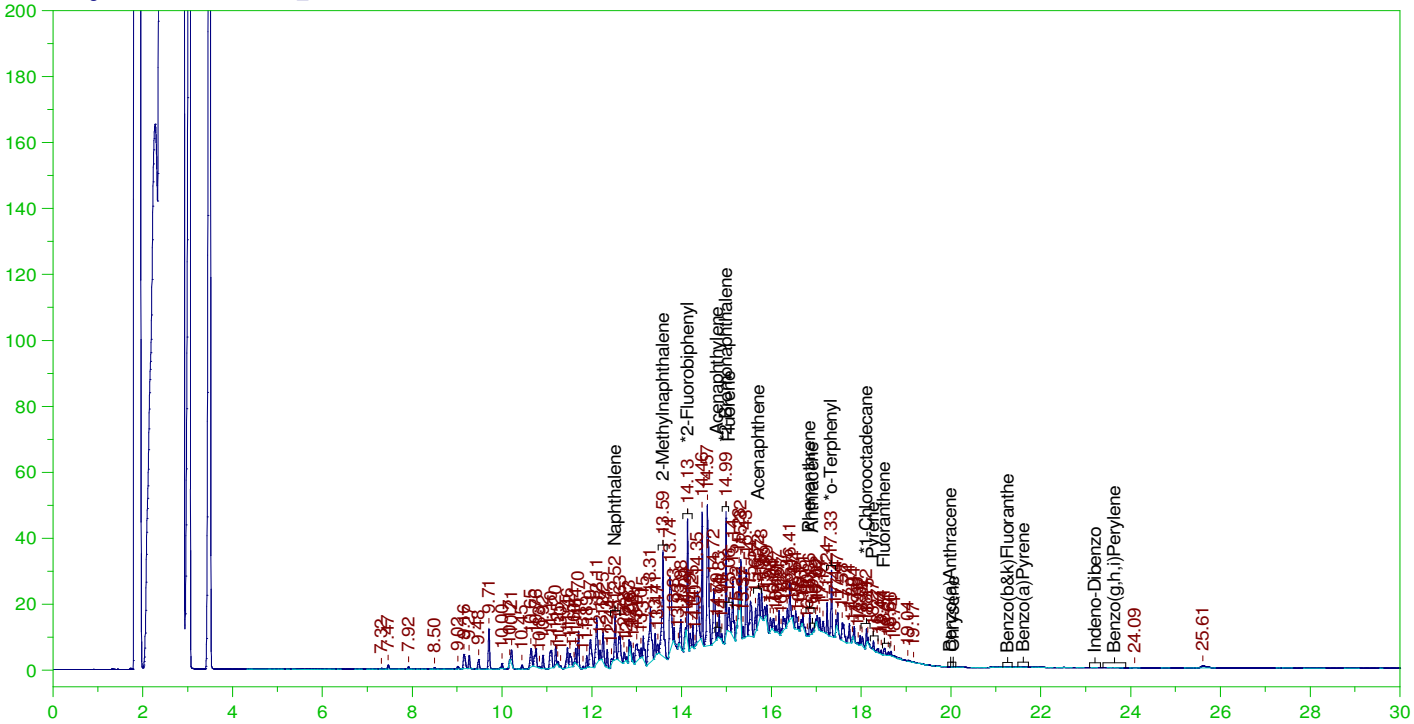
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.42 to 23.89

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.132	89115	7.299	22.045	302.01	-
*2-Bromonaphthalene	14.988	94680	7.299	34.042	466.38	-
*o-Terphenyl	17.334	109255	7.299	23.983	328.57	-
*1-Chlorooctadecane	18.116	31910	7.299	8.8	120.57	-

C11-C22 Aromatics Area:4293681 C11-C22 Aromatics Amount: 953.5677
EPH Aromatics total Area:4730209 EPH Aromatics Total Amount: 1050.515

OS-204-SGRAY Batch ID: 34837

— G:\Org\1GC\DAT\1GC102116_b\1021GC1.0014.RAW H16100312-003A ;1021GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

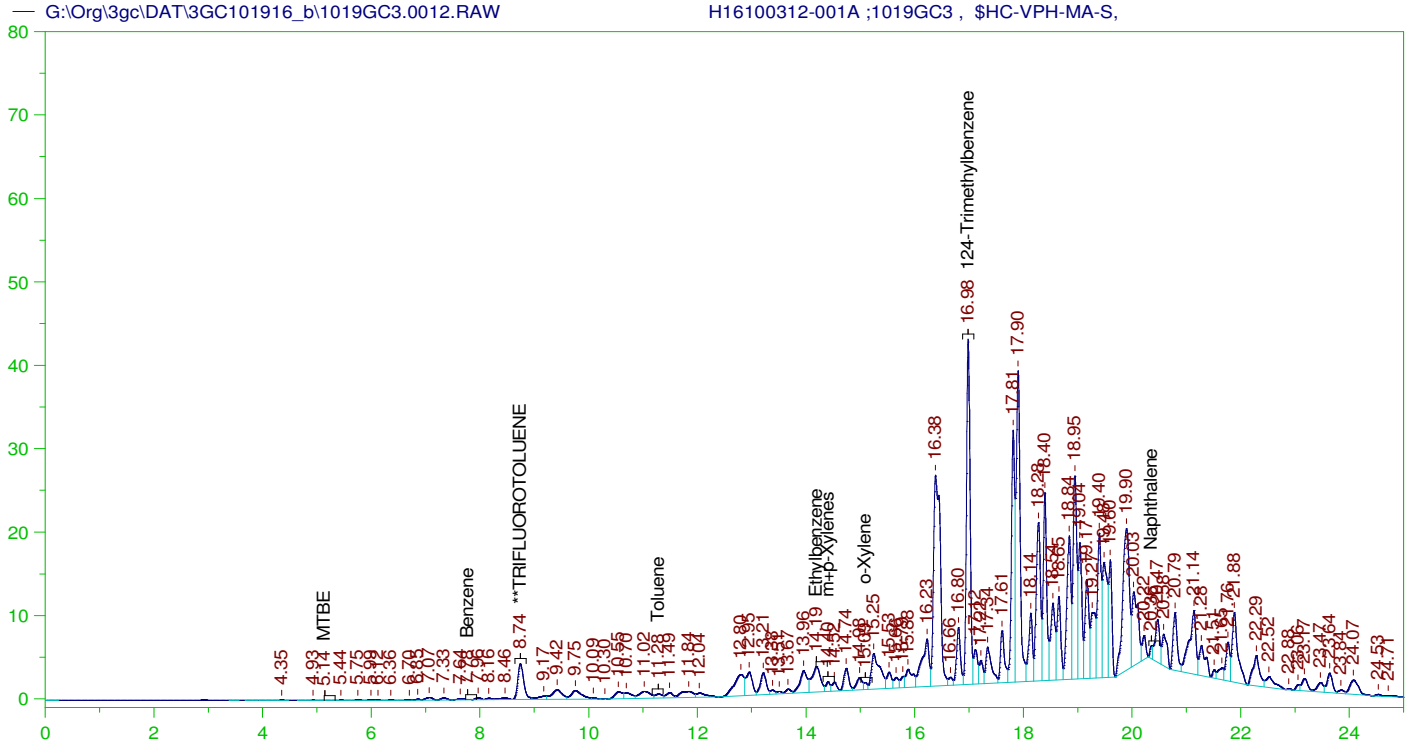
Sample Name: H16100312-003A ;1021GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC102116_b\1021GC1.0014.RAW
Date & Time Acquired: 10/21/2016 7:29:37 PM
Method File: G:\Org\1GC\Methods\AROQC082416G.met
Calibration File: G:\Org\1GC\Cals\AR082416G.CAL
Sample Weight: 27.4 Dilution: 6 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.518	2.46	2.47	30620	7.013	
2-Methylnaphthalene	13.587	1.4	1.401	92292	21.132	
Acenaphthylene	14.794	.17	.193	2058	.479	
Fluorene	15.057	-.07	-.069	19479	4.236	
Acenaphthene	15.717	-.71	-.73	23591	5.313	
Phenanthrene	16.855	-1.88	-1.868	11492	2.573	
Anthracene	16.914	-1.93	-1.927	2012	.446	
Pyrene	18.271	-3.31	-3.283	4562	1.001	
Fluoranthene	18.515	-3.58	-3.527	5347	1.159	
Benzo(a)Anthracene	.	.	.		.219	U
Chrysene	.	.	.		.219	U
Benzo(b&k)Fluoranthe	.	.	.		.438	U
Benzo(a)Pyrene	.	.	.		.219	U
Indeno-Dibenzo	.	.	.		.438	U
Benzo(g,h,i)Perylene	.	.	.		.219	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.132	55212	7.299	13.658	187.11	40-140
*2-Bromonaphthalene	14.988	57741	7.299	20.76	284.42	40-140
*o-Terphenyl	17.334	34300	7.299	7.529	103.15	40-140
*1-Chlorooctadecane	18.116	7106	7.299	1.96	26.85	40-140

OS-202-NGRAY Batch ID: 34773

G:\Org\3gc\DAT\3GC101916_b\1019GC3.0012.RAW H16100312-001A ;1019GC3 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-001A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0012.RAW
Date & Time Acquired: 10/19/2016 5:33:35 PM
Method File: G:\Org\3gc\Methods\10191612$nap.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.13 S.A.: 1.13

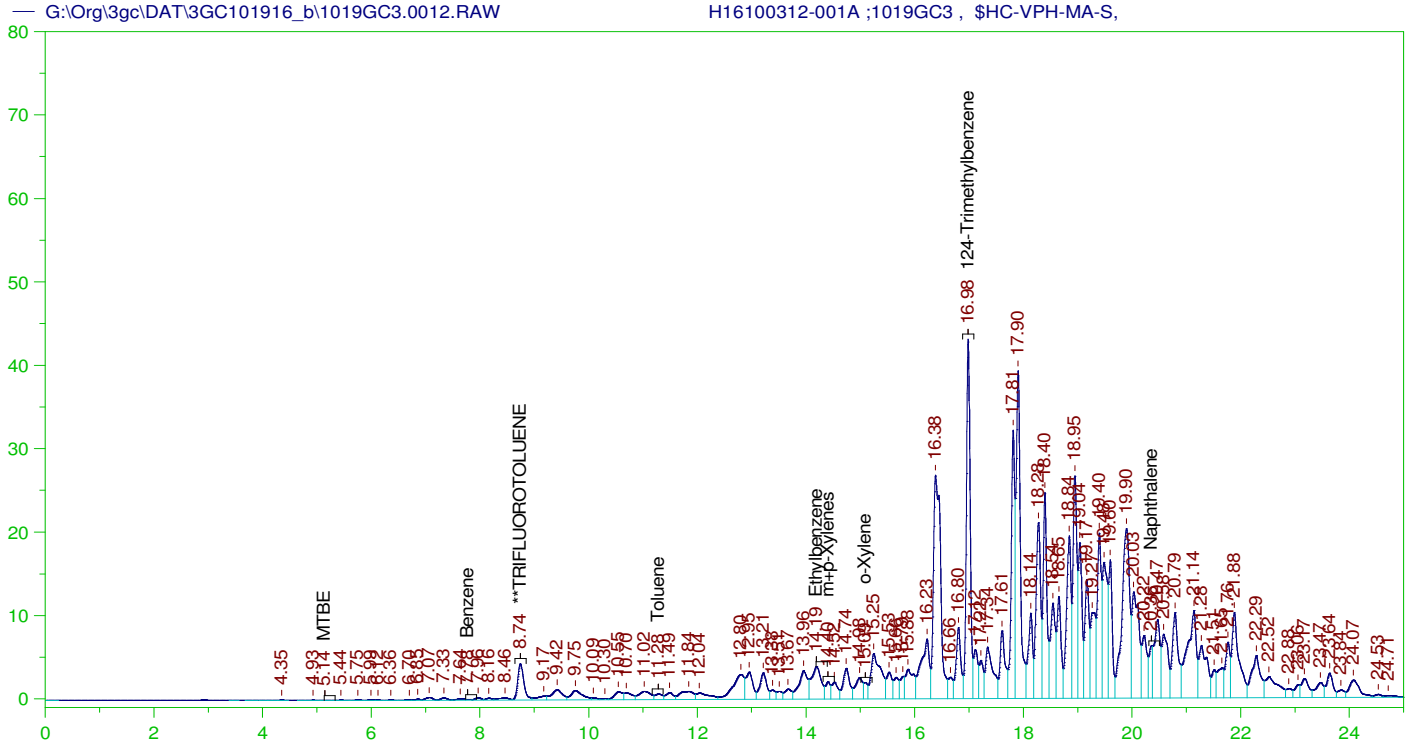
Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2241670 C9-C10 Aromatics Amount: 94.48598

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.141	5.141	5.141	106	.113	U
Benzene	7.777	7.777	7.777	357	.057	U
Toluene	11.285	-2.524	-2.54	4413	.127	
Ethylbenzene	14.195	-5.539	-5.45	33519	1.358	
m+p-Xylenes	14.404	-5.669	-5.659	6681	.215	
o-Xylene	15.089	-6.363	-6.345	3653	.138	
124-Trimethylbenzene	16.985	-8.239	-8.24	190009	9.078	
Naphthalene	20.357	-11.66	-11.612	5175	.378	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.745	33555	2.825	2.811	99.49

OS-202-NGRAY Batch ID: 34773

G:\Org\3gc\DAT\3GC101916_b\1019GC3.0012.RAW H16100312-001A ;1019GC3 , $HC-VPH-MA-S,



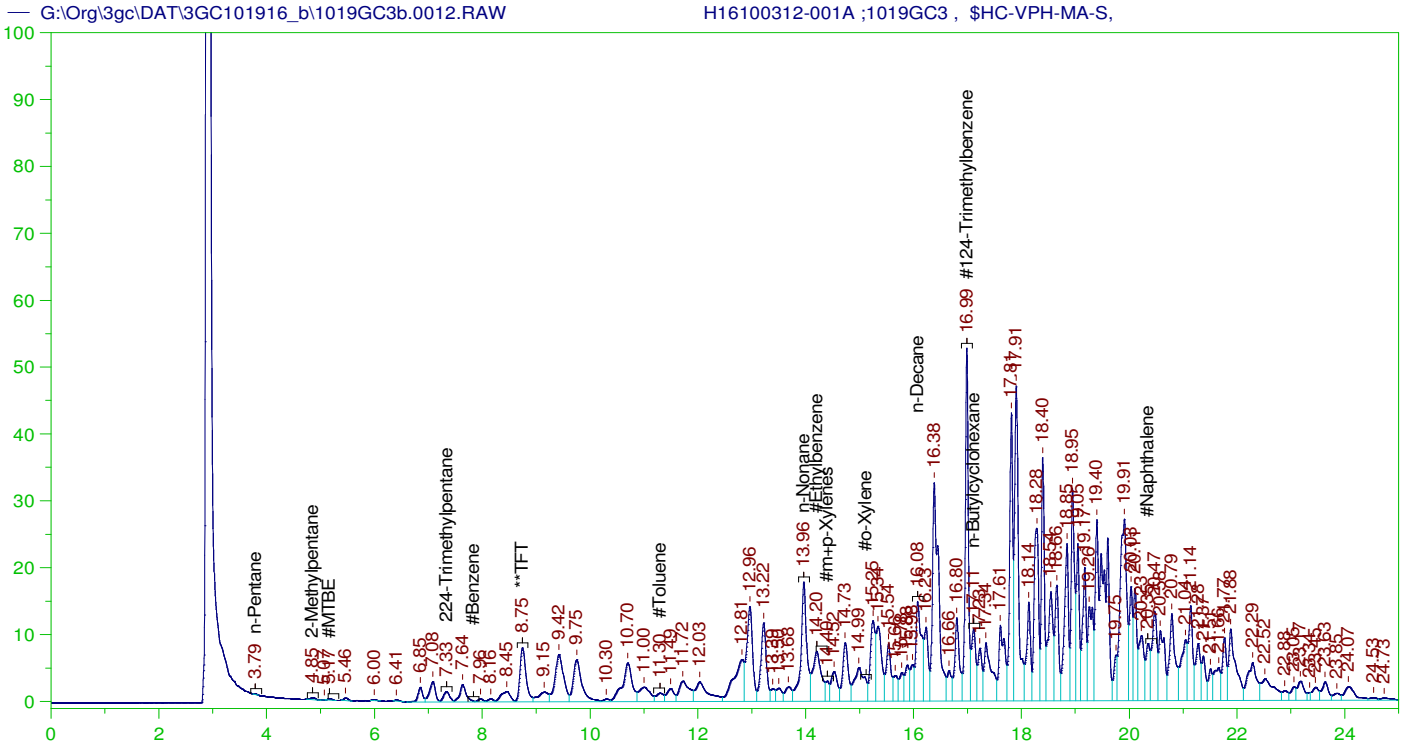
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-001A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0012.RAW
Date & Time Acquired: 10/19/2016 5:33:35 PM
Method File: G:\Org\3gc\Methods\10191612.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.13 S.A.: 1.13

Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2884672 C9-C10 Aromatics Amount: 121.5884

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.141	5.141	5.141	106	.113	U
Benzene	7.777	7.777	7.777	557	.057	U
Toluene	11.285	-2.524	-2.54	6592	.19	
Ethylbenzene	14.195	-5.539	-5.45	48409	1.961	
m+p-Xylenes	14.404	-5.669	-5.659	13367	.429	
o-Xylene	15.089	-6.363	-6.345	9212	.347	
124-Trimethylbenzene	16.985	-8.239	-8.24	209070	9.989	
Naphthalene	20.357	-11.66	-11.612	29373	2.143	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.745	34688	2.825	2.906	102.85



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-001A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3b.0012.RAW
Date & Time Acquired: 10/19/2016 5:33:35 PM
Method File: G:\Org\3gc\Methods\10191612B.MET
Calibration File: G:\Org\3gc\Cals\GC3081516B.cal
Sample Weight: 50 Dilution: 1.13 S.A.: 1.13

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 389.9413
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 276.4579
Mean RF for all calibrated compounds: 436.7597
Rt range for Gasoline Range Organics: 4.759 to 16.178
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.707 to 13.872
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.922 to 20.31

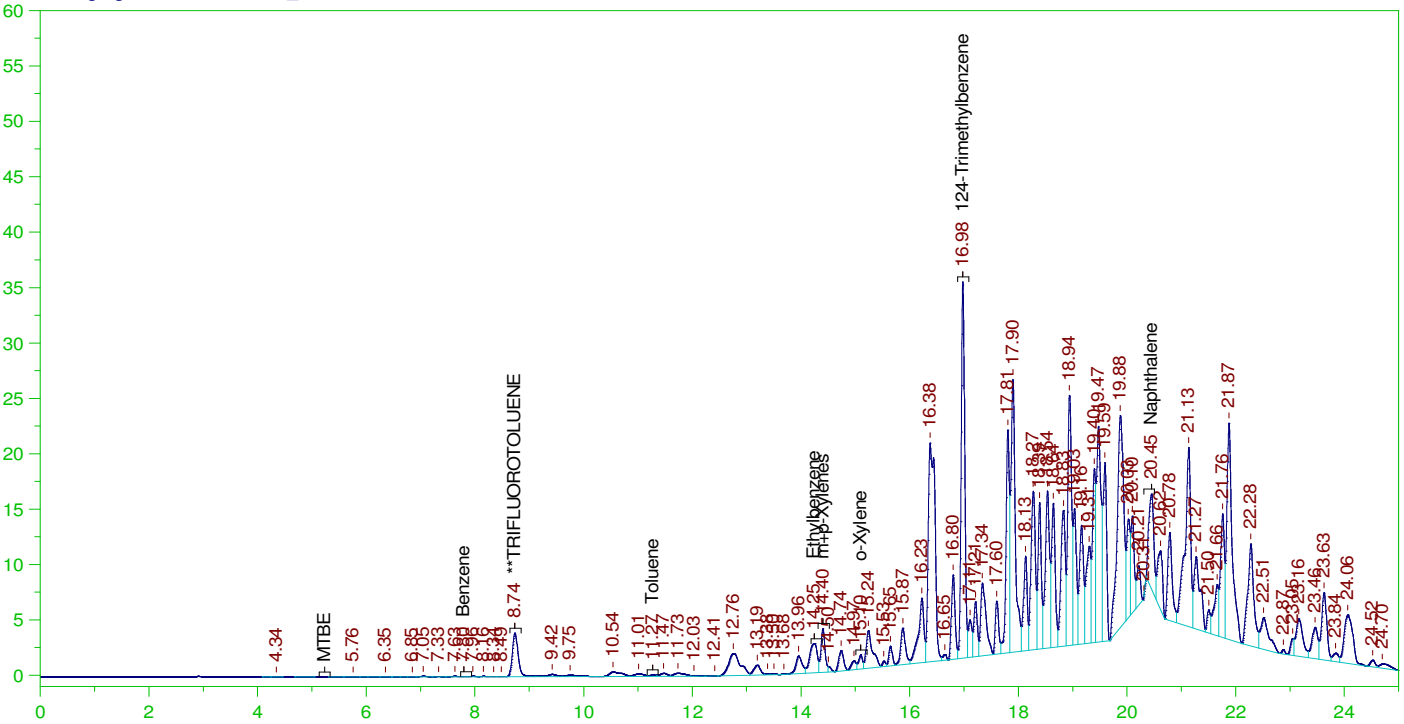
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.747	63833	2.825	3.744	132.52	-

GRO Area:1642997 GRO Amount: 85.01639
TPH Area:5911804 TPH Amount: 305.9045

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:820511.3 C5-C8 Amount: 47.55473
C9-C12 Area:4070859 C9-C12 Amount: 332.7863

OS-203-EGRAY Batch ID: 34773

G:\Org\3gc\DAT\3GC101916_b\1019GC3.0015.RAW H16100312-002A ;1019GC3 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-002A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0015.RAW
Date & Time Acquired: 10/19/2016 7:16:09 PM
Method File: G:\Org\3gc\Methods\10191615$nap.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

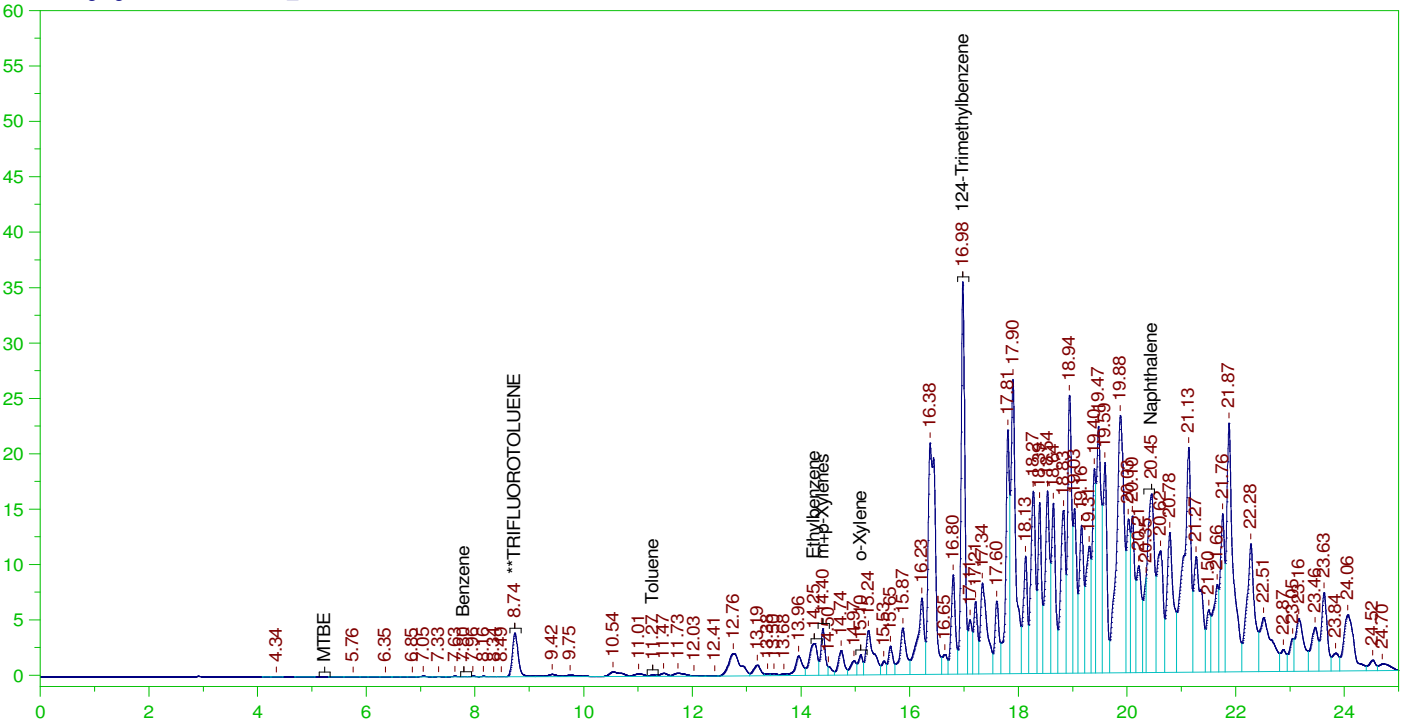
Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:1994395 C9-C10 Aromatics Amount: 82.57555

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.8	7.8	7.8	115	.056	U
Toluene	11.274	11.274	11.274	1041	.056	U
Ethylbenzene	14.245	-5.539	-5.508	25592	1.018	
m+p-Xylenes	14.403	-5.669	-5.666	21210	.669	
o-Xylene	15.098	-6.363	-6.361	6542	.242	
124-Trimethylbenzene	16.979	-8.239	-8.242	154455	7.249	
Naphthalene	20.449	-11.66	-11.713	56550	4.052	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.737	30096	2.775	2.476	89.24

OS-203-EGRAY Batch ID: 34773

G:\Org\3gc\DAT\3GC101916_b\1019GC3.0015.RAW H16100312-002A ;1019GC3 , $HC-VPH-MA-S,



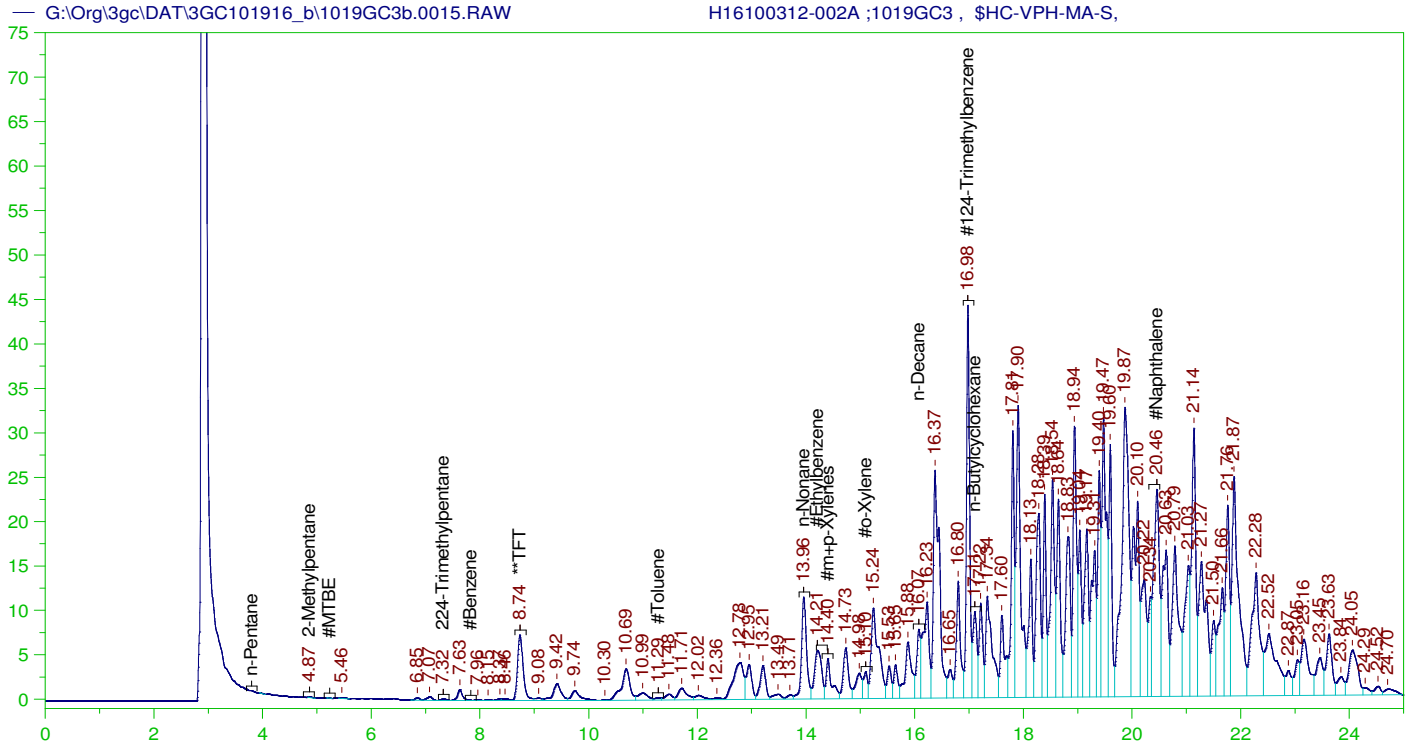
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-002A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0015.RAW
Date & Time Acquired: 10/19/2016 7:16:09 PM
Method File: G:\Org\3gc\Methods\10191615.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2621201 C9-C10 Aromatics Amount: 108.5277

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.111	U
Benzene	7.8	7.8	7.8	115	.056	U
Toluene	11.274	11.274	11.274	1041	.056	U
Ethylbenzene	14.245	-5.539	-5.508	28740	1.144	
m+p-Xylenes	14.403	-5.669	-5.666	23797	.751	
o-Xylene	15.098	-6.363	-6.361	10383	.385	
124-Trimethylbenzene	16.979	-8.239	-8.242	169854	7.972	
Naphthalene	20.449	-11.66	-11.713	140570	10.073	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.737	30096	2.775	2.476	89.24



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-002A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3b.0015.RAW
Date & Time Acquired: 10/19/2016 7:16:09 PM
Method File: G:\Org\3gc\Methods\10191615B.MET
Calibration File: G:\Org\3gc\Cals\GC3081516B.cal
Sample Weight: 50 Dilution: 1.11 S.A.: 1.11

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 389.9413
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 276.4579
Mean RF for all calibrated compounds: 436.7597
Rt range for Gasoline Range Organics: 4.759 to 16.178
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.707 to 13.872
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.922 to 20.31

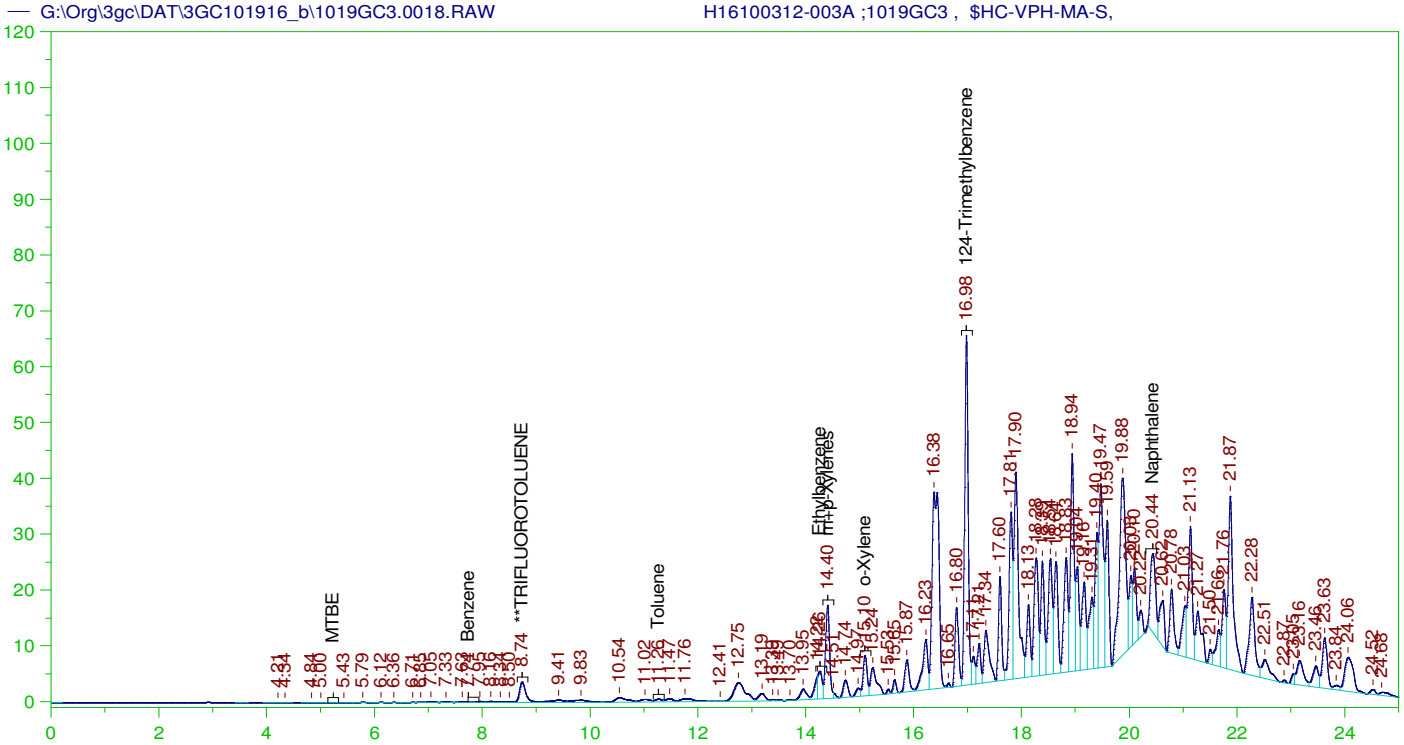
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.737	54352	2.775	3.131	112.83	-

GRO Area:724694 GRO Amount: 36.83538
TPH Area:5760842 TPH Amount: 292.8171

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:256341.7 C5-C8 Amount: 14.59395
C9-C12 Area:3616448 C9-C12 Amount: 290.4064

OS-204-SGRAY Batch ID: 34773

— G:\Org\3gc\DAT\3GC101916_b\1019GC3.0018.RAW H16100312-003A ;1019GC3 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-003A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0018.RAW
Date & Time Acquired: 10/19/2016 9:00:17 PM
Method File: G:\Org\3gc\Methods\10191618$nap.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

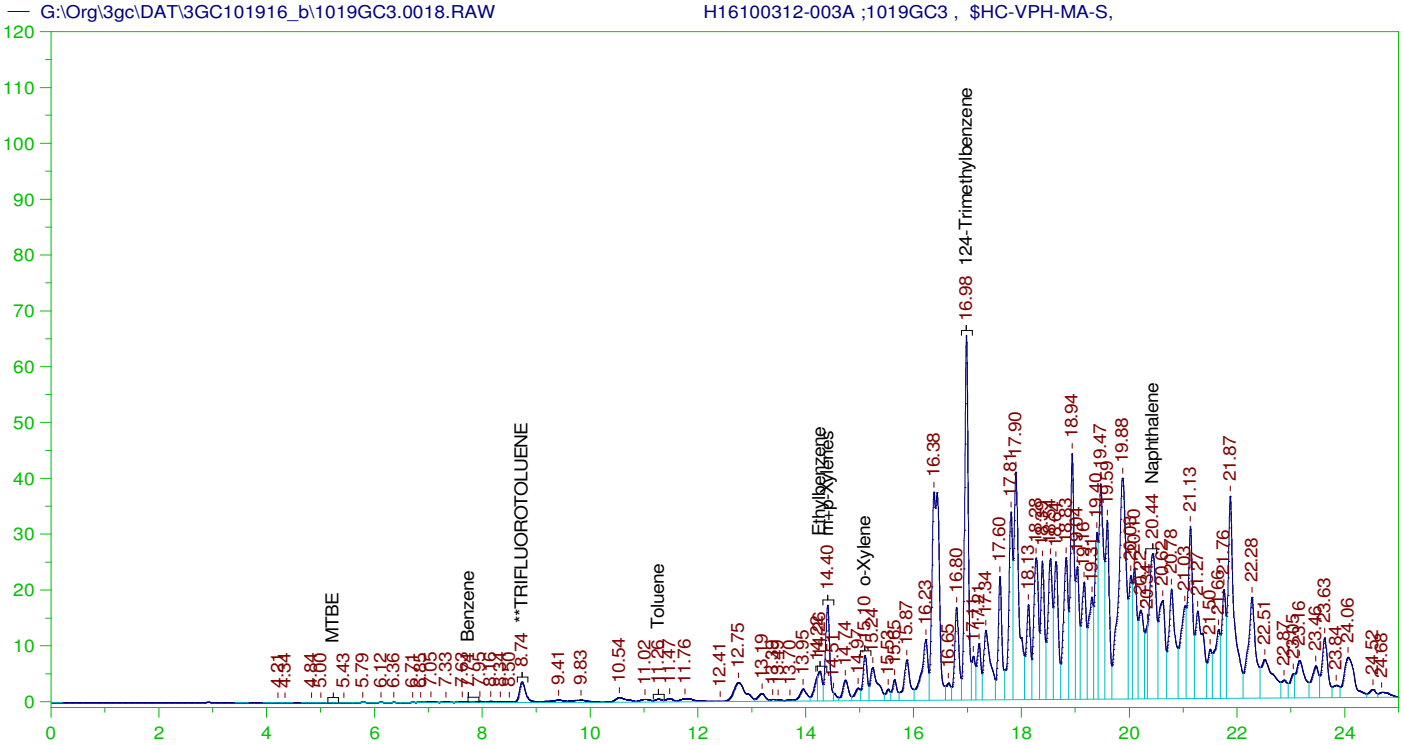
Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:3225274 C9-C10 Aromatics Amount: 134.7417

