# memorandum

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| **To:** | Ms. Moriah Bucy, Montana DEQ |
| **From:** | Mr. Andrew Vann |
| **cc:** | Mr. Luke Darnell |
| **Date:** | May 17, 2017, Revised June 15, 2017 |
| **Re:** | 2016 Diamond P Remediation – Diamond P Summary Report, Diamond P Ranch, West Yellowstone, Montana |

## BACKGROUND

The Diamond P Ranch Facility (Facility) is located along Highway 20, also known as Targhee Pass Road, seven miles west of West Yellowstone, Gallatin County, Montana. The property has operated as a ranch and then a seasonal tourist horse riding operation for the past 60 years. During the first 40 years of ranch operations, wooden fence posts were treated with used motor oil, and for a short time in the 1980s pentachlorophenol (PCP) was used. The property owner has identified the former wood treating took place in three partially buried drums on the west side of the former homestead house. In 1999, DEQ's Enforcement Division confirmed that PCP and extractable petroleum hydrocarbons (EPH) were present in surface soil (0-2 feet below ground surface (bgs)) and subsurface soil (2-4 feet bgs) at concentrations above screening levels near the barrels used for dipping posts. Information from the 1999 sampling event indicated that the horizontal extent of soil impacts was estimated to be roughly a 30 by 30 foot area. By 2002 the property owner had removed the treatment barrels and associated used oil and four two-inch groundwater monitoring wells were later installed; three immediately surrounding the former wood treatment area and a fourth on the east side of the former homestead house. The property owner's consultant sampled these wells five times between 2004 and 2015. The static groundwater levels in the monitoring wells exhibit seasonal fluctuations from 15 to 24 feet bgs. Because there are confirmed soil impacts from PCP used in a wood treating operation and the PCP appears to be preservative drippage or spent formulation, the PCP impacted media was treated as F032 listed RCRA hazardous waste.

In October 2015, Trihydro Corporation (Trihydro), on behalf of DEQ, conducted a soil sampling event to delineate and characterize/quantify soil impacts around the former wood-treating operation. Ten soil borings were installed to depths of 15 to 20 feet below ground surface in and around the presumed spill area. Details and results of the soil investigation were provided in the Final Excavation Design Report (March 4, 2016).

Excavation of the impacted soil from the PCP source area took place in July 2016. Exceedances in confirmation soil samples, detailed below, required two additional excavation events in September 2016 and November 2016. Two groundwater sampling events were conducted in September 2016 and April 2017.

## JULY 2016 SOIL EXCAVATION, DISPOSAL, AND CONFIRMATION SAMPLING

Excavation was performed in accordance with the March 4, 2016 Final Excavation Design Report. Trihydro contracted with Repose Excavation (Repose) based in Deer Lodge, MT to perform excavations at the Facility. On July 8 – 11, 2016 Repose excavated an approximate 1,000 square foot area (approximately 30 feet east-west x 35 feet north-south) adjacent to the former homestead house, based on samples collected during the 2015 direct push investigation (Figure 1). The excavation was cone shaped and reached a depth of approximately 20 feet at the deepest point. Groundwater was not observed in the excavation. Sandy clay soil was observed from approximately seven feet bgs to the total depth of the excavation. The three monitoring wells surrounding the original post treating area (previously installed by the property owner) were not disturbed during the excavation work. The eastern extent of the excavation was limited by the former homestead house. Excavation ended approximately two feet west of the building to protect the structural integrity of the foundation. Stained soil consistent with the source area material was observed in a small area of the eastern sidewall, near the location of the former dipping barrels (see photo log in Attachment C).

Approximately 57 tons of hazardous soil was excavated and loaded into lined rolloffs. The rolloffs were transported to Utah for incineration and disposal by Clean Harbors. Hazardous waste manifests and invoices including rolloff weights are included in Attachment A. An additional 231 tons of non-hazardous soil was excavated and transported to the Gallatin Solid Waste Management District (GSWMD) Logan Landfill. Weigh tickets for the non-hazardous soil are included in Attachment B1. The non-hazardous soil was covered by municipal solid waste and a minimum of two feet of cover soil when it was placed in the landfill. The GSWMD Logan Landfill accepted the soil based on the analytical results. DEQ provided a No Longer Contained-In determination for the non-hazardous waste and approval for disposal at the GSWMD Landfill on July 1, 2016 (Attachment B2). Following excavation, confirmation samples were collected on July 11, 2016. Following confirmation sampling, the excavation was fenced off to prevent access. Backfill of the excavation was planned to occur after receipt of confirmation sample results. Field notes, forms, excavation coordinates, and photos are included in Attachment C.

Confirmation sampling was performed according to Section 5.3 of the Final Excavation Design Report. The excavation was divided into four triangular-shaped sample areas, one for each cardinal direction. This lead to a maximum confirmation sample area of approximately 250 square feet or less per sample. Surface soil samples were collected from 0-2 feet bgs. Subsurface soil samples were collected from 2-20 feet bgs. Because the sidewalls sloped and converged in the cone-shaped excavation, there was no excavation floor and therefore floor samples were not collected. Five-point composite samples were collected for surface and subsurface soil in each sample area. Surface soil aliquots were collected by scraping from bottom of the interval (2 feet bgs) to the top (0 feet bgs). Subsurface soil aliquots were collected by scraping up across about 2 feet intervals at random depths to provide a representative sample. Confirmation sample results were compared to residential and leaching to groundwater site-specific screening levels (SSSLs) for surface soil (0-2 feet), and construction and leaching to groundwater SSSLs

for subsurface soil. Surface and subsurface soil SSSLs were calculated by DEQ and provided in a memorandum dated March 9, 2016.

### Surface Soil Sidewall

Four, five-point composite samples were collected from the surface soil portion of the sidewalls of the excavation (depth of 0-2 feet) (Figure 1). The samples were analyzed for surface soil contaminants of potential concern (COPCs) including PCP, dioxin/furan, extractable petroleum hydrocarbon (EPH) fractions, and polycyclic aromatic hydrocarbons (PAHs), and sample results and SSSLs are shown on Table1. Sample results from the following samples exceeded SSSLs:

- DIAP-S-EAST: PCP (1.2 milligrams per kilogram [mg/kg]; exceeded leaching-based SSSL of 0.68 mg/kg), dioxin/furan (440 nanograms per kilogram [ng/kg]; exceeded residential SSSL of 34.4 ng/kg and leaching-based SSSL of 66.64 ng/kg; measured as a toxicity equivalence quotient [TEQ])
- DIAP-S-NORTH: Dioxin/furan (170 ng/kg; exceeded residential SSSL of 34.4 ng/kg and leaching-based SSSL of 66.64 ng/kg), carcinogenic PAHs (cPAH) (TEQ) (0.222 mg/kg; exceeded residential SSSL of 0.1 mg/kg)
- DIAP-S-SOUTH: Dioxin/furan (360 ng/kg; exceeded residential SSSL of 34.4 ng/kg and leaching-based SSSL of 66.64 ng/kg)

### Subsurface Soil Sidewall

Four, five-point composite samples and one duplicate sample were collected from the subsurface soil portion of the sidewalls of the excavation (depth greater than 2 feet) (Figure 1). The samples were analyzed for subsurface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and the results and SSSLs are shown on Table 2. Sample results did not exceed SSSLs, with the exceptions below:

- DIAP-SS-EAST (2-20): PCP (11 mg/kg/15 mg/kg (Dup); exceeded leaching-based SSSL of 0.68 mg/kg), dioxin/furan (400 ng/kg/620 ng/kg (Dup); exceeded leaching-based SSSL of 66.64 ng/kg)
- DIAP-SS-WEST (2-20): Dioxin/furan (77 ng/kg; exceeded leaching-based SSSL of 66.64 ng/kg)

DEQ did not request additional excavation to remove the DIAP-SS-WEST sample, as other sites show that dioxin is not a leaching risk in the absence of a carrier solution and the site-specific dioxin leaching analysis for this facility can be conducted at a later time, per DEQ email dated September 9, 2016.