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.112	U
Benzene	7.742	7.742	7.742	290	.056	U
Toluene	11.265	-2.524	-2.526	4256	.121	
Ethylbenzene	14.26	-5.539	-5.522	26069	1.047	
m+p-Xylenes	14.405	-5.669	-5.666	88890	2.829	
o-Xylene	15.101	-6.363	-6.362	37234	1.392	
124-Trimethylbenzene	16.979	-8.239	-8.241	285300	13.511	
Naphthalene	20.439	-11.66	-11.7	96183	6.954	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.739	30620	2.8	2.542	90.79

OS-204-SGRAY Batch ID: 34773

— G:\Org\3gc\DAT\3GC101916_b\1019GC3.0018.RAW H16100312-003A ;1019GC3 , $HC-VPH-MA-S,



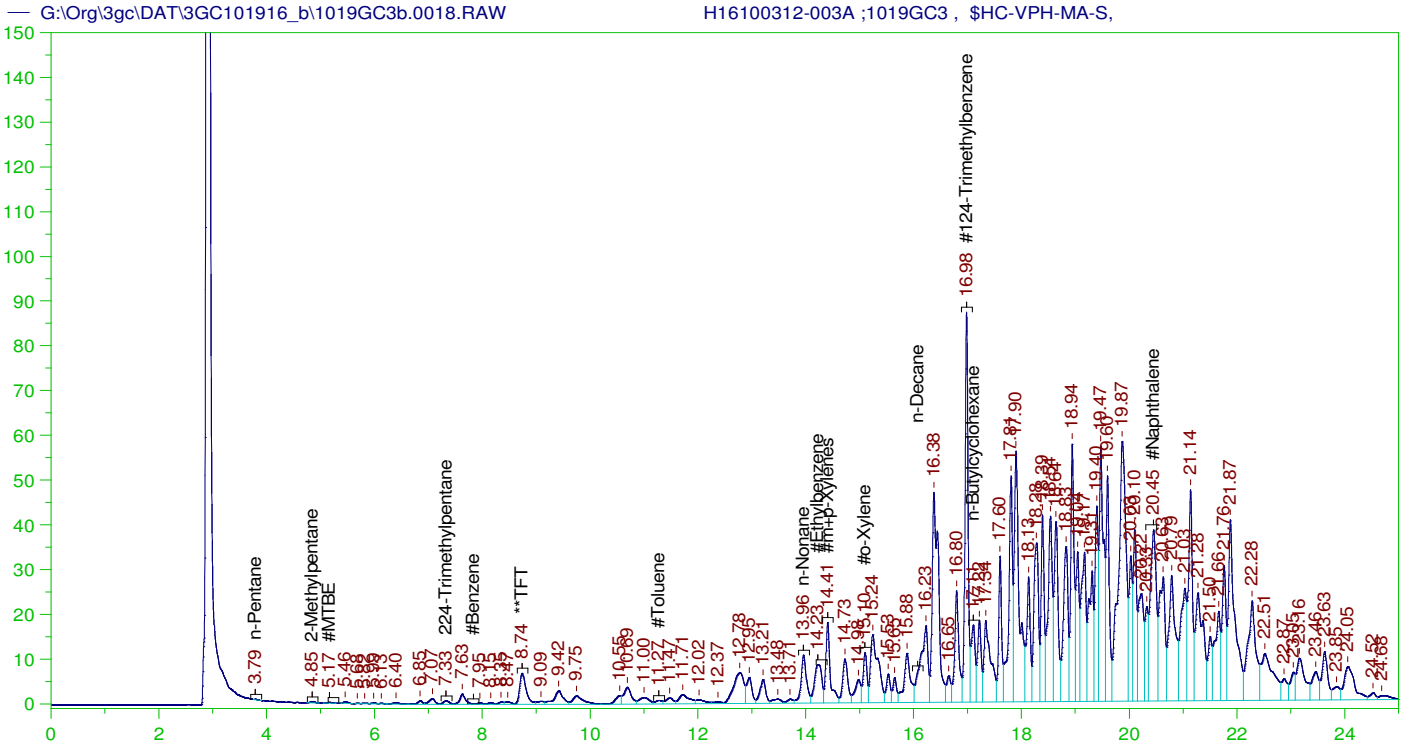
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-003A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3.0018.RAW
Date & Time Acquired: 10/19/2016 9:00:17 PM
Method File: G:\Org\3gc\Methods\10191618.MET
Calibration File: G:\Org\3gc\Cals\GC3081516.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

Mean RF for C9 to C10 Aromatic Hydrocarbons: 536.1825
Rt range for C9 to C10 Aromatics: 15.212 to 20.309
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:4418924 C9-C10 Aromatics Amount: 184.6086

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		.112	U
Benzene	7.742	7.742	7.742	290	.056	U
Toluene	11.265	-2.524	-2.526	4382	.125	
Ethylbenzene	14.26	-5.539	-5.522	28350	1.138	
m+p-Xylenes	14.405	-5.669	-5.666	93723	2.983	
o-Xylene	15.101	-6.363	-6.362	45084	1.685	
124-Trimethylbenzene	16.979	-8.239	-8.241	314369	14.887	
Naphthalene	20.439	-11.66	-11.7	231734	16.755	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.739	30620	2.8	2.542	90.79



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100312-003A ;1019GC3 , $HC-VPH-MA-S,
Raw File: G:\Org\3gc\DAT\3GC101916_b\1019GC3b.0018.RAW
Date & Time Acquired: 10/19/2016 9:00:17 PM
Method File: G:\Org\3gc\Methods\10191618B.MET
Calibration File: G:\Org\3gc\Cals\GC3081516B.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 389.9413
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 276.4579
Mean RF for all calibrated compounds: 436.7597
Rt range for Gasoline Range Organics: 4.759 to 16.178
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.707 to 13.872
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.922 to 20.31

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.741	58229	2.8	3.385	120.88	-

GRO Area:1174504 GRO Amount: 60.23651
TPH Area:1.017813E+07 TPH Amount: 522.0033

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:441270.3 C5-C8 Amount: 25.34856
C9-C12 Area:6603885 C9-C12 Amount: 535.0798

Work Order Receipt Checklist

Hydrometrics Inc

H16100312

Login completed by: Tracy L. Lorash

Date Received: 10/19/2016

Reviewed by: BL2000\rwilliams

Received by: abc

Reviewed Date: 10/20/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	4.2°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

CHAIN OF CUSTODY RECORD

H16100312

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: (Signature) JPW

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH	VPH	See Cover letter	REMARKS
10/17/16	1430	X		OS-202-NGRAY	02												48-Hour RUSH
10/18/16	1015	X		OS-203-EGRAY	02												48-Hour RUSH
10/18/16	1500	X		OS-204-SGRAY	02												48-Hour RUSH

Relinquished (Signature)	Date / Time	Received by (Signature)	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPW	10/18/16 1600	[illegible]	ELI HELENA	HLN 10286	Other hand-deliver Air Bill #
Relinquished (Signature)	Date / Time	Received by (Signature)	Remarks Please forward results to: Janie Poell, Hydrometrics, 3020 Bozeman Avenue, Helena, Montana 59601		turnaround on hardcopy
Kathi Brown	10/18/16 4:59	[illegible]	email: jpoell@hydrometrics.com		
Relinquished (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	Enclosed: ☐ Parameter sheet w/detection limits ☐ QA / AC standard mixing instructions ☒ Cover letter ☐ Other	
[illegible]	10/19/16 0900	Amanda Carlson	10/19/16 9:00		

Split Samples:
☐ Accepted ☐ Declined

HFORM-1 07/11

Return results & electronic copy to:

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 19, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples – Rush 48-hour TAT

Enclosed are three soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
- If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

As discussed previously, we are requesting a Rush 48-hour turnaround time for these samples.

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150 x154 or Mark Walker at 443-4150 x146.

Sincerely,

Mark Walker

For/ James Poell
Environmental Scientist

enclosures

K:\project\16048 Meagher County Remediation\Lab\Lab Cover 10-19-16-Soils.doc

ANALYTICAL SUMMARY REPORT

December 07, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100551

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 2 samples for Hydrometrics Inc on 10/28/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100551-001	05-205-WGRAY	10/25/16 12:30	10/28/16	Soil	EPH-Ultrasonic Extraction Methanol Extraction for Volatiles EPH-Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum-Scrn Volatile Petroleum Hydrocarbons Moisture Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs
H16100551-002	05-206-TOP	10/25/16 13:30	10/28/16	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100551

Report Date: 12/07/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100551-001
Client Sample ID: 05-205-WGRAY

Report Date: 12/07/16
Collection Date: 10/25/16 12:30
DateReceived: 10/28/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.1	wt%		0.2		SW3550C	10/28/16 17:06 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.11	0.08	MA-VPH	11/11/16 20:47 / tjb
Benzene	0.066	mg/kg-dry	*	0.056	0.04	MA-VPH	11/11/16 20:47 / tjb
Toluene	0.51	mg/kg-dry		0.056	10	MA-VPH	11/11/16 20:47 / tjb
Ethylbenzene	2.8	mg/kg-dry		0.056	10	MA-VPH	11/11/16 20:47 / tjb
m+p-Xylenes	1.2	mg/kg-dry		0.056		MA-VPH	11/11/16 20:47 / tjb
o-Xylene	2.4	mg/kg-dry		0.056		MA-VPH	11/11/16 20:47 / tjb
Xylenes, Total	3.6	mg/kg-dry		0.056	30	MA-VPH	11/11/16 20:47 / tjb
Naphthalene	2.9	mg/kg-dry		0.11	9	MA-VPH	11/11/16 20:47 / tjb
C9 to C10 Aromatics	219	mg/kg-dry	*	2.2	100	MA-VPH	11/11/16 20:47 / tjb
C5 to C8 Aliphatics	65	mg/kg-dry	*	2.2	40	MA-VPH	11/11/16 20:47 / tjb
C9 to C12 Aliphatics	397	mg/kg-dry	*	2.2	90	MA-VPH	11/11/16 20:47 / tjb
Total Purgeable Hydrocarbons	500	mg/kg-dry	*	2.2	100	MA-VPH	11/11/16 20:47 / tjb
Surr: VPH Aromatics Surrogate	101	%REC		70-130		MA-VPH	11/11/16 20:47 / tjb
Surr: VPH Aliphatics Surrogate	102	%REC		70-130		MA-VPH	11/11/16 20:47 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- *=The default MCLs listed for the target analytes are based on the Draft Tier 1 Risk Based Screening Levels (RBSLs). The hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	1090	mg/kg-dry	*	11	200	SW8015M	11/10/16 23:25 / JRS
Surr: o-Terphenyl	95.0	%REC		40-140		SW8015M	11/10/16 23:25 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	447	mg/kg-dry	*	11	200	MA-EPH	11/17/16 01:21 / JRS
C19 to C36 Aliphatics	93	mg/kg-dry		11	20000	MA-EPH	11/17/16 01:21 / JRS
Surr: 1-Chloro-octadecane	99.0	%REC		40-140		MA-EPH	11/17/16 01:21 / JRS
C11 to C22 Aromatics	169	mg/kg-dry		11	400	MA-EPH	11/17/16 02:03 / JRS
Total Extractable Hydrocarbons	757	mg/kg-dry		11		MA-EPH	11/17/16 02:03 / JRS
Surr: 2-Bromonaphthalene	64.0	%REC		40-140		MA-EPH	11/17/16 02:03 / JRS
Surr: 2-Fluorobiphenyl	53.0	%REC		40-140		MA-EPH	11/17/16 02:03 / JRS
Surr: o-Terphenyl	77.0	%REC		40-140		MA-EPH	11/17/16 02:03 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	2.7	mg/kg-dry		0.37		SW8270C	11/22/16 03:04 / eli-b
Acenaphthene	ND	mg/kg-dry		0.37	200	SW8270C	11/22/16 03:04 / eli-b
Acenaphthylene	ND	mg/kg-dry		0.37		SW8270C	11/22/16 03:04 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100551-001
Client Sample ID: 05-205-WGRAY

Report Date: 12/07/16
Collection Date: 10/25/16 12:30
DateReceived: 10/28/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		0.37	2000	SW8270C	11/22/16 03:04 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		0.37	0.2	SW8270C	11/22/16 03:04 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		0.37	0.02	SW8270C	11/22/16 03:04 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		0.37	0.2	SW8270C	11/22/16 03:04 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		0.37		SW8270C	11/22/16 03:04 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		0.37	2	SW8270C	11/22/16 03:04 / eli-b
Chrysene	ND	mg/kg-dry		0.37	20	SW8270C	11/22/16 03:04 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		0.37	0.02	SW8270C	11/22/16 03:04 / eli-b
Fluoranthene	ND	mg/kg-dry		0.37	300	SW8270C	11/22/16 03:04 / eli-b
Fluorene	0.30	mg/kg-dry	J	0.37	300	SW8270C	11/22/16 03:04 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		0.37	0.2	SW8270C	11/22/16 03:04 / eli-b
Naphthalene	0.69	mg/kg-dry		0.37	4	SW8270C	11/22/16 03:04 / eli-b
Phenanthrene	0.39	mg/kg-dry		0.37		SW8270C	11/22/16 03:04 / eli-b
Pyrene	ND	mg/kg-dry		0.37	200	SW8270C	11/22/16 03:04 / eli-b
Surr: 2-Fluorobiphenyl	59.0	%REC		40-140		SW8270C	11/22/16 03:04 / eli-b
Surr: o-Terphenyl	71.0	%REC		40-140		SW8270C	11/22/16 03:04 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100551-002
Client Sample ID: 05-206-TOP

Report Date: 12/07/16
Collection Date: 10/25/16 13:30
DateReceived: 10/28/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	14.9	wt%		0.2		SW3550C	10/28/16 17:06 / tjb
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.12	0.08	MA-VPH	11/01/16 00:42 / tjb
Benzene	ND	mg/kg-dry		0.058	0.04	MA-VPH	11/01/16 00:42 / tjb
Toluene	ND	mg/kg-dry		0.058	10	MA-VPH	11/01/16 00:42 / tjb
Ethylbenzene	0.19	mg/kg-dry		0.058	10	MA-VPH	11/01/16 00:42 / tjb
m+p-Xylenes	0.12	mg/kg-dry		0.058		MA-VPH	11/01/16 00:42 / tjb
o-Xylene	ND	mg/kg-dry		0.058		MA-VPH	11/01/16 00:42 / tjb
Xylenes, Total	0.12	mg/kg-dry		0.058	30	MA-VPH	11/01/16 00:42 / tjb
Naphthalene	0.74	mg/kg-dry		0.12	9	MA-VPH	11/01/16 00:42 / tjb
C9 to C10 Aromatics	33	mg/kg-dry		2.3	100	MA-VPH	11/01/16 00:42 / tjb
C5 to C8 Aliphatics	2.6	mg/kg-dry		2.3	40	MA-VPH	11/01/16 00:42 / tjb
C9 to C12 Aliphatics	70	mg/kg-dry		2.3	90	MA-VPH	11/01/16 00:42 / tjb
Total Purgeable Hydrocarbons	106	mg/kg-dry	*	2.3	100	MA-VPH	11/01/16 00:42 / tjb
Surr: VPH Aromatics Surrogate	86.0	%REC		70-130		MA-VPH	11/01/16 00:42 / tjb
Surr: VPH Aliphatics Surrogate	88.0	%REC		70-130		MA-VPH	11/01/16 00:42 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.
- The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RSBLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	519	mg/kg-dry	*	12	200	SW8015M	11/11/16 00:10 / JRS
Surr: o-Terphenyl	95.0	%REC		40-140		SW8015M	11/11/16 00:10 / JRS

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	205	mg/kg-dry	*	23	200	MA-EPH	11/20/16 19:02 / JRS
C19 to C36 Aliphatics	49	mg/kg-dry		23	20000	MA-EPH	11/20/16 19:02 / JRS
Surr: 1-Chloro-octadecane	91.0	%REC		40-140		MA-EPH	11/20/16 19:02 / JRS
C11 to C22 Aromatics	85	mg/kg-dry		23	400	MA-EPH	11/22/16 17:05 / JRS
Total Extractable Hydrocarbons	338	mg/kg-dry		23		MA-EPH	11/22/16 17:05 / JRS
Surr: 2-Bromonaphthalene	71.0	%REC		40-140		MA-EPH	11/22/16 17:05 / JRS
Surr: 2-Fluorobiphenyl	72.0	%REC		40-140		MA-EPH	11/22/16 17:05 / JRS
Surr: o-Terphenyl	81.0	%REC		40-140		MA-EPH	11/22/16 17:05 / JRS

- *=The reported value exceeds the Maximum Contaminant Limit (MCL). The MCLs listed for target analyte and hydrocarbon range values are the most conservative Montana DEQ RBSLs. These limits may not apply to your samples.

SEMI-VOLATILE ORGANIC COMPOUNDS							
2-Methylnaphthalene	ND	mg/kg-dry		0.39		SW8270C	12/05/16 18:56 / eli-b
Acenaphthene	ND	mg/kg-dry		0.39	200	SW8270C	12/05/16 18:56 / eli-b
Acenaphthylene	ND	mg/kg-dry		0.39		SW8270C	12/05/16 18:56 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100551-002
Client Sample ID: 05-206-TOP

Report Date: 12/07/16
Collection Date: 10/25/16 13:30
DateReceived: 10/28/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS							
Anthracene	ND	mg/kg-dry		0.39	2000	SW8270C	12/05/16 18:56 / eli-b
Benzo(a)anthracene	ND	mg/kg-dry		0.39	0.2	SW8270C	12/05/16 18:56 / eli-b
Benzo(a)pyrene	ND	mg/kg-dry		0.39	0.02	SW8270C	12/05/16 18:56 / eli-b
Benzo(b)fluoranthene	ND	mg/kg-dry		0.39	0.2	SW8270C	12/05/16 18:56 / eli-b
Benzo(g,h,i)perylene	ND	mg/kg-dry		0.39		SW8270C	12/05/16 18:56 / eli-b
Benzo(k)fluoranthene	ND	mg/kg-dry		0.39	2	SW8270C	12/05/16 18:56 / eli-b
Chrysene	ND	mg/kg-dry		0.39	20	SW8270C	12/05/16 18:56 / eli-b
Dibenzo(a,h)anthracene	ND	mg/kg-dry		0.39	0.02	SW8270C	12/05/16 18:56 / eli-b
Fluoranthene	ND	mg/kg-dry		0.39	300	SW8270C	12/05/16 18:56 / eli-b
Fluorene	ND	mg/kg-dry		0.39	300	SW8270C	12/05/16 18:56 / eli-b
Indeno(1,2,3-cd)pyrene	ND	mg/kg-dry		0.39	0.2	SW8270C	12/05/16 18:56 / eli-b
Naphthalene	ND	mg/kg-dry		0.39	4	SW8270C	12/05/16 18:56 / eli-b
Phenanthrene	ND	mg/kg-dry		0.39		SW8270C	12/05/16 18:56 / eli-b
Pyrene	ND	mg/kg-dry		0.39	200	SW8270C	12/05/16 18:56 / eli-b
Surr: 2-Fluorobiphenyl	77.0	%REC		40-140		SW8270C	12/05/16 18:56 / eli-b
Surr: o-Terphenyl	43.0	%REC		40-140		SW8270C	12/05/16 18:56 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 35069
Lab ID: MB-35069-34963	3	Method Blank				Run: HHP_161111D				11/12/16 13:03
C9 to C18 Aliphatics		ND	mg/kg-dry	10						
C19 to C36 Aliphatics		ND	mg/kg-dry	10						
Surr: 1-Chloro-octadecane				0.17	78	40	140			
Lab ID: MB-35069-34963	20	Method Blank				Run: HHP_161111D				11/12/16 13:45
C11 to C22 Aromatics		ND	mg/kg-dry	10						
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Naphthalene		ND	mg/kg-dry	0.17						
2-MethylNaphthalene		ND	mg/kg-dry	0.17						
Acenaphthylene		ND	mg/kg-dry	0.17						
Acenaphthene		ND	mg/kg-dry	0.17						
Fluorene		ND	mg/kg-dry	0.17						
Phenanthrene		ND	mg/kg-dry	0.17						
Anthracene		ND	mg/kg-dry	0.17						
Fluoranthene		ND	mg/kg-dry	0.17						
Pyrene		ND	mg/kg-dry	0.17						
Benzo(a)Anthracene		ND	mg/kg-dry	0.17						
Chrysene		ND	mg/kg-dry	0.17						
Benzo(b)Fluoranthene/Benzo(k)Fluorant		ND	mg/kg-dry	0.17						
Benzo(a)Pyrene		ND	mg/kg-dry	0.17						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		ND	mg/kg-dry	0.17						
Benzo(g,h,I)perylene		ND	mg/kg-dry	0.17						
Surr: 2-Bromonaphthalene				0.17	73	40	140			
Surr: 2-Fluorobiphenyl				0.17	76	40	140			
Surr: o-Terphenyl				0.17	79	40	140			
Lab ID: H16100506-013AMS	17	Sample Matrix Spike				Run: HHP2_161111A				11/11/16 21:51
C9 to C18 Aliphatics		2010	mg/kg-dry	31	148	40	140			S
C19 to C36 Aliphatics		320	mg/kg-dry	31	76	40	140			
n-Nonane		1.61	mg/kg-dry	0.52	23	30	140			S
n-Decane		3.98	mg/kg-dry	0.52	46	40	140			
n-Dodecane		3.46	mg/kg-dry	0.52	40	40	140			
n-Tetradecane		7.02	mg/kg-dry	0.52	96	40	140			
n-Hexadecane		7.18	mg/kg-dry	0.52	69	40	140			
n-Octadecane		5.56	mg/kg-dry	0.52	57	40	140			
n-Nonadecane		11.6	mg/kg-dry	0.52	75	40	140			
n-Eicosane		6.68	mg/kg-dry	0.52	83	40	140			
n-Docosane		6.21	mg/kg-dry	0.52	89	40	140			
n-Tetracosane		6.20	mg/kg-dry	0.52	89	40	140			
n-Hexacosane		6.27	mg/kg-dry	0.52	90	40	140			
n-Octacosane		5.94	mg/kg-dry	0.52	85	40	140			
n-Triacontane		6.25	mg/kg-dry	0.52	90	40	140			
n-Hexatriacontane		6.21	mg/kg-dry	0.52	89	40	140			
Surr: 1-Chloro-octadecane				0.52	66	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 35069	
Lab ID: H16100506-013AMSD	17	Sample Matrix Spike Duplicate				Run: HHP2_161111A			11/11/16 23:20	
C9 to C18 Aliphatics		2190	mg/kg-dry	31	590	40	140	8.8	20	S
C19 to C36 Aliphatics		339	mg/kg-dry	31	111	40	140	5.8	20	
n-Nonane		2.48	mg/kg-dry	0.52	36	30	140	43	30	R
n-Decane		5.36	mg/kg-dry	0.52	66	40	140	30	20	R
n-Dodecane		3.92	mg/kg-dry	0.52	47	40	140	12	20	
n-Tetradecane		7.17	mg/kg-dry	0.52	98	40	140	2.2	20	
n-Hexadecane		7.53	mg/kg-dry	0.52	74	40	140	4.8	20	
n-Octadecane		5.91	mg/kg-dry	0.52	62	40	140	6.0	20	
n-Nonadecane		6.68	mg/kg-dry	0.52	4	40	140	54	20	SR
n-Eicosane		6.85	mg/kg-dry	0.52	85	40	140	2.5	20	
n-Docosane		6.48	mg/kg-dry	0.52	93	40	140	4.3	20	
n-Tetracosane		6.47	mg/kg-dry	0.52	93	40	140	4.2	20	
n-Hexacosane		6.53	mg/kg-dry	0.52	94	40	140	4.1	20	
n-Octacosane		6.24	mg/kg-dry	0.52	90	40	140	5.0	20	
n-Triacontane		6.68	mg/kg-dry	0.52	96	40	140	6.5	20	
n-Hexatriacontane		6.45	mg/kg-dry	0.52	93	40	140	3.8	20	
Surr: 1-Chloro-octadecane				0.52	72	40	140			
Lab ID: H16100506-013AMS	19	Sample Matrix Spike				Run: HHP2_161111A			11/11/16 22:35	
C11 to C22 Aromatics		1330	mg/kg-dry	31	134	40	140			
Naphthalene		7.00	mg/kg-dry	0.52	50	40	140			
2-MethylNaphthalene		11.1	mg/kg-dry	0.52	62	40	140			
Acenaphthylene		13.2	mg/kg-dry	0.52	85	40	140			
Acenaphthene		18.3	mg/kg-dry	0.52	81	40	140			
Fluorene		6.41	mg/kg-dry	0.52	71	40	140			
Phenanthrene		10.9	mg/kg-dry	0.52	85	40	140			
Anthracene		6.14	mg/kg-dry	0.52	79	40	140			
Fluoranthene		6.17	mg/kg-dry	0.52	82	40	140			
Pyrene		7.34	mg/kg-dry	0.52	98	40	140			
Benzo(a)Anthracene		5.09	mg/kg-dry	0.52	73	40	140			
Chrysene		3.26	mg/kg-dry	0.52	47	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.9	mg/kg-dry	0.52	93	40	140			
Benzo(a)Pyrene		6.07	mg/kg-dry	0.52	87	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		11.7	mg/kg-dry	0.52	85	40	140			
Benzo(g,h,I)perylene		6.04	mg/kg-dry	0.52	87	40	140			
Surr: 2-Bromonaphthalene				0.52	87	40	140			
Surr: 2-Fluorobiphenyl				0.52	65	40	140			
Surr: o-Terphenyl				0.52	110	40	140			
Lab ID: H16100506-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP2_161111A			11/12/16 00:05	
C11 to C22 Aromatics		1210	mg/kg-dry	31	30	40	140	9.7	20	S
Naphthalene		8.38	mg/kg-dry	0.52	70	40	140	18	40	
2-MethylNaphthalene		11.9	mg/kg-dry	0.52	73	40	140	6.6	20	
Acenaphthylene		12.4	mg/kg-dry	0.52	73	40	140	6.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 35069
Lab ID: H16100506-013AMSD	19	Sample Matrix Spike Duplicate				Run: HHP2_161111A			11/12/16 00:05	
Acenaphthene		16.5	mg/kg-dry	0.52	55	40	140	10	20	
Fluorene		6.20	mg/kg-dry	0.52	68	40	140	3.4	20	
Phenanthrene		9.76	mg/kg-dry	0.52	69	40	140	11	20	
Anthracene		5.39	mg/kg-dry	0.52	68	40	140	13	20	
Fluoranthene		5.57	mg/kg-dry	0.52	73	40	140	10	20	
Pyrene		6.71	mg/kg-dry	0.52	89	40	140	9.0	20	
Benzo(a)Anthracene		4.54	mg/kg-dry	0.52	65	40	140	11	20	
Chrysene		2.89	mg/kg-dry	0.52	42	40	140	12	20	
Benzo(b)Fluoranthene/Benzo(k)Fluorant		11.6	mg/kg-dry	0.52	84	40	140	10	20	
Benzo(a)Pyrene		5.51	mg/kg-dry	0.52	79	40	140	9.6	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		10.5	mg/kg-dry	0.52	76	40	140	10	20	
Benzo(g,h,I)perylene		5.41	mg/kg-dry	0.52	78	40	140	11	20	
Surr: 2-Bromonaphthalene				0.52	67	40	140			
Surr: 2-Fluorobiphenyl				0.52	61	40	140			
Surr: o-Terphenyl				0.52	104	40	140			
Lab ID: LCS-35069-34963	17	Laboratory Control Sample				Run: HHP2_161112A			11/12/16 15:19	
C9 to C18 Aliphatics		27.5	mg/kg-dry	10	69	40	140			
C19 to C36 Aliphatics		48.9	mg/kg-dry	10	92	40	140			
n-Nonane		2.90	mg/kg-dry	0.17	44	30	140			
n-Decane		3.78	mg/kg-dry	0.17	57	40	140			
n-Dodecane		4.31	mg/kg-dry	0.17	65	40	140			
n-Tetradecane		4.62	mg/kg-dry	0.17	69	40	140			
n-Hexadecane		5.18	mg/kg-dry	0.17	78	40	140			
n-Octadecane		5.68	mg/kg-dry	0.17	85	40	140			
n-Nonadecane		5.97	mg/kg-dry	0.17	90	40	140			
n-Eicosane		5.99	mg/kg-dry	0.17	90	40	140			
n-Docosane		6.14	mg/kg-dry	0.17	92	40	140			
n-Tetracosane		6.21	mg/kg-dry	0.17	93	40	140			
n-Hexacosane		6.24	mg/kg-dry	0.17	94	40	140			
n-Octacosane		5.94	mg/kg-dry	0.17	89	40	140			
n-Triacontane		6.21	mg/kg-dry	0.17	93	40	140			
n-Hexatriacontane		5.88	mg/kg-dry	0.17	88	40	140			
Surr: 1-Chloro-octadecane				0.17	73	40	140			
Lab ID: LCS-35069-34963	19	Laboratory Control Sample				Run: HHP2_161112A			11/12/16 16:04	
C11 to C22 Aromatics		101	mg/kg-dry	10	89	40	140			
Naphthalene		4.66	mg/kg-dry	0.17	70	40	140			
2-MethylNaphthalene		4.89	mg/kg-dry	0.17	73	40	140			
Acenaphthylene		5.26	mg/kg-dry	0.17	79	40	140			
Acenaphthene		5.77	mg/kg-dry	0.17	87	40	140			
Fluorene		5.64	mg/kg-dry	0.17	85	40	140			
Phenanthrene		6.04	mg/kg-dry	0.17	91	40	140			
Anthracene		5.85	mg/kg-dry	0.17	88	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 35069
Lab ID: LCS-35069-34963	19	Laboratory Control Sample				Run: HHP2_161112A				11/12/16 16:04
Fluoranthene		6.58	mg/kg-dry	0.17	99	40	140			
Pyrene		6.47	mg/kg-dry	0.17	97	40	140			
Benzo(a)Anthracene		6.30	mg/kg-dry	0.17	94	40	140			
Chrysene		4.57	mg/kg-dry	0.17	69	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		13.0	mg/kg-dry	0.17	99	40	140			
Benzo(a)Pyrene		6.13	mg/kg-dry	0.17	92	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		11.9	mg/kg-dry	0.17	90	40	140			
Benzo(g,h,I)perylene		6.11	mg/kg-dry	0.17	92	40	140			
Surr: 2-Bromonaphthalene				0.17	63	40	140			
Surr: 2-Fluorobiphenyl				0.17	80	40	140			
Surr: o-Terphenyl				0.17	84	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R120704	
Lab ID: CCV_1116GC104r-S	15	Continuing Calibration Verification Standard							11/16/16 23:56	
n-Nonane		6.90	mg/kg-dry	0.17	103	75	125			
n-Decane		6.95	mg/kg-dry	0.17	104	75	125			
n-Dodecane		6.75	mg/kg-dry	0.17	101	75	125			
n-Tetradecane		6.82	mg/kg-dry	0.17	102	75	125			
n-Hexadecane		6.85	mg/kg-dry	0.17	103	75	125			
n-Octadecane		6.89	mg/kg-dry	0.17	103	75	125			
n-Nonadecane		6.90	mg/kg-dry	0.17	104	75	125			
n-Eicosane		6.92	mg/kg-dry	0.17	104	75	125			
n-Docosane		6.92	mg/kg-dry	0.17	104	75	125			
n-Tetracosane		6.94	mg/kg-dry	0.17	104	75	125			
n-Hexacosane		6.96	mg/kg-dry	0.17	104	75	125			
n-Octacosane		6.97	mg/kg-dry	0.17	105	75	125			
n-Triacontane		7.02	mg/kg-dry	0.17	105	75	125			
n-Hexatriacontane		7.12	mg/kg-dry	0.17	107	75	125			
Surr: 1-Chloro-octadecane				0.17	108	75	125			
Lab ID: CCV_1116GC105r-S	18	Continuing Calibration Verification Standard							11/17/16 00:39	
Naphthalene		6.80	mg/kg-dry	0.17	102	75	125			
2-MethylNaphthalene		6.73	mg/kg-dry	0.17	101	75	125			
Acenaphthylene		6.83	mg/kg-dry	0.17	102	75	125			
Acenaphthene		6.74	mg/kg-dry	0.17	101	75	125			
Fluorene		6.88	mg/kg-dry	0.17	103	75	125			
Phenanthrene		6.52	mg/kg-dry	0.17	98	75	125			
Anthracene		6.99	mg/kg-dry	0.17	105	75	125			
Fluoranthene		6.83	mg/kg-dry	0.17	102	75	125			
Pyrene		6.81	mg/kg-dry	0.17	102	75	125			
Benzo(a)Anthracene		6.47	mg/kg-dry	0.17	97	75	125			
Chrysene		7.27	mg/kg-dry	0.17	109	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		13.8	mg/kg-dry	0.17	103	75	125			
Benzo(a)Pyrene		6.90	mg/kg-dry	0.17	104	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		13.9	mg/kg-dry	0.17	104	75	125			
Benzo(g,h,I)perylene		6.90	mg/kg-dry	0.17	103	75	125			
Surr: 2-Bromonaphthalene				0.17	101	40	140			
Surr: 2-Fluorobiphenyl				0.17	100	40	140			
Surr: o-Terphenyl				0.17	102	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R120764	
Lab ID: CCV_1120GC102r-S	15	Continuing Calibration Verification Standard							11/20/16 15:31	
n-Nonane		7.23	mg/kg-dry	0.17	108	75	125			
n-Decane		7.28	mg/kg-dry	0.17	109	75	125			
n-Dodecane		7.10	mg/kg-dry	0.17	106	75	125			
n-Tetradecane		7.09	mg/kg-dry	0.17	106	75	125			
n-Hexadecane		7.10	mg/kg-dry	0.17	107	75	125			
n-Octadecane		7.14	mg/kg-dry	0.17	107	75	125			
n-Nonadecane		7.13	mg/kg-dry	0.17	107	75	125			
n-Eicosane		7.15	mg/kg-dry	0.17	107	75	125			
n-Docosane		7.15	mg/kg-dry	0.17	107	75	125			
n-Tetracosane		7.17	mg/kg-dry	0.17	108	75	125			
n-Hexacosane		7.20	mg/kg-dry	0.17	108	75	125			
n-Octacosane		7.22	mg/kg-dry	0.17	108	75	125			
n-Triacontane		7.28	mg/kg-dry	0.17	109	75	125			
n-Hexatriacontane		7.33	mg/kg-dry	0.17	110	75	125			
Surr: 1-Chloro-octadecane				0.17	111	75	125			
Method: MA-EPH									Analytical Run: R120811	
Lab ID: CCV_1122GC103r-S	18	Continuing Calibration Verification Standard							11/22/16 10:43	
Naphthalene		5.90	mg/kg-dry	0.17	89	75	125			
2-MethylNaphthalene		5.76	mg/kg-dry	0.17	86	75	125			
Acenaphthylene		5.88	mg/kg-dry	0.17	88	75	125			
Acenaphthene		5.93	mg/kg-dry	0.17	89	75	125			
Fluorene		5.72	mg/kg-dry	0.17	86	75	125			
Phenanthrene		5.89	mg/kg-dry	0.17	88	75	125			
Anthracene		5.95	mg/kg-dry	0.17	89	75	125			
Fluoranthene		5.93	mg/kg-dry	0.17	89	75	125			
Pyrene		5.96	mg/kg-dry	0.17	89	75	125			
Benzo(a)Anthracene		5.93	mg/kg-dry	0.17	89	75	125			
Chrysene		5.89	mg/kg-dry	0.17	88	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		12.1	mg/kg-dry	0.17	91	75	125			
Benzo(a)Pyrene		6.06	mg/kg-dry	0.17	91	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		12.2	mg/kg-dry	0.17	92	75	125			
Benzo(g,h,I)perylene		6.09	mg/kg-dry	0.17	91	75	125			
Surr: 2-Bromonaphthalene				0.17	90	40	140			
Surr: 2-Fluorobiphenyl				0.17	87	40	140			
Surr: o-Terphenyl				0.17	89	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34931
Lab ID: MB-34931	14	Method Blank				Run: GC3_161031A				10/31/16 13:36
Methyl tert-butyl ether (MTBE)		ND	mg/kg-dry	0.10						
Benzene		ND	mg/kg-dry	0.050						
Toluene		ND	mg/kg-dry	0.050						
Ethylbenzene		ND	mg/kg-dry	0.050						
m+p-Xylenes		ND	mg/kg-dry	0.050						
o-Xylene		ND	mg/kg-dry	0.050						
Naphthalene		ND	mg/kg-dry	0.10						
C9 to C10 Aromatics		ND	mg/kg-dry	2.0						
C5 to C8 Aliphatics		ND	mg/kg-dry	2.0						
C9 to C12 Aliphatics		ND	mg/kg-dry	2.0						
Total Purgeable Hydrocarbons		ND	mg/kg-dry	2.0						
Xylenes, Total		ND	mg/kg-dry	0.050						
Surr: VPH Aromatics Surrogate				0.050	107	70	130			
Surr: VPH Aliphatics Surrogate				0.050	103	70	130			
Lab ID: H16100506-019AMS	10	Sample Matrix Spike				Run: GC3_161031A				10/31/16 17:32
Methyl tert-butyl ether (MTBE)		3.03	mg/kg-dry	0.11	109	70	130			
Benzene		2.80	mg/kg-dry	0.056	101	70	130			
Toluene		2.81	mg/kg-dry	0.056	101	70	130			
Ethylbenzene		2.99	mg/kg-dry	0.056	108	70	130			
m+p-Xylenes		5.96	mg/kg-dry	0.056	107	70	130			
o-Xylene		2.97	mg/kg-dry	0.056	107	70	130			
Naphthalene		2.79	mg/kg-dry	0.11	97	70	130			
Total Purgeable Hydrocarbons		44.1	mg/kg-dry	2.2	106	70	130			
Surr: VPH Aromatics Surrogate				0.056	100	70	130			
Surr: VPH Aliphatics Surrogate				0.056	98	70	130			
Lab ID: H16100506-019AMSD	10	Sample Matrix Spike Duplicate				Run: GC3_161031A				10/31/16 18:07
Methyl tert-butyl ether (MTBE)		3.08	mg/kg-dry	0.11	112	70	130	1.6	20	
Benzene		2.84	mg/kg-dry	0.055	103	70	130	1.4	20	
Toluene		2.84	mg/kg-dry	0.055	103	70	130	1.4	20	
Ethylbenzene		3.03	mg/kg-dry	0.055	110	70	130	1.4	20	
m+p-Xylenes		6.03	mg/kg-dry	0.055	110	70	130	1.2	20	
o-Xylene		3.01	mg/kg-dry	0.055	110	70	130	1.4	20	
Naphthalene		2.72	mg/kg-dry	0.11	95	70	130	2.4	20	
Total Purgeable Hydrocarbons		44.9	mg/kg-dry	2.2	109	70	130	1.7	20	
Surr: VPH Aromatics Surrogate				0.055	90	70	130			
Surr: VPH Aliphatics Surrogate				0.055	88	70	130			
Lab ID: LCS-34931	14	Laboratory Control Sample				Run: GC2_161031A				10/31/16 13:09
2-Methylpentane		2.67	mg/kg-dry	0.10	107	70	130			
n-Butylcyclohexane		2.92	mg/kg-dry	0.10	117	70	130			
n-Decane		2.91	mg/kg-dry	0.10	116	70	130			
n-Pentane		2.49	mg/kg-dry	0.10	100	30	130			
Methyl tert-butyl ether (MTBE)		2.50	mg/kg-dry	0.10	100	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH										Batch: 34931
Lab ID: LCS-34931	14	Laboratory Control Sample				Run: GC2_161031A				10/31/16 13:09
Benzene		2.60	mg/kg-dry	0.050	104	70	130			
Toluene		2.56	mg/kg-dry	0.050	103	70	130			
Ethylbenzene		2.54	mg/kg-dry	0.050	102	70	130			
m+p-Xylenes		5.39	mg/kg-dry	0.050	108	70	130			
o-Xylene		2.65	mg/kg-dry	0.050	106	70	130			
Naphthalene		2.43	mg/kg-dry	0.10	97	70	130			
Total Purgeable Hydrocarbons		40.6	mg/kg-dry	2.0	108	70	130			
Surr: VPH Aromatics Surrogate				0.050	106	70	130			
Surr: VPH Aliphatics Surrogate				0.050	106	70	130			
Method: MA-VPH										Analytical Run: R120143
Lab ID: CCV_1031GC202r-S	15	Continuing Calibration Verification Standard								10/31/16 11:35
1,2,4-Trimethylbenzene		2.58	mg/kg-dry	0.10	103	75	125			
2,2,4-Trimethylpentane		2.73	mg/kg-dry	0.10	109	75	125			
2-Methylpentane		2.62	mg/kg-dry	0.10	105	75	125			
n-Butylcyclohexane		2.41	mg/kg-dry	0.10	97	75	125			
n-Decane		2.28	mg/kg-dry	0.10	91	75	125			
n-Pentane		2.58	mg/kg-dry	0.10	103	75	125			
Methyl tert-butyl ether (MTBE)		2.52	mg/kg-dry	0.10	101	75	125			
Benzene		2.46	mg/kg-dry	0.050	98	75	125			
Toluene		2.46	mg/kg-dry	0.050	99	75	125			
Ethylbenzene		2.43	mg/kg-dry	0.050	97	75	125			
m+p-Xylenes		5.08	mg/kg-dry	0.050	102	75	125			
o-Xylene		2.50	mg/kg-dry	0.050	100	75	125			
Naphthalene		2.36	mg/kg-dry	0.10	94	75	125			
Surr: VPH Aromatics Surrogate				0.050	104	70	130			
Surr: VPH Aliphatics Surrogate				0.050	105	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Analytical Run: R120465	
Lab ID: CCV_1111GC202r-S	15	Continuing Calibration Verification Standard							11/11/16 11:28	
1,2,4-Trimethylbenzene		2.62	mg/kg-dry	0.10	105	75	125			
2,2,4-Trimethylpentane		2.74	mg/kg-dry	0.10	110	75	125			
2-Methylpentane		2.75	mg/kg-dry	0.10	110	75	125			
n-Butylcyclohexane		2.44	mg/kg-dry	0.10	98	75	125			
n-Decane		2.46	mg/kg-dry	0.10	98	75	125			
n-Pentane		2.86	mg/kg-dry	0.10	114	75	125			
Methyl tert-butyl ether (MTBE)		2.70	mg/kg-dry	0.10	108	75	125			
Benzene		2.66	mg/kg-dry	0.050	107	75	125			
Toluene		2.66	mg/kg-dry	0.050	106	75	125			
Ethylbenzene		2.53	mg/kg-dry	0.050	101	75	125			
m+p-Xylenes		5.29	mg/kg-dry	0.050	106	75	125			
o-Xylene		2.58	mg/kg-dry	0.050	103	75	125			
Naphthalene		2.32	mg/kg-dry	0.10	93	75	125			
Surr: VPH Aromatics Surrogate				0.050	95	70	130			
Surr: VPH Aliphatics Surrogate				0.050	94	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW3550C**								Batch: R119957	
Lab ID:	**H16100555-007ADUP**	Sample Duplicate				Run: EXTRACT OV 2_161028B			10/28/16 17:06	
Moisture		2.11	wt%	0.20				7.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M										Batch: 34963
Lab ID: MB-34963	2	Method Blank				Run: HHP2_161101A				11/01/16 17:19
Total Extractable Hydrocarbons		ND	mg/kg-dry	10						
Surr: o-Terphenyl				0.17	90	40	140			
Lab ID: LCS-34963	2	Laboratory Control Sample				Run: HHP2_161101A				11/01/16 18:08
Total Extractable Hydrocarbons		216.3	mg/kg-dry	10	105	60	140			
Surr: o-Terphenyl				0.17	93	40	140			
Lab ID: H16100506-013AMS	2	Sample Matrix Spike				Run: HHP2_161102A				11/02/16 17:21
Total Extractable Hydrocarbons		3505	mg/kg-dry	10	-6	60	140			S
Surr: o-Terphenyl				0.17	83	40	140			
Lab ID: H16100506-013AMSD	2	Sample Matrix Spike Duplicate				Run: HHP2_161102A				11/02/16 18:10
Total Extractable Hydrocarbons		4313	mg/kg-dry	10	370	60	140	21	20	SR
Surr: o-Terphenyl				0.17	100	40	140			
Method: SW8015M										Analytical Run: R120398
Lab ID: CCV_1110GC102r-S	15	Continuing Calibration Verification Standard								11/10/16 13:00
n-Nonane		6.543	mg/kg-dry		98	75	125			
n-Decane		6.510	mg/kg-dry		98	75	125			
n-Dodecane		6.034	mg/kg-dry		91	75	125			
n-Tetradecane		6.070	mg/kg-dry		91	75	125			
n-Hexadecane		6.055	mg/kg-dry		91	75	125			
n-Octadecane		6.046	mg/kg-dry		91	75	125			
n-Nonadecane		6.035	mg/kg-dry		91	75	125			
n-Eicosane		6.038	mg/kg-dry		91	75	125			
n-Docosane		6.019	mg/kg-dry		90	75	125			
n-Tetracosane		6.045	mg/kg-dry		91	75	125			
n-Hexacosane		6.070	mg/kg-dry		91	75	125			
n-Octacosane		6.095	mg/kg-dry		91	75	125			
n-Triacontane		6.130	mg/kg-dry		92	75	125			
n-Hexatriacontane		6.156	mg/kg-dry		92	75	125			
Surr: o-Terphenyl				0.17	93	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C										Batch: B_104620
Lab ID: MB-104620-35069-349	19	Method Blank				Run: SUB-B270792				11/22/16 00:32
2-Methylnaphthalene		ND	mg/kg	0.33						
Acenaphthene		ND	mg/kg	0.33						
Acenaphthylene		ND	mg/kg	0.33						
Anthracene		ND	mg/kg	0.33						
Benzo(a)anthracene		ND	mg/kg	0.33						
Benzo(a)pyrene		ND	mg/kg	0.33						
Benzo(b)fluoranthene		ND	mg/kg	0.33						
Benzo(g,h,i)perylene		ND	mg/kg	0.33						
Benzo(k)fluoranthene		ND	mg/kg	0.33						
Chrysene		ND	mg/kg	0.33						
Dibenzo(a,h)anthracene		ND	mg/kg	0.33						
Fluoranthene		ND	mg/kg	0.33						
Fluorene		ND	mg/kg	0.33						
Indeno(1,2,3-cd)pyrene		ND	mg/kg	0.33						
Naphthalene		ND	mg/kg	0.33						
Phenanthrene		ND	mg/kg	0.33						
Pyrene		ND	mg/kg	0.33						
Surr: 2-Fluorobiphenyl				0.33	77	40	140			
Surr: o-Terphenyl				0.33	81	40	140			
Lab ID: LCS-104620	19	Laboratory Control Sample				Run: SUB-B270792				11/22/16 01:02
2-Methylnaphthalene		4.60	mg/kg	0.33	69	40	140			
Acenaphthene		6.88	mg/kg	0.33	103	40	140			
Acenaphthylene		5.41	mg/kg	0.33	81	40	140			
Anthracene		6.21	mg/kg	0.33	93	40	140			
Benzo(a)anthracene		7.62	mg/kg	0.33	114	40	140			
Benzo(a)pyrene		6.55	mg/kg	0.33	98	40	140			
Benzo(b)fluoranthene		5.76	mg/kg	0.33	86	40	140			
Benzo(g,h,i)perylene		6.77	mg/kg	0.33	101	40	140			
Benzo(k)fluoranthene		6.93	mg/kg	0.33	104	40	140			
Chrysene		4.13	mg/kg	0.33	62	40	140			
Dibenzo(a,h)anthracene		6.00	mg/kg	0.33	90	40	140			
Fluoranthene		6.94	mg/kg	0.33	104	40	140			
Fluorene		6.46	mg/kg	0.33	97	40	140			
Indeno(1,2,3-cd)pyrene		6.63	mg/kg	0.33	99	40	140			
Naphthalene		4.27	mg/kg	0.33	64	40	140			
Phenanthrene		5.90	mg/kg	0.33	88	40	140			
Pyrene		6.72	mg/kg	0.33	101	40	140			
Surr: 2-Fluorobiphenyl				0.33	81	40	140			
Surr: o-Terphenyl				0.33	90	40	140			
Lab ID: H16100506-013AMS	19	Sample Matrix Spike				Run: SUB-B270792				11/22/16 02:03
2-Methylnaphthalene		16.4	mg/kg-dry	1.0	98	40	140	0.0	40	
Acenaphthene		7.72	mg/kg-dry	1.0	101	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 12/07/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100551

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_104620	
Lab ID: H16100506-013AMS	19	Sample Matrix Spike				Run: SUB-B270792			11/22/16 02:03	
Acenaphthylene		6.44	mg/kg-dry	1.0	92	40	140	0.0	40	
Anthracene		6.84	mg/kg-dry	1.0	98	40	140	0.0	40	
Benzo(a)anthracene		7.78	mg/kg-dry	1.0	112	40	140	0.0	40	
Benzo(a)pyrene		6.15	mg/kg-dry	1.0	88	40	140	0.0	40	
Benzo(b)fluoranthene		7.22	mg/kg-dry	1.0	104	40	140	0.0	40	
Benzo(g,h,i)perylene		6.49	mg/kg-dry	1.0	93	40	140	0.0	40	
Benzo(k)fluoranthene		5.96	mg/kg-dry	1.0	85	40	140	0.0	40	
Chrysene		4.23	mg/kg-dry	1.0	61	40	140	0.0	40	
Dibenzo(a,h)anthracene		6.39	mg/kg-dry	1.0	92	40	140	0.0	40	
Fluoranthene		7.12	mg/kg-dry	1.0	102	40	140	0.0	40	
Fluorene		10.2	mg/kg-dry	1.0	95	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene		7.57	mg/kg-dry	1.0	109	40	140	0.0	40	
Naphthalene		7.32	mg/kg-dry	1.0	73	40	140	0.0	40	
Phenanthrene		12.3	mg/kg-dry	1.0	108	40	140	0.0	40	
Pyrene		7.16	mg/kg-dry	1.0	103	40	140	0.0	40	
Surr: 2-Fluorobiphenyl				1.0	97	40	140			
Surr: o-Terphenyl				1.0	85	40	140			
Lab ID: H16100506-013AMSD	19	Sample Matrix Spike				Run: SUB-B270792			11/22/16 02:34	
2-Methylnaphthalene		17.3	mg/kg-dry	1.0	111	40	140	5.4	40	
Acenaphthene		7.98	mg/kg-dry	1.0	104	40	140	3.2	40	
Acenaphthylene		6.54	mg/kg-dry	1.0	94	40	140	1.6	40	
Anthracene		6.05	mg/kg-dry	1.0	87	40	140	12	40	
Benzo(a)anthracene		6.89	mg/kg-dry	1.0	99	40	140	12	40	
Benzo(a)pyrene		6.22	mg/kg-dry	1.0	89	40	140	1.1	40	
Benzo(b)fluoranthene		6.74	mg/kg-dry	1.0	97	40	140	6.8	40	
Benzo(g,h,i)perylene		6.30	mg/kg-dry	1.0	90	40	140	3.0	40	
Benzo(k)fluoranthene		6.47	mg/kg-dry	1.0	93	40	140	8.2	40	
Chrysene		3.99	mg/kg-dry	1.0	57	40	140	5.8	40	
Dibenzo(a,h)anthracene		6.16	mg/kg-dry	1.0	88	40	140	3.7	40	
Fluoranthene		6.56	mg/kg-dry	1.0	94	40	140	8.2	40	
Fluorene		8.81	mg/kg-dry	1.0	75	40	140	14	40	
Indeno(1,2,3-cd)pyrene		7.47	mg/kg-dry	1.0	107	40	140	1.3	40	
Naphthalene		8.72	mg/kg-dry	1.0	93	40	140	17	40	
Phenanthrene		10.6	mg/kg-dry	1.0	82	40	140	15	40	
Pyrene		6.23	mg/kg-dry	1.0	89	40	140	14	40	
Surr: 2-Fluorobiphenyl				1.0	75	40	140			
Surr: o-Terphenyl				1.0	71	40	140			

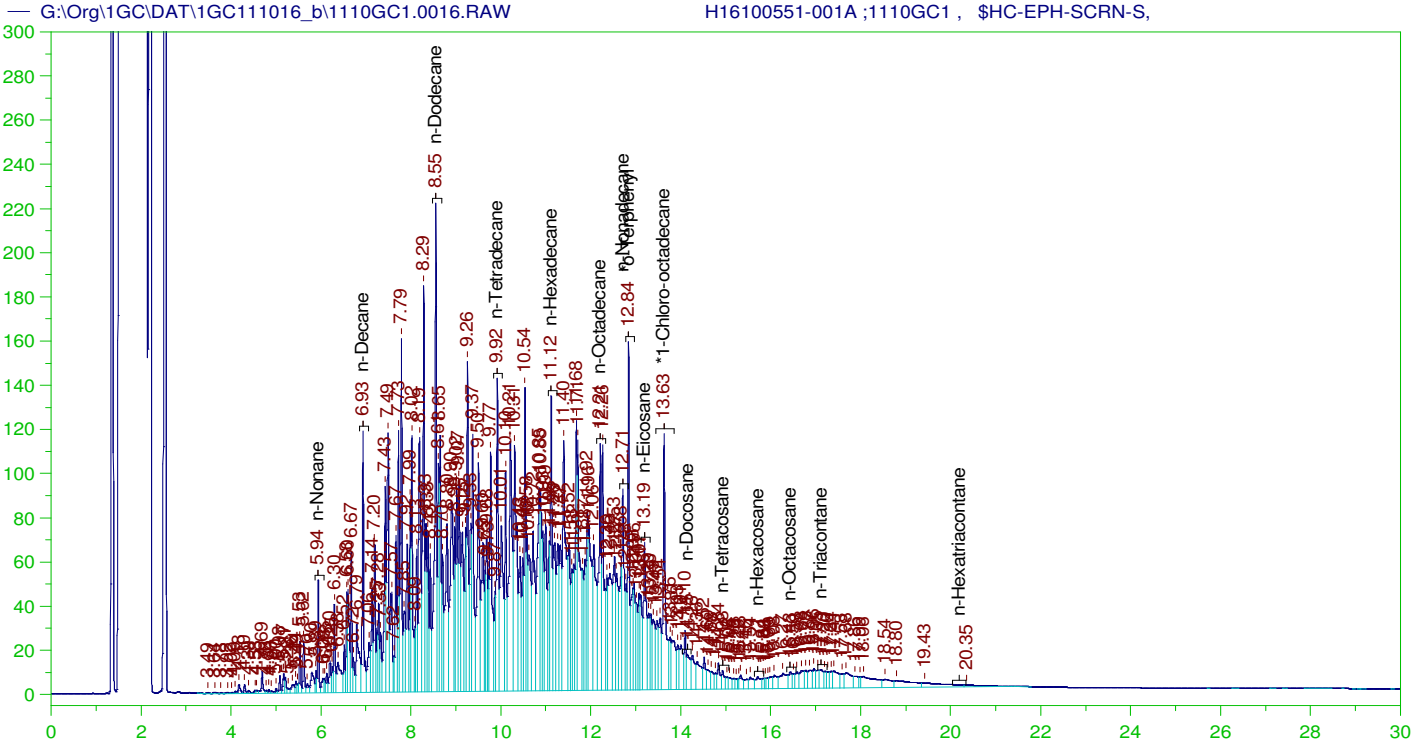
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

05-205-WGRAY Batch ID: 34963

— G:\Org\1GC\DAT\1GC111016_b\1110GC1.0016.RAW H16100551-001A ;1110GC1 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100551-001A ;1110GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111016_b\1110GC1.0016.RAW
Date & Time Acquired: 11/10/2016 11:25:12 PM
Method File: G:\Org\1GC\Methods\11101616.MET
Calibration File: G:\Org\1GC\Cals\SR082516G.CAL
Sample Weight: 27.2 Dilution: 2 S.A.: 1

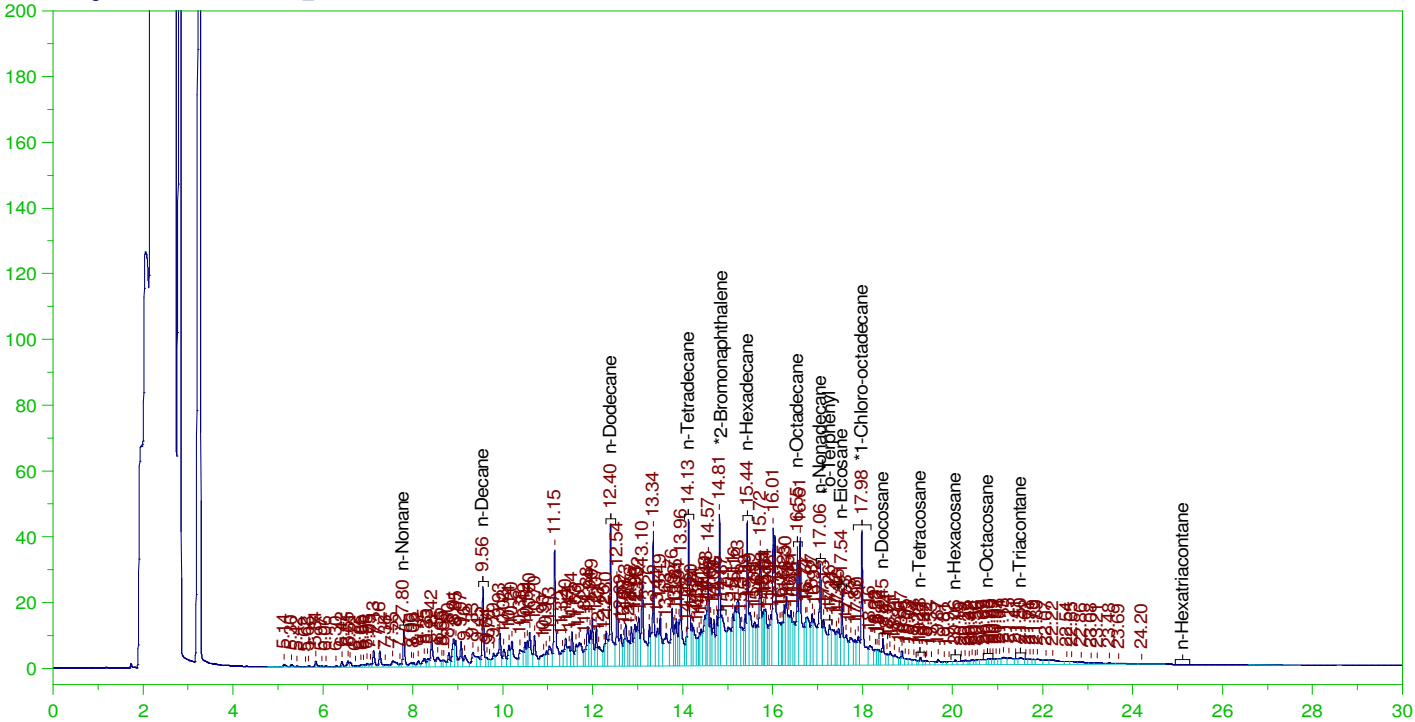
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.86 to 17.25
Rt range for C9 to C18 Hydrocarbons: 5.87 to 12.77
Rt range for C19 to C36 Hydrocarbons: 12.82 to 20.34

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.839	7.353	13.399	182.23	-
*1-Chloro-octadecane	13.626	7.353	19.942	271.21	-

DRO Area:2.47059E+07 DRO Amount: 1005.672
TEH Area:2.668232E+07 TEH Amount: 1086.124
C9-C18 Area:2.222678E+07 C9-C18 Amount: 930.3421
C19-C36 Area:3957889 C19-C36 Amount: 156.7969

05-205-WGRAY Batch ID: 35069

— G:\Org\1GC\DAT\1GC111616_b\1116GC1.0006.RAW H16100551-001A ;1116GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100551-001A ;1116GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC111616_b\1116GC1.0006.RAW
Date & Time Acquired: 11/17/2016 1:21:09 AM
Method File: G:\Org\1GC\Methods\11161606.MET
Calibration File: G:\Org\1GC\Cals\AL082516I.CAL
Sample Weight: 27.2 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.469999 to 20.89
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.71 to 16.97
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.02 to 25.26

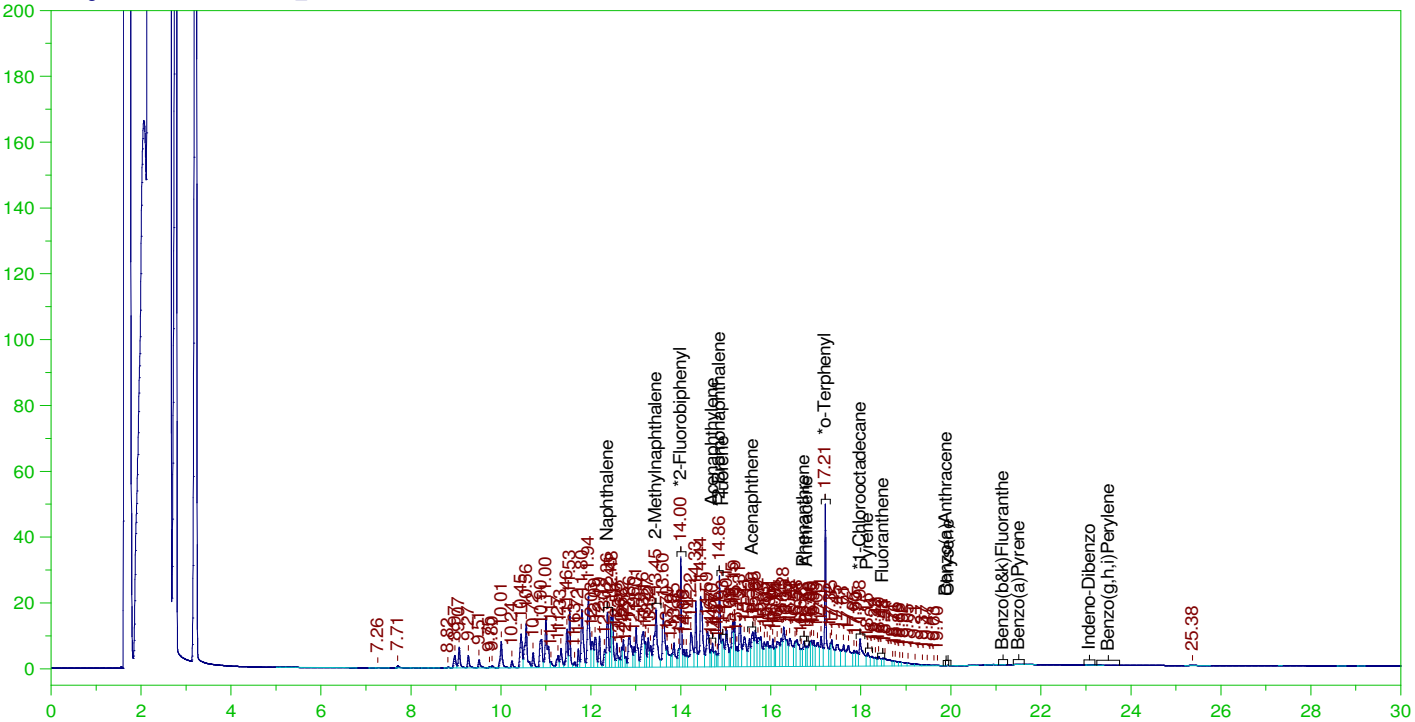
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.981	140716	7.353	13.742	186.89	-

DRO Area:5655281 DRO Amount: 481.6536
TEH Area:6350993 TEH Amount: 540.9065

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:5140663 C9-C18 Amount: 446.7853
C19-C36 Area:1113237 C19-C36 Amount: 93.40795

05-205-WGRAY Batch ID: 35069

G:\Org\1GC\DAT\1GC111616_b\1116GC1.0007.RAW H16100551-001A ;1116GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100551-001A ;1116GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC111616_b\1116GC1.0007.RAW
Date & Time Acquired: 11/17/2016 2:03:15 AM
Method File: G:\Org\1GC\Methods\AR082416I.MET
Calibration File: G:\Org\1GC\Cals\AR082416I.CAL
Sample Weight: 27.2 Dilution: 2 S.A.: 1

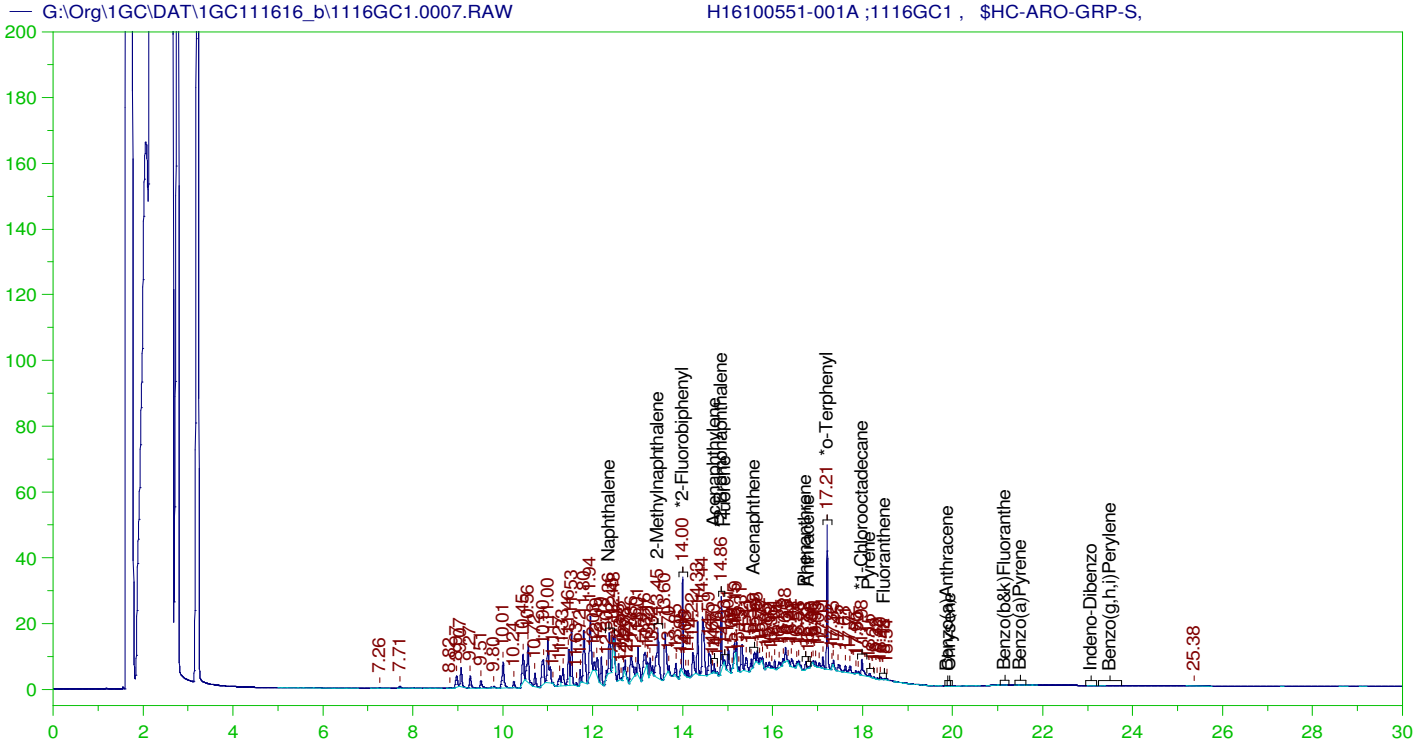
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.28 to 23.75

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	13.999	67583	7.353	5.614	76.35	-
*2-Bromonaphthalene	14.857	69786	7.353	8.425	114.58	-
*o-Terphenyl	17.208	117786	7.353	8.682	118.08	-
*1-Chlorooctadecane	17.982	47682	7.353	4.416	60.05	-

C11-C22 Aromatics Area:2267407 C11-C22 Aromatics Amount: 169.0876
EPH Aromatics total Area:2901964 EPH Aromatics Total Amount: 216.4084

05-205-WGRAY Batch ID: 35069

— G:\Org\1GC\DAT\1GC111616_b\1116GC1.0007.RAW H16100551-001A ;1116GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