## Data Validation

Data validation was performed in accordance with DEQ guidelines, and data were determined to be useable for decision-making purposes. Laboratory analytical reports and associated data validation reports for the confirmation samples are included in Attachment D.

## Recommendations

The DIAP-S-EAST (surface soil) and DIAP-SS-EAST (subsurface soil) samples were collected adjacent to the former homestead house, so additional excavation to the east was not feasible. Limited surface excavations to the north and south are possible, and could be performed during backfill of the existing excavation. As a result of the exceedances in the surface soil in the north and south sidewalls, Trihydro recommended additional surface soil excavation to the north and south of the excavation to remove additional contaminated soil, to the extent possible based on nearby site features. The additional excavation was approved by DEQ.

## SEPTEMBER 2016 SOIL EXCAVATION, DISPOSAL, CONFIRMATION SAMPLING, AND BACKFILL

In September 2016, Trihydro and Repose returned to the Diamond P Ranch to backfill the July 2016 excavation and expand the excavation to remove surface soil exceedances on the north and south sides. On September 12, 2016 Repose excavated an approximate 120 square foot area (approximately 10 x 12 feet) immediately south of the July 2016 excavation to remove the DIAP-S-SOUTH surface soil sample (dioxin/furan: 360 ng/kg) and an approximately 25 square foot area (approximately 10 x 25 feet) immediately north of the July 2016 excavation to remove the DIAP-S-NORTH surface soil sample (dioxin/furan,170 ng/kg; cPAH TEQ, 0.222 mg/kg) (Figure 1). The excavations were completed to a depth of at least 2 feet (floors sloped toward the previous excavation). Approximately 33 tons of non-hazardous soil was excavated and transported to the GSWMD Logan Landfill (Attachment B). The contaminated soil was covered by municipal solid waste and a minimum of two feet of cover soil when it was placed in the landfill. The GSWMD Logan Landfill accepted the soil based on the analytical results. DEQ provided a No Longer Contained-In determination for the non-hazardous waste and approval for disposal at the GSWMD Landfill on September 9, 2016. Field notes, forms, excavation coordinates, and photos are included in Attachment C. Following excavation, confirmation samples were collected from sidewalls (surface soil) and floors (subsurface) on September 12, 2016. Confirmation sampling was performed according to Section 5.3 of the Final Excavation Design Report. Confirmation sample results were compared to residential and leaching to groundwater SSSLs for surface soil (0-2 feet), and construction and leaching to groundwater SSSLs for subsurface soil.

## Surface Soil Sidewall

Two, five-point composite samples were collected from the sidewalls of the excavation (depth of 0-2 feet) (Figure 1). The samples were analyzed for surface soil COPCs, including PCP, dioxin/furan, EPH

fractions, and PAHs, and sample results and SSSLs are shown on Table 1. Sample results from the following samples exceeded SSSLs:

- DIAP-S-NORTH-01: Dioxin/furan (330 ng/kg; exceeded residential SSSL of 34.4 ng/kg and leaching-based SSSL of 66.64 ng/kg), cPAH TEQ (0.464 mg/kg; exceeded residential SSSL of 0.1 mg/kg)

### Subsurface Soil Floor

Two, five-point composite samples and one duplicate sample were collected from the floors of each excavation (depth greater than 2 feet) (Figure 1). The samples were analyzed for subsurface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and the results and SSSLs are shown on Table 2. Sample results did not exceed SSSLs.

### Backfill

Backfill of the July 2016 excavation coincided with the September 2016 excavation. The September 2016 excavations were backfilled immediately after samples were collected to limit additional disruptions to the property owner. Sample results representing an onsite backfill source were submitted for DEQ review and approval on August 9, 2016, and DEQ approved use of this soil on August 12, 2016. One 5-point composite sample (DIAP-BKFL-POND), representing up to 400 cubic yards, was collected from the onsite backfill source. The sample was composited in the field and analyzed for RCRA 8 metals and compared to the Montana Background Threshold Values from the 2013 Inorganic Background Study (Hydrometrics, 2013) and adjusted EPA RSLs (USEPA, 2016) (only used for compounds whose detection limits (not-detected) exceeded the background threshold value). A five-point composite sample (DIAP-BKFL-DTCH) was also collected from material excavated from irrigation ditches as an additional potential onsite backfill source but that material was not used during this project. The onsite backfill source was an empty pond located approximately 2,000 feet south of the source area, on the south side of Highway 20 that is part of the ranch's irrigation system. The backfill material was primarily clay with some sand and silt. Backfill sample analytical results did not exceed threshold values except detection limits for cadmium, selenium, and silver. However, the detection limits for these three analytes did not exceed EPA RSLs (Table 3). DEQ approved use of the onsite backfill source via email dated August 12, 2016.

Trihydro confirmed that road mix/gravel surface restoration was acceptable to the property owner, and sampled the proposed source, Deer Lodge Asphalt's pit in Deer Lodge, MT on August 10, 2016. DEQ approved use of the road mix/gravel in email dated September 9, 2016. The sample was analyzed for the RCRA 8 metals. Sample results were compared to the Montana Background Threshold Values from the 2013 Inorganic Background Study (Hydrometrics, 2013) and adjusted EPA RSLs (USEPA, 2016) (only used for compounds whose detection limits (not-detected) exceeded the background threshold value). Road mix/gravel sample analytical results did not exceed threshold values except detection limits for

cadmium, selenium, and silver. However, the detection limits for these three analytes did not exceed EPA RSLs (Table 3). DEQ approved use of the Deer Lodge road mix via email dated September 9, 2016.

### Data Validation

Data validation was performed in accordance with DEQ guidelines, and data were determined to be useable for decision-making purposes. Laboratory analytical reports and associated data validation reports for the confirmation, onsite backfill, and road mix samples are included in Attachment D.

### Recommendations

As a result of the exceedances for dioxin and cPAHs in the surface soil in the north sidewall, Trihydro recommended additional surface soil excavation to the north excavation to remove additional contaminated soil, to the extent possible based on nearby site features. DEQ concurred with the recommendation.

## NOVEMBER 2016

In November 2016, Trihydro and Repose returned to the Diamond P Ranch to expand the excavation to remove the surface soil exceedance. On November 12, 2016 Repose excavated an approximate 500 square foot area (approximately 20 x 25 feet) immediately north of the September 2016 excavation to remove the DIAP-S-NORTH-01 surface soil sample (dioxin/furan, 330 ng/kg; cPAH TEQ, 0.464 mg/kg). The excavation was completed to a depth of 2 feet. Approximately 52 tons of non-hazardous contaminated material was excavated and transported to the landfill (Attachment B). The contaminated soil was covered by municipal solid waste and a minimum of two feet of cover soil when it was placed in the landfill. The GSWMD Logan Landfill accepted the soil based on the analytical results. DEQ provided a No Longer Contained-In determination for the non-hazardous waste and approval for disposal at the GSWMD Landfill on November 11, 2016. Field notes, forms, excavation coordinates, and photos are included in Attachment C. Following excavation, confirmation samples were collected from sidewalls (surface soil) and floor (subsurface) on November 12, 2016. Confirmation sampling was performed according to Section 5.3 of the Final Excavation Design Report. Confirmation sample results were compared to residential and leaching to groundwater SSSLs for surface soil (0-2 feet), and construction and leaching to groundwater SSSLs for subsurface soil.

### Surface Soil Sidewall

Three, five-point composite samples were collected from the sidewalls of the excavation (depth of 0-2 feet) (Figure 1). The samples were analyzed for surface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and sample results and SSSLs are shown on Table 1. Sample results from the following samples exceeded SSSLs:

- DIAP-3-S-East: Dioxin/furan (42 ng/kg; exceeded residential SSSL of 34.4 ng/kg), cPAH TEQ (0.142 mg/kg; exceeded residential SSSL of 0.1 mg/kg)

The DIAP-3-S-EAST sample is adjacent to a storage building, so additional excavation to the east is not feasible under current conditions. However, if the storage building is removed, remaining contamination will be accessible.