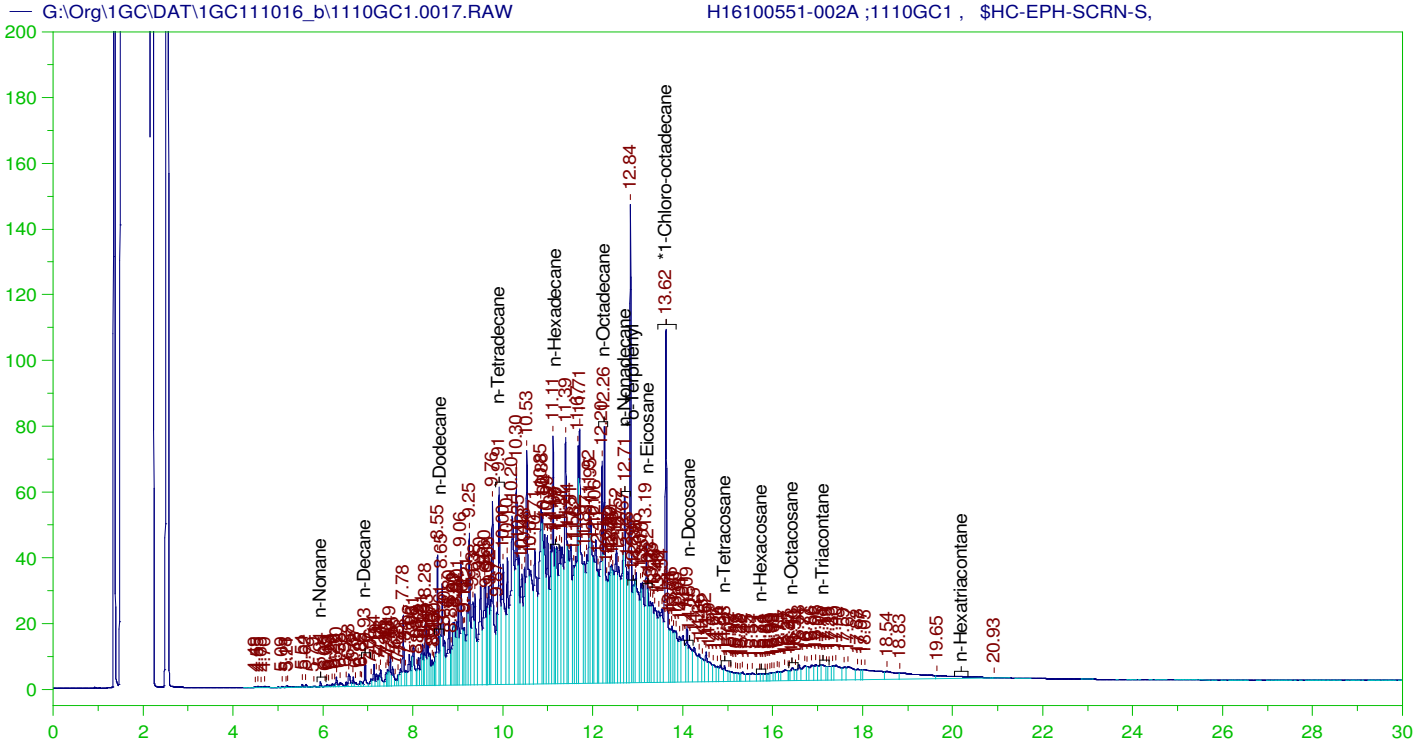
Sample Name: H16100551-001A ;1116GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC111616_b\1116GC1.0007.RAW
Date & Time Acquired: 11/17/2016 2:03:15 AM
Method File: G:\Org\1GC\Methods\AROQC082416I.met
Calibration File: G:\Org\1GC\Cals\AR082416I.CAL
Sample Weight: 27.2 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.362	2.49	2.496	32270	2.482	
2-Methylnaphthalene	13.447	1.41	1.41	53441	4.109	
Acenaphthylene	14.704	.17	.154	3853	.301	
Fluorene	14.93	-.07	-.072	2389	.174	
Acenaphthene	15.593	-.7	-.736	9437	.714	
Phenanthrene	16.731	-1.87	-1.874	4429	.333	
Anthracene	16.79	16.79	16.79	661	.074	U
Pyrene	18.151	-3.31	-3.293	2500	.184	
Fluoranthene	18.485	18.485	18.485	680	.074	U
Benzo(a)Anthracene	.	.	.		.074	U
Chrysene	.	.	.		.074	U
Benzo(b&k)Fluoranthe	.	.	.		.147	U
Benzo(a)Pyrene	.	.	.		.074	U
Indeno-Dibenzo	.	.	.		.147	U
Benzo(g,h,i)Perylene	.	.	.		.074	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	13.999	46739	7.353	3.882	52.8	40-140
*2-Bromonaphthalene	14.857	38676	7.353	4.669	63.5	40-140
*o-Terphenyl	17.208	76801	7.353	5.661	76.99	40-140
*1-Chlorooctadecane	17.982	13771	7.353	1.275	17.34	40-140

05-206-TOP Batch ID: 34963

— G:\Org\1GC\DAT\1GC111016_b\1110GC1.0017.RAW H16100551-002A ;1110GC1 , $HC-EPH-SCRN-S,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100551-002A ;1110GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111016_b\1110GC1.0017.RAW
Date & Time Acquired: 11/11/2016 12:10:00 AM
Method File: G:\Org\1GC\Methods\11101617.MET
Calibration File: G:\Org\1GC\Cals\SR082516G.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

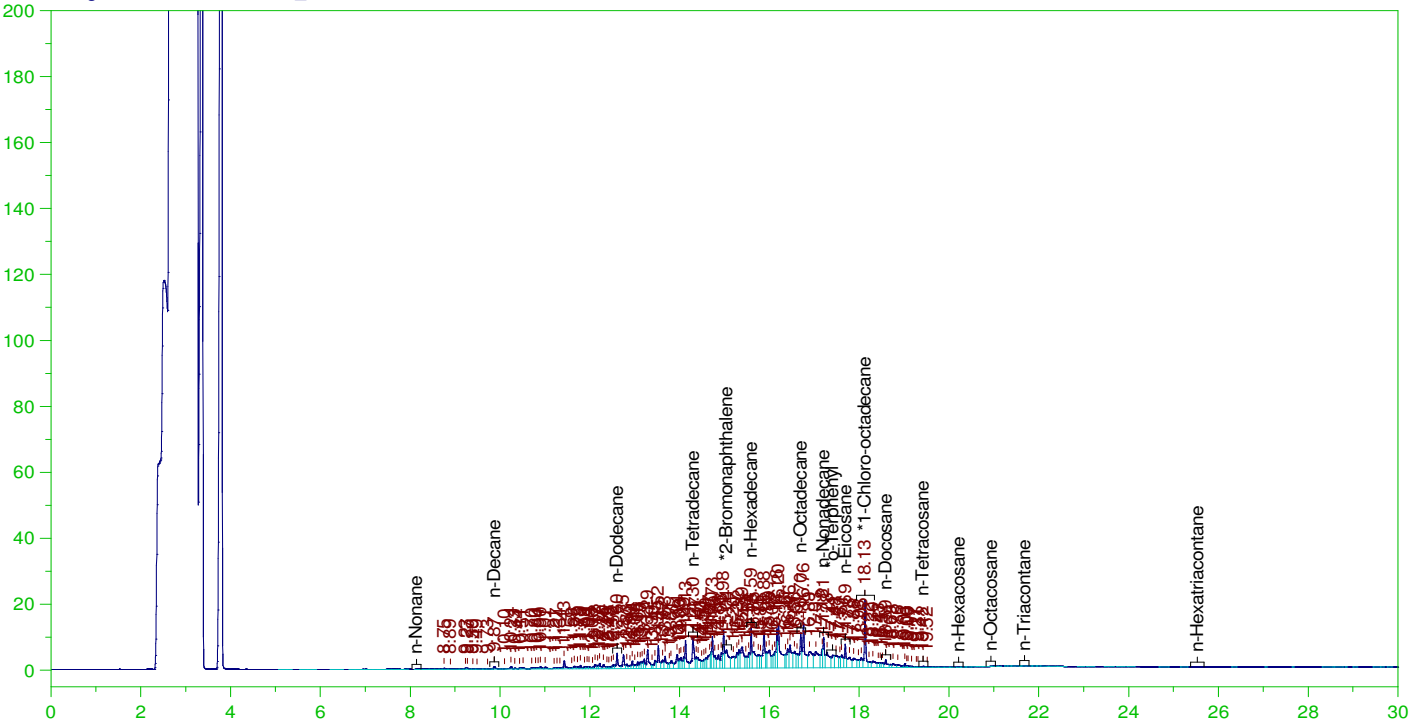
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.86 to 17.25
Rt range for C9 to C18 Hydrocarbons: 5.87 to 12.77
Rt range for C19 to C36 Hydrocarbons: 12.82 to 20.34

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.891	7.813	2.033	26.03	-
*1-Chloro-octadecane	13.623	7.813	15.176	194.25	-

DRO Area:1.15325E+07 DRO Amount: 498.779
TEH Area:1.201086E+07 TEH Amount: 519.4678
C9-C18 Area:9014827 C9-C18 Amount: 400.9152
C19-C36 Area:2890150 C19-C36 Amount: 121.6531

05-206-TOP Batch ID: 35069

— G:\Org\1GC\DAT\1GC112016_b\1120GC1.0007.RAW H16100551-002A ;1120GC1 , $HC-ALI-GRP-S,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100551-002A ;1120GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC112016_b\1120GC1.0007.RAW
Date & Time Acquired: 11/20/2016 7:02:42 PM
Method File: G:\Org\1GC\Methods\AL082516J.MET
Calibration File: G:\Org\1GC\Cals\AL082516J.CAL
Sample Weight: 25.6 Dilution: 4 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.77 to 21.03
Rt range for C9 to C18 Aliphatic Hydrocarbons: 8.04 to 17.12
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.17 to 25.68

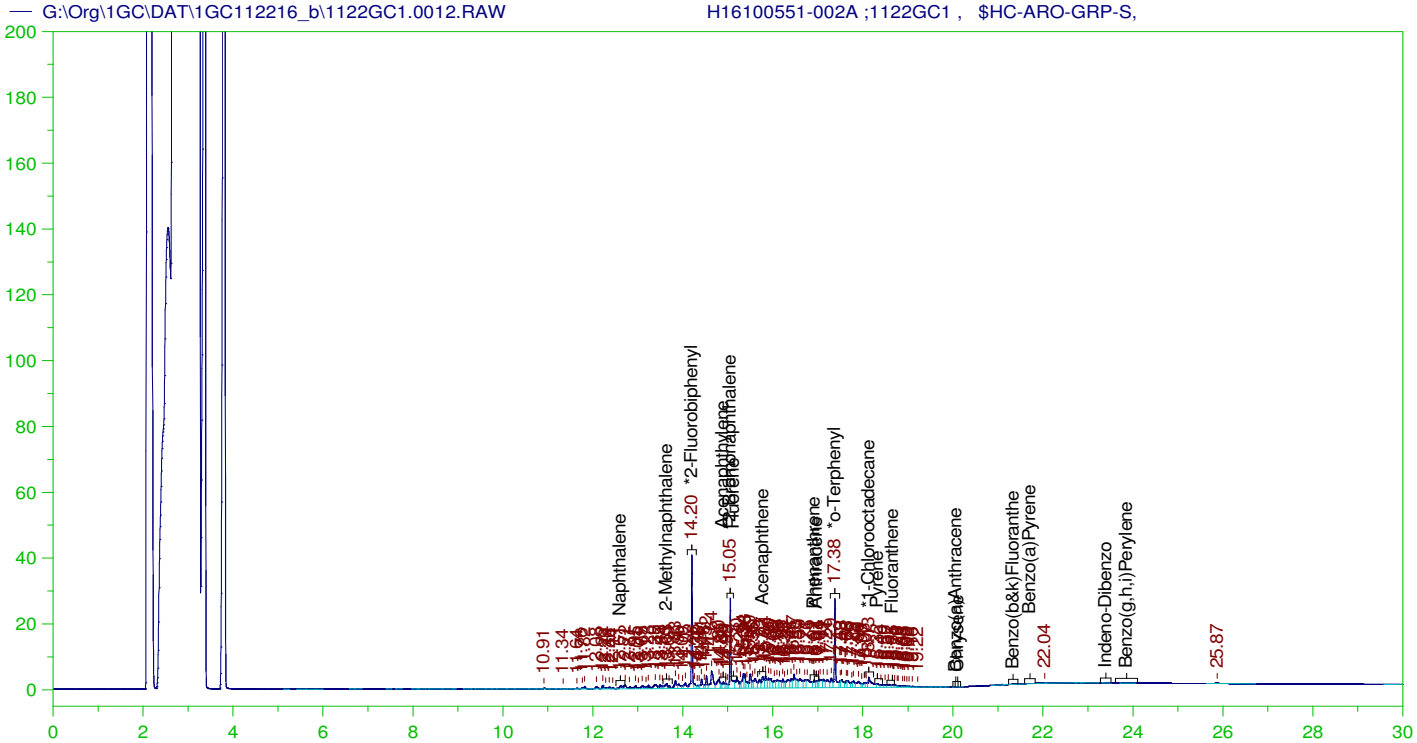
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	18.129	48786	7.813	10.124	129.59	-

DRO Area:1320896 DRO Amount: 239.0607
TEH Area:1382971 TEH Amount: 250.2953

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:1108815 C9-C18 Amount: 204.7848
C19-C36 Area:272848.9 C19-C36 Amount: 48.64939

05-206-TOP Batch ID: 35069

— G:\Org\1GC\DAT\1GC112216_b\1122GC1.0012.RAW H16100551-002A ;1122GC1 , $HC-ARO-GRP-S,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100551-002A ;1122GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC112216_b\1122GC1.0012.RAW
Date & Time Acquired: 11/22/2016 5:05:26 PM
Method File: G:\Org\1GC\Methods\AR082416J.MET
Calibration File: G:\Org\1GC\Cals\AR082416J.CAL
Sample Weight: 25.6 Dilution: 4 S.A.: 1

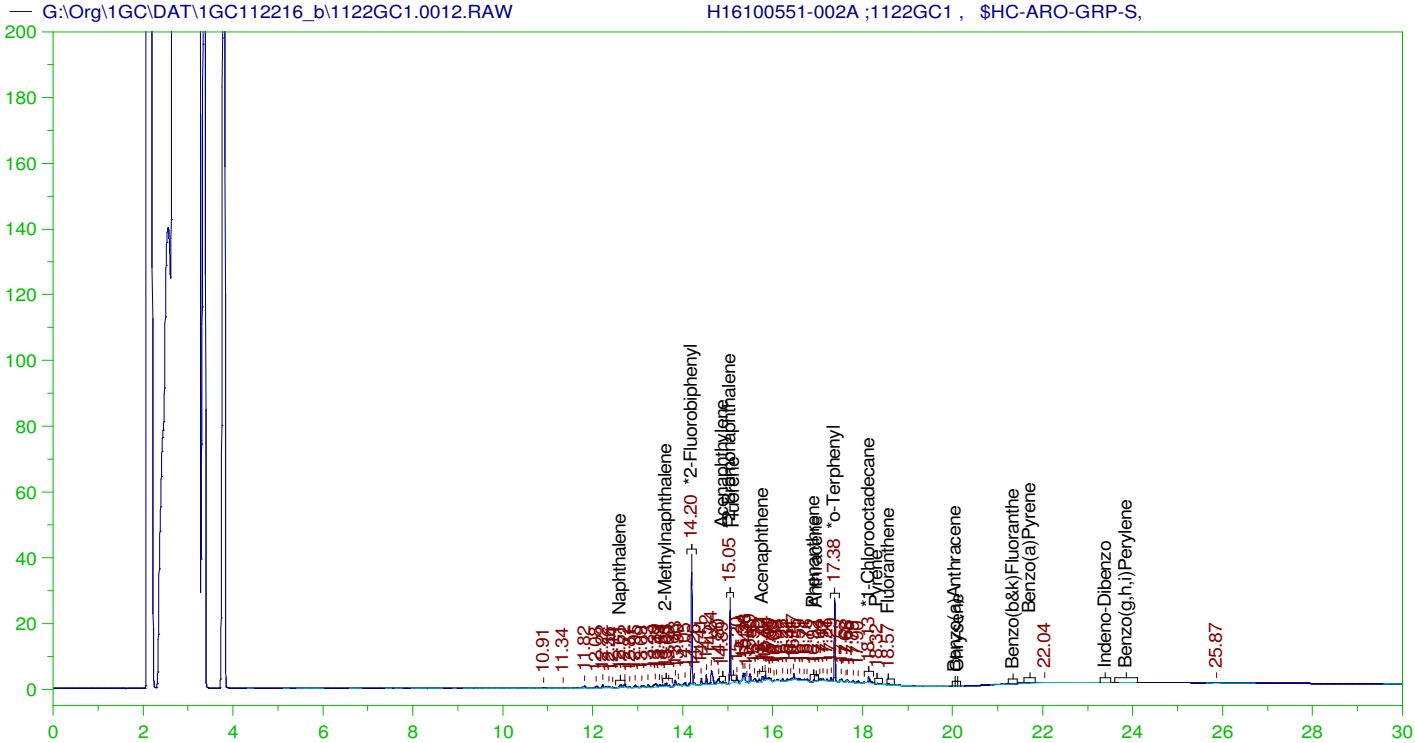
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.51 to 24.11

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.197	70023	7.813	12.36	158.21	-
*2-Bromonaphthalene	15.05	55328	7.813	14.194	181.69	-
*o-Terphenyl	17.378	52949	7.813	8.294	106.16	-
*1-Chlorooctadecane	18.133	17191	7.813	3.383	43.3	-

C11-C22 Aromatics Area:534630.3 C11-C22 Aromatics Amount: 84.72171
EPH Aromatics total Area:552448.3 EPH Aromatics Total Amount: 87.54528

05-206-TOP Batch ID: 35069

— G:\Org\1GC\DAT\1GC112216_b\1122GC1.0012.RAW H16100551-002A ;1122GC1 , $HC-ARO-GRP-S,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

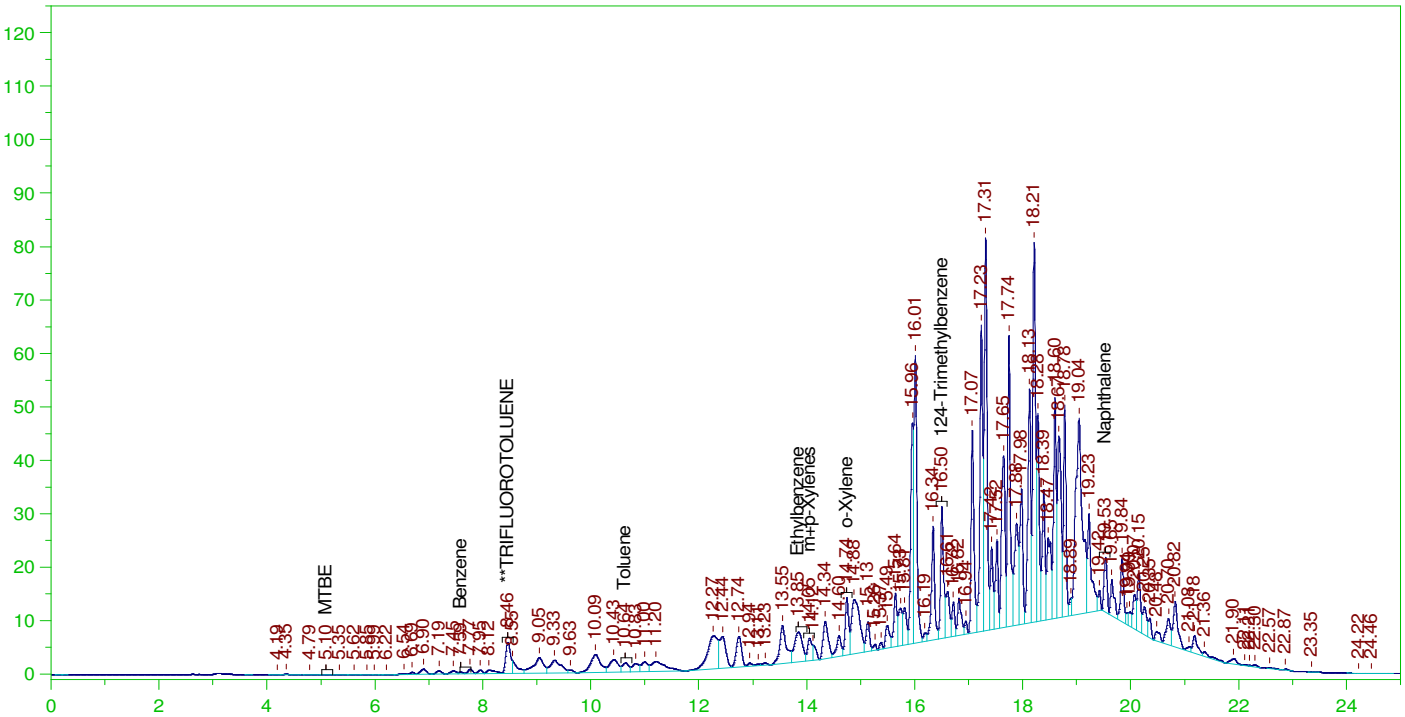
Sample Name: H16100551-002A ;1122GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC112216_b\1122GC1.0012.RAW
Date & Time Acquired: 11/22/2016 5:05:26 PM
Method File: G:\Org\1GC\Methods\AROQC082416J.met
Calibration File: G:\Org\1GC\Cals\AR082416J.CAL
Sample Weight: 25.6 Dilution: 4 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.61	2.44	2.44	2066	.338	
2-Methylnaphthalene	13.632	1.39	1.418	2708	.442	
Acenaphthylene	14.894	.17	.156	1087	.18	
Fluorene	.	.	.		.156	U
Acenaphthene	15.771	-.7	-.721	4073	.655	
Phenanthrene	16.915	-1.87	-1.865	1353	.216	
Anthracene	.	.	.		.156	U
Pyrene	18.322	18.322	18.322	612	.156	U
Fluoranthene	18.569	18.569	18.569	604	.156	U
Benzo(a)Anthracene	.	.	.		.156	U
Chrysene	.	.	.		.156	U
Benzo(b&k)Fluoranthe	.	.	.		.313	U
Benzo(a)Pyrene	.	.	.		.156	U
Indeno-Dibenzo	.	.	.		.313	U
Benzo(g,h,i)Perylene	.	.	.		.156	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.197	63574	7.813	11.221	143.63	40-140
*2-Bromonaphthalene	15.05	43515	7.813	11.164	142.9	40-140
*o-Terphenyl	17.378	40386	7.813	6.326	80.97	40-140
*1-Chlorooctadecane	18.133	4830	7.813	.95	12.17	40-140

05-205-WGRAY Batch ID: 34931

G:\Org\2GC\DAT\2GC111116_b\1111GC2.0018.RAW H16100551-001A ;1111GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-001A ;1111GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC111116_b\1111GC2.0018.RAW
Date & Time Acquired: 11/11/2016 8:47:12 PM
Method File: G:\Org\2GC\Methods\11111618$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

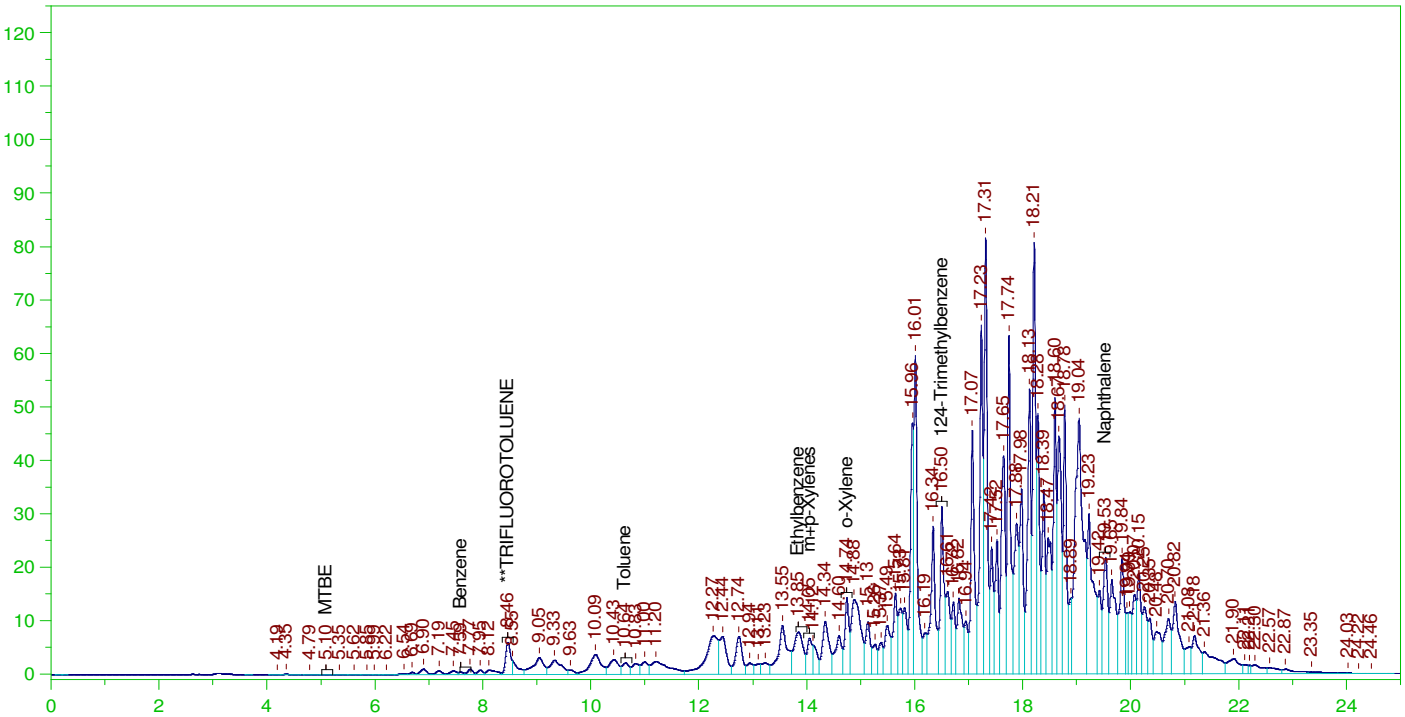
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:3832594 C9-C10 Aromatics Amount: 140.8538

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.096	5.096	5.096	388	.112	U
Benzene	7.59	.789	.874	2082	.047	J
Toluene	10.64	-2.196	-2.176	14443	.385	
Ethylbenzene	13.846	-5.449	-5.382	58004	1.75	
m+p-Xylenes	14.051	-5.579	-5.587	24524	.669	
o-Xylene	14.744	-6.279	-6.28	48240	1.516	
124-Trimethylbenzene	16.504	-8.037	-8.04	100851	4.461	
Naphthalene	19.534	-11.056	-11.07	40741	2.888	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.464	37629	2.8	2.665	95.2

05-205-WGRAY Batch ID: 34931

— G:\Org\2GC\DAT\2GC111116_b\1111GC2.0018.RAW H16100551-001A ;1111GC2 , $HC-VPH-MA-S,



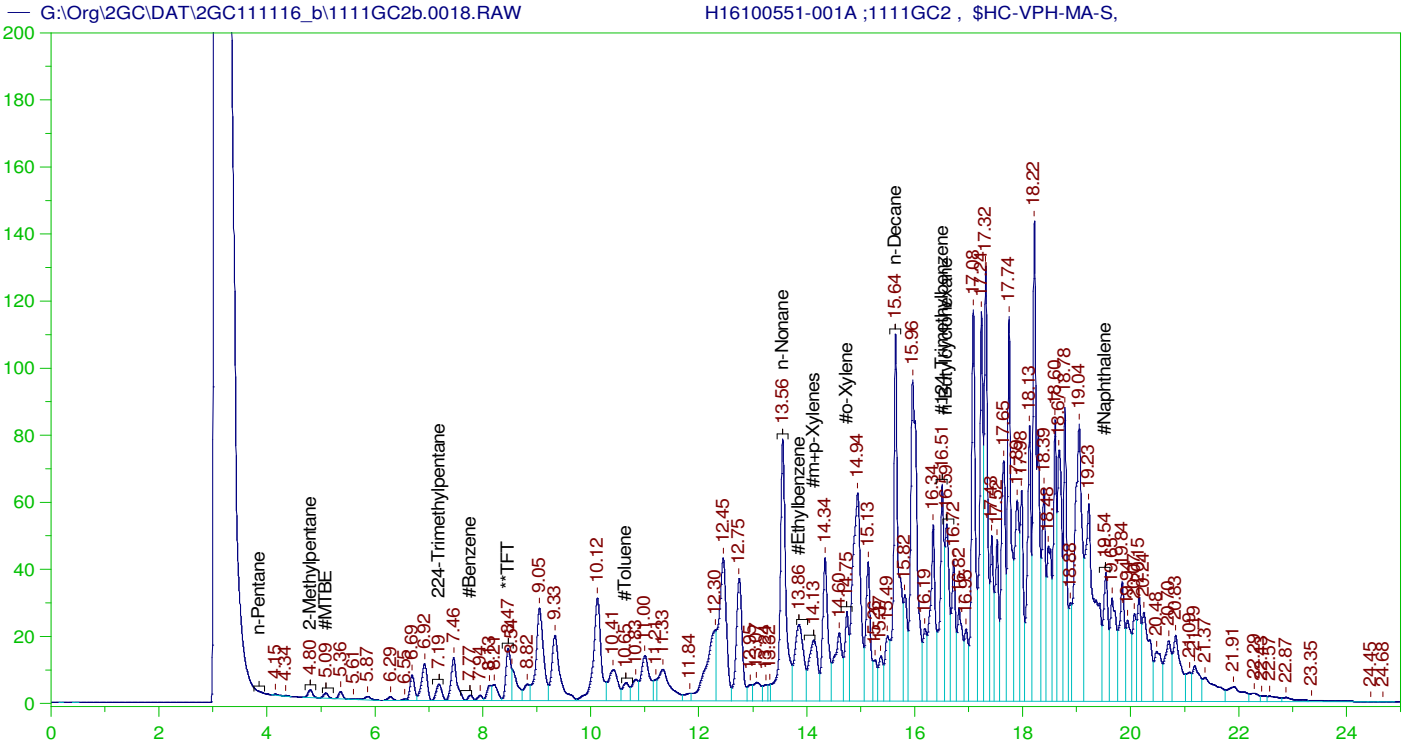
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-001A ;1111GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC111116_b\1111GC2.0018.RAW
Date & Time Acquired: 11/11/2016 8:47:12 PM
Method File: G:\Org\2GC\Methods\11111618.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:5949406 C9-C10 Aromatics Amount: 218.65

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.096	5.096	5.096	388	.112	U
Benzene	7.59	.789	.874	2931	.066	
Toluene	10.64	-2.196	-2.176	19303	.514	
Ethylbenzene	13.846	-5.449	-5.382	94057	2.837	
m+p-Xylenes	14.051	-5.579	-5.587	45123	1.23	
o-Xylene	14.744	-6.279	-6.28	75787	2.382	
124-Trimethylbenzene	16.504	-8.037	-8.04	155213	6.866	
Naphthalene	19.534	-11.056	-11.07	134401	9.528	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.464	39941	2.8	2.829	101.05



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-001A ;1111GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC111116_b\1111GC2b.0018.RAW
Date & Time Acquired: 11/11/2016 8:47:12 PM
Method File: G:\Org\2GC\Methods\11111618B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.12 S.A.: 1.12

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

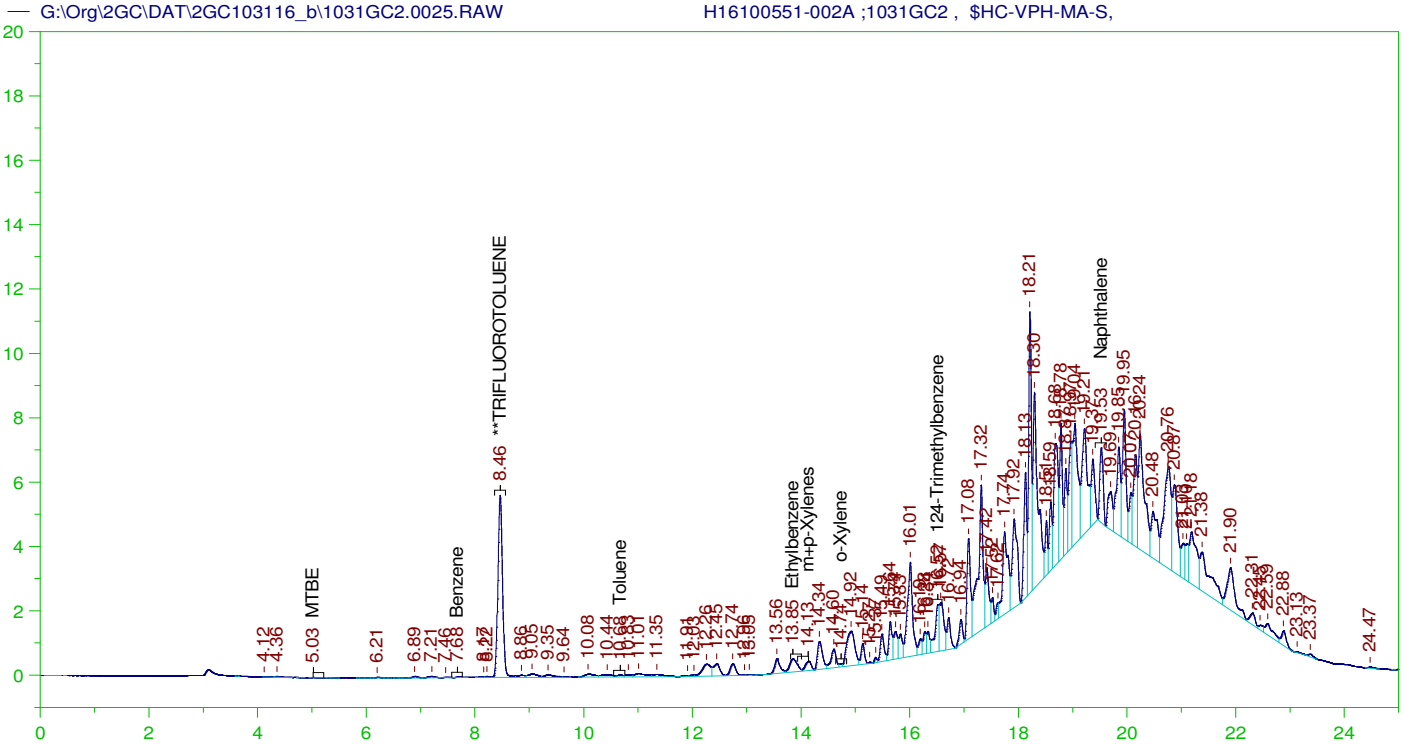
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.469	97559	2.8	2.845	101.59	-

GRO Area:6447464 GRO Amount: 164.565
TPH Area:1.959697E+07 TPH Amount: 500.193

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:2898281 C5-C8 Amount: 65.68714
C9-C12 Area:1.432696E+07 C9-C12 Amount: 622.1316

05-206-TOP Batch ID: 34931

G:\Org\2GC\DAT\2GC103116_b\1031GC2.0025.RAW H16100551-002A ;1031GC2 , $HC-VPH-MA-S,



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-002A ;1031GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC103116_b\1031GC2.0025.RAW
Date & Time Acquired: 11/1/2016 12:42:51 AM
Method File: G:\Org\2GC\Methods\10311625$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.17 S.A.: 1.17

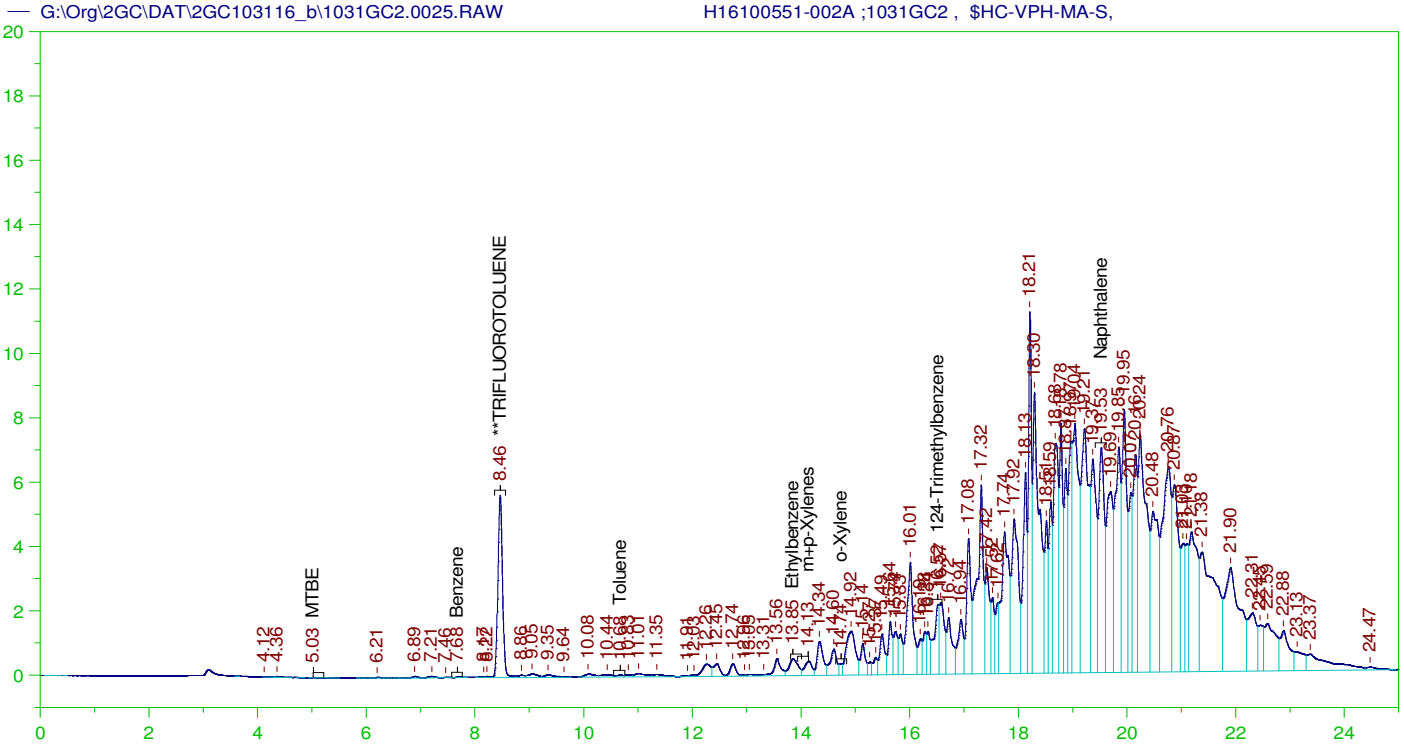
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:392822.6 C9-C10 Aromatics Amount: 15.08135

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.026	5.026	5.026	66	.117	U
Benzene	7.682	7.682	7.682	83	.059	U
Toluene	10.676	10.676	10.676	454	.059	U
Ethylbenzene	13.851	-5.449	-5.386	3957	.125	
m+p-Xylenes	14.131	-5.579	-5.666	2165	.062	
o-Xylene	14.735	14.735	14.735	328	.059	U
124-Trimethylbenzene	16.519	-8.037	-8.054	7302	.337	
Naphthalene	19.526	-11.056	-11.061	10009	.741	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.465	33978	2.925	2.514	85.96

05-206-TOP Batch ID: 34931

G:\Org\2GC\DAT\2GC103116_b\1031GC2.0025.RAW H16100551-002A ;1031GC2 , $HC-VPH-MA-S,



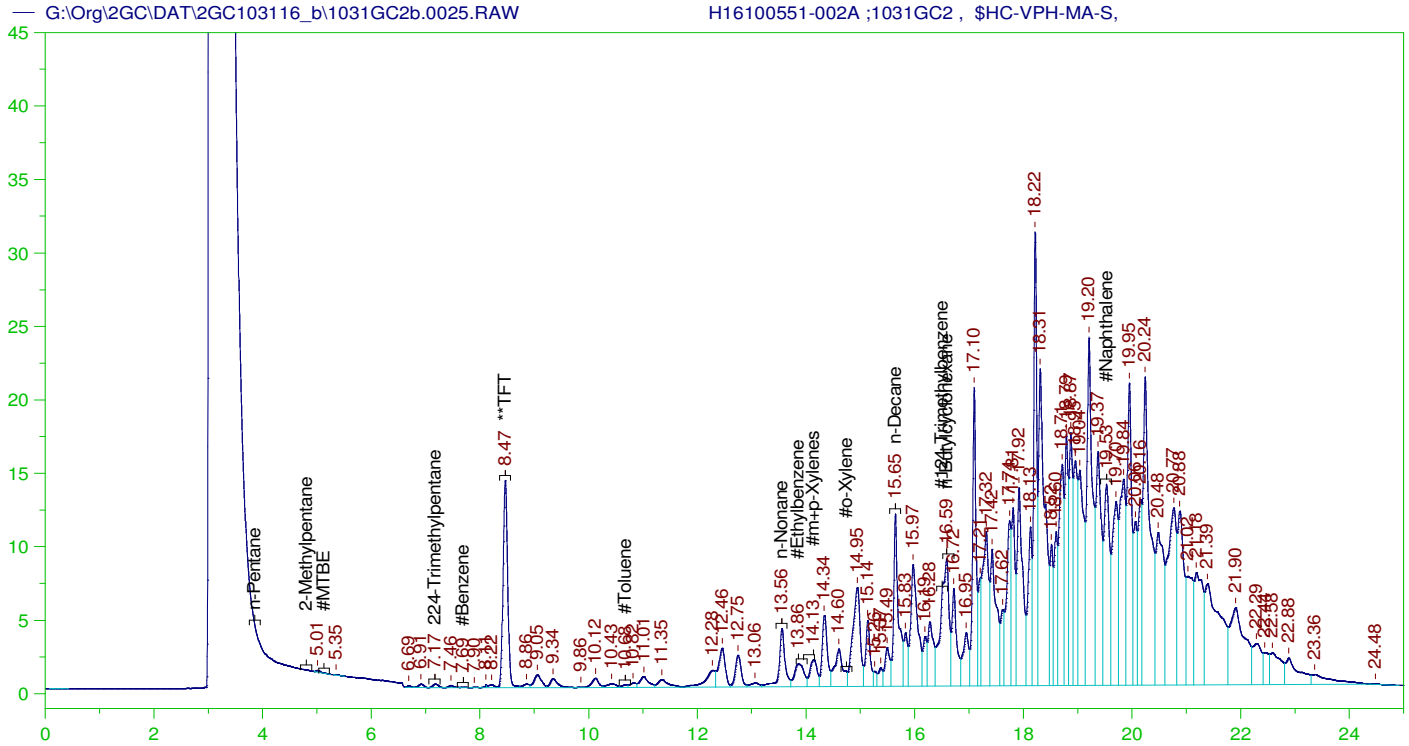
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-002A ;1031GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC103116_b\1031GC2.0025.RAW
Date & Time Acquired: 11/1/2016 12:42:51 AM
Method File: G:\Org\2GC\Methods\10311625.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 50 Dilution: 1.17 S.A.: 1.17

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:859429.7 C9-C10 Aromatics Amount: 32.99545

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.026	5.026	5.026	66	.117	U
Benzene	7.682	7.682	7.682	83	.059	U
Toluene	10.676	10.676	10.676	454	.059	U
Ethylbenzene	13.851	-5.449	-5.386	6157	.194	
m+p-Xylenes	14.131	-5.579	-5.666	4361	.124	
o-Xylene	14.735	14.735	14.735	1293	.059	U
124-Trimethylbenzene	16.519	-8.037	-8.054	13715	.634	
Naphthalene	19.526	-11.056	-11.061	50990	3.776	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.465	33978	2.925	2.514	85.96



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100551-002A ;1031GC2 , $HC-VPH-MA-S,
Raw File: G:\Org\2GC\DAT\2GC103116_b\1031GC2b.0025.RAW
Date & Time Acquired: 11/1/2016 12:42:51 AM
Method File: G:\Org\2GC\Methods\10311625B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 50 Dilution: 1.17 S.A.: 1.17

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.467	84867	2.925	2.585	88.38	-

GRO Area:431364.5 GRO Amount: 11.50167
TPH Area:3965088 TPH Amount: 105.7229

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:111832.8 C5-C8 Amount: 2.647751
C9-C12 Area:2285160 C9-C12 Amount: 103.6604

Work Order Receipt Checklist

Hydrometrics Inc

H16100551

Login completed by: Tracy L. Lorash

Date Received: 10/28/2016

Reviewed by: BL2000\rwilliams

Received by: bjs

Reviewed Date: 11/2/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.0°C Blue Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

H16100551

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: (Signature) JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH	VPH	See Cover Letter						REMARKS
10/25/16	1230	X		05-205-WGRAY	02									X	X							Normal Turnaround
10/25/16	1330	X		05-206-TOP	02									X	X							Normal Turnaround

Relinquished (Signature)	Date / Time	Received by (Signature)	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell	10/28/16 0900		3.0 blue ice/ +D cooler	HLN10286	Other hand-delivered Air Bill #
Relinquished (Signature)	Date / Time	Received by (Signature)	Remarks Please forward results to; email: jpell@hydrometrics.com		Jamie Pell, Hydrometrics 3020 Bozeman Avenue Helena, Montana 59601
Relinquished (Signature)	Date / Time	Received for Laboratory by (Signature): Brandy Sehr	Date / Time: 10/28/16 9:00		Enclosed: ☐ Parameter sheet w/detection limits ☐ QA / AC standard mixing instructions ☒ Cover letter ☐ Other

Split Samples:
☐ Accepted ☐ Declined

HFORM-1 07/11

Return results & electronic copy to:
QA / QC Dept. at address at top of page

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 28, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Soil Samples

Enclosed are 2 soil samples collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
  - If the sample EPH Screen results in TEH > 200 mg/kg, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

The analyses should be billed to Hydrometrics, referencing PO# HLN10286. If you have any questions concerning these samples, please contact me at 443-4150, Ext. 154.

Sincerely,

James Poell
Environmental Scientist

Enclosures

APPENDIX I

OLD SHOP AREA EXCAVATION
PIT WATER ANALYTICAL RESULTS

ANALYTICAL SUMMARY REPORT

November 16, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16100331

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 2 samples for Hydrometrics Inc on 10/19/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16100331-001	05-300-BASE	10/19/16 8:30	10/19/16	Aqueous	EPH-Sep Funnel Extraction EPH Fractionation Hydrocarbons, Aliphatic Extractable Petroleum Hydrocarbons, Aromatic Extractable Petroleum Hydrocarbons, Extractable Petroleum Screen Volatile Petroleum Hydrocarbons Separatory Funnel Liquid-Liquid Ext. Low Level PAH
H16100331-002	TB5915	10/19/16 8:30	10/19/16	Trip Blank	Volatile Petroleum Hydrocarbons

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16100331

Report Date: 11/16/16

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100331-001
Client Sample ID: 05-300-BASE

Report Date: 11/16/16
Collection Date: 10/19/16 08:30
DateReceived: 10/19/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	8.0	30	MA-VPH	10/24/16 19:18 / tjb
Benzene	133	ug/L	*	2.5	5	MA-VPH	10/24/16 19:18 / tjb
Toluene	301	ug/L		2.5	1000	MA-VPH	10/24/16 19:18 / tjb
Ethylbenzene	70	ug/L		2.5	700	MA-VPH	10/24/16 19:18 / tjb
m+p-Xylenes	388	ug/L		2.5		MA-VPH	10/24/16 19:18 / tjb
o-Xylene	153	ug/L		2.5		MA-VPH	10/24/16 19:18 / tjb
Xylenes, Total	541	ug/L		2.5	10000	MA-VPH	10/24/16 19:18 / tjb
Naphthalene	21	ug/L		5.0	100	MA-VPH	10/24/16 19:18 / tjb
C9 to C10 Aromatics	988	ug/L		100	1000	MA-VPH	10/24/16 19:18 / tjb
C5 to C8 Aliphatics	440	ug/L		100	700	MA-VPH	10/24/16 19:18 / tjb
C9 to C12 Aliphatics	2060	ug/L	*	100	1000	MA-VPH	10/24/16 19:18 / tjb
Total Purgeable Hydrocarbons	3380	ug/L	*	100	1000	MA-VPH	10/24/16 19:18 / tjb
Surr: VPH Aromatics Surrogate	110	%REC		70-130		MA-VPH	10/24/16 19:18 / tjb
Surr: VPH Aliphatics Surrogate	111	%REC		70-130		MA-VPH	10/24/16 19:18 / tjb
- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.							
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.							
EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS							
Total Extractable Hydrocarbons	41600	ug/L	*	300	1000	SW8015M	11/10/16 14:04 / JRS
Surr: o-Terphenyl	81.0	%REC		40-140		SW8015M	11/10/16 14:04 / JRS
- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.							
EXTRACTABLE PETROLEUM HYDROCARBONS							
C9 to C18 Aliphatics	14500	ug/L	*	300	1000	MA-EPH	11/11/16 20:12 / JRS
C19 to C36 Aliphatics	3760	ug/L	*	300	1000	MA-EPH	11/11/16 20:12 / JRS
Surr: 1-Chloro-octadecane	136	%REC		40-140		MA-EPH	11/11/16 20:12 / JRS
C11 to C22 Aromatics	3860	ug/L	*	300	1000	MA-EPH	11/11/16 20:54 / JRS
Total Extractable Hydrocarbons	22600	ug/L	*	300	1000	MA-EPH	11/11/16 20:54 / JRS
Surr: 2-Bromonaphthalene	63.0	%REC		40-140		MA-EPH	11/11/16 20:54 / JRS
Surr: 2-Fluorobiphenyl	69.0	%REC		40-140		MA-EPH	11/11/16 20:54 / JRS
Surr: o-Terphenyl	82.0	%REC		40-140		MA-EPH	11/11/16 20:54 / JRS
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
2-Methylnaphthalene	ND	ug/L		0.19		SW8270C	11/15/16 14:23 / eli-b
Acenaphthene	ND	ug/L		0.19	670	SW8270C	11/15/16 14:23 / eli-b
Acenaphthylene	ND	ug/L		0.19		SW8270C	11/15/16 14:23 / eli-b
Anthracene	ND	ug/L		0.19	2110	SW8270C	11/15/16 14:23 / eli-b
Benzo(a)anthracene	ND	ug/L		0.19	0.5	SW8270C	11/15/16 14:23 / eli-b
Benzo(a)pyrene	ND	ug/L		0.19	0.05	SW8270C	11/15/16 14:23 / eli-b
Benzo(b)fluoranthene	ND	ug/L		0.19	0.5	SW8270C	11/15/16 14:23 / eli-b
Benzo(g,h,i)perylene	ND	ug/L		0.19		SW8270C	11/15/16 14:23 / eli-b
Benzo(k)fluoranthene	ND	ug/L		0.19	5	SW8270C	11/15/16 14:23 / eli-b
Chrysene	ND	ug/L		0.19	50	SW8270C	11/15/16 14:23 / eli-b
Dibenzo(a,h)anthracene	ND	ug/L		0.19	0.05	SW8270C	11/15/16 14:23 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
* - The result exceeds the MCL.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100331-001
Client Sample ID: 05-300-BASE

Report Date: 11/16/16
Collection Date: 10/19/16 08:30
DateReceived: 10/19/16
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)							
Fluoranthene	ND	ug/L		0.19	130	SW8270C	11/15/16 14:23 / eli-b
Fluorene	ND	ug/L		0.19	1100	SW8270C	11/15/16 14:23 / eli-b
Indeno(1,2,3-cd)pyrene	ND	ug/L		0.19	0.5	SW8270C	11/15/16 14:23 / eli-b
Naphthalene	0.21	ug/L	B	0.19	100	SW8270C	11/15/16 14:23 / eli-b
Phenanthrene	ND	ug/L		0.19		SW8270C	11/15/16 14:23 / eli-b
Pyrene	ND	ug/L		0.19	830	SW8270C	11/15/16 14:23 / eli-b
Surr: 2-Fluorobiphenyl	58.0	%REC		40-140		SW8270C	11/15/16 14:53 / eli-b
Surr: o-Terphenyl	60.0	%REC		40-140		SW8270C	11/15/16 14:53 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
B - The analyte was detected in the method blank.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16100331-002
Client Sample ID: TB5915

Report Date: 11/16/16
Collection Date: 10/19/16 08:30
DateReceived: 10/19/16
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0	30	MA-VPH	10/24/16 17:46 / tjb
Benzene	ND	ug/L		0.50	5	MA-VPH	10/24/16 17:46 / tjb
Toluene	ND	ug/L		0.50	1000	MA-VPH	10/24/16 17:46 / tjb
Ethylbenzene	ND	ug/L		0.50	700	MA-VPH	10/24/16 17:46 / tjb
m+p-Xylenes	ND	ug/L		0.50		MA-VPH	10/24/16 17:46 / tjb
o-Xylene	ND	ug/L		0.50		MA-VPH	10/24/16 17:46 / tjb
Xylenes, Total	ND	ug/L		0.50	10000	MA-VPH	10/24/16 17:46 / tjb
Naphthalene	ND	ug/L		1.0	100	MA-VPH	10/24/16 17:46 / tjb
C9 to C10 Aromatics	ND	ug/L		20	1000	MA-VPH	10/24/16 17:46 / tjb
C5 to C8 Aliphatics	ND	ug/L		20	700	MA-VPH	10/24/16 17:46 / tjb
C9 to C12 Aliphatics	ND	ug/L		20	1000	MA-VPH	10/24/16 17:46 / tjb
Total Purgeable Hydrocarbons	ND	ug/L		20	1000	MA-VPH	10/24/16 17:46 / tjb
Surr: VPH Aromatics Surrogate	87.0	%REC		70-130		MA-VPH	10/24/16 17:46 / tjb
Surr: VPH Aliphatics Surrogate	85.0	%REC		70-130		MA-VPH	10/24/16 17:46 / tjb

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene and Toluene.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents Ethylbenzene, m+p-Xylenes, o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34964
Lab ID: MB-34964-34886	3	Method Blank				Run: HHP_161101A				11/01/16 13:20
C9 to C18 Aliphatics		ND	ug/L	300						
C19 to C36 Aliphatics		ND	ug/L	300						
Surr: 1-Chloro-octadecane				5.0	81	40	140			
Lab ID: LCS-34964-34886	17	Laboratory Control Sample				Run: HHP_161101A				11/01/16 15:24
C9 to C18 Aliphatics		788	ug/L	300	66	40	140			
C19 to C36 Aliphatics		1370	ug/L	300	86	40	140			
n-Nonane		86.0	ug/L	5.0	43	30	140			
n-Decane		109	ug/L	5.0	55	40	140			
n-Dodecane		126	ug/L	5.0	63	40	140			
n-Tetradecane		131	ug/L	5.0	66	40	140			
n-Hexadecane		143	ug/L	5.0	72	40	140			
n-Octadecane		155	ug/L	5.0	78	40	140			
n-Nonadecane		164	ug/L	5.0	82	40	140			
n-Eicosane		166	ug/L	5.0	83	40	140			
n-Docosane		169	ug/L	5.0	85	40	140			
n-Tetracosane		172	ug/L	5.0	86	40	140			
n-Hexacosane		174	ug/L	5.0	87	40	140			
n-Octacosane		170	ug/L	5.0	85	40	140			
n-Triacontane		179	ug/L	5.0	89	40	140			
n-Hexatriacontane		169	ug/L	5.0	85	40	140			
Surr: 1-Chloro-octadecane				5.0	80	40	140			
Lab ID: H16100309-001AMS	17	Sample Matrix Spike				Run: HHP_161101A				11/01/16 19:41
C9 to C18 Aliphatics		1640	ug/L	600	68	40	140			
C19 to C36 Aliphatics		2890	ug/L	600	90	40	140			
n-Nonane		181	ug/L	10	45	30	140			
n-Decane		234	ug/L	10	58	40	140			
n-Dodecane		264	ug/L	10	66	40	140			
n-Tetradecane		281	ug/L	10	70	40	140			
n-Hexadecane		303	ug/L	10	76	40	140			
n-Octadecane		328	ug/L	10	82	40	140			
n-Nonadecane		344	ug/L	10	86	40	140			
n-Eicosane		350	ug/L	10	88	40	140			
n-Docosane		358	ug/L	10	90	40	140			
n-Tetracosane		364	ug/L	10	91	40	140			
n-Hexacosane		367	ug/L	10	92	40	140			
n-Octacosane		358	ug/L	10	90	40	140			
n-Triacontane		377	ug/L	10	94	40	140			
n-Hexatriacontane		358	ug/L	10	90	40	140			
Surr: 1-Chloro-octadecane				10	82	40	140			
Lab ID: H16100309-001AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161101A				11/01/16 21:06
C9 to C18 Aliphatics		1720	ug/L	600	72	40	140	4.7	20	
C19 to C36 Aliphatics		3020	ug/L	600	94	40	140	4.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Batch: 34964	
Lab ID: H16100309-001AMSD	17	Sample Matrix Spike Duplicate				Run: HHP_161101A			11/01/16 21:06	
n-Nonane		175	ug/L	10	44	30	140	3.4	30	
n-Decane		226	ug/L	10	56	40	140	3.4	20	
n-Dodecane		277	ug/L	10	69	40	140	4.8	20	
n-Tetradecane		287	ug/L	10	72	40	140	2.1	20	
n-Hexadecane		313	ug/L	10	78	40	140	3.1	20	
n-Octadecane		336	ug/L	10	84	40	140	2.5	20	
n-Nonadecane		353	ug/L	10	88	40	140	2.4	20	
n-Eicosane		362	ug/L	10	90	40	140	3.2	20	
n-Docosane		374	ug/L	10	93	40	140	4.3	20	
n-Tetracosane		381	ug/L	10	95	40	140	4.5	20	
n-Hexacosane		384	ug/L	10	96	40	140	4.6	20	
n-Octacosane		375	ug/L	10	94	40	140	4.7	20	
n-Triacontane		398	ug/L	10	99	40	140	5.5	20	
n-Hexatriacontane		378	ug/L	10	94	40	140	5.4	20	
Surr: 1-Chloro-octadecane				10	86	40	140	0.0	20	
Lab ID: MB-34964-34886	20	Method Blank				Run: HHP_161101A			11/01/16 14:42	
C11 to C22 Aromatics		ND	ug/L	300						
Total Extractable Hydrocarbons		ND	ug/L	300						
Naphthalene		ND	ug/L	5.0						
2-MethylNaphthalene		ND	ug/L	5.0						
Acenaphthylene		ND	ug/L	5.0						
Acenaphthene		ND	ug/L	5.0						
Fluorene		ND	ug/L	5.0						
Phenanthrene		ND	ug/L	5.0						
Anthracene		ND	ug/L	5.0						
Fluoranthene		ND	ug/L	5.0						
Pyrene		ND	ug/L	5.0						
Benzo(a)Anthracene		ND	ug/L	5.0						
Chrysene		ND	ug/L	5.0						
Benzo(b)Fluoranthene/Benzo(k)Fluorant		ND	ug/L	5.0						
Benzo(a)Pyrene		ND	ug/L	5.0						
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		ND	ug/L	5.0						
Benzo(g,h,I)perylene		ND	ug/L	5.0						
Surr: 2-Bromonaphthalene				5.0	62	40	140			
Surr: 2-Fluorobiphenyl				5.0	72	40	140			
Surr: o-Terphenyl				5.0	75	40	140			
Lab ID: LCS-34964-34886	19	Laboratory Control Sample				Run: HHP_161101A			11/01/16 16:07	
C11 to C22 Aromatics		2600	ug/L	300	76	40	140			
Naphthalene		123	ug/L	5.0	62	40	140			
2-MethylNaphthalene		123	ug/L	5.0	62	40	140			
Acenaphthylene		134	ug/L	5.0	67	40	140			
Acenaphthene		144	ug/L	5.0	72	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34964
Lab ID: LCS-34964-34886	19	Laboratory Control Sample				Run: HHP_161101A				11/01/16 16:07
Fluorene		129	ug/L	5.0	65	40	140			
Phenanthrene		131	ug/L	5.0	65	40	140			
Anthracene		128	ug/L	5.0	64	40	140			
Fluoranthene		165	ug/L	5.0	83	40	140			
Pyrene		164	ug/L	5.0	82	40	140			
Benzo(a)Anthracene		130	ug/L	5.0	65	40	140			
Chrysene		85.9	ug/L	5.0	43	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		338	ug/L	5.0	84	40	140			
Benzo(a)Pyrene		170	ug/L	5.0	85	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		308	ug/L	5.0	77	40	140			
Benzo(g,h,I)perylene		162	ug/L	5.0	81	40	140			
Surr: 2-Bromonaphthalene				5.0	47	40	140			
Surr: 2-Fluorobiphenyl				5.0	67	40	140			
Surr: o-Terphenyl				5.0	76	40	140			
Lab ID: H16100309-001AMS	19	Sample Matrix Spike				Run: HHP_161101A				11/01/16 20:24
C11 to C22 Aromatics		5450	ug/L	600	80	40	140			
Naphthalene		241	ug/L	10	60	40	140			
2-MethylNaphthalene		251	ug/L	10	63	40	140			
Acenaphthylene		265	ug/L	10	66	40	140			
Acenaphthene		293	ug/L	10	73	40	140			
Fluorene		245	ug/L	10	61	40	140			
Phenanthrene		266	ug/L	10	67	40	140			
Anthracene		263	ug/L	10	66	40	140			
Fluoranthene		352	ug/L	10	88	40	140			
Pyrene		349	ug/L	10	87	40	140			
Benzo(a)Anthracene		279	ug/L	10	70	40	140			
Chrysene		183	ug/L	10	46	40	140			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		726	ug/L	10	91	40	140			
Benzo(a)Pyrene		365	ug/L	10	91	40	140			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		660	ug/L	10	82	40	140			
Benzo(g,h,I)perylene		345	ug/L	10	86	40	140			
Surr: 2-Bromonaphthalene				10	51	40	140			
Surr: 2-Fluorobiphenyl				10	64	40	140			
Surr: o-Terphenyl				10	77	40	140			
Lab ID: H16100309-001AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161101A				11/01/16 21:49
C11 to C22 Aromatics		5380	ug/L	600	79	40	140	1.2	20	
Naphthalene		254	ug/L	10	63	40	140	5.3	20	
2-MethylNaphthalene		271	ug/L	10	68	40	140	7.9	20	
Acenaphthylene		285	ug/L	10	71	40	140	7.2	20	
Acenaphthene		307	ug/L	10	77	40	140	4.5	20	
Fluorene		264	ug/L	10	66	40	140	7.2	20	
Phenanthrene		263	ug/L	10	66	40	140	1.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH										Batch: 34964
Lab ID: H16100309-001AMSD	19	Sample Matrix Spike Duplicate				Run: HHP_161101A			11/01/16 21:49	
Anthracene		259	ug/L	10	65	40	140	1.6	20	
Fluoranthene		337	ug/L	10	84	40	140	4.5	20	
Pyrene		333	ug/L	10	83	40	140	4.5	20	
Benzo(a)Anthracene		262	ug/L	10	66	40	140	6.2	20	
Chrysene		172	ug/L	10	43	40	140	6.2	20	
Benzo(b)Fluoranthene/Benzo(k)Fluorant		689	ug/L	10	86	40	140	5.2	20	
Benzo(a)Pyrene		348	ug/L	10	87	40	140	4.7	20	
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		628	ug/L	10	78	40	140	5.0	20	
Benzo(g,h,I)perylene		328	ug/L	10	82	40	140	5.0	20	
Surr: 2-Bromonaphthalene				10	37	40	140			S
Surr: 2-Fluorobiphenyl				10	67	40	140			
Surr: o-Terphenyl				10	76	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-EPH									Analytical Run: R120482	
Lab ID: CCV_1111GC107r-W	15	Continuing Calibration Verification Standard							11/11/16 16:35	
n-Nonane		204	ug/L	5.0	102	30	125			
n-Decane		204	ug/L	5.0	102	75	125			
n-Dodecane		199	ug/L	5.0	100	75	125			
n-Tetradecane		199	ug/L	5.0	99	75	125			
n-Hexadecane		200	ug/L	5.0	100	75	125			
n-Octadecane		200	ug/L	5.0	100	75	125			
n-Nonadecane		200	ug/L	5.0	100	75	125			
n-Eicosane		200	ug/L	5.0	100	75	125			
n-Docosane		200	ug/L	5.0	100	75	125			
n-Tetracosane		200	ug/L	5.0	100	75	125			
n-Hexacosane		201	ug/L	5.0	101	75	125			
n-Octacosane		202	ug/L	5.0	101	75	125			
n-Triacontane		203	ug/L	5.0	102	75	125			
n-Hexatriacontane		204	ug/L	5.0	102	75	125			
Surr: 1-Chloro-octadecane				5.0	104	75	125			
Lab ID: CCV_1111GC108r-W	18	Continuing Calibration Verification Standard							11/11/16 17:17	
Naphthalene		204	ug/L	5.0	102	75	125			
2-MethylNaphthalene		203	ug/L	5.0	102	75	125			
Acenaphthylene		205	ug/L	5.0	102	75	125			
Acenaphthene		204	ug/L	5.0	102	75	125			
Fluorene		205	ug/L	5.0	102	75	125			
Phenanthrene		204	ug/L	5.0	102	75	125			
Anthracene		202	ug/L	5.0	101	75	125			
Fluoranthene		204	ug/L	5.0	102	75	125			
Pyrene		204	ug/L	5.0	102	75	125			
Benzo(a)Anthracene		206	ug/L	5.0	103	75	125			
Chrysene		205	ug/L	5.0	103	75	125			
Benzo(b)Fluoranthene/Benzo(k)Fluorant		413	ug/L	5.0	103	75	125			
Benzo(a)Pyrene		207	ug/L	5.0	104	75	125			
Dibenz(a,h)anthracene/Indeno(1,2,3-cd)		418	ug/L	5.0	104	75	125			
Benzo(g,h,I)perylene		209	ug/L	5.0	104	75	125			
Surr: 2-Bromonaphthalene				5.0	103	40	140			
Surr: 2-Fluorobiphenyl				5.0	101	40	140			
Surr: o-Terphenyl				5.0	102	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Analytical Run: R119810	
Lab ID: CCV_1024GC202r-W	15	Continuing Calibration Verification Standard							10/24/16 11:24	
1,2,4-Trimethylbenzene		24.3	ug/L	1.0	97	75	125			
2,2,4-Trimethylpentane		24.3	ug/L	1.0	97	75	125			
2-Methylpentane		23.3	ug/L	1.0	93	75	125			
n-Butylcyclohexane		25.8	ug/L	1.0	103	75	125			
n-Decane		27.3	ug/L	1.0	109	75	125			
n-Pentane		22.8	ug/L	1.0	91	75	125			
Methyl tert-butyl ether (MTBE)		22.3	ug/L	1.0	89	75	125			
Benzene		22.6	ug/L	0.50	91	75	125			
Toluene		22.7	ug/L	0.50	91	75	125			
Ethylbenzene		22.4	ug/L	0.50	90	75	125			
m+p-Xylenes		46.7	ug/L	0.50	93	75	125			
o-Xylene		23.4	ug/L	0.50	94	75	125			
Naphthalene		23.0	ug/L	1.0	92	75	125			
Surr: VPH Aromatics Surrogate				1.0	94	70	130			
Surr: VPH Aliphatics Surrogate				1.0	91	70	130			
Method: MA-VPH									Batch: R119810	
Lab ID: LCS_1024GC203r	16	Laboratory Control Sample				Run: GC2_161024B			10/24/16 12:08	
1,2,4-Trimethylbenzene		27.4	ug/L	1.0	110	70	130			
2,2,4-Trimethylpentane		27.4	ug/L	1.0	110	70	130			
2-Methylpentane		27.5	ug/L	1.0	110	70	130			
n-Butylcyclohexane		24.9	ug/L	1.0	100	70	130			
n-Decane		24.4	ug/L	1.0	98	70	130			
n-Pentane		28.3	ug/L	1.0	113	70	130			
Methyl tert-butyl ether (MTBE)		25.7	ug/L	1.0	103	70	130			
Benzene		25.4	ug/L	0.50	102	70	130			
Toluene		24.9	ug/L	0.50	100	70	130			
Ethylbenzene		24.3	ug/L	0.50	97	70	130			
m+p-Xylenes		51.5	ug/L	0.50	103	70	130			
o-Xylene		25.6	ug/L	0.50	102	70	130			
Naphthalene		25.8	ug/L	1.0	103	70	130			
Total Purgeable Hydrocarbons		391	ug/L	20	104	70	130			
Surr: VPH Aromatics Surrogate				1.0	98	70	130			
Surr: VPH Aliphatics Surrogate				1.0	100	70	130			
Lab ID: MBLK_1024GC207r	14	Method Blank				Run: GC2_161024B			10/24/16 14:41	
Methyl tert-butyl ether (MTBE)		ND	ug/L	1.0						
Benzene		ND	ug/L	0.50						
Toluene		ND	ug/L	0.50						
Ethylbenzene		ND	ug/L	0.50						
m+p-Xylenes		ND	ug/L	0.50						
o-Xylene		ND	ug/L	0.50						
Naphthalene		ND	ug/L	1.0						
C9 to C10 Aromatics		ND	ug/L	20						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: MA-VPH									Batch: R119810	
Lab ID: MBLK_1024GC207r	14	Method Blank				Run: GC2_161024B			10/24/16 14:41	
C5 to C8 Aliphatics		ND	ug/L	20						
C9 to C12 Aliphatics		ND	ug/L	20						
Total Purgeable Hydrocarbons		ND	ug/L	20						
Xylenes, Total		ND	ug/L	0.50						
Surr: VPH Aromatics Surrogate				1.0	93	70	130			
Surr: VPH Aliphatics Surrogate				1.0	94	70	130			
Lab ID: H16100277-007AMS	10	Sample Matrix Spike				Run: GC2_161024B			10/24/16 16:13	
Methyl tert-butyl ether (MTBE)		1950	ug/L	75	96	70	130			
Benzene		11400	ug/L	38	90	70	130			
Toluene		2090	ug/L	38	97	70	130			
Ethylbenzene		2270	ug/L	38	96	70	130			
m+p-Xylenes		4470	ug/L	38	102	70	130			
o-Xylene		2040	ug/L	38	103	70	130			
Naphthalene		1950	ug/L	75	104	70	130			
Total Purgeable Hydrocarbons		47900	ug/L	1500	94	70	130			
Surr: VPH Aromatics Surrogate				75	99	70	130			
Surr: VPH Aliphatics Surrogate				75	98	70	130			
Lab ID: H16100277-007AMSD	10	Sample Matrix Spike Duplicate				Run: GC2_161024B			10/24/16 16:44	
Methyl tert-butyl ether (MTBE)		2010	ug/L	75	99	70	130	3.0	20	
Benzene		11700	ug/L	38	105	70	130	2.6	20	
Toluene		2210	ug/L	38	103	70	130	5.9	20	
Ethylbenzene		2360	ug/L	38	101	70	130	4.2	20	
m+p-Xylenes		4610	ug/L	38	106	70	130	3.1	20	
o-Xylene		2060	ug/L	38	104	70	130	1.0	20	
Naphthalene		2000	ug/L	75	107	70	130	2.4	20	
Total Purgeable Hydrocarbons		50200	ug/L	1500	102	70	130	4.5	20	
Surr: VPH Aromatics Surrogate				75	107	70	130			
Surr: VPH Aliphatics Surrogate				75	104	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M										Batch: 34886
Lab ID: MB-34886	2	Method Blank				Run: HHP2_161026B				10/26/16 11:10
Total Extractable Hydrocarbons		ND	ug/L	300						
Surr: o-Terphenyl					109	40	140			
Lab ID: LCS-34886	2	Laboratory Control Sample				Run: HHP2_161026B				10/26/16 11:59
Total Extractable Hydrocarbons		7320	ug/L	300	118	60	140			
Surr: o-Terphenyl					113	40	140			
Lab ID: H16100309-001AMS	2	Sample Matrix Spike				Run: HHP2_161026B				10/26/16 13:36
Total Extractable Hydrocarbons		14700	ug/L	600	119	60	140			
Surr: o-Terphenyl					111	40	140			
Lab ID: H16100309-001AMSD	2	Sample Matrix Spike Duplicate				Run: HHP2_161026B				10/26/16 14:25
Total Extractable Hydrocarbons		15000	ug/L	600	121	60	140	1.7	20	
Surr: o-Terphenyl					113	40	140			
Method: SW8015M										Analytical Run: R120370
Lab ID: CCV_1109GC418r-W	15	Continuing Calibration Verification Standard								11/10/16 03:33
n-Nonane		197	ug/L		99	75	125			
n-Decane		197	ug/L		98	75	125			
n-Dodecane		198	ug/L		99	75	125			
n-Tetradecane		200	ug/L		100	75	125			
n-Hexadecane		194	ug/L		97	75	125			
n-Octadecane		194	ug/L		97	75	125			
n-Nonadecane		195	ug/L		98	75	125			
n-Eicosane		194	ug/L		97	75	125			
n-Docosane		194	ug/L		97	75	125			
n-Tetracosane		195	ug/L		97	75	125			
n-Hexacosane		196	ug/L		98	75	125			
n-Octacosane		204	ug/L		102	75	125			
n-Triacontane		211	ug/L		106	75	125			
n-Hexatriacontane		185	ug/L		93	75	125			
Surr: o-Terphenyl					100	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_104468	
Lab ID: MB-104468-34964-348	17	Method Blank				Run: SUB-B270452			11/15/16 11:22	
2-Methylnaphthalene		ND	ug/L	0.20						
Acenaphthene		ND	ug/L	0.20						
Acenaphthylene		ND	ug/L	0.20						
Anthracene		ND	ug/L	0.20						
Benzo(a)anthracene		ND	ug/L	0.20						
Benzo(a)pyrene		ND	ug/L	0.20						
Benzo(b)fluoranthene		ND	ug/L	0.20						
Benzo(g,h,i)perylene		ND	ug/L	0.20						
Benzo(k)fluoranthene		ND	ug/L	0.20						
Chrysene		ND	ug/L	0.20						
Dibenzo(a,h)anthracene		ND	ug/L	0.20						
Fluoranthene		ND	ug/L	0.20						
Fluorene		ND	ug/L	0.20						
Indeno(1,2,3-cd)pyrene		ND	ug/L	0.20						
Naphthalene		0.220	ug/L	0.20						
Phenanthrene		ND	ug/L	0.20						
Pyrene		ND	ug/L	0.20						
Lab ID: LCS-104468	19	Laboratory Control Sample				Run: SUB-B270452			11/15/16 12:22	
2-Methylnaphthalene		125	ug/L	4.0	62	40	140	0.0	40	
Acenaphthene		134	ug/L	4.0	67	40	140	0.0	40	
Acenaphthylene		130	ug/L	4.0	65	40	140	0.0	40	
Anthracene		150	ug/L	4.0	75	40	140	0.0	40	
Benzo(a)anthracene		155	ug/L	4.0	78	40	140	0.0	40	
Benzo(a)pyrene		141	ug/L	4.0	71	40	140	0.0	40	
Benzo(b)fluoranthene		131	ug/L	4.0	66	40	140	0.0	40	
Benzo(g,h,i)perylene		158	ug/L	4.0	79	40	140	0.0	40	
Benzo(k)fluoranthene		161	ug/L	4.0	81	40	140	0.0	40	
Chrysene		118	ug/L	4.0	59	40	140	0.0	40	
Dibenzo(a,h)anthracene		114	ug/L	4.0	57	40	140	0.0	40	
Fluoranthene		166	ug/L	4.0	83	40	140	0.0	40	
Fluorene		143	ug/L	4.0	72	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene		114	ug/L	4.0	57	40	140	0.0	40	
Naphthalene		118	ug/L	4.0	59	40	140	0.0	40	
Phenanthrene		150	ug/L	4.0	75	40	140	0.0	40	
Pyrene		159	ug/L	4.0	80	40	140	0.0	40	
Surr: 2-Fluorobiphenyl				4.0	64	40	140			
Surr: o-Terphenyl				4.0	73	40	140			
Lab ID: H16100309-001AMS	19	Sample Matrix Spike				Run: SUB-B270452			11/15/16 13:22	
2-Methylnaphthalene		205	ug/L	8.0	48	40	140	0.0	40	
Acenaphthene		234	ug/L	8.0	57	40	140	0.0	40	
Acenaphthylene		226	ug/L	8.0	57	40	140	0.0	40	
Anthracene		271	ug/L	8.0	68	40	140	0.0	40	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Batch: B_104468	
Lab ID: H16100309-001AMS	19	Sample Matrix Spike				Run: SUB-B270452			11/15/16 13:22	
Benzo(a)anthracene		299	ug/L	8.0	75	40	140	0.0	40	
Benzo(a)pyrene		270	ug/L	8.0	67	40	140	0.0	40	
Benzo(b)fluoranthene		253	ug/L	8.0	63	40	140	0.0	40	
Benzo(g,h,i)perylene		316	ug/L	8.0	79	40	140	0.0	40	
Benzo(k)fluoranthene		309	ug/L	8.0	77	40	140	0.0	40	
Chrysene		226	ug/L	8.0	56	40	140	0.0	40	
Dibenzo(a,h)anthracene		213	ug/L	8.0	53	40	140	0.0	40	
Fluoranthene		318	ug/L	8.0	79	40	140	0.0	40	
Fluorene		251	ug/L	8.0	63	40	140	0.0	40	
Indeno(1,2,3-cd)pyrene		218	ug/L	8.0	55	40	140	0.0	40	
Naphthalene		198	ug/L	8.0	47	40	140	0.0	40	
Phenanthrene		271	ug/L	8.0	65	40	140	0.0	40	
Pyrene		307	ug/L	8.0	77	40	140	0.0	40	
Surr: 2-Fluorobiphenyl				8.0	60	40	140			
Surr: o-Terphenyl				8.0	70	40	140			
Lab ID: H16100309-001AMSD	19	Sample Matrix Spike				Run: SUB-B270452			11/15/16 13:53	
2-Methylnaphthalene		230	ug/L	8.0	54	40	140	11	40	
Acenaphthene		258	ug/L	8.0	63	40	140	10	40	
Acenaphthylene		248	ug/L	8.0	62	40	140	9.1	40	
Anthracene		276	ug/L	8.0	69	40	140	1.8	40	
Benzo(a)anthracene		290	ug/L	8.0	73	40	140	3.0	40	
Benzo(a)pyrene		266	ug/L	8.0	67	40	140	1.2	40	
Benzo(b)fluoranthene		254	ug/L	8.0	63	40	140	0.3	40	
Benzo(g,h,i)perylene		304	ug/L	8.0	76	40	140	3.9	40	
Benzo(k)fluoranthene		310	ug/L	8.0	77	40	140	0.3	40	
Chrysene		221	ug/L	8.0	55	40	140	2.2	40	
Dibenzo(a,h)anthracene		211	ug/L	8.0	53	40	140	0.8	40	
Fluoranthene		300	ug/L	8.0	75	40	140	5.7	40	
Fluorene		266	ug/L	8.0	67	40	140	5.9	40	
Indeno(1,2,3-cd)pyrene		220	ug/L	8.0	55	40	140	0.7	40	
Naphthalene		211	ug/L	8.0	50	40	140	6.2	40	
Phenanthrene		240	ug/L	8.0	58	40	140	12	40	
Pyrene		298	ug/L	8.0	75	40	140	2.9	40	
Surr: 2-Fluorobiphenyl				8.0	62	40	140			
Surr: o-Terphenyl				8.0	66	40	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hydrometrics Inc **Report Date:** 11/16/16