### Subsurface Soil Floor

One, five-point composite sample was collected from the floor of the excavation (depth greater than 2 feet) (Figure 1). The samples were analyzed for subsurface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and the results and SSSLs are shown on Table 2. Sample results did not exceed SSSLs.

### Backfill

Backfill material for the November 2016 portion of the excavation was imported from the Beck Borrow Area in Deer Lodge, MT. The sample was analyzed for the RCRA 8 metals. Sample results were compared to the 2013 Montana Background Threshold Values and adjusted EPA RSLs (only used for compounds whose detection limits (not-detected) exceeded the background threshold value). Backfill sample analytical results did not exceed threshold values except detection limits for silver. However, the detection limits for silver did not exceed EPA RSLs (Table 3). Trihydro obtained DEQ's verbal approval for use of backfill from the Beck Borrow Area based on sampling results collected for Milwaukee Roundhouse, and submitted these results to DEQ on May 17, 2017. The surface was completed with approximately 4 to 6 inches of road mix/gravel imported from Deer Lodge's Asphalt pit in Deer Lodge, MT. The previously submitted and approved road mix/gravel sample results covered adequate volume to serve as the results for the additional material used for surface completion in November.

### Data Validation

Data validation was performed in accordance with DEQ guidelines, and data are determined to be useable for decision-making purposes. Laboratory analytical reports and associated data validation reports for the confirmation and backfill samples are included in Attachment D.

## SUMMARY OF EXISTING SOIL CONDITIONS

### Surface Soil

Six, five-point composite samples from the surface soil portion of the sidewalls of the excavations (depth of 0-2 feet) (Figure 1) were not excavated and represent existing conditions. The samples were analyzed for surface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and sample results and SSSLs are shown on Table 1. Sample results from the following samples exceeded SSSLs:

- DIAP-S-EAST (7/11/16): Pentachlorophenol (1.2 mg/kg; exceeded leaching-based SSSL of 0.68 mg/kg), dioxin/furan (440 ng/kg; exceeded residential SSSL of 34.4 ng/kg and leaching-based SSSL of 66.64 ng/kg)
- DIAP-3-S-EAST (11/12/16): Dioxin/furan (42 ng/kg; exceeded residential SSSL of 34.4 ng/kg), cPAH TEQ (0.142 mg/kg; exceeded residential SSSL of 0.1 mg/kg)

Pentachlorophenol only exceeds the leaching-based SSSL. The 95% UCL was calculated for dioxin/furan and cPAH TEQ using ProUCL v5.1 and the ProUCL input and output files are provided in Attachment E. The cPAH TEQ UCL was less than the residential SSSL, but the dioxin/furan UCL exceeds both the residential and leaching-based SSCLs. The higher concentrations of parent/duplicate samples were used in the 95% UCL calculations.

- cPAH TEQ 95% UCL: 0.0957 mg/kg
- Dioxin/furan 95% UCL: 419.9 ng/kg

The DIAP-S-EAST and DIAP-3-S-EAST samples are adjacent to the former homestead house and a storage building, so additional excavation to the east is not feasible under current conditions. However, if the foundation of the former homestead house and/or storage building is removed, remaining contamination will be accessible and additional excavation may be needed to achieve SSCLs.

### Subsurface Soil

Seven, five-point composite samples from the subsurface soil portion of the sidewalls and floors of the excavation and expansion areas (depth greater than 2 feet) (Figure 1) were not excavated and represent existing conditions. The samples were analyzed for subsurface soil COPCs, including PCP, dioxin/furan, EPH fractions, and PAHs, and the results and SSSLs are shown on Table 2. Sample results did not exceed SSSLs, with the exceptions below:

- DIAP-SS-EAST (2-20) (7/11/16): PCP (11 mg/kg/15 mg/kg (Dup); exceeded leaching-based SSSL of 0.68 mg/kg), dioxin/furan (400 ng/kg/620 ng/kg (Dup); exceeded leaching-based SSSL of 66.64 ng/kg)
- DIAP-SS-WEST (2-20) (7/11/16): Dioxin/furan (77 ng/kg; exceeded leaching-based SSSL of 66.64 ng/kg)

The DIAP-SS-EAST sample is adjacent to the former homestead house, so additional excavation to the east is not feasible under current conditions. However, if the foundation of the former homestead house and/or storage building is removed, remaining contamination will be accessible and additional excavation may be needed. As previously noted, DEQ did not request additional excavation to remove the DIAP-SS-WEST sample, as other sites show that dioxin is not a leaching risk in the absence of a carrier solution and the site-specific dioxin leaching analysis for this facility can be conducted at a later time, per DEQ email dated September 9, 2016.

## GROUNDWATER SAMPLING

Trihydro collected groundwater samples from existing monitoring wells at the site on two occasions, fall 2016 and spring 2017. The fall 2016 event was intended to coincide with lower groundwater levels and the spring 2017 event was intended to coincide with highest groundwater. However, measured groundwater levels were actually higher in September 2016 and lower in April 2017. Field forms, photographs, daily logs, and field log book pages for both events are included in Attachment C. Groundwater samples were collected using a Geotech bladder pump. Dedicated tubing was used for each well. Wells were purged by low-flow methods until field parameters (pH, conductivity, turbidity, dissolved oxygen) stabilized. The stabilization criteria are within 0.5 SU for pH and within 10% for conductivity, turbidity, and dissolved oxygen over three consecutive readings. Field parameters were measured with a YSI Water Quality Meter. Purge water from the September sampling event was poured on the soil being disposed of at the landfill, based on prior knowledge of sampling results. The water (approximately 4 gallons) was absorbed by the dry soil, and did not saturate the soil. Purge water (approximately 4 gallons) from the April sampling event was disposed of by Clean Harbors as hazardous waste following receipt of the sampling results (manifest is included in Attachment A).

### September 2016

Groundwater sample results (Table 3) did not exceed DEQ-7 water quality standards with the exception of the following:

- MW-4: PCP (1.2 µg/L; exceeded the DEQ-7 standard of 1.0 µg/L) in September 2016

The polyaromatic hydrocarbons (PAHs) benzo(a)pyrene and dibenz(a,h)anthracene were not detected in the groundwater samples, but detection limits of 0.1 µg/L exceeded the DEQ-7 standards of 0.05 µg/L. However, these PAHs were not considered contaminants of concern in soil for migration to groundwater in the March 9, 2016 Site-Specific Screening Levels for 2016 Interim Actions memorandum from DEQ as soil sample results did not exceed generic leaching to groundwater screening levels. Confirmation soil sample results still did not exceed the generic leaching to groundwater screening levels. Therefore, these PAHs are unlikely to be present in groundwater at concentrations exceeding the DEQ-7 standards.

Field parameters and fluid levels are provided in Tables 4 and 5, respectively. The potentiometric surface for the fall 2016 sampling event is provided on Figure 2. The elevation for well MW-2 was not included in the potentiometric surface because the water detected in the well appeared to be due to condensation in the bottom of the well (0.09 feet of water in the well), and not representative of the groundwater surface.

### April 2017

In April 2017, groundwater samples were collected from the monitoring wells at the facility. Monitoring well MW-2 did not have enough water to collect a sample. Groundwater samples were delivered to Energy Labs in Helena, MT for analysis. Also, samples were sent to ALS Laboratories in Houston, TX for dioxin/furan analysis.

In addition to the monitoring wells, the domestic well that provides water to the main house (sample ID = HOUSE) at the ranch was sampled during the April 2017 event. The well sample came from a freeze-proof hydrant approximately 160 feet to the east of MW-4, but the well is located farther east, east of the ranch house. The Montana Ground Water Information Center (GWIC ID# 158029) has a record of the domestic well from installation in 1954, which indicates that the well is a 6-inch diameter well finished at 60-ft bgs. Water from a freeze-proof hydrant was allowed to flow into a five gallon bucket to purge the well and collect field parameters. The domestic well was purged at the slowest rate possible for the freeze-proof hydrant operation of approximately 0.5 gallons per minute. Field parameters were collected using the YSI EXO with the probe placed in the bucket and purge water allowed to overflow from the bucket to the lawn, since the hydrant is used to irrigate the lawn by the property owner. After parameters (pH, conductivity, turbidity, and dissolved oxygen) stabilized, a sample was collected from the hydrant.