Project: 16048 Meagher County Shop Remediation **Work Order:** H16100331

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8270C									Analytical Run: B_R270452	
Lab ID: 15-Nov-16_CCV_2	21	Continuing Calibration Verification Standard							11/15/16 10:21	
2-Methylnaphthalene		1.71	ug/L	0.10	86	80	120			
Acenaphthene		1.67	ug/L	0.10	84	80	120			
Acenaphthylene		1.79	ug/L	0.10	90	80	120			
Anthracene		1.78	ug/L	0.10	89	80	120			
Benzo(a)anthracene		1.76	ug/L	0.10	88	80	120			
Benzo(a)pyrene		1.66	ug/L	0.10	83	80	120			
Benzo(b)fluoranthene		1.71	ug/L	0.10	86	80	120			
Benzo(g,h,i)perylene		1.92	ug/L	0.10	96	80	120			
Benzo(k)fluoranthene		1.91	ug/L	0.10	96	80	120			
Chrysene		1.91	ug/L	0.10	96	80	120			
Dibenzo(a,h)anthracene		1.66	ug/L	0.10	83	80	120			
Fluoranthene		1.77	ug/L	0.10	89	80	120			
Fluorene		1.74	ug/L	0.10	87	80	120			
Indeno(1,2,3-cd)pyrene		1.61	ug/L	0.10	81	80	120			
Naphthalene		1.77	ug/L	0.10	89	80	120			
o-Terphenyl		1.74	ug/L	0.10	87	80	120			
Phenanthrene		1.83	ug/L	0.10	92	80	120			
Pyrene		1.81	ug/L	0.10	91	80	120			
Surr: 2-Fluorobiphenyl				0.10	90	80	120			
Surr: Nitrobenzene-d5				0.10	100	80	120			
Surr: Terphenyl-d14				0.10	87	80	120			

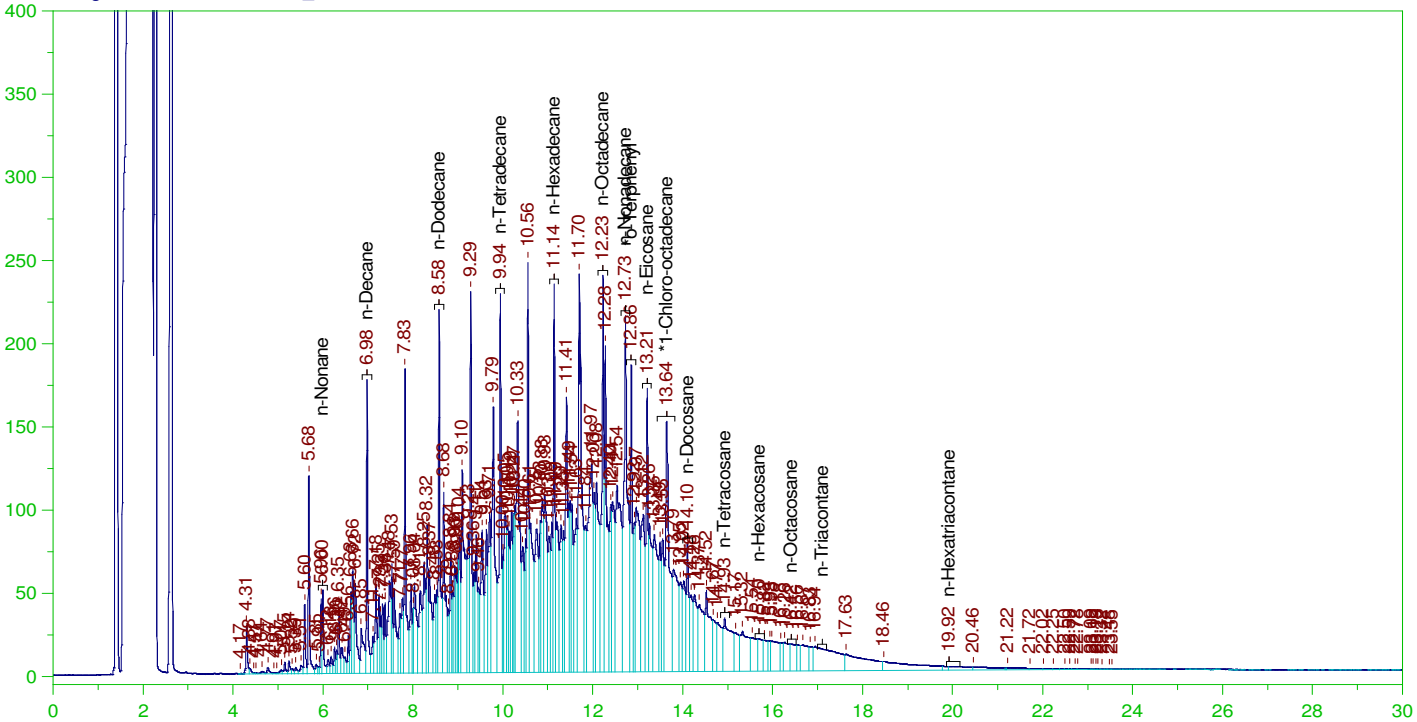
Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

05-300-BASE Batch ID: 34886

— G:\Org\4GC\DAT\4GC110916_b\1109GC4.0031.RAW H16100331-001A ;1109GC4 , $HC-EPH-SCRN-W,



EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM

Sample Name: H16100331-001A ;1109GC4 , $HC-EPH-SCRN-W,
Raw File: G:\Org\4GC\DAT\4GC110916_b\1109GC4.0031.RAW
Date & Time Acquired: 11/10/2016 2:04:34 PM
Method File: G:\Org\4GC\Methods\11091631.MET
Calibration File: G:\Org\4GC\Cals\SC010816AJ.CAL
Sample Weight: 1.0306 Dilution: 2 S.A.: 1

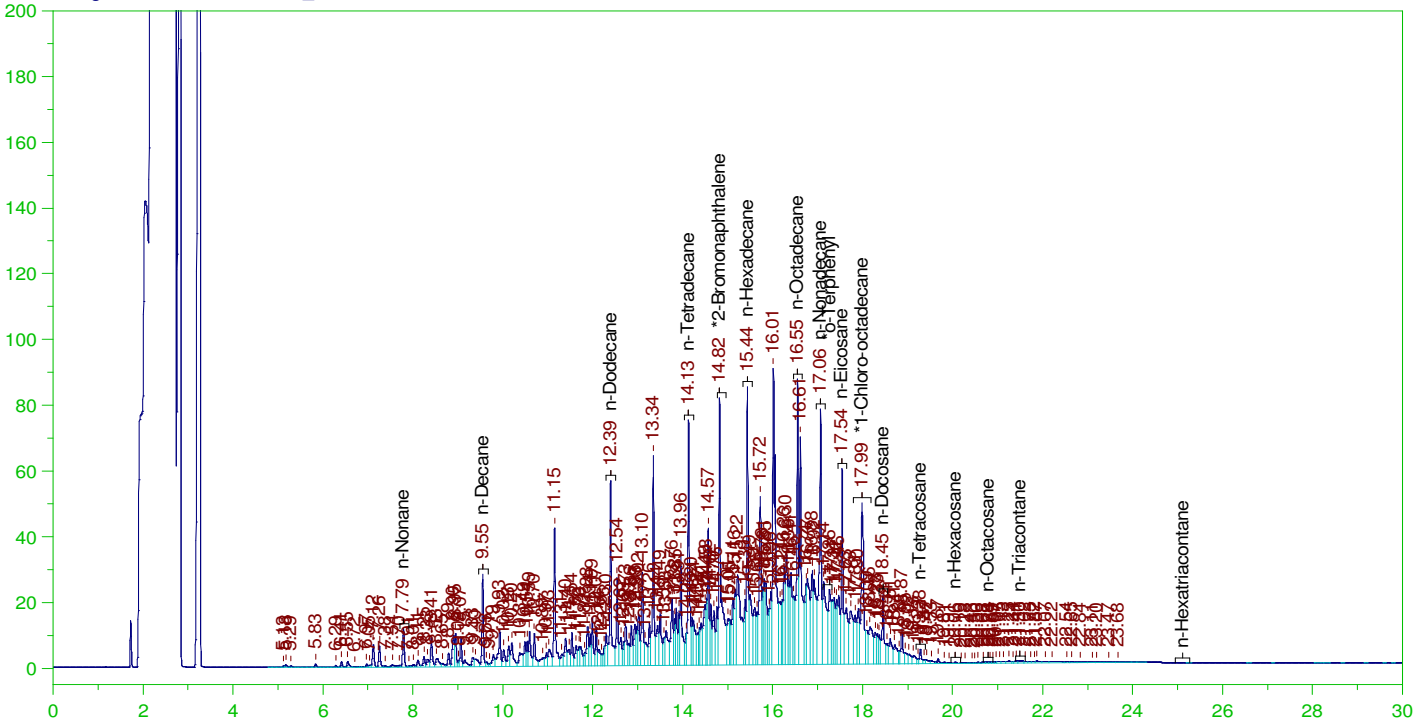
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 6.88 to 17.2
Rt range for C9 to C18 Hydrocarbons: 5.9 to 12.75
Rt range for C19 to C36 Hydrocarbons: 12.8 to 20.16

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.857	501001	194.062	480.881	247.8	-
*1-Chloro-octadecane	13.638	888303	194.062	1092.368	562.9	-

DRO Area:3.664238E+07 DRO Amount: 38859.05
TEH Area:3.920083E+07 TEH Amount: 41572.28
C9-C18 Area:2.859866E+07 C9-C18 Amount: 30638.01
C19-C36 Area:9884984 C19-C36 Amount: 10378.21

05-300-BASE Batch ID: 34964

— G:\Org\1GC\DAT\1GC111116_b\1111GC1.0012.RAW H16100331-001A ;1111GC1 , $HC-ALI-GRP-W,



EPH ALIPHATICS (FID) ANALYSIS REPORT

Sample Name: H16100331-001A ;1111GC1 , $HC-ALI-GRP-W,
Raw File: G:\Org\1GC\DAT\1GC111116_b\1111GC1.0012.RAW
Date & Time Acquired: 11/11/2016 8:12:53 PM
Method File: G:\Org\1GC\Methods\11111612.MET
Calibration File: G:\Org\1GC\Cals\AL082516I.CAL
Sample Weight: 1.0306 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 846.0213
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 876.3241
Mean RF for Total Extractable Hydrocarbons: 863.3373
Rt range for Diesel Range Organics: 9.469999 to 20.89
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.71 to 16.97
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.02 to 25.26

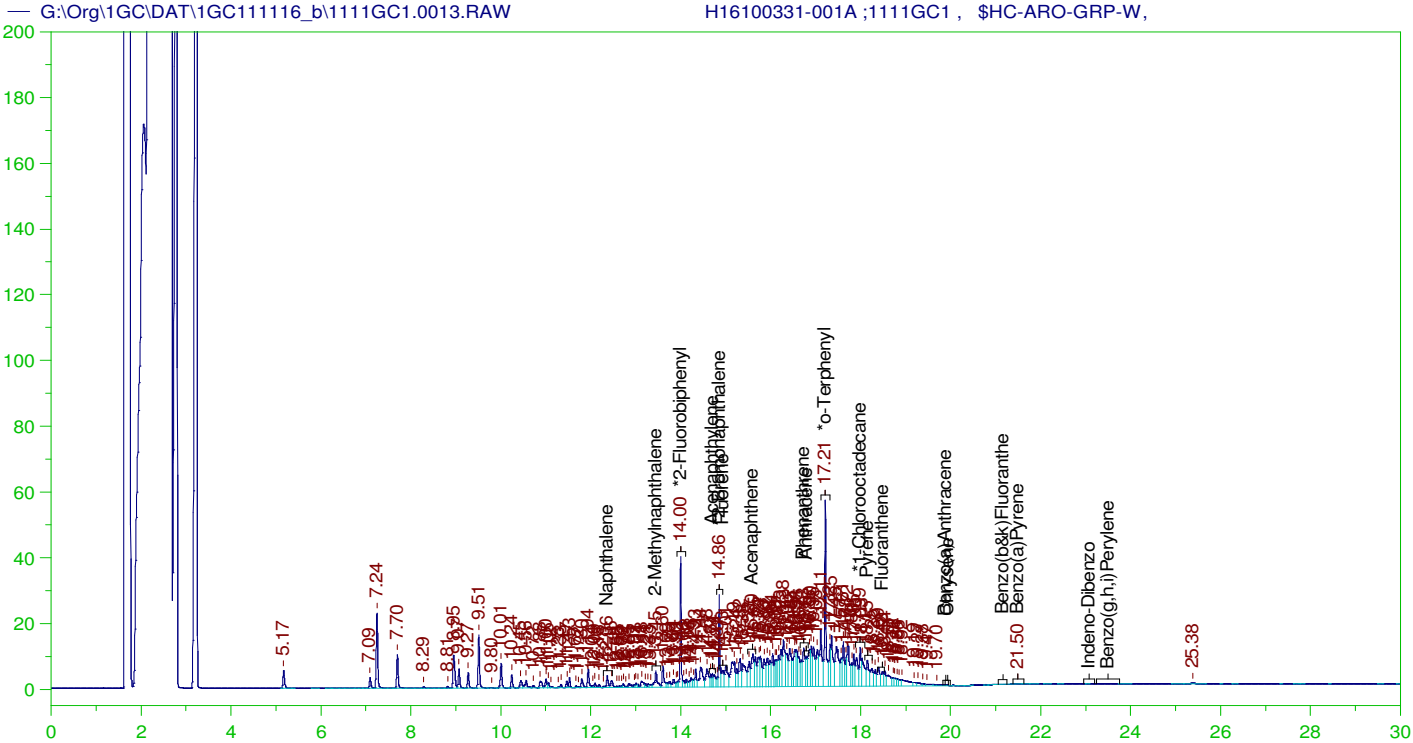
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*1-Chloro-octadecane	17.985	192693	194.062	496.641	255.92	-

DRO Area:7341408 DRO Amount: 16502.08
TEH Area:8073567 TEH Amount: 18147.83

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:6303887 C9-C18 Amount: 14459.96
C19-C36 Area:1698007 C19-C36 Amount: 3760.23

05-300-BASE Batch ID: 34964

— G:\Org\1GC\DAT\1GC111116_b\1111GC1.0013.RAW H16100331-001A ;1111GC1 , $HC-ARO-GRP-W,



EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT

Sample Name: H16100331-001A ;1111GC1 , $HC-ARO-GRP-W,
Raw File: G:\Org\1GC\DAT\1GC111116_b\1111GC1.0013.RAW
Date & Time Acquired: 11/11/2016 8:54:53 PM
Method File: G:\Org\1GC\Methods\AR082416I.MET
Calibration File: G:\Org\1GC\Cals\AR082416I.CAL
Sample Weight: 1.0306 Dilution: 2 S.A.: 1

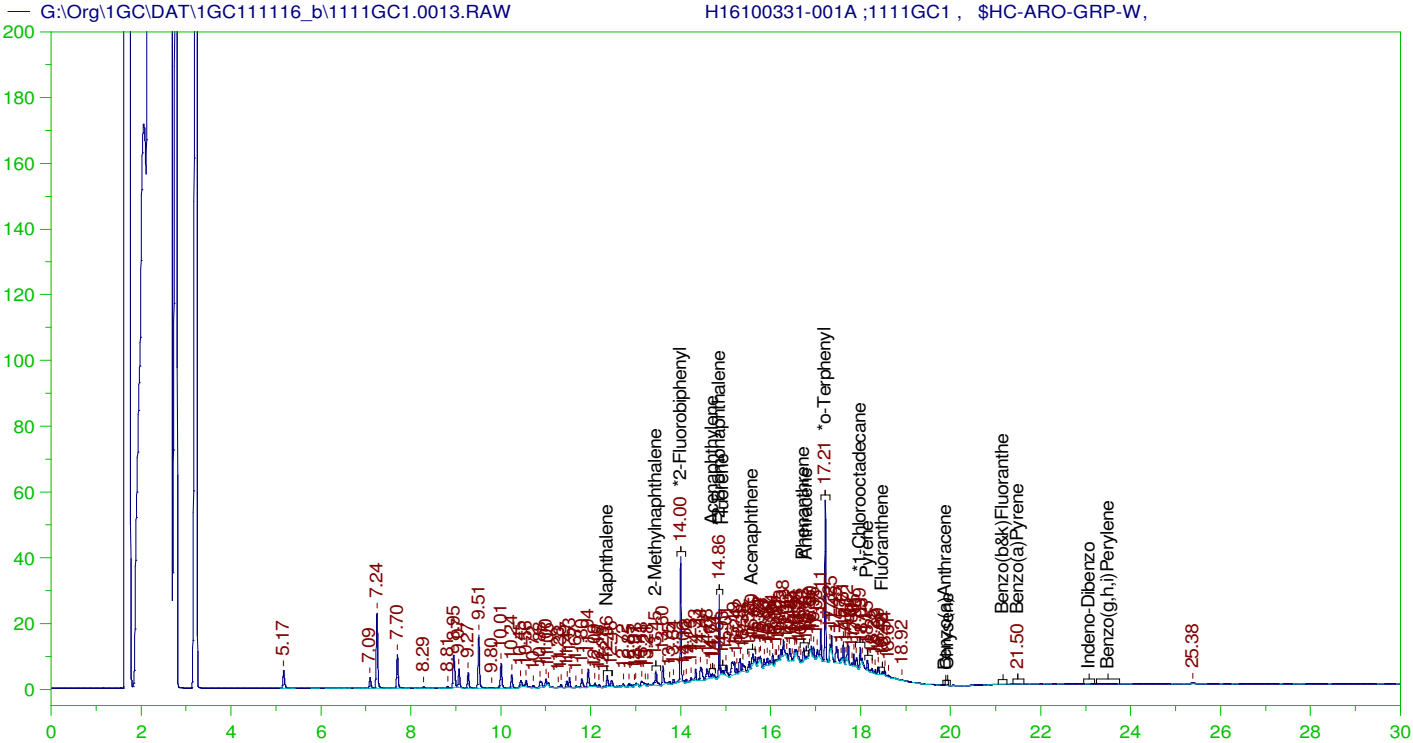
Mean RF EPH Aromatics: 986.0045
Rt range for EPH C11 to C22 Aromatics: 12.28 to 23.75

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
*2-Fluorobiphenyl	14.	70277	194.062	154.065	79.39	-
*2-Bromonaphthalene	14.856	52630	194.062	167.699	86.42	-
*o-Terphenyl	17.211	134612	194.062	261.872	134.94	-
*1-Chlorooctadecane	17.989	30278	194.062	74.001	38.13	-

C11-C22 Aromatics Area:1962718 C11-C22 Aromatics Amount: 3862.948
EPH Aromatics total Area:2286693 EPH Aromatics Total Amount: 4500.583

05-300-BASE Batch ID: 34964

— G:\Org\1GC\DAT\1GC111116_b\1111GC1.0013.RAW H16100331-001A ;1111GC1 , $HC-ARO-GRP-W,



EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT

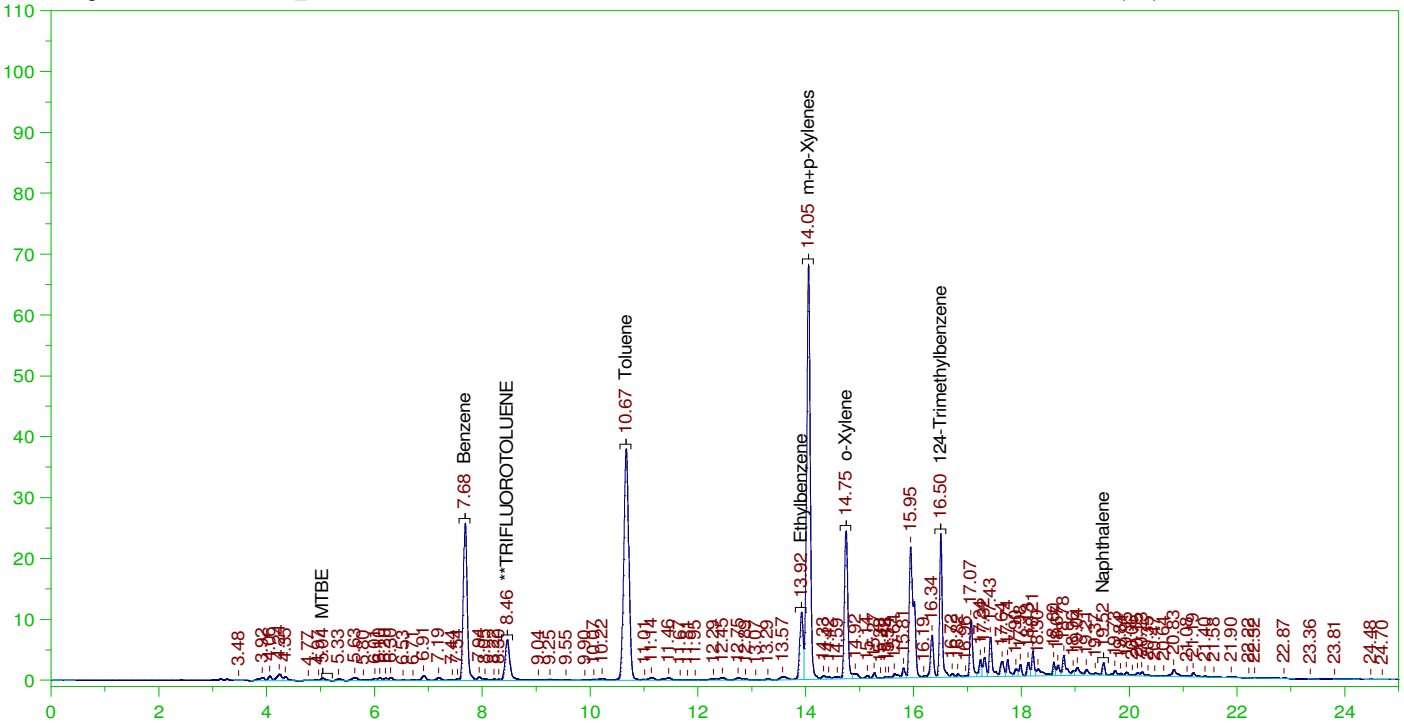
Sample Name: H16100331-001A ;1111GC1 , $HC-ARO-GRP-W,
Raw File: G:\Org\1GC\DAT\1GC111116_b\1111GC1.0013.RAW
Date & Time Acquired: 11/11/2016 8:54:53 PM
Method File: G:\Org\1GC\Methods\AROQC082416I.met
Calibration File: G:\Org\1GC\Cals\AR082416I.CAL
Sample Weight: 1.0306 Dilution: 2 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
Naphthalene	12.363	2.49	2.493	7531	15.285	
2-Methylnaphthalene	13.448	1.41	1.408	12836	26.046	
Acenaphthylene	14.706	.17	.15	1521	3.136	
Fluorene	14.932	-.07	-.076	2670	5.146	
Acenaphthene	15.596	-.7	-.74	7892	15.75	
Phenanthrene	16.729	-1.87	-1.873	6827	13.548	
Anthracene	16.788	-1.93	-1.932	1119	2.198	
Pyrene	18.147	-3.31	-3.291	5466	10.623	
Fluoranthene	18.48	-3.58	-3.624	2087	4.009	
Benzo(a)Anthracene	.	.	.		1.941	U
Chrysene	.	.	.		1.941	U
Benzo(b&k)Fluoranthe	.	.	.		3.881	U
Benzo(a)Pyrene	21.496	21.496	21.496	648	1.941	U
Indeno-Dibenzo	.	.	.		3.881	U
Benzo(g,h,i)Perylene	.	.	.		1.941	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	QC LIMITS
*2-Fluorobiphenyl	14.	61002	194.062	133.73	68.91	40-140
*2-Bromonaphthalene	14.856	38374	194.062	122.272	63.01	40-140
*o-Terphenyl	17.211	81392	194.062	158.339	81.59	40-140
*1-Chlorooctadecane	17.989	8152	194.062	19.923	10.27	40-140

05-300-BASE

— G:\Org\2GC\DAT\2GC102416_b\1024GC2.0015.RAW H16100331-001B ;1024GC2 , $HC-VPH-MA-W,,(1,5)



VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100331-001B ;1024GC2 , $HC-VPH-MA-W,,(1,5)
Raw File: G:\Org\2GC\DAT\2GC102416_b\1024GC2.0015.RAW
Date & Time Acquired: 10/24/2016 7:18:25 PM
Method File: G:\Org\2GC\Methods\10241615$nap.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 5 Dilution: 5 S.A.: 5

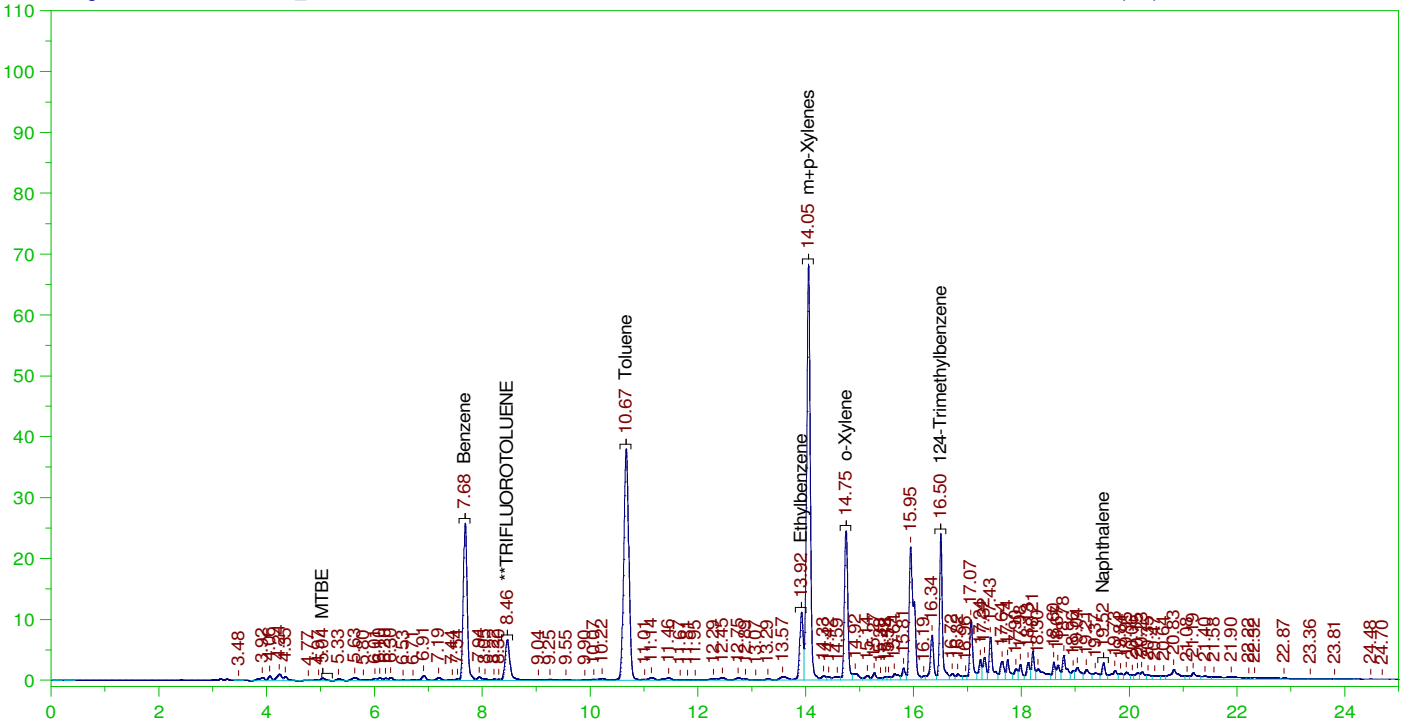
Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:459555.1 C9-C10 Aromatics Amount: 753.9897

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.038	3.34	3.426	2312	7.781	
Benzene	7.683	.789	.781	133082	133.019	
Toluene	10.671	-2.196	-2.206	252845	300.665	
Ethylbenzene	13.921	-5.449	-5.457	50650	68.205	
m+p-Xylenes	14.05	-5.579	-5.585	316647	385.396	
o-Xylene	14.747	-6.279	-6.283	106073	148.846	
124-Trimethylbenzene	16.504	-8.037	-8.04	84810	167.489	
Naphthalene	19.522	-11.056	-11.057	6522	20.642	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.464	43655	125.	138.053	110.44

05-300-BASE

— G:\Org\2GC\DAT\2GC102416_b\1024GC2.0015.RAW H16100331-001B ;1024GC2 , $HC-VPH-MA-W,,(1,5)



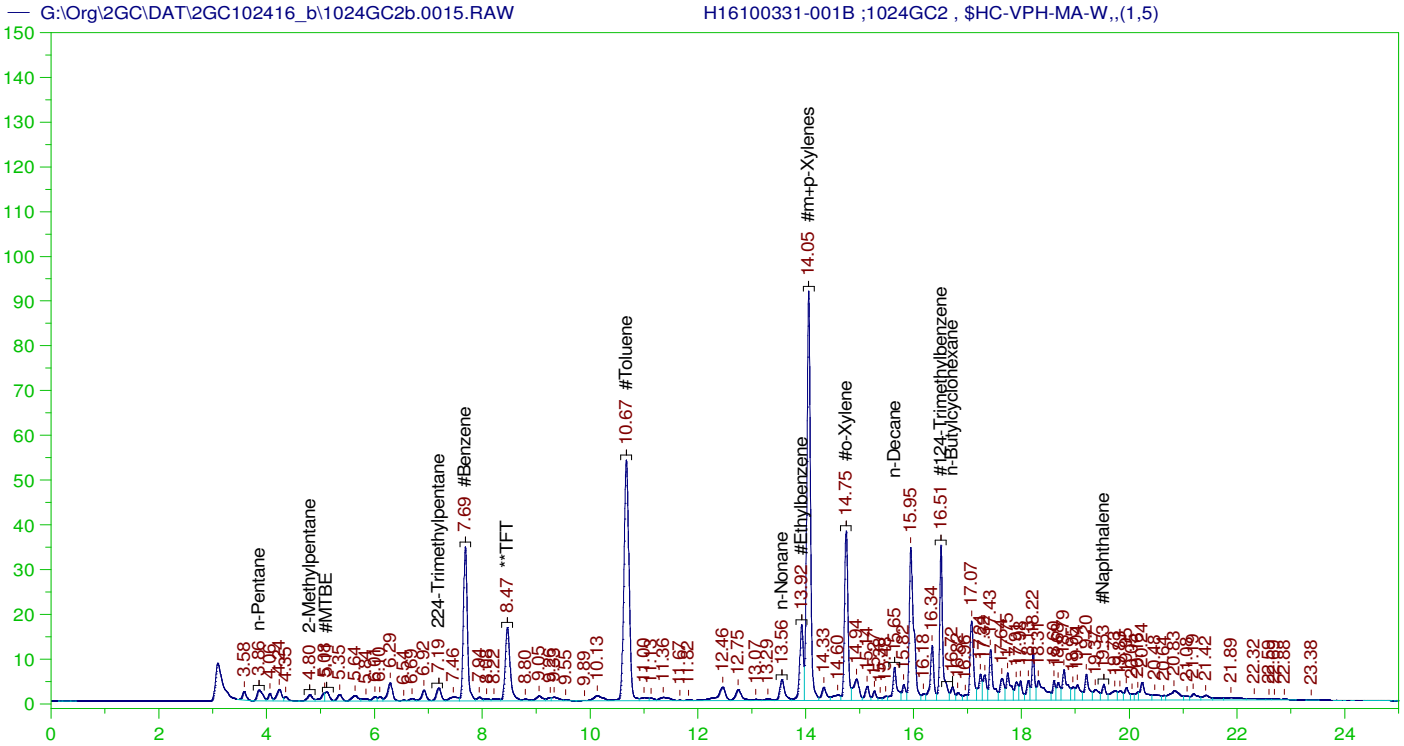
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100331-001B ;1024GC2 , $HC-VPH-MA-W,,(1,5)
Raw File: G:\Org\2GC\DAT\2GC102416_b\1024GC2.0015.RAW
Date & Time Acquired: 10/24/2016 7:18:25 PM
Method File: G:\Org\2GC\Methods\10241615.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 5 Dilution: 5 S.A.: 5