Groundwater sample results from the April 2017 sampling event (Table 4) did not exceed DEQ-7 water quality standards with the exception of the following:

- MW-4: PCP (354 µg/L/333 µg/L (Dup); exceeded the DEQ-7 standard of 1.0 µg/L), dioxin/furan (7.75 pg/L/3.19 pg/L (Dup); exceeded the DEQ-7 standard of 2 pg/L) in April 2017
- HOUSE: dioxin/furan (5.8 pg/L; exceeded the DEQ-7 standard of 2 pg/L) in April 2017

The polyaromatic hydrocarbons (PAHs) benzo(a)pyrene and dibenz(a,h)anthracene were not detected in the groundwater samples, but detection limits of 0.1 µg/L exceeded the DEQ-7 standards of 0.05 µg/L. However, these PAHs were not considered contaminants of concern in soil for migration to groundwater in the March 9, 2016 Site-Specific Screening Levels for 2016 Interim Actions memorandum from DEQ as soil sample results did not exceed generic leaching to groundwater screening levels. Confirmation soil sample results also did not exceed the generic leaching to groundwater screening levels. Therefore, these PAHs are unlikely to be present in groundwater at concentrations exceeding the DEQ-7 standards.

The PCP concentration reported in the April 2017 sample from MW-4 was much higher than previously observed at the site. Prior to the September 2016 sampling event, results had been reported by the property owner's consultant as <50 µg/L (Environmental Resources, LLC, 2015). MW-4 is approximately 50 feet east-southeast of the former dipping area. Based on 2015, 2016, and previous (Environmental Resources, LLC, 2015) fluid level data groundwater flow is to the northwest or north-northwest. Therefore, MW-4 is located cross and slightly upgradient of the former source area, and would not be anticipated to be impacted by PCP by groundwater flow. There are several factors that may explain the large increase in the PCP concentration in this well in April 2017:

- During collection of the April 2017 sample at MW-4, the bladder pump had to be lowered due to drawdown in the monitoring well. Moving the pump near the bottom of the well stirred up sediment from the bottom that may have influenced the sampling results. The turbidity was elevated during the

beginning of purging, but decreased as the other parameters stabilized (see groundwater sampling forms in Attachment C).

- A sandy clay layer was identified around 7 ft bgs during excavation. The well logs were not detailed enough to identify this layer, but it is possible that it slopes to the east from the source area, as the topography generally does in this area (Environmental Resources, LLC, 2015). The top of the lighter tan soil layer appears to slope to the east in the first photo shown on the July 11, 2016 oversight log included in Attachment C. If this layer is less permeable than the soil above it, and the top of the layer slopes toward the east, water migrating through the vadose zone may be transported east before reaching the static groundwater level.
- The disturbance of source area soil during the excavation may have temporarily changed contaminant transport. Since the excavation was open for approximately two months during the late summer, precipitation falling on the exposed soil on the eastern sidewall (where the remnants of the source area were left in place) could have caused contaminant transport to the east, especially if a lower-permeability layer is sloped toward the east. Contamination may not have reached MW-4 in September, but could have reached the well in April. If this is the case, high contaminant levels at MW-4 would be expected to decline fairly quickly after the excavation was backfilled, reducing or eliminating this transport pathway.
- The monitoring wells at the site had not been previously sampled during the spring. Previous sampling events were conducted between August and November. The spring thaw of the ground may affect contaminant transport, since thawing snow increases vadose zone water content. Lower groundwater levels measured in April than September along with patchy ground coverage by snow during the April sampling event indicate that the ground was thawing, but thaw was not yet complete. The initial slug of water may have much higher contaminant concentrations, as it may have been in contact with contaminated soil in the vadose zone for several months during the winter, and PCP has fairly high solubility in water. Based on this factor, high PCP concentrations would be expected at MW-1 since it is downgradient of the remaining source area and the excavation, but if the top of a lower-permeability soil layer is sloped from the source area toward MW-4, transient high PCP concentrations might be observed at MW-4 but not the other wells. Based on a calculated groundwater gradient of 0.52 ft/ft from April 2017 potentiometric surface, migration of contamination from remaining source material would migrate to MW-1 in less than one month. As PCP concentrations remained less than the DEQ-7 standard in April 2017, contaminant migration in the saturated zone does not appear to be occurring.

Field parameters and fluid levels are provided in Tables 4 and 5, respectively. The potentiometric surface for the spring 2017 sampling event is provided on Figure 3.

## Data Validation

Data validation was performed in accordance with DEQ guidelines, and data were determined to be useable for decision-making purposes. Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report packages.

Precision, accuracy, method compliance, and completeness of each data package were assessed during data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from field duplicate pairs and matrix spike (MS) and matrix spike duplicate (MSD) pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of MS/MSD samples, laboratory control samples (LCS) and laboratory fortified blank (LFB) samples, and organic system monitoring compounds (surrogates) to verify that data are not biased.

Method compliance was established by reviewing sample integrity, holding times, detection limits, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with analytical data sets.

Data validation reports are attached (Attachment D).

## FINAL DISPOSITION

The majority of the source area and impacted soil was removed during excavation. Excavation of remaining source area is not feasible due to its location adjacent to the former homestead house and storage building. The clay layer encountered during the July 2016 excavation may have prevented PCP contamination from coming in contact with groundwater and moving north towards MW-1 as groundwater elevations would predict. The elevated PCP and dioxin/furan concentrations in well MW-4 may be a result of several factors, including the top of the tan sandy clay layer sloping east under the former homestead house, increased sediment in the sample due to low water levels requiring lowering of the pump to the bottom of the well, spring thaw conditions, and a temporary change in vadose zone infiltration/groundwater transport due to the excavation being open. Excavation of the remaining source material would be recommended if the foundation of the former homestead house and/or storage building is removed, as remaining contamination will be accessible and additional excavation will be needed. Given the presence of PCP and dioxin/furans in groundwater at MW-4 at concentrations exceeding the DEQ-7 standard during the fall 2016 and spring 2017 sampling events, Trihydro recommends additional groundwater sampling, including during spring, to demonstrate that groundwater is below standards during consecutive low and high water events.

If you have questions or concerns regarding this interim action summary report, please contact Andrew Vann at (307) 745-7474.

## REFERENCES

DEQ, 2012. Circular DEQ-7, Montana Numeric Water Quality Standards. Department of Environmental Quality, Water Quality Planning Bureau, Water Quality Standards Section. October 2012.