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:602137.1 C9-C10 Aromatics Amount: 987.9232

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	5.038	3.34	3.426	2312	~~7.781~~ <8 tjb 10/25/16	
Benzene	7.683	.789	.781	133082	133.019	
Toluene	10.671	-2.196	-2.206	252992	300.84	
Ethylbenzene	13.921	-5.449	-5.457	51942	69.945	
m+p-Xylenes	14.05	-5.579	-5.585	318762	387.97	
o-Xylene	14.747	-6.279	-6.283	108832	152.718	
124-Trimethylbenzene	16.504	-8.037	-8.04	91118	179.946	
Naphthalene	19.522	-11.056	-11.057	13259	41.961	

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.464	43655	125.	138.053	110.44



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100331-001B ;1024GC2 , $HC-VPH-MA-W,,(1,5)
Raw File: G:\Org\2GC\DAT\2GC102416_b\1024GC2b.0015.RAW
Date & Time Acquired: 10/24/2016 7:18:25 PM
Method File: G:\Org\2GC\Methods\10241615B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 5 Dilution: 5 S.A.: 5

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

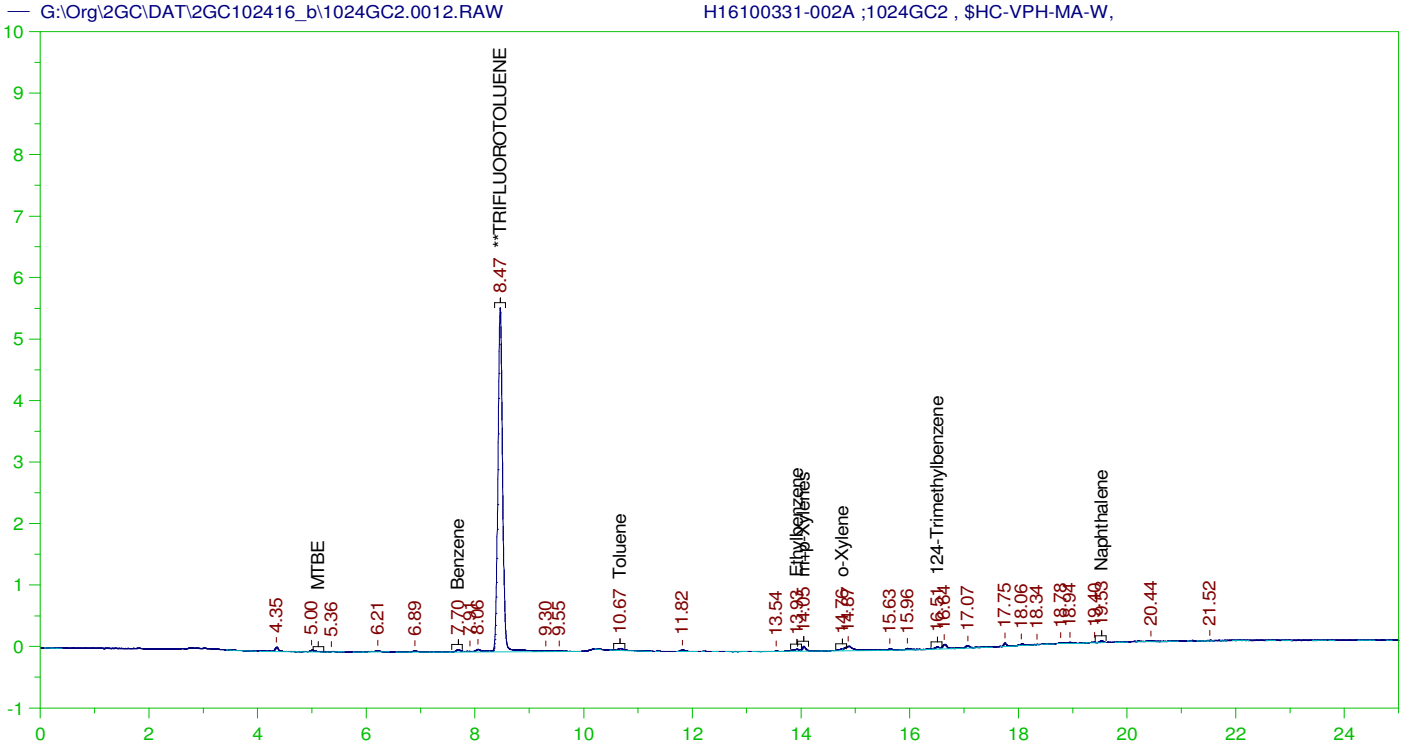
SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.468	106915	125.	139.169	111.34	-

GRO Area:1679101 GRO Amount: 1913.275
TPH Area:2965148 TPH Amount: 3378.679

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:864134.1 C5-C8 Amount: 874.3252
C9-C12 Area:1885266 C9-C12 Amount: 3654.709

TB5915

G:\Org\2GC\DAT\2GC102416_b\1024GC2.0012.RAW H16100331-002A ;1024GC2 , $HC-VPH-MA-W,



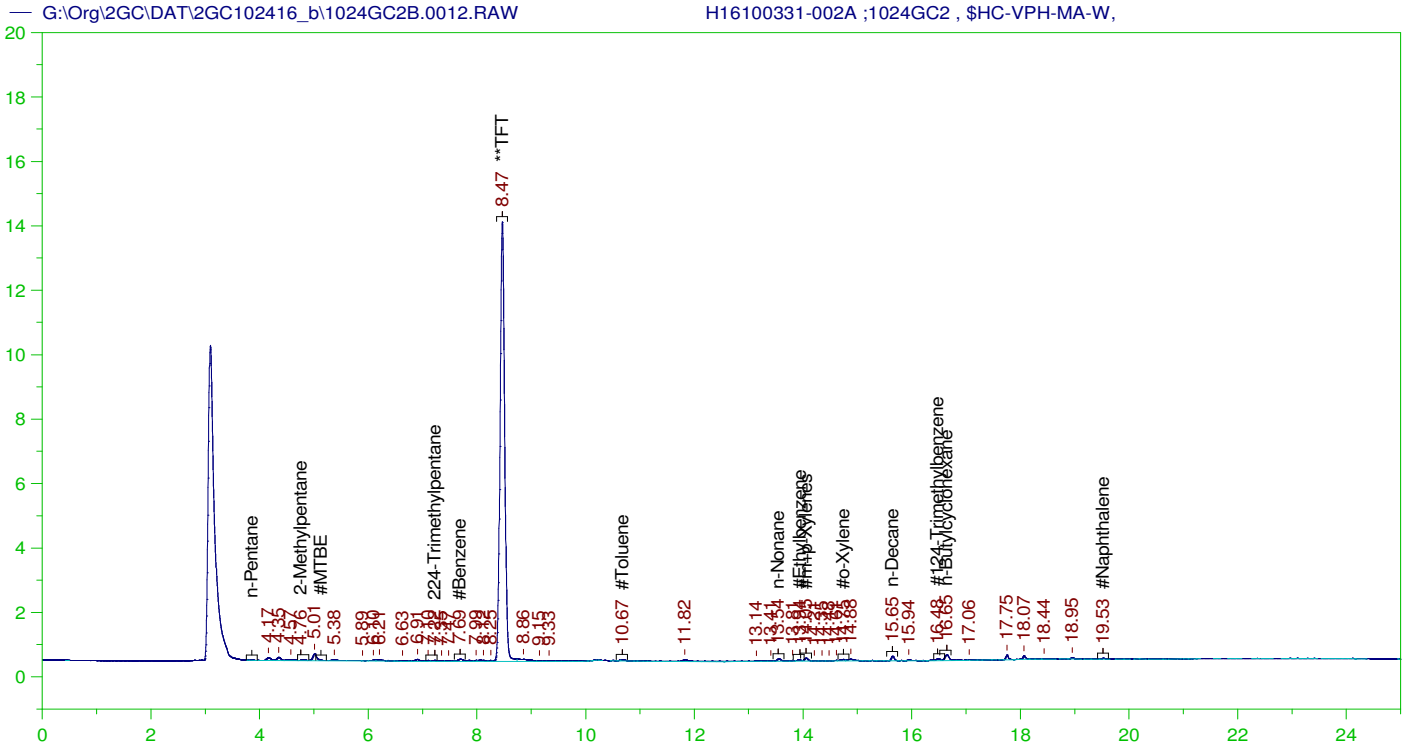
VPH AROMATICS PHOTOIONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100331-002A ;1024GC2 , $HC-VPH-MA-W,
Raw File: G:\Org\2GC\DAT\2GC102416_b\1024GC2.0012.RAW
Date & Time Acquired: 10/24/2016 5:46:14 PM
Method File: G:\Org\2GC\Methods\GC2091316.MET
Calibration File: G:\Org\2GC\Cals\GC2091316.cal
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C9 to C10 Aromatic Hydrocarbons: 609.4979
Rt range for C9 to C10 Aromatics: 14.839 to 19.416
Aromatic Hydrocarbon Range Area and Quantitation:
C9-C10 Aromatics Area:2855.898 C9-C10 Aromatics Amount: 0.9371315

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.696	7.696	7.696	272	.5	U
Toluene	10.671	10.671	10.671	304	.5	U
Ethylbenzene	13.927	13.927	13.927	366	.5	U
m+p-Xylenes	14.051	14.051	14.051	450	1.	U
o-Xylene	14.76	14.76	14.76	192	.5	U
124-Trimethylbenzene	16.512	16.512	16.512	181	.5	U
Naphthalene	19.532	19.532	19.532	128	1.	U

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC
**TRIFLUOROTOLUENE	8.465	34249	25.	21.662	86.65



VPH ALIPHATICS FLAME IONIZATION DETECTOR CHROMATOGRAM REPORT

Sample Name: H16100331-002A ;1024GC2 , $HC-VPH-MA-W,
Raw File: G:\Org\2GC\DAT\2GC102416_b\1024GC2B.0012.RAW
Date & Time Acquired: 10/24/2016 5:46:14 PM
Method File: G:\Org\2GC\Methods\GC2091316B.MET
Calibration File: G:\Org\2GC\Cals\GC2091316B.cal
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for C5 to C8 Aliphatic Hydrocarbons: 988.344
Mean RF for C9 to C12 Aliphatic Hydrocarbons: 515.8457
Mean RF for all calibrated compounds: 877.6057
Rt range for Gasoline Range Organics: 4.697 to 15.742
Rt range for C5 to C8 Aliphatic Hydrocarbons: 3.754 to 13.451
Rt range for C9 to C12 Aliphatic Hydrocarbons: 13.501 to 19.423

SURROGATE COMPOUND	RT	AREA	ACTUAL	MEASURED	%REC	
**TFT	8.468	81463	25.	21.208	84.83	-

GRO Area:10903.64 GRO Amount: 2.484861
TPH Area:16186.16 TPH Amount: 3.688708

Aliphatic Hydrocarbon Areas and Quantitations uncorrected for Aromatics:
C5-C8 Area:9043.891 C5-C8 Amount: 1.83011
C9-C12 Area:6593.705 C9-C12 Amount: 2.556464

Work Order Receipt Checklist

Hydrometrics Inc

H16100331

Login completed by: Wanda Johnson

Date Received: 10/19/2016

Reviewed by: BL2000\rwilliams

Received by: RAT

Reviewed Date: 10/20/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.4°C On Ice		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	Not Applicable ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

Trip Blank received frozen & the septa was bulging. wj 10/19/16

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

CHAIN OF CUSTODY RECORD

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: (Signature) JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	TPH	EPH	VPH	See cover letter						REMARKS
10/19/16	0830		X	OS-300-BASE	04									X	X							H16100331

Relinquished (Signature)	Date / Time	Received by (Signature)	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell	10/19/16 1300		3.4°C #3 tb frozen cooler / no seals hand del	HLN10287	Other hand-deliver Air Bill #
Relinquished (Signature)	Date / Time	Received by (Signature)	Remarks Please forward results to: Jamie Poell, Hydrometrics 3020 Bozeman Avenue Helena, Montana 59601 email: jpoell@hydrometrics.com		
Relinquished (Signature)	Date / Time	Received for Laboratory by (Signature) Rebecca Foote	Date / Time 10/19/16 1300	Enclosed: ☐ Parameter sheet w/detection limits ☐ QA / AC standard mixing instructions ☒ Cover letter ☐ Other	

Split Samples: ☐ Accepted ☐ Declined _____ Signature

HFORM-1 07/11

Return results & electronic copy to: QA / QC Dept. at address at top of page

Hydrometrics, Inc.
consulting scientists and engineers

3020 Bozeman Avenue
Helena, MT 59601
(406) 443-4150
Fax: (406) 443-4155
www.hydrometrics.com

October 19, 2016

Energy Laboratories
3161 E Lyndale Ave.
Helena, Montana 59601

RE: Meagher County Shop Remediation Groundwater Samples

Enclosed ~~are~~ is one groundwater sample~~s~~ collected during remediation of the Meagher County Shop site in White Sulphur Springs, Montana. Please analyze the samples as shown on the attached chain-of-custody, as follows:

- **EPH Screen** (Massachusetts Method Extractable Petroleum Hydrocarbon Screen)
  - If the sample EPH Screen results in TEH > 1,000 ug/L, analyze the sample for **EPH fractions** and for semi-volatile organic compounds (**SVOCs**) using Method 8270.

- **VPH** (Massachusetts Method Volatile Petroleum Hydrocarbons)

The analyses should be billed to Hydrometrics, referencing PO# HLN10287. If you have any questions concerning these samples, please contact me at 443-4150, Ext. 154.

Sincerely,

James Poell
Environmental Scientist

Enclosures

H:\Files\MTDEQ\16048\I16 Lab Cover - Water.doc\HLN\9/29/2016\034

9/29/2016 11:22 AM

APPENDIX J

MEAGHER COUNTY REMEDIAL EXCAVATION DATA VALIDATION REPORTS

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	Meagher County Shop SB96 Remedial Excavation
5. Name of DEQ-approved sampling plan	No SAP-Task Order 13/Contract 414019 and HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Ericka Vallance
8. Phone	(406) 443-4150, Ext. 187
9. Date validated	3/17/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	8/31/2016 M/D/YY
12. Sample collection end date	8/31/2016 M/D/YY
13. Analytical methods used *Use Add Method button to list multiple methods. Enter any other methods in the field manually.*	Add Method / Analytical Method(s)
	Delete Method: D2974 - Moisture
	Delete Method: SW6020 - 3050 Extractable Metals and Extractable Metals Dried and Sieved
	Delete Method: SW7471B - Total Mercury

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT		
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order H16090157-001		
16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes ●	No ○	Comments
17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	Yes ●	No ○	Comments

18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	Yes ●	No ○	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample			No project samples used for MS/MSD.

22. Is the total number of laboratory control samples at least 5% of the total number of samples?	Yes ●	No ○	Comments

Consultant/Validator Questions

23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	Yes ●	No ○	Comments
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	Yes ●	No ○	Comments
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	Yes ●	No ○	Comments
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	Yes ●	No ○	Comments
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	Yes ○	No ●	Comments No blanks required for soil sampling.

If no, explain

28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	Yes ○	No ●	Comments Not required.
28a. Were all blank samples free of analyte contamination?	Yes ○	No ●	Comments Not required.

If no, explain

28b. Were field duplicates collected as required?	Yes ○	No ●	Comments: Not required.

If no, explain

28c. Are field duplicate relative percent differences within data validation quality control limits?	Yes ○	No ●	Comments: Not required.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample				No data were qualified.

30. What is the percent completeness (samples planned versus valid samples collected)?	100	Comments:
31. Was the completeness goal met?	Yes ● / No ○	Comments:

32. Other general comments or observations?

Samples evaluated in this report are part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples?	Yes ○	No ●	Comments:

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	Meagher County Shop SB96 Remedial Excavation
5. Name of DEQ-approved sampling plan	No SAP for this work, work conducted under Task Order 13, Contract 414019 and conducted per Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/19/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	10/6/2016 M/D/YY
12. Sample collection end date	10/6/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	SW8015M EPH Screen and Organic Characteristics
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8270C Semi-Volatile Organic Compounds By Gas Chromatography/ Mass Spectrometry

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order/Sample Delivery Group H16100086

16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes	No	Comments
	○	●	Two % recoveries for surrogate spikes were slightly outside of the specified limits. see below for additional discussion.

If no, explain

	Yes	No	Comments
17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	●	○	The samples were received at the lab at 7.6 C, which is slightly higher than the specified limit of 6 C. However, the samples were delivered to the lab on ice and within 3 hours of collection. The samples likely did not have adequate time to chill to 6 C. No qualification of the data is necessary.
18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	○	●	
18a. Were all calibration verification results within acceptable limits?	●	○	
18b. Were laboratory blank samples free of contamination?	●	○	
18c. Are the percent recoveries and relative percent differences of matrix spike and matrix spike duplicates within quality control limits?	●	○	
18d. Are the control samples the same matrix as the samples, and prepared the same as associated samples?	●	○	
18e. Were laboratory control samples and laboratory control sample duplicate percent recoveries and relative percent differences within laboratory control limits?	●	○	
18f. Were surrogate recoveries within laboratory quality control limits?	○	●	Sample MCMW2-103-EGrey had an o-Terphenyl at 142 % recovery (the specified QC limit is 40-140%). This would tend to bias the results for Total Extractable Hydrocarbons slightly high. No qualification of the data is necessary. In sample MCMW2-104-WGrey, the 0-Terphenyl surrogate had 37% recovered, slightly lower than the lower QC limit of 40%. The other surrogates in this sample where within specified limits. No qualification of the data is necessary.

If no, explain

	Yes	No	Comments
18g. Were the laboratory duplicate relative percent differences within data validation quality control limits?	●	○	
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	●	○	

	Yes	No	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	●	○	

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample			no project samples were used for MSMSD

	Yes	No	Comments
22. Is the total number of laboratory control samples at least 5% of the total number of samples?	●	○	

Consultant/Validator Questions

	Yes	No	Comments
23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	●	○	
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	●	○	
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	●	○	
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	●	○	
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	○	●	No blanks were collected for this soil sampling work. All detected contaminants are assumed to be related to the site.

If no, explain

	Yes	No	Comments
28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	○	●	Field blanks and duplicates were not required for the soil samples in this data package. All detected contaminants are assumed to be related to the site.
28a. Were all blank samples free of analyte contamination?	●	○	Method blanks did not contain detectable contaminants.
28b. Were field duplicates collected as required?	○	●	Field duplicates were not required for these soil samples.

If no, explain

	Yes	No	Comments
28c. Are field duplicate relative percent differences within data validation quality control limits?	○	●	Field duplicates were not collected as part of this sampling event. The usability of the soil results are not affected by this.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample				no data were qualified in this report

30. What is the percent completeness (samples planned versus valid samples collected)? 100

Comments

31. Was the completeness goal met? Yes ● No ○

Comments

32. Other general comments or observations?

The samples evaluated in this report are part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples? Yes ○ No ●

Comments

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	Meagher County Shop SB96 Remedial Excavation
5. Name of DEQ-approved sampling plan	No SAP for this work. Work conducted under Task Order 13, Contract 414019 and Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/19/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	10/7/2016 M/D/YY
12. Sample collection end date	10/7/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	SW8015M EPH Screen and Organic Characteristics
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8270C Semi-Volatile Organic Compounds By Gas Chromatography/ Mass Spectrometry

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order/Sample Delivery Group H16100140

16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes	No	Comments
	○	●	MSMSD % recoveries for some compounds were outside of limits in some MSMSD runs.

If no, explain

17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	Yes ●	No ○	Comments
18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	Yes ●	No ○	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample			

22. Is the total number of laboratory control samples at least 5% of the total number of samples?	Yes ●	No ○	Comments

Consultant/Validator Questions

23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	Yes ●	No ○	Comments
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	Yes ●	No ○	Comments
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	Yes ●	No ○	Comments
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	Yes ●	No ○	Comments
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	Yes ○	No ●	Comments No field blanks were required for this soil sampling work and none were collected. All detected contamination is assumed to be attributable to the site.

If no, explain

28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	Yes ○	No ●	Comments Field blanks and duplicates were not required for the 2 soil samples in this data package. All detected contamination is assumed to be attributable to the site.
28a. Were all blank samples free of analyte contamination?	Yes ●	No ○	Comments Field blanks were not collected. However, laboratory method blanks were free from contamination. All detected contamination is assumed to be attributable to the site.
28b. Were field duplicates collected as required?	Yes ○	No ●	Comments Field soil sample duplicates were not collected as part of this sampling event. The usability of the soil sample results is not affected.

If no, explain

28c. Are field duplicate relative percent differences within data validation quality control limits?	Yes ○	No ●	Comments Not applicable. Field duplicated were not collected. The usability of the data is not affected.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample				no data were qualified in this report

30. What is the percent completeness (samples planned versus valid samples collected)?	100		Comments
31. Was the completeness goal met?	Yes ●	No ○	Comments

32. Other general comments or observations?
The samples evaluated in this report are part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples?	Yes	No	Comments
	○	●	

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	Meagher County Shop SB96 Remedial Excavation
5. Name of DEQ-approved sampling plan	No SAP for this work. Work conducted under Task Order 13, Contract 414019 and Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/17/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	10/10/2016 M/D/YY
12. Sample collection end date	10/12/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8260C Volatile Organic Compounds By Gas Chromatography/ Mass Spectrometry (GC/
Delete Method	SW8015M EPH Screen and Organic Characteristics

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order H16100204

	Yes	No	Comments
16. Does all data conform to analytical methods and data quality objectives specified for this project?	●	○	
17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	●	○	

18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	Yes ○	No ●	Comments Sample OSFFT-201-BASE had a "D" flag because the reporting limit for MTBE was slightly increased due to matrix interference. MTBE is not a COC at this site. The D flag does not affect the interpretation of other results.
18a. Were all calibration verification results within acceptable limits?	Yes ●	No ○	Comments
18b. Were laboratory blank samples free of contamination?	Yes ●	No ○	Comments
18c. Are the percent recoveries and relative percent differences of matrix spike and matrix spike duplicates within quality control limits?	Yes ○	No ●	Comments The MS MSD recoveries of the parent sample H16100204-003 are less than the low limit for several compounds. The MS MSD results conducted on two additional samples not from the Site were within qc limits. Some results in the parent sample are J-flagged with a potential low bias (see table below)

If no, explain

18d. Are the control samples the same matrix as the samples, and prepared the same as associated samples?	Yes ●	No ○	Comments
18e. Were laboratory control samples and laboratory control sample duplicate percent recoveries and relative percent differences within laboratory control limits?	Yes ●	No ○	Comments
18f. Were surrogate recoveries within laboratory quality control limits?	Yes ●	No ○	Comments
18g. Were the laboratory duplicate relative percent differences within data validation quality control limits?	Yes ●	No ○	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments

Delete Sample	H16100204-003	OSFFT-201-BASE	Some spike recoveries were less than advisory limits. Energy Lab indicated the spike concentration was low relative to the contaminant concentration (< 4x) in the parent sample. Also, matrix interference increased the overall variability of results. These two factors resulted in some low and negative % MS recoveries. This may not have been an appropriate sample to use for a MS. All other lab QAQC was within specified limits. Qualification of some parameters in the parent sample are necessary (J-), see summary table.

	Yes	No	Comments
22. Is the total number of laboratory control samples at least 5% of the total number of samples?	●	○	

Consultant/Validator Questions

	Yes	No	Comments
23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	●	○	
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	●	○	
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	●	○	The methods used are those specified in Task Order 13 and by the COC.
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	●	○	
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	○	●	No blanks were collected in this sampling event. Any detected contaminants are assumed to be attributable to the site.

If no, explain

	Yes	No	Comments
28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	○	●	Field duplicates were not collected for this sampling event. The usability of the results is not affected.
28a. Were all blank samples free of analyte contamination?	●	○	Laboratory method blanks were free from contamination. No other blanks were required due to one-time sampling equipment for the collection of soil samples. Any detected contaminants are assumed to be attributable to the site.
28b. Were field duplicates collected as required?	○	●	Field duplicates were not collected for this sampling event. The usability of the results is not affected.

If no, explain

28c. Are field duplicate relative percent differences within data validation quality control limits?	Yes	No	Comments
	○	●	Not applicable. Field duplicates were not collected. The usability of the results is not affected.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample	H16100204-003	OSFFT-201-BASE	J-	toluene, ethylbenzene, xylenes, naphthalene, and Total Purgable Hydrocarbons had low MS recoveries. All other lab QC was within limits. Apply a J- flag to this sample due to tendency for estimated values with a potential low bias due to matrix interference.

30. What is the percent completeness (samples planned versus valid samples collected)?	100	Comments

31. Was the completeness goal met?	Yes	No	Comments
	●	○	

32. Other general comments or observations?

These samples were part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples?	Yes	No	Comments
	○	●	

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	Meagher County Shop SB96 Remedial Excavation
5. Name of DEQ-approved sampling plan	No SAP for this work. Work conducted under Task Order 13, Contract 414019 and Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/17/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	10/17/2016 M/D/YY
12. Sample collection end date	10/18/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	SW8015M EPH Screen and Organic Characteristics
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8260C Volatile Organic Compounds By Gas Chromatography/ Mass Spectrometry (GC/

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order H16100312

16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes	No	Comments
	○	●	MSMSD % recoveries for some compounds were outside of limits in some MSMSD runs.

If no, explain

17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	Yes ●	No ○	Comments
18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	Yes ○	No ●	Comments See below.
18a. Were all calibration verification results within acceptable limits?	Yes ●	No ○	Comments
18b. Were laboratory blank samples free of contamination?	Yes ●	No ○	Comments
18c. Are the percent recoveries and relative percent differences of matrix spike and matrix spike duplicates within quality control limits?	Yes ○	No ●	Comments The MS recoveries for 2 compounds outside specified limits in the parent sample H16100312-003 run at 20:12 on 10/21/16. A later MSMSD run on this same parent sample reported only one compound with a MS duplicate result slightly less than the RPD limit. Another MSMSD sample not associated with this project had spike recoveries much higher than specified limits, and since this parent sample is not related to the project its results do not necessitate qualification of samples in this dataset. No sample data has been flagged as a result of the MSMSD results. All other lab data quality parameters are within specified limits.

If no, explain

18d. Are the control samples the same matrix as the samples, and prepared the same as associated samples?	Yes ●	No ○	Comments
18e. Were laboratory control samples and laboratory control sample duplicate percent recoveries and relative percent differences within laboratory control limits?	Yes ●	No ○	Comments
18f. Were surrogate recoveries within laboratory quality control limits?	Yes ●	No ○	Comments
18g. Were the laboratory duplicate relative percent differences within data validation quality control limits?	Yes ●	No ○	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments

	Yes	No	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	●	○	

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample	H16100312-003	OS-204-SGRAY	The lab ran two MSMSDs on this sample. A third MSMSD was run on a non-project sample, and those results have been disregarded in this data validation report.

	Yes	No	Comments
22. Is the total number of laboratory control samples at least 5% of the total number of samples?	●	○	

Consultant/Validator Questions

	Yes	No	Comments
23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	●	○	
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	●	○	
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	●	○	
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	●	○	
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	○	●	No blanks were collected for this soil sampling work. All detected contaminants are assumed to be attributable to the site.

If no, explain

	Yes	No	Comments
28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	○	●	Field blanks and duplicates were not collected as part of the 3 soil samples in this data package.
28a. Were all blank samples free of analyte contamination?	●	○	All laboratory blanks were free from contamination.
28b. Were field duplicates collected as required?	○	●	Field duplicates were not collected. The interpretation and usability of the data is not affected by the lack of field duplicates.

If no, explain

28c. Are field duplicate relative percent differences within data validation quality control limits?	Yes	No	Comments
	○	●	No applicable. Field duplicates were not collected.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample				no data were qualified in this report

30. What is the percent completeness (samples planned versus valid samples collected)?	100	Comments

31. Was the completeness goal met?	Yes	No	Comments
	●	○	

32. Other general comments or observations?

The samples evaluated in this report are part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples?	Yes	No	Comments
	○	●	

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	16048 Meagher County Shop Remediation
5. Name of DEQ-approved sampling plan	No SAP for this work. Work conducted under Task Order 13, Contract 414019 and Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/17/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☐ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☒ Other water in excavation
11. Sample collection start date	10/19/2016 M/D/YY
12. Sample collection end date	10/19/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	SW8015M EPH Screen and Organic Characteristics
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8270C Analysis of Semivolitatile Organic Compounds By Combined Gas Chromatograp

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order H16100331

16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes	No	Comments
	○	●	Naphthalene was detected (0.220 ug/L) just above the RL of 0.20 ug/L in one of the three method blanks.

If no, explain

	Yes	No	Comments
17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	●	○	
18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	○	●	see below
18a. Were all calibration verification results within acceptable limits?	●	○	
18b. Were laboratory blank samples free of contamination?	○	●	Naphthalene was detected (0.220 ug/L) just above the RL of 0.20 ug/L in one of the three method blanks, MB-104468-34964-348. The lab report flagged one positive naphthalene result in sample 05-300-BASE with a B. The naphthalene detection in this sample may be attributed to lab contamination, and this result was given a "UB" data validation flag. The sample detection was 0.21 ug/L, well below the most protective applicable screening level. The other lab method blanks did not have detections.

If no, explain

	Yes	No	Comments
18c. Are the percent recoveries and relative percent differences of matrix spike and matrix spike duplicates within quality control limits?	○	●	The MSD recovery for 1 compound, benzo(g,h,i) perylene parent sample H16100309-001 (which was not a sample from this project) was slightly less than QC limits. The other MSMSD run on this same parent sample had no QC issues. No sample data has been flagged as a result of the MSMSD results.

If no, explain

	Yes	No	Comments
18d. Are the control samples the same matrix as the samples, and prepared the same as associated samples?	●	○	
18e. Were laboratory control samples and laboratory control sample duplicate percent recoveries and relative percent differences within laboratory control limits?	●	○	
18f. Were surrogate recoveries within laboratory quality control limits?	●	○	
18g. Were the laboratory duplicate relative percent differences within data validation quality control limits?	●	○	

	Yes	No	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	●	○	
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	●	○	

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample			

	Yes	No	Comments
22. Is the total number of laboratory control samples at least 5% of the total number of samples?	●	○	

Consultant/Validator Questions

	Yes	No	Comments
23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	●	○	
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	●	○	The lab indicated that the RL for MTBE was increased due to matrix interference. However the RL for MTBE (8 ug/l) is less than the standard of 30 ug/L, and MTBE was not detected. No qualification of data is required.
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	●	○	
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	●	○	
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	●	○	A trip blank was submitted for this water sample. No analytes were detected in the trip blank, and all detected analytes in the sample are assumed to be attributable to the site. No equipment or rinsate blanks were required because sample was collected by dipping the sample containers directly into the excavation water.
28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	●	○	Field blanks and duplicates were not required for the 1 pit water sample in this data package. This does not affect the interpretation or usability of the sample results.

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable

Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample	H16100331-001	05-300-BASE	UB	naphthalene 0.21 ug/L in SVOC low level (SW8270C)

30. What is the percent completeness (samples planned versus valid samples collected)?	100	Comments
31. Was the completeness goal met?	Yes ● No ○	Comments

32. Other general comments or observations?

The sample evaluated in this report was collected to document petroleum concentrations in water in the excavation. This water is a mix of groundwater and surface water runoff.

Split Samples

33. Did DEQ collect split samples?	Yes ○ No ●	Comments

Print Form | Save As | Open Instructions | Hide Instructions

Montana DEQ - Remediation Division

Data Validation Summary Form (Version 1.2, Revised 11/4/16)

Please fill out the information below, using one form for each lab batch (one form can be used for multiple analytical methods). The form will grow and adjust, based on your responses. Please include a discussion regarding the sampling event in the report that is sent to DEQ with this form. For additional instructions, please click the Open Complete Instructions button.

Open Complete Instructions

Basic Questions

1. Site/Facility name	Meagher County Shop
2. Site code or facility ID (if applicable)	
3. Release ID (if applicable)	
4. Project name	16048 Meagher County Shop Remediation
5. Name of DEQ-approved sampling plan	No SAP for this work. Work conducted under Task Order 13, Contract 414019 and Hydrometrics Standard Operating Procedures HSSOP-6 and HSSOP-57
6. Date DEQ approved the sampling plan	M/D/YY
7. Name of data validator	Laura Alvey
8. Phone	406-444-0212
9. Date validated	3/17/2017 M/D/YY

Field Collection Questions

10. Sample matrix	☒ Soil ☐ Sediment ☐ Surface water ☐ Groundwater ☐ Tap water ☐ Air (including soil gas) ☐ Other
11. Sample collection start date	10/25/2016 M/D/YY
12. Sample collection end date	10/25/2016 M/D/YY

13. Analytical methods used

Use Add Method button to list multiple methods. Enter any other methods in the field manually.

Add Method	Analytical Method(s)
Delete Method	SW8015M EPH Screen and Organic Characteristics
Delete Method	MADEP EPH Rev 1.1 - Mass Dep Method For The Determination of Extractable Petroleum
Delete Method	MADEP VPH Rev 1.1 - The Mass Dep Method For The Determination of Volatile Petroleun
Delete Method	E8260C Volatile Organic Compounds By Gas Chromatography/ Mass Spectrometry (GC/

Laboratory-related Questions

14. Laboratory name and location	Energy Laboratories, Helena, MT
15. Laboratory project ID	16048 Meagher County Shop Remediation, Work Order H16100551

16. Does all data conform to analytical methods and data quality objectives specified for this project?	Yes	No	Comments
	○	●	MSMSD % recoveries for some compounds were outside of limits in one of the four MSMSD runs.

If no, explain

17. Were samples received in good condition and at appropriate temperature, chain-of-custody forms complete, and all samples analyzed within holding times?	Yes ●	No ○	Comments
18. Were all laboratory quality control procedures complied with and is data validated without qualifiers? Note: non-QA/QC related U and J flags do not require additional qualification in this section.	Yes ○	No ●	Comments
18a. Were all calibration verification results within acceptable limits?	Yes ●	No ○	Comments
18b. Were laboratory blank samples free of contamination?	Yes ●	No ○	Comments
18c. Are the percent recoveries and relative percent differences of matrix spike and matrix spike duplicates within quality control limits?	Yes ○	No ●	Comments The MS recoveries for 1 compound and 1 surrogate were outside specified limits parent sample H16100506-013 run at 21:51 on 11/11/16. The other 2 MSMSD runs on this same parent sample reported no QC problems. This parent sample is not from the Meagher Co cleanup project.A 4th MSMSD sample not associated with this project also had no QC issues. No sample data has been flagged as a result of the MSMSD results. All other lab data quality parameters are within specified limits.