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776-029-001

# TABLES

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | Acenaph-thene (mg/kg-dry) | Acenaph-thylene (mg/kg-dry) | Anthracene (mg/kg-dry) | Benzo(a)-anthracene (mg/kg-dry) | Benzo(a)-pyrene (mg/kg-dry) | Benzo(b)- fluor - anthene (mg/kg-dry) | Benzo(ghi)-perylene (mg/kg-dry) | Benzo(k) fluor-anthene (mg/kg-dry) |
|---|---|---|---|---|---|---|---|---|---|
| DIAP-3-S-East (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | ND(0.0041) | ND(0.0041) | 0.019 | 0.03 | 0.086 | 0.2 J+ | 0.073 | 0.1 |
| DIAP-3-S-North (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | ND(0.0039) | ND(0.0039) | ND(0.0039) | ND(0.0039) | 0.015 | 0.02 J+ | 0.0071 | 0.0086 |
| DIAP-3-S-West (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | ND(0.004) | ND(0.004) | ND(0.004) | 0.0076 | 0.02 | 0.027 J+ | 0.01 | 0.011 |
| DIAP-3-S-West (0-2 ft) Dup | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | ND(0.0039) | ND(0.0039) | ND(0.0039) | 0.0063 | 0.015 | 0.019 J+ | 0.0087 | 0.0075 |
| DIAP-S-EAST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(0.0048) | ND(0.0048) | 0.0078 | 0.019 | 0.024 | 0.064 | 0.089 | 0.05 |
| DIAP-S-South-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) |
| DIAP-S-WEST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(0.0036) | ND(0.0036) | ND(0.0036) | 0.0062 | 0.0091 | 0.013 | 0.0066 | 0.0077 |
| Residential Direct Contact SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |
| Construction Direct Contact SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |
| Leaching to Groundwater SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | C9-C18, Aliphatic, Adjus (mg/kg-dry) | C11-C22, Aromatic, Adju (mg/kg-dry) | C19-C36, Aliphatic, Adjus (mg/kg-dry) | Chrysene (mg/kg-dry) | Dibenz (a,h) anthracene (mg/kg-dry) | Fluor- anthene (mg/kg-dry) | Fluorene (mg/kg-dry) | Indeno- (1,2,3-cd) pyrene (mg/kg-dry) |
|---|---|---|---|---|---|---|---|---|---|
| DIAP-3-S-East (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | -- | -- | -- | 0.1 | 0.023 | 0.058 | ND(0.0041) | 0.09 |
| DIAP-3-S-North (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | -- | -- | -- | 0.0043 | 0.0098 | 0.0047 | ND(0.0039) | 0.015 |
| DIAP-3-S-West (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | -- | -- | -- | 0.01 J | 0.01 | 0.017 | ND(0.004) | 0.022 |
| DIAP-3-S-West (0-2 ft) Dup | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11/12/16 | -- | -- | -- | 0.0051 J | 0.0095 | 0.011 | ND(0.0039) | 0.015 |
| DIAP-S-EAST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(15) | 159 J | 817 | 0.039 | 0.037 J+ | 0.054 | ND(0.0048) | 0.13 J+ |
| DIAP-S-South-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | -- | -- | -- | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) | ND(0.0035) |
| DIAP-S-WEST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(11) | ND(11) UJ | ND(11) | 0.0051 | ND(0.0036) | 0.013 | ND(0.0036) | 0.0091 J+ |
| Residential Direct Contact SSSL | | 911 | 5,092 | 245,831 | NA | NA | NA | NA | NA |
| Construction Direct Contact SSSL | | 5,713 | 31,452 | NA | NA | NA | NA | NA | NA |
| Leaching to Groundwater SSSL | | NA | 2,035 | NA | NA | NA | NA | NA | NA |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | 2-Methyl-naphthalene (mg/kg-dry) | Naphthalene (mg/kg-dry) | Penta- chloro-phenol (mg/kg-dry) | Phen- anthrene (mg/kg-dry) | Pyrene (mg/kg-dry) | Total Extractable Hy (mg/kg-dry) | Total PAH TEQ (mg/kg-dry) | WHO 2005 Toxicity Equival (ng/kg) |
|---|---|---|---|---|---|---|---|---|---|
| DIAP-3-S-East (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | ***42*** |
| | 11/12/16 | ND(0.0041) | ND(0.0041) | 0.016 J- | 0.013 | 0.053 | 17 | ***0.1421*** | -- |
| DIAP-3-S-North (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | 15 |
| | 11/12/16 | ND(0.0039) | ND(0.0039) | 0.003 J- | ND(0.0039) | 0.0047 | ND(12) | 0.0285853 | -- |
| DIAP-3-S-West (0-2 ft) | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | 6.7 |
| | 11/12/16 | ND(0.004) | ND(0.004) | 0.0039 J- | ND(0.004) | 0.016 | 18 | 0.03578 | -- |
| DIAP-3-S-West (0-2 ft) Dup | 11/12/16 | -- | -- | -- | -- | -- | -- | -- | 8.9 |
| | 11/12/16 | ND(0.0039) | ND(0.0039) | 0.0026 J- | ND(0.0039) | 0.011 | 19 | 0.0286101 | -- |
| DIAP-S-EAST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | ***440*** |
| | 07/11/16 | ND(0.0048) | ND(0.0048) | ***1.2*** | 0.014 | 0.056 | 1790 | 0.082839 | -- |
| DIAP-S-South-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | 23 |
| | 09/12/16 | ND(0.0035) | ND(0.0035) | 0.041 J- | ND(0.0035) | ND(0.0035) | 32 | 0.00404425 | -- |
| DIAP-S-WEST (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | 17 |
| | 07/11/16 | ND(0.0036) | ND(0.0036) | 0.018 | ND(0.0036) | 0.0095 | ND(11) | 0.0138121 | -- |
| Residential Direct Contact SSSL | | NA | NA | 5 | NA | NA | NA | 0.1 | 34.4 |
| Construction Direct Contact SSSL | | NA | NA | 386 | NA | NA | NA | NA | 455 |
| Leaching to Groundwater SSSL | | NA | NA | 0.68 | NA | NA | NA | NA | 66.64 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | Acenaph-thene (mg/kg-dry) | Acenaph-thylene (mg/kg-dry) | Anthracene (mg/kg-dry) | Benzo(a)-anthracene (mg/kg-dry) | Benzo(a)-pyrene (mg/kg-dry) | Benzo(b)- fluor - anthene (mg/kg-dry) | Benzo(ghi)-perylene (mg/kg-dry) | Benzo(k) fluor-anthene (mg/kg-dry) |
|---|---|---|---|---|---|---|---|---|---|
| EX-DIAP-S-NORTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(0.0042) | ND(0.0042) | 0.017 | 0.091 | 0.14 | 0.2 | 0.055 | 0.057 |
| EX-DIAP-S-North-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.0036) | 0.024 | 0.044 | 0.27 | 0.29 | 0.52 | 0.22 | 0.17 |
| EX-DIAP-S-SOUTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(0.0042) | ND(0.0042) | ND(0.0042) | 0.0063 | 0.014 | 0.019 | 0.0076 | ND(0.0042) |
| Residential Direct Contact SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |
| Construction Direct Contact SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |
| Leaching to Groundwater SSSL | | NA | NA | NA | NA | NA | NA | NA | NA |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | C9-C18, Aliphatic, Adjus (mg/kg-dry) | C11-C22, Aromatic, Adju (mg/kg-dry) | C19-C36, Aliphatic, Adjus (mg/kg-dry) | Chrysene (mg/kg-dry) | Dibenz (a,h) anthracene (mg/kg-dry) | Fluor- anthene (mg/kg-dry) | Fluorene (mg/kg-dry) | Indeno- (1,2,3-cd) pyrene (mg/kg-dry) |
|---|---|---|---|---|---|---|---|---|---|
| EX-DIAP-S-NORTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(13) | 43 J | 71 | 0.1 | 0.033 J+ | 0.2 | ND(0.0042) | 0.19 J+ |
| EX-DIAP-S-North-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | 30 | 28 | 121 | 0.34 | 0.072 | 0.72 | 0.0072 | 0.21 |
| EX-DIAP-S-SOUTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 07/11/16 | ND(12) | ND(12) UJ | ND(12) | 0.0068 | 0.008 J+ | 0.011 | ND(0.0042) | 0.024 J+ |
| Residential Direct Contact SSSL | | 911 | 5,092 | 245,831 | NA | NA | NA | NA | NA |
| Construction Direct Contact SSSL | | 5,713 | 31,452 | NA | NA | NA | NA | NA | NA |
| Leaching to Groundwater SSSL | | NA | 2,035 | NA | NA | NA | NA | NA | NA |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 1. SURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | 2-Methyl-naphthalene (mg/kg-dry) | Naphthalene (mg/kg-dry) | Penta- chloro-phenol (mg/kg-dry) | Phen- anthrene (mg/kg-dry) | Pyrene (mg/kg-dry) | Total Extractable Hy (mg/kg-dry) | Total PAH TEQ (mg/kg-dry) | WHO 2005 Toxicity Equival (ng/kg) |
|---|---|---|---|---|---|---|---|---|---|
| EX-DIAP-S-NORTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | ***170*** |
| | 07/11/16 | ND(0.0042) | ND(0.0042) | 0.19 | 0.056 | 0.21 | 248 | ***0.22177*** | -- |
| EX-DIAP-S-North-01 (0-2 ft) | 09/12/16 | -- | -- | -- | -- | -- | -- | -- | ***330*** |
| | 09/12/16 | ND(0.0036) | ND(0.0036) | 0.052 J- | 0.15 | 0.58 | 392 | ***0.46404*** | -- |
| EX-DIAP-S-SOUTH (0-2 ft) | 07/11/16 | -- | -- | -- | -- | -- | -- | -- | ***360*** |
| | 07/11/16 | ND(0.0042) | ND(0.0042) | 0.49 | ND(0.0042) | 0.011 | 59 | 0.0269578 | -- |
| Residential Direct Contact SSSL | | NA | NA | 5 | NA | NA | NA | 0.1 | 34.4 |
| Construction Direct Contact SSSL | | NA | NA | 386 | NA | NA | NA | NA | 455 |
| Leaching to Groundwater SSSL | | NA | NA | 0.68 | NA | NA | NA | NA | 66.64 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms
J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit
EX - Sample IDs DIAP-S-SOUTH, DIAP-S-NORTH, and DIAP-S-NORTH-01 have been excavated