If no, explain

18d. Are the control samples the same matrix as the samples, and prepared the same as associated samples?	Yes ●	No ○	Comments
18e. Were laboratory control samples and laboratory control sample duplicate percent recoveries and relative percent differences within laboratory control limits?	Yes ●	No ○	Comments
18f. Were surrogate recoveries within laboratory quality control limits?	Yes ●	No ○	Comments
18g. Were the laboratory duplicate relative percent differences within data validation quality control limits?	Yes ●	No ○	Comments
19. Were the total number of lab method blanks at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments
20. Were the total number of lab matrix spike samples prepared at least 5% of the total number of samples, or as required by the method?	Yes ●	No ○	Comments

21. Please list any project samples used for matrix spike/matrix spike duplicates.

Add Sample	Lab ID	Field Sample ID	Comments
Delete Sample			

	Yes	No	Comments
22. Is the total number of laboratory control samples at least 5% of the total number of samples?	●	○	

Consultant/Validator Questions

	Yes	No	Comments
23. Are the detection limits appropriate for the project (i.e. at or below screening levels)?	●	○	
24. Are the reported units appropriate for the sample matrix (i.e. water results in ug/L, not mg/kg)?	●	○	
25. Do the analytical methods comply with project requirements (e.g. in the SAP, work plan, or QAPP)?	●	○	
26. Do the laboratory reports include all constituents requested to be analyzed on the chain-of-custody or under the sampling plan or other applicable document?	●	○	
27. Is the number of sample blanks (e.g. equipment, trip, or field blanks) equal to at least 10% of the total number of samples, or as otherwise required?	○	●	No blanks were collected for this soil sampling work. Any detected analytes are assumed to be attributable to the site.

If no, explain

	Yes	No	Comments
28. Are field blanks free from contamination, duplicates collected as required, and field duplicate percent differences within data validation quality control limits?	○	●	Field blanks and duplicates were not collected for the 2 soil samples in this data package. Any detected analytes are assumed to be attributable to the site. The usability or interpretation of the data is not affected.
28a. Were all blank samples free of analyte contamination?	○	●	Not applicable. No blanks were collected. See above.

If no, explain

	Yes	No	Comments
28b. Were field duplicates collected as required?	○	●	Field duplicates were not collected for this sampling event. See above for explanation.

If no, explain

	Yes	No	Comments
28c. Are field duplicate relative percent differences within data validation quality control limits?	○	●	Not applicable. Field duplicates were not collected.

If no, explain

29. Please provide an Excel or CSV file to the DEQ project manager (via e-mail or CD) that lists all samples evaluated in this summary and lists any qualified data.
Please use the following format:

Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Example 48310-2.31E	Example GW-1	R	Sample dropped in lab and unrecoverable
Example 48310-2.32D	Example GW-2		

Please use the following format for qualifiers. See EPA's National Functional Guidelines for more information on qualifiers for unique samples such as dioxins.

Qualifier	Explanation
C	Pesticide and Arochlor results confirmed with GC/MS
J-	Estimated value, may be biased low
J	Analyte identified, but concentration is estimated
J+	Estimated value, may be biased high
NJ	Tentatively identified compound
R	Sample result rejected
U	Analyte analyzed for, but not detected above quantitation limit
UJ	Analyte not detected above CRQL, but CRQL may be inaccurate
X	Pesticide and Arochlor results attempted using GC/MS, but unsuccessful

If you wish to manually enter qualified sample results, please use the table below.

Add Sample	Lab ID	Field Sample ID	Qualifiers	Comments (indicate whether the issue biases the results high or low)
Delete Sample				no data were qualified in this report

30. What is the percent completeness (samples planned versus valid samples collected)? 100

Comments

31. Was the completeness goal met? Yes ● No ○

Comments

32. Other general comments or observations?

The samples evaluated in this report are part of a larger set of confirmation soil samples.

Split Samples

33. Did DEQ collect split samples? Yes ○ No ●

Comments

Print Form | Save As | Open Instructions | Hide Instructions

APPENDIX K

BACKFILL MATERIAL ANALYTICAL RESULTS

ANALYTICAL SUMMARY REPORT

September 30, 2016

Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Work Order: H16090157

Project Name: 16048 Meagher County Shop Remediation

Energy Laboratories Inc Helena MT received the following 2 samples for Hydrometrics Inc on 9/8/2016 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H16090157-001	APRP-1	08/31/16 15:00	09/08/16	Soil	Metals by ICP/ICPMS, Total Mercury in Solid By CVAA Percent Moisture Digestion, Total Metals Digestion, Mercury by CVAA Sieve Analysis, Dry Soil Preparation
H16090157-002	LPRP-1	08/31/16 16:50	09/08/16	Soil	Metals by ICP/ICPMS, Total Mercury in Solid By CVAA Percent Moisture Digestion, Total Metals Digestion, Mercury by CVAA

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Work Order: H16090157

Revised Date: 09/30/16
Report Date: 09/15/16

CASE NARRATIVE

Per phone request from M. Walker, sample H16090157-001 (APRP-1) was dried and sieved in the laboratory then analyzed for metals as requested on the COC. abc 9/19/16

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16090157-001
Client Sample ID: APRP-1

Revised Date: 09/30/16
Report Date: 09/15/16
Collection Date: 08/31/16 15:00
DateReceived: 09/08/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	8.0	wt%		0.2		D2974	09/13/16 09:21 / cbt
3050 EXTRACTABLE METALS							
Arsenic	10	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Barium	120	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Cadmium	ND	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Chromium	23	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Lead	15	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Selenium	ND	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
Silver	ND	mg/kg-dry		1		SW6020	09/12/16 16:19 / dck
EXTRACTABLE METALS, DRIED AND SIEVED							
Arsenic	15	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Barium	151	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Cadmium	ND	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Chromium	28	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Lead	22	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Selenium	ND	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
Silver	ND	mg/kg-dry		1		SW6020	09/26/16 15:33 / dck
METALS, TOTAL							
Mercury	ND	mg/kg-dry		0.50		SW7471B	09/12/16 11:29 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hydrometrics Inc
Project: 16048 Meagher County Shop Remediation
Lab ID: H16090157-002
Client Sample ID: LPRP-1

Revised Date: 09/30/16
Report Date: 09/15/16
Collection Date: 08/31/16 16:50
DateReceived: 09/08/16
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	5.1	wt%		0.2		D2974	09/13/16 09:21 / cbt
3050 EXTRACTABLE METALS							
Arsenic	5	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Barium	67	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Cadmium	ND	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Chromium	13	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Lead	15	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Selenium	ND	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
Silver	ND	mg/kg-dry		1		SW6020	09/12/16 16:36 / dck
METALS, TOTAL							
Mercury	ND	mg/kg-dry		0.50		SW7471B	09/12/16 11:36 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: D2974									Batch: R118594
Lab ID: H16090157-001ADUP	Sample Duplicate				Run: SOIL DRYING OVEN 2_16091			09/13/16 09:21	
Moisture	7.90	wt%	0.20				0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6020**								Analytical Run: ICPMS204-B_160912C	
Lab ID:	**ICV STD**	Initial Calibration Verification Standard							09/12/16 13:19	
Arsenic		0.0616	mg/L	0.0010	103	90	110			
Barium		0.0587	mg/L	0.0010	98	90	110			
Cadmium		0.0301	mg/L	0.0010	100	90	110			
Chromium		0.0603	mg/L	0.0010	100	90	110			
Lead		0.0585	mg/L	0.0010	97	90	110			
Selenium		0.0600	mg/L	0.0010	100	90	110			
Silver		0.0306	mg/L	0.0010	102	90	110			
Method:	**SW6020**									Batch: 34378
Lab ID:	**MB-34378**	Method Blank				Run: ICPMS204-B_160912C			09/12/16 15:08	
Arsenic		0.1	mg/kg	0.05						
Barium		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.2						
Chromium		ND	mg/kg	0.8						
Lead		ND	mg/kg	0.09						
Selenium		ND	mg/kg	0.2						
Silver		0.06	mg/kg	0.05						
Lab ID:	**LCS-34378**	Laboratory Control Sample				Run: ICPMS204-B_160912C			09/12/16 15:12	
Arsenic		176	mg/kg	1.0	90	71.4	105.1			
Barium		195	mg/kg	1.0	104	78.6	112.8			
Cadmium		99.4	mg/kg	1.0	100	73.9	106.1			
Chromium		124	mg/kg	1.0	106	73.5	108.5			
Lead		114	mg/kg	1.0	108	74.4	108.6			
Selenium		198	mg/kg	1.0	97	71.2	110.2			
Silver		45.3	mg/kg	1.0	108	70.8	111.9			
Lab ID:	**LFB-34378**	Laboratory Fortified Blank				Run: ICPMS204-B_160912C			09/12/16 15:15	
Arsenic		48.9	mg/kg	1.0	99	80	120			
Barium		49.0	mg/kg	1.0	99	80	120			
Cadmium		24.6	mg/kg	1.0	99	80	120			
Chromium		51.4	mg/kg	1.0	104	80	120			
Lead		50.2	mg/kg	1.0	101	80	120			
Selenium		47.1	mg/kg	1.0	95	80	120			
Silver		23.8	mg/kg	1.0	96	80	120			
Lab ID:	**H16090057-001APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_160912C			09/12/16 15:25	
Arsenic		495	mg/kg-dry	1.0	95	75	125			
Barium		630	mg/kg-dry	1.0	101	75	125			
Cadmium		242	mg/kg-dry	1.0	94	75	125			
Chromium		524	mg/kg-dry	1.0	101	75	125			
Lead		536	mg/kg-dry	1.0	100	75	125			
Selenium		454	mg/kg-dry	1.0	88	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6020**									Batch: 34378
Lab ID:	**H16090057-001APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_160912C				09/12/16 15:25
Silver		211	mg/kg-dry	1.0	82	75	125			
Lab ID:	**H16090157-001APDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_160912C				09/12/16 16:26
Arsenic		502	mg/kg-dry	1.0	94	75	125			
Barium		644	mg/kg-dry	1.0	100	75	125			
Cadmium		246	mg/kg-dry	1.0	94	75	125			
Chromium		553	mg/kg-dry	1.0	101	75	125			
Lead		542	mg/kg-dry	1.0	100	75	125			
Selenium		450	mg/kg-dry	1.0	85	75	125			
Silver		208	mg/kg-dry	1.0	79	75	125			
Lab ID:	**H16090157-001AMS**	Sample Matrix Spike				Run: ICPMS204-B_160912C				09/12/16 16:29
Arsenic		58.7	mg/kg-dry	1.0	90	75	125			
Barium		192	mg/kg-dry	1.0	135	75	125			S
Cadmium		26.2	mg/kg-dry	1.0	98	75	125			
Chromium		80.3	mg/kg-dry	1.0	106	75	125			
Lead		71.4	mg/kg-dry	1.0	105	75	125			
Selenium		49.7	mg/kg-dry	1.0	92	75	125			
Silver		26.3	mg/kg-dry	1.0	98	75	125			
Lab ID:	**H16090157-001AMSD**	Sample Matrix Spike Duplicate				Run: ICPMS204-B_160912C				09/12/16 16:32
Arsenic		58.4	mg/kg-dry	1.0	89	75	125	0.6	20	
Barium		187	mg/kg-dry	1.0	125	75	125	2.9	20	
Cadmium		26.7	mg/kg-dry	1.0	99	75	125	1.8	20	
Chromium		79.8	mg/kg-dry	1.0	105	75	125	0.7	20	
Lead		73.2	mg/kg-dry	1.0	109	75	125	2.6	20	
Selenium		49.5	mg/kg-dry	1.0	92	75	125	0.3	20	
Silver		26.1	mg/kg-dry	1.0	97	75	125	1.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6020**								Analytical Run: ICPMS204-B_160926B	
Lab ID:	**ICV STD**	Initial Calibration Verification Standard							09/26/16 15:00	
Arsenic		0.0606	mg/L	0.0010	101	90	110			
Barium		0.0580	mg/L	0.0010	97	90	110			
Cadmium		0.0294	mg/L	0.0010	98	90	110			
Chromium		0.0592	mg/L	0.0010	99	90	110			
Lead		0.0582	mg/L	0.0010	97	90	110			
Selenium		0.0619	mg/L	0.0010	103	90	110			
Silver		0.0300	mg/L	0.0010	100	90	110			
Method:	**SW6020**									Batch: 34509
Lab ID:	**MB-34509**	Method Blank				Run: ICPMS204-B_160926B			09/26/16 15:20	
Arsenic		ND	mg/kg	0.05						
Barium		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.2						
Chromium		ND	mg/kg	0.8						
Lead		ND	mg/kg	0.09						
Selenium		ND	mg/kg	0.1						
Silver		0.3	mg/kg	0.05						
Lab ID:	**LCS-34509**	Laboratory Control Sample				Run: ICPMS204-B_160926B			09/26/16 15:23	
Arsenic		171	mg/kg	1.0	87	71.4	105.1			
Barium		191	mg/kg	1.0	102	78.6	112.8			
Cadmium		96.4	mg/kg	1.0	97	73.9	106.1			
Chromium		116	mg/kg	1.0	99	73.5	108.5			
Lead		104	mg/kg	1.0	99	74.4	108.6			
Selenium		192	mg/kg	1.0	94	71.2	110.2			
Silver		41.3	mg/kg	1.0	98	70.8	111.9			
Lab ID:	**LFB-34509**	Laboratory Fortified Blank				Run: ICPMS204-B_160926B			09/26/16 15:26	
Arsenic		50.1	mg/kg	1.0	102	80	120			
Barium		51.3	mg/kg	1.0	104	80	120			
Cadmium		24.9	mg/kg	1.0	101	80	120			
Chromium		52.4	mg/kg	1.0	107	80	120			
Lead		51.4	mg/kg	1.0	105	80	120			
Selenium		49.5	mg/kg	1.0	101	80	120			
Silver		26.2	mg/kg	1.0	106	80	120			
Lab ID:	**H16090157-001BPDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_160926B			09/26/16 15:39	
Arsenic		470	mg/kg-dry	1.0	93	75	125			
Barium		642	mg/kg-dry	1.0	100	75	125			
Cadmium		226	mg/kg-dry	1.0	92	75	125			
Chromium		507	mg/kg-dry	1.0	98	75	125			
Lead		515	mg/kg-dry	1.0	100	75	125			
Selenium		425	mg/kg-dry	1.0	86	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6020**									Batch: 34509
Lab ID:	**H16090157-001BPDS**	Post Digestion/Distillation Spike				Run: ICPMS204-B_160926B				09/26/16 15:39
Silver		221	mg/kg-dry	1.0	90	75	125			
Lab ID:	**H16090157-001BMS**	Sample Matrix Spike				Run: ICPMS204-B_160926B				09/26/16 15:43
Arsenic		63.5	mg/kg-dry	1.0	99	75	125			
Barium		218	mg/kg-dry	1.0	137	75	125			S
Cadmium		24.5	mg/kg-dry	1.0	99	75	125			
Chromium		80.7	mg/kg-dry	1.0	108	75	125			
Lead		72.4	mg/kg-dry	1.0	103	75	125			
Selenium		46.2	mg/kg-dry	1.0	93	75	125			
Silver		25.5	mg/kg-dry	1.0	103	75	125			
Lab ID:	**H16090157-001BMSD**	Sample Matrix Spike Duplicate				Run: ICPMS204-B_160926B				09/26/16 15:46
Arsenic		63.5	mg/kg-dry	1.0	99	75	125	0.0	20	
Barium		225	mg/kg-dry	1.0	152	75	125	3.3	20	S
Cadmium		24.6	mg/kg-dry	1.0	99	75	125	0.4	20	
Chromium		82.3	mg/kg-dry	1.0	112	75	125	2.0	20	
Lead		72.7	mg/kg-dry	1.0	104	75	125	0.4	20	
Selenium		45.7	mg/kg-dry	1.0	92	75	125	1.0	20	
Silver		25.3	mg/kg-dry	1.0	102	75	125	1.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 09/30/16

Client: Hydrometrics Inc

Report Date: 09/15/16

Project: 16048 Meagher County Shop Remediation

Work Order: H16090157

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW7471B**							Analytical Run: HGCV201-H_160912A		
Lab ID:	**ICV**	Initial Calibration Verification Standard							09/12/16 11:03	
Mercury		0.0010	mg/kg	0.50	102	90	110			
Lab ID:	**CCV**	Continuing Calibration Verification Standard							09/12/16 11:05	
Mercury		0.0025	mg/kg	0.50	102	90	110			
Method:	**SW7471B**								Batch: 34383	
Lab ID:	**MB-34383**	Method Blank				Run: HGCV201-H_160912A			09/12/16 11:23	
Mercury		ND	mg/kg	0.001						
Lab ID:	**LCS-34383**	Laboratory Control Sample				Run: HGCV201-H_160912A			09/12/16 11:25	
Mercury		5.4	mg/kg	0.50	107	71	126.4			
Lab ID:	**LFB-34383**	Laboratory Fortified Blank				Run: HGCV201-H_160912A			09/12/16 11:27	
Mercury		0.19	mg/kg	0.50	97	80	120			
Lab ID:	**H16090157-001AMS**	Sample Matrix Spike				Run: HGCV201-H_160912A			09/12/16 11:32	
Mercury		0.21	mg/kg-dry	0.50	100	80	120			
Lab ID:	**H16090157-001AMSD**	Sample Matrix Spike Duplicate				Run: HGCV201-H_160912A			09/12/16 11:34	
Mercury		0.21	mg/kg-dry	0.50	101	80	120		20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Hydrometrics Inc

H16090157

Login completed by: Tracy L. Lorash

Date Received: 9/8/2016

Reviewed by: BL2000\sdull

Received by: RAT

Reviewed Date: 9/12/2016

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	4.2°C Blue Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

Hydrometrics, Inc.

3020 Bozeman Ave. • Helena, MT 59601 • (406) 443-4150

PROJ. NO.: 16048

PROJECT NAME: Meagher County Shop Remediation

SAMPLERS: *(Signature)* JPell

DATE	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Commons UF / RAW	Nutrients UF / H_2SO_4	Diss. Metal F / HNO_3	CN UF / NaOH	Total Metals UF / HNO_3	Total Recoverable Metals UF / HNO_3	BTEX	~~TPH~~	Total lead	Total arsenic	Total barium	Total cadmium	Total chromium	Total Selenium	Total silver	Total mercury 74T/A	REMARKS
8/31/16	1500	X		APRP-1	01								X	X	X	X	X	X	X	X		* RUSH
8/31/16	1650	X		LPRP-1	01								X	X	X	X	X	X	X	X		* RUSH
																						H16090157

Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Lab	P.O. #	Shipped via: Bus FedEx UPS
JPell	9/8/16 1135			HLN 10284	Other hand-deliver Air Bill #
Relinquished *(Signature)*	Date / Time	Received by *(Signature)*	Remarks Please process on RUSH/Expedited Analysis basis Please forward results to Jamie Paell, Hydrometrics, 3020 Bozeman Avenue, Helena, MT 59601 4.2° to blue ice/cooler		
Relinquished *(Signature)*	Date / Time	Received for Laboratory by *(Signature)* Rebecca Foote	Date / Time 9/8/16 11:35	Enclosed: ❑ Parameter sheet w/detection limits ❑ QA / AC standard mixing instructions ❑ Cover letter ❑ Other	

HFORM-1 07/11

Return results & electronic copy to:

Split Samples:
❑ Accepted ❑ Declined

September 20, 2016

Jamie Poell
Hydrometrics, Inc.
3020 Bozeman Ave.
Helena, MT 59601

RE: Hydrometrics Material Testing
Meagher County Shop Remediation, HLN10285
Pioneer Technical Services, Inc. Project No. 1601067

Dear Mr. Poell,

On September 8, two samples from the Meagher County Shop Remediation project were delivered to our AASHTO/ASTM accredited materials testing laboratory. The samples were referenced as "APRP-1" and "LPRP-1" and given Lab Nos. 19244 and 19245 respectively. The testing was performed in general accordance with the following Standard:

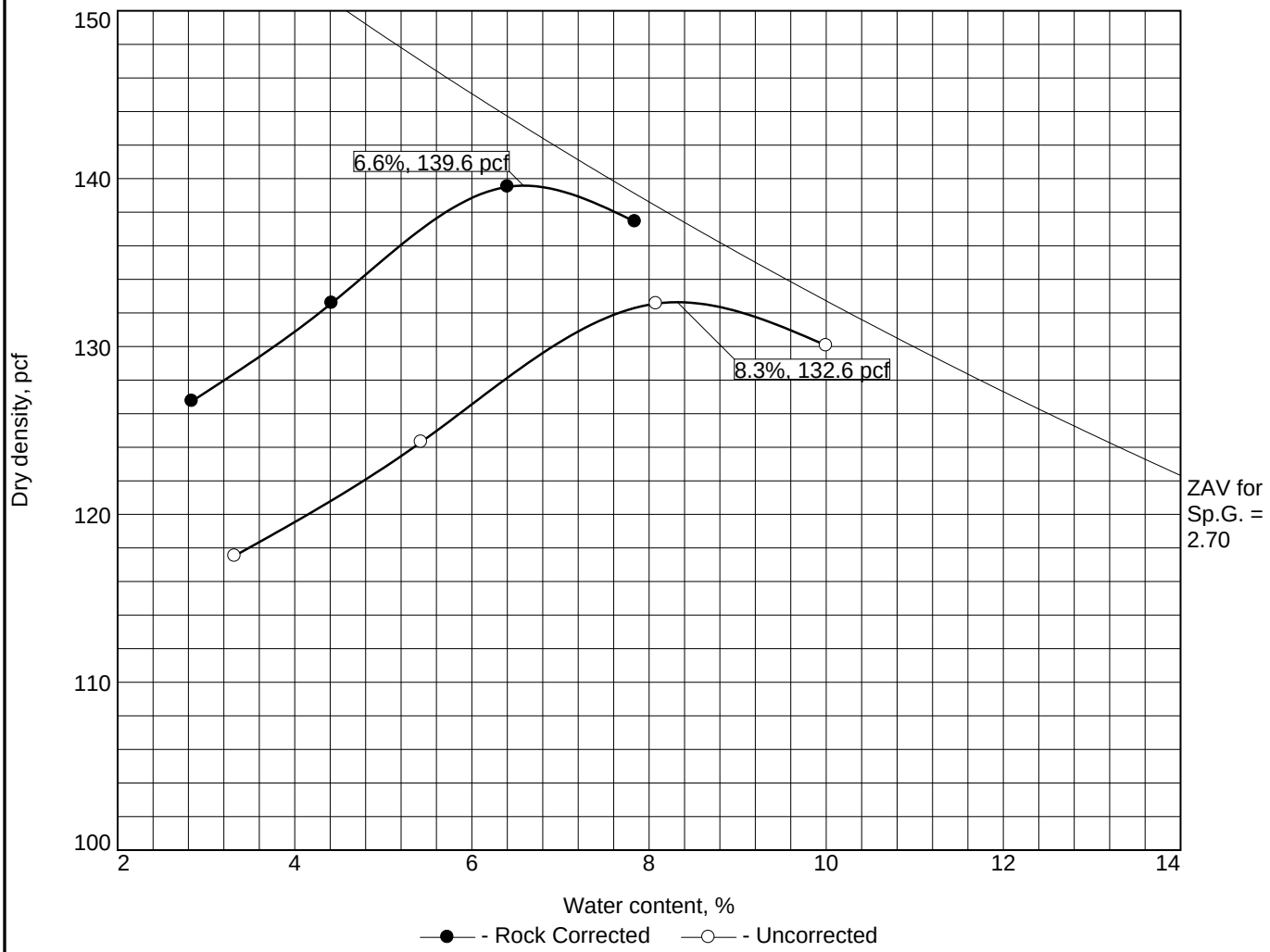
- Standard Proctor Moisture/Density Relationships (ASTM D698 Method C).

The Proctor curves are included with this report. We thank you for using Pioneer Technical Services, Inc. for your geotechnical and materials testing requirements. If you have any questions regarding these results, please contact Kevin Mock at (406) 443-6053.

Sincerely,
PIONEER TECHNICAL SERVICES, INC.

Kevin Mock
Materials Testing Supervisor

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method C Standard
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
				2.65			25.1	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 139.6 pcf	132.6 pcf	Clayey Sand with Gravel
Optimum moisture = 6.6 %	8.3 %	

Project No. 1601067 **Client:** Hydrometrics, Inc.
Project: Meagher County Shop Remediation

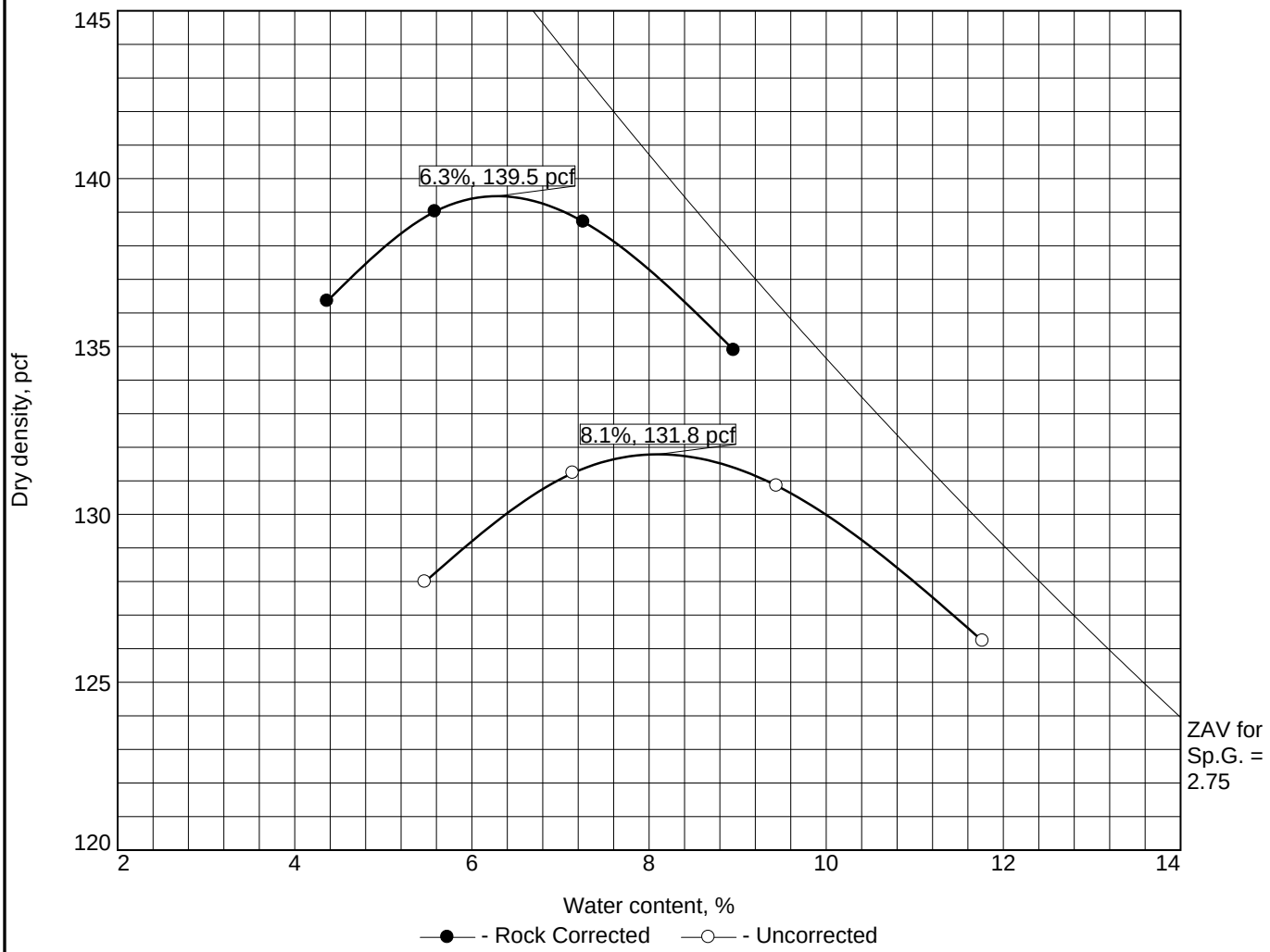
○**Location:** APRP-1 **Sample Number:** 19244

Remarks:
9-8-16

PIONEER TECHNICAL SERVICES, INC.

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method C Standard
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
				2.65			27.1	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 139.5 pcf	131.8 pcf	Silty Gravel with Sand
Optimum moisture = 6.3 %	8.1 %	

Project No. 1601067 **Client:** Hydrometrics, Inc.
Project: Meagher County Shop Remediation

○**Location:** LPRP-1 **Sample Number:** 19245

Remarks:
9-8-16

PIONEER TECHNICAL SERVICES, INC.

Figure

PIONEER TECHNICAL SERVICES, INC.
1309 Cole Ave
Helena, MT 59601
Phone: (406) 443-6053 | Fax: (406) 442-1158

Soil Nuclear Gauge

Report Date: 10/28/2016
Test Method: ASTM D 6938

Client:
Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Project:
1601067
General Testing Hydrometrics

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Remark
1		10/27/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	6.4	135.9	6	97	95	DP/MP
2		10/27/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	6.8	139.3	6	100	95	DP/MP

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
1	Backfill: 15' south and 18' east of northwest corner of excavation		approximately 6' below finish grade	Troxler 3430 21901	Mock, Kevin
2	Backfill: 35' south and 25' east of northwest corner of excavation		approximately 6' below finish grade	Troxler 3430 21901	Mock, Kevin

Remarks	Comments
DP/MP: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Michael Browne, P.E.
Geotechnical Engineer

This report applies to conditions existing on test date. Subsequent changes in conditions (e.g., effects of rainfall, frost, etc.) may invalidate this report.

PIONEER TECHNICAL SERVICES, INC.
1309 Cole Ave
Helena, MT 59601
Phone: (406) 443-6053 | Fax: (406) 442-1158

Soil Nuclear Gauge

Report Date: 11/18/2016
Test Method: ASTM D 6938

Client:
Hydrometrics Inc
3020 Bozeman Ave
Helena, MT 59601

Project:
1601067
General Testing Hydrometrics

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Remark
3		11/2/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	6.5	127.9	6	92	95	DF
4		11/2/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	6.2	128.4	6	92	95	DF
5		11/2/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	5.9	133.3	6	95	95	DP
6		11/2/16	APRP-1 #19244	D698 C	GM w/S	6.6	139.6	6.5	133.0	6	95	95	DP

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
3	Backfill: White Sulphur Springs, Meagher Co. Shop, 48 ft north and 51 ft east of northwest corner of existing shop		final lift	Troxler 3440 27855	Neff, Robert
4	Backfill: White Sulphur Springs, Meagher Co. Shop, 75 ft north and 33 ft east of northwest corner of existing shop		final lift	Troxler 3440 27855	Neff, Robert
5	Backfill: White Sulphur Springs, Meagher Co. Shop, 84 ft north and 60 ft east of the northwest corner of existing shop		final lift	Troxler 3440 27855	Neff, Robert
6	Backfill: White Sulphur Springs, Meagher Co. Shop, 30 ft south of Garfield, 21 ft east of 6th Ave		final lift	Troxler 3440 27855	Neff, Robert

Remarks	Comments
DF: Density Fail **DP:** Density Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

Kevin Mock
Materials Testing Superivsor

This report applies to conditions existing on test date. Subsequent changes in conditions (e.g., effects of rainfall, frost, etc.) may invalidate this report.

APPENDIX L

MCMW-2R2 REPLACEMENT MONITORING WELL INSTALLATION LOG AND NOTES

Hydrometrics, Inc.

Consulting Scientists and Engineers
Helena, Montana

Monitor Well Log

Hole Name: MCMW-2R2

Date Hole Started: 11/8/2016 Date Hole Finished: 11/8/2016

Client: Meagher County
Project: Meagher County Soil Remediation
County: Meagher County State: Montana
Property Owner: Meagher County
Legal Description: SW, SE, NE S13, T9N R6E
Location Description: Meagher County Shop, between SW corner of East Shop and SE corner of West Shop

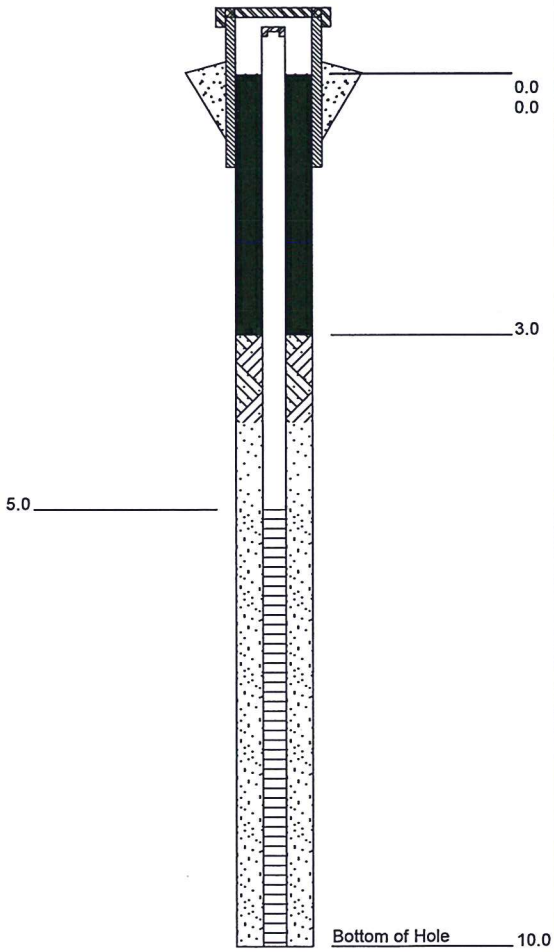
Recorded By: R. Lane
Drilling Company: Hydrometrics, Inc.
Driller: Hydrometrics, Inc.
Drilling Method: Hollow Stem Auger
Drilling Fluids Used: None
Purpose of Hole: Replacement Well
Target Aquifer:
Hole Diameter (in): 6"
Total Depth Drilled (ft): 10

WELL COMPLETION	Y/N	DESCRIPTION	INTERVAL
Well Installed?	Y	2-inch, flush threaded, Sch 40, PVC	0 - 10
Surface Casing Used?	Y	6" Steel	1.5 - 2.55
Screen/Perforations?	Y	0.010-inch slot, Sch 40, PVC	5 - 10
Sand Pack?	Y	Sand Pack	3 - 10
Annular Seal?	Y	Bentonite	0 - 3
Surface Seal?	Y	Concrete	0 - +4
DEVELOPMENT/SAMPLING			
Well Developed?	N		
Water Samples Taken?	N		
Boring Samples Taken?	N		

Northing: Easting:
Static Water Level Below MP: 9.68
Date: 1/14/2017
MP Description: Top of PVC
MP Height Above or Below Ground (ft):
Surface Casing Height (ft): 2.55
Riser Height (ft): 2.30
Ground Surface Elevation (ft): 5016.87
MP Elevation (ft): 5019.42

Remarks:

WELL CONSTRUCTION



GRAPHICS

GEOLOGICAL DESCRIPTION

0.0 - 8.0' **BACKFILL**
Dug backfill from excavation.

8.0 - 10.0'
Very wet, slurry backfill from excavation.

STANDARD_REV3 K:\GINT\PROJECTS\16048 - GEOTECHNICAL LOG.GPJ HYDHLN2.GDT 1/31/17

(1) ~20ft N of hydrant, edge of road.

→ MCMW-1 : 4.69
→ MCMW-2R : N/A
→ MCMW-3R : 0.33

mw-3R = 5017.72'

(2) next to A2-16 power pole, ~~east~~ West lane - center.

MCMW-2R 6.35
MCMW-1 6.41

mw-2R = 5019.42'

mw-1 = 5013.36'

ON-SITE @ MEAGHER COUNTY SHOP @ 9:45 TO SHOOT IN ELEVATION OF MONITORING WELLS MCMW-2R + MCMW-3R. MONITORING WELL MCMW-1 WAS USED AS BENCHMARK.

- PERSONNEL: R. WOODS, J. HARWOOD
- WEATHER: 16°F, BREEZE, CLEAR
- EQUIPMENT: AUTO-LEVEL