**TABLE 2. SUBSURFACE SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS, 2016**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | C9-C18, Aliphatic, Adjusted (mg/kg-dry) | C11-C22, Aromatic, Adjusted (mg/kg-dry) | C19-C36, Aliphatic, Adjusted (mg/kg-dry) | Penta- chloro-phenol (mg/kg-dry) | Total Extractable Hydrocarbon (mg/kg-dry) | WHO 2005 Toxicity Equivalence Quotien (ng/kg) |
|---|---|---|---|---|---|---|---|
| DIAP-SS-EAST (2-20 ft) | 07/11/16 | -- | -- | -- | -- | -- | ***400*** |
| DIAP-SS-EAST (2-20 ft) Dup | 07/11/16 | -- | -- | -- | -- | -- | ***620*** |
| | 07/11/16 | 173 J | 159 J | 764 J | ***15*** | 1240 J | -- |
| DIAP-SS-EAST (2-20 ft) | 07/11/16 | 58 J | 39 J | 294 J | ***11*** | 494 J | -- |
| DIAP-SS-NORTH (2-20 ft) | 07/11/16 | -- | -- | -- | -- | -- | 54 |
| | 07/11/16 | ND(12) | ND(12) UJ | ND(12) | 0.19 | ND(12) | -- |
| DIAP-SS-SOUTH (2-20 ft) | 07/11/16 | -- | -- | -- | -- | -- | 61 |
| | 07/11/16 | ND(24) UJ | ND(24) UJ | ND(24) UJ | 0.16 | ND(24) UJ | -- |
| DIAP-SS-WEST (2-20 ft) | 07/11/16 | -- | -- | -- | -- | -- | ***77*** |
| | 07/11/16 | ND(12) | ND(12) UJ | ND(12) | 0.47 | ND(12) | -- |
| DIAP-SS-N-F (3 ft) | 09/12/16 | -- | -- | -- | -- | -- | 65 |
| | 09/12/16 | -- | -- | -- | 0.061 J- | 132 | -- |
| DIAP-SS-S-F (2 ft) | 09/12/16 | -- | -- | -- | -- | -- | 14 |
| DIAP-SS-S-F (2 ft) Dup | 09/12/16 | -- | -- | -- | -- | -- | 24 |
| DIAP-SS-S-F (2 ft) | 09/12/16 | -- | -- | -- | 0.011 J- | 18 | -- |
| DIAP-SS-S-F (2 ft) Dup | 09/12/16 | -- | -- | -- | 0.0074 J- | 17 | -- |
| DIAP-3-SS-F (2 ft) | 11/12/16 | -- | -- | -- | -- | -- | 7.9 |
| | 11/12/16 | -- | -- | -- | 0.0088 J- | ND(12) | -- |
| Construction Direct Contact SSSL | | 5,713 | 31,452 | NA | 386 | NA | 455 |
| Leaching to Groundwater SSSL | | NA | 2,035 | NA | 0.68 | NA | 66.64 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/kg - milligrams per kilogram
ng/kg - nanograms per kilograms

J+ - Estimated concentration, possibly biased high
J- - Estimated concentration, possibly biased low
J - Estimated concentration
UJ - Estimated reporting limit

**TABLE 3. BACKFILL ANALYTICAL RESULTS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | Silver, Total (mg/kg-dry) | Arsenic, Total (mg/kg-dry) | Barium, Total (mg/kg-dry) | Cadmium, Total (mg/kg-dry) | Chromium, Total (mg/kg-dry) | Lead, Total (mg/kg-dry) | Mercury, Total (mg/kg-dry) | Selenium, Total (mg/kg-dry) |
|---|---|---|---|---|---|---|---|---|---|
| DIAP-BKFL-DITCH | 06/27/16 | ND(5) | 5 | 142 | ND(1) | 27 | 14 | ND(0.5) | ND(1) |
| DIAP-BKFL-POND | 06/27/16 | ND(5) | 6 | 179 | ND(1) | 24 | 17 | ND(0.5) | ND(1) |
| MRH-BKFL-306 | 10/10/16 | ND(0.494)UJ | 2.55J | 85.9 | 0.1J | 4.17J | 7.62 | 0.00267J | 0.431J |
| MRH-BKFL-307 | 10/10/16 | ND(0.481)UJ | 2.24J | 87.5 | 0.0897J | 3.66J | 7.14 | 0.00259J | 0.336J |
| MRH-BKFL-308 | 10/10/16 | ND(0.488)UJ | 1.66J | 61 | 0.0633J | 2.75J | 5.85 | 0.00121J | 0.243J |
| MRH-BKFL-309 | 10/10/16 | ND(0.48)UJ | 2.76J | 103 | 0.116J | 4.98J | 8.37 | 0.00269J | 0.43J |
| DIAP-BKFL-01 | 08/10/16 | ND(5) | 6 | 56 | ND(1) | 9 | 7 | ND(0.5) | ND(1) |
| MT Background Threshold Values | | 0.3 | 22.5 | 429 | 0.7 | 41.7 | 29.8 | NA | 0.7 |
| EPA RSL Residential | | 39 | 0.68 | 1,500 | 7.1 | 12,000 | 400 | 1.1 | 39 |

Notes:

Bold values exceed screening level(s)

Results reported on dry weight basis

ND() - not detected (reporting limit)

NA - not applicable

mg/kg - milligrams per kilogram

SSCLs - site-specific cleanup levels

Data qualifiers include:

J - Estimated concentration

UJ - Estimated reporting limit

**TABLE 4. GROUNDWATER SAMPLING RESULTS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | DIOXINS_FURANS | METALS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total TEQ (pg/L) | Arsenic, Dissolved (mg/L) | Barium, Dissolved (mg/L) | Cadmium, Dissolved (mg/L) | Chromium, Dissolved (mg/L) | Lead, Dissolved (mg/L) | Mercury, Dissolved (mg/L) |
| House | 04/24/17 | **5.8** | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | -- | ND(0.001) | 0.06 | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MW-1 | 09/13/16 | 0.164 | -- | -- | -- | -- | -- | -- |
| | 09/13/16 | -- | ND(0.001) | 0.05 | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| | 04/24/17 | 0.306 | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | -- | 0.001 | ND(0.05) | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MW-3 | 09/12/16 | 0.137 | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | -- | 0.002 | ND(0.05) | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| | 04/24/17 | 0.159 | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | -- | 0.002 | ND(0.05) | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MW-3 Dup | 09/12/16 | 0.0932 | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | -- | 0.002 | ND(0.05) | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MW-4 | 09/12/16 | 0.183 | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | -- | 0.001 | 0.05 | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| | 04/24/17 | **7.75 J** | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | -- | 0.001 | 0.06 | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MW-4 Dup | 04/24/17 | **3.19 J** | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | -- | 0.001 | 0.06 | ND(0.001) | ND(0.005) | ND(0.001) | ND(0.0001) |
| MDEQ 7 for Groundwater | | 2 | 0.01 | 1 | 0.005 | 0.1 | 0.015 | 0.002 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/L - milligrams per liter
ug/L - micrograms per liter
pg/L - picograms per liter
J- - Estimated concentration, possibly biased low
UJ - Estimated reporting limit

**TABLE 4. GROUNDWATER SAMPLING RESULTS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | METALS | | SVOC | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Selenium, Dissolved (mg/L) | Silver, Dissolved (mg/L) | Acenaph- thene (ug/L) | Acenaph- thylene (ug/L) | Anthracene (ug/L) | Benzo(a)- anthracene (ug/L) | Benzo(a)- pyrene (ug/L) |
| House | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MW-1 | 09/13/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/13/16 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MW-3 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MW-3 Dup | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MW-4 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MW-4 Dup | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.001) | ND(0.001) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** |
| MDEQ 7 for Groundwater | | 0.05 | 0.1 | 670 | NA | 2,100 | 0.5 | 0.05 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/L - milligrams per liter
ug/L - micrograms per liter
pg/L - picograms per liter
J- - Estimated concentration, possibly biased low
UJ - Estimated reporting limit

**TABLE 4. GROUNDWATER SAMPLING RESULTS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | SVOC | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Benzo(b)- fluor-anthene (ug/L) | Benzo(ghi)-perylene (ug/L) | Benzo(k) fluor-anthene (ug/L) | Chrysene (ug/L) | Dibenz (a,h) anthracene (ug/L) | Fluor- anthene (ug/L) | Fluorene (ug/L) |
| House | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MW-1 | 09/13/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/13/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MW-3 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MW-3 Dup | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MW-4 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MW-4 Dup | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **ND(0.1)** | ND(0.1) | ND(0.1) |
| MDEQ 7 for Groundwater | | 0.5 | NA | 0.5 | 50 | 0.05 | 130 | 1,100 |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/L - milligrams per liter
ug/L - micrograms per liter
pg/L - picograms per liter
J- - Estimated concentration, possibly biased low
UJ - Estimated reporting limit

**TABLE 4. GROUNDWATER SAMPLING RESULTS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location ID | Date Sampled | SVOC | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Indeno- (1,2,3-cd) pyrene (ug/L) | Naphthalene (ug/L) | Phen- anthrene (ug/L) | Pyrene (ug/L) | Penta- chloro-phenol (ug/L) | 2-Methyl-naphthalene (ug/L) | 1-Methyl-naphthalene (ug/L) |
| House | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) |
| MW-1 | 09/13/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/13/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) UJ | ND(0.1) | -- |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) |
| MW-3 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) UJ | ND(0.1) | -- |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) |
| MW-3 Dup | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) UJ | ND(0.1) | -- |
| MW-4 | 09/12/16 | -- | -- | -- | -- | -- | -- | -- |
| | 09/12/16 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **1.2 J-** | ND(0.1) | -- |
| | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **354** | ND(0.1) | ND(0.1) |
| MW-4 Dup | 04/24/17 | -- | -- | -- | -- | -- | -- | -- |
| | 04/24/17 | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | **333** | ND(0.1) | ND(0.1) |
| MDEQ 7 for Groundwater | | 0.5 | 100 | NA | 830 | 1 | NA | NA |

Notes:
Bold values exceed screening level(s)
ND() - not detected (reporting limit)
NA - not applicable
mg/L - milligrams per liter
ug/L - micrograms per liter
pg/L - picograms per liter
J- - Estimated concentration, possibly biased low
UJ - Estimated reporting limit

**TABLE 5. GROUNDWATER FIELD PARAMETERS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

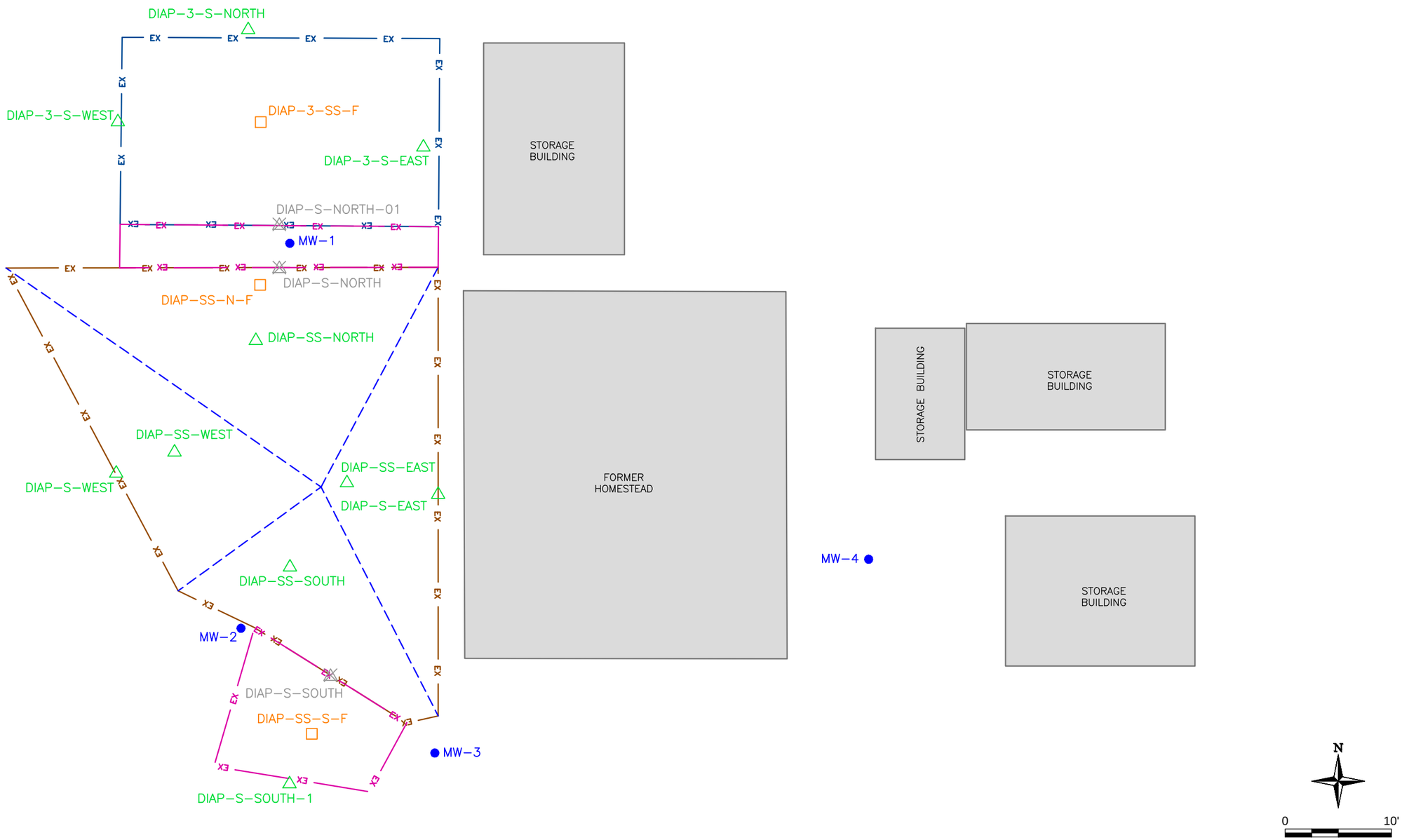
| Location ID | Date Sampled | pH (Std Units) | Specific Conductance Field (umhos/cm) | Oxygen, Dissolved (mg/L) | Oxidation-Reduction Potential (mV) | Temperature (oC) | Turbidity, Field (NTU) |
|---|---|---|---|---|---|---|---|
| House | 04/24/17 | 7.37 | 345.3 | 7.17 | 76.4 | 6.21 | 6.51 |
| MW-1 | 09/13/16 | 6.82 | 331.5 | 9.31 | 76.7 | 6.4 | 0.8 |
| | 04/24/17 | 6.56 | 159.5 | 7.24 | 72.6 | 5.95 | 98.63 |
| MW-3 | 09/12/16 | 6.74 | 267.7 | 10.4 | 88 | 6.3 | 2 |
| | 04/24/17 | 6.54 | 170 | 9.44 | 80.8 | 5.65 | 11.08 |
| MW-4 | 09/12/16 | 6.92 | 400.3 | 9.69 | 77.9 | 5.8 | 52.9 |
| | 04/24/17 | 6.69 | 274 | 8.23 | 70.5 | 5.22 | 24.06 |

Notes:

**TABLE 6. GROUNDWATER FLUID LEVELS**
**DIAMOND P RANCH**
**WEST YELLOWSTONE, MT**

| Location | Date Measured | Measuring Point Elevation (ft-msl) | Depth to Water (ft-bmp) | Water Elevation (ft-msl) | Depth Gauged (ft-bmp) |
|---|---|---|---|---|---|
| MW-1 | 9/13/2016 | 6620.11 | 21.21 | 6598.90 | 27.25 |
| MW-1 | 4/24/2017 | 6620.11 | 23.79 | 6596.32 | 27.25 |
| MW-2 | 9/13/2016 | 6620.98 | 17.81 | 6603.17 | 18.35 |
| MW-2 | 4/24/2017 | 6620.98 | 18.26 | 6602.72 | 18.35 |
| MW-3 | 9/12/2016 | 6622.15 | 18.21 | 6603.94 | 25.36 |
| MW-3 | 4/24/2017 | 6622.15 | 20.32 | 6601.83 | 25.36 |
| MW-4 | 9/12/2016 | 6621.84 | 18.72 | 6603.12 | 25.91 |
| MW-4 | 4/24/2017 | 6621.84 | 22.01 | 6599.83 | 25.91 |

# FIGURES




## EXPLANATION

| | |
|---|---|
| ● MW-3 | GROUNDWATER MONITORING WELL AND DESIGNATION |
| △DIAP-S-SOUTH-1 | SOIL SAMPLE LOCATION AND DESIGNATION |
| ⊠DIAP-S-SOUTH | EXCAVATED SAMPLE LOCATION AND DESIGNATION |
| □DIAP-SS-S-F | SUBSURFACE FLOOR SAMPLE LOCATION AND DESIGNATION |
| ▭ | BUILDING OR OTHER STRUCTURE |
| - - - - - | CONFIRMATION SAMPLING SECTION |
| EX | APPROXIMATE EXCAVATION BOUNDARY (JULY 2016) |
| EX | APPROXIMATE EXCAVATION BOUNDARY (SEPTEMBER 2016) |
| EX | APPROXIMATE EXCAVATION BOUNDARY (NOVEMBER 2016) |

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

**FIGURE 1**

**EXCAVATION**

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY**
**DIAMOND P RANCH CECRA FACILITY**
**WEST YELLOWSTONE, MONTANA**

| Drawn By: REP | Checked By: LD | Scale: 1" = 10' | Date: 5/16/17 | File: 776-EXCAVPLAN-201612 |
|---|---|---|---|---|

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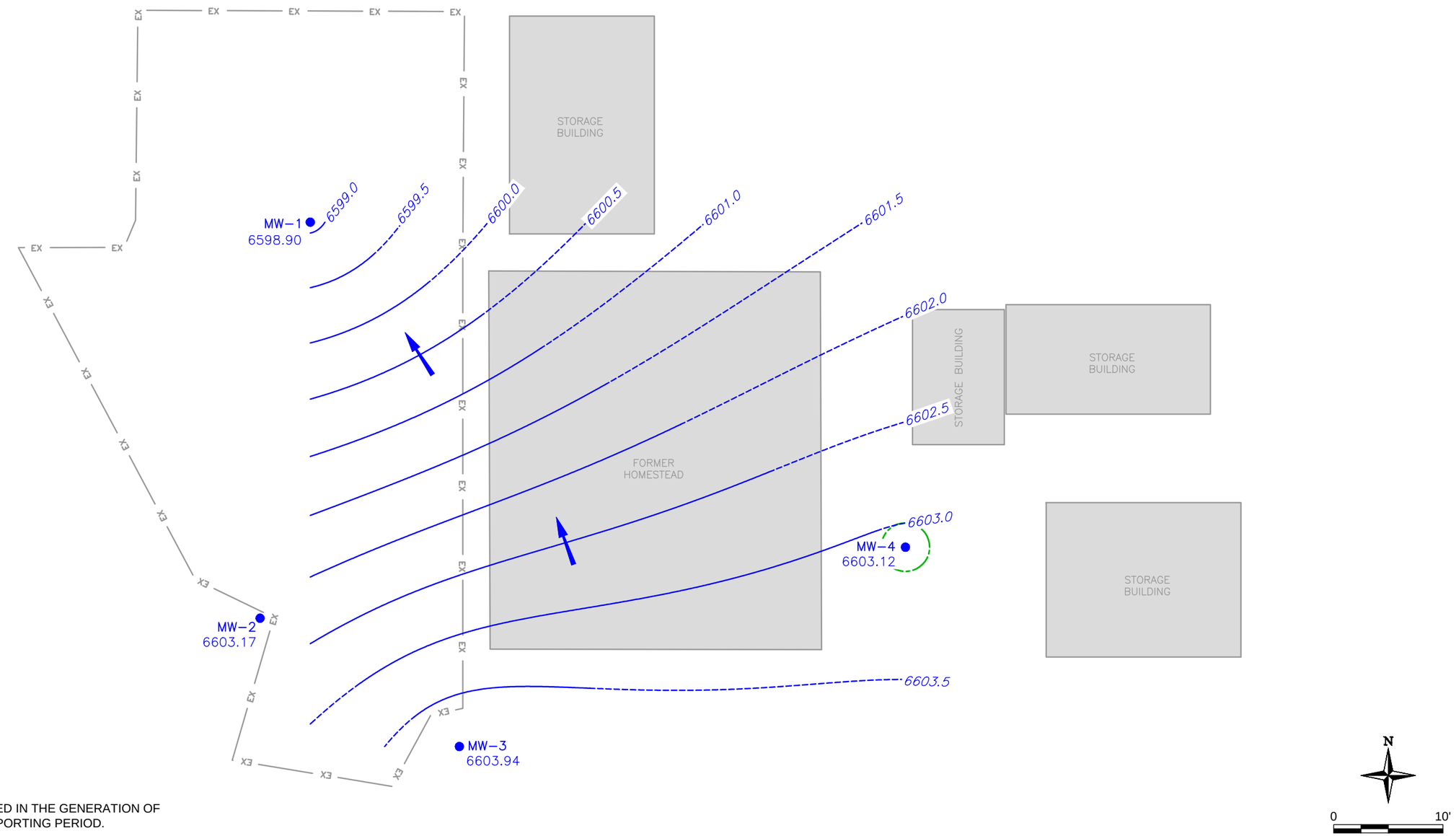


**NOTE:**
WELL MW-2 WAS NOT USED IN THE GENERATION OF CONTOURS FOR THIS REPORTING PERIOD.

## EXPLANATION

| | |
|---|---|
| MW-3 ● 6603.94 | MONITORING WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL) |
| 6603.5 | LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED) |
| ← | ESTIMATED GROUNDWATER FLOW DIRECTION |
| | DISSOLVED PCP PLUME |
| EX | EXCAVATION (2016) |
| | BUILDING OR OTHER STRUCTURE |
| FT AMSL | FEET ABOVE MEAN SEA LEVEL |

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1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

**FIGURE 2**

**GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2016**

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY DIAMOND P RANCH CECRA FACILITY WEST YELLOWSTONE, MONTANA**

| Drawn By: REP | Checked By: LD | Scale: 1" = 10' | Date: 4/25/17 | File: 776-PS-201609 |
|---|---|---|---|---|

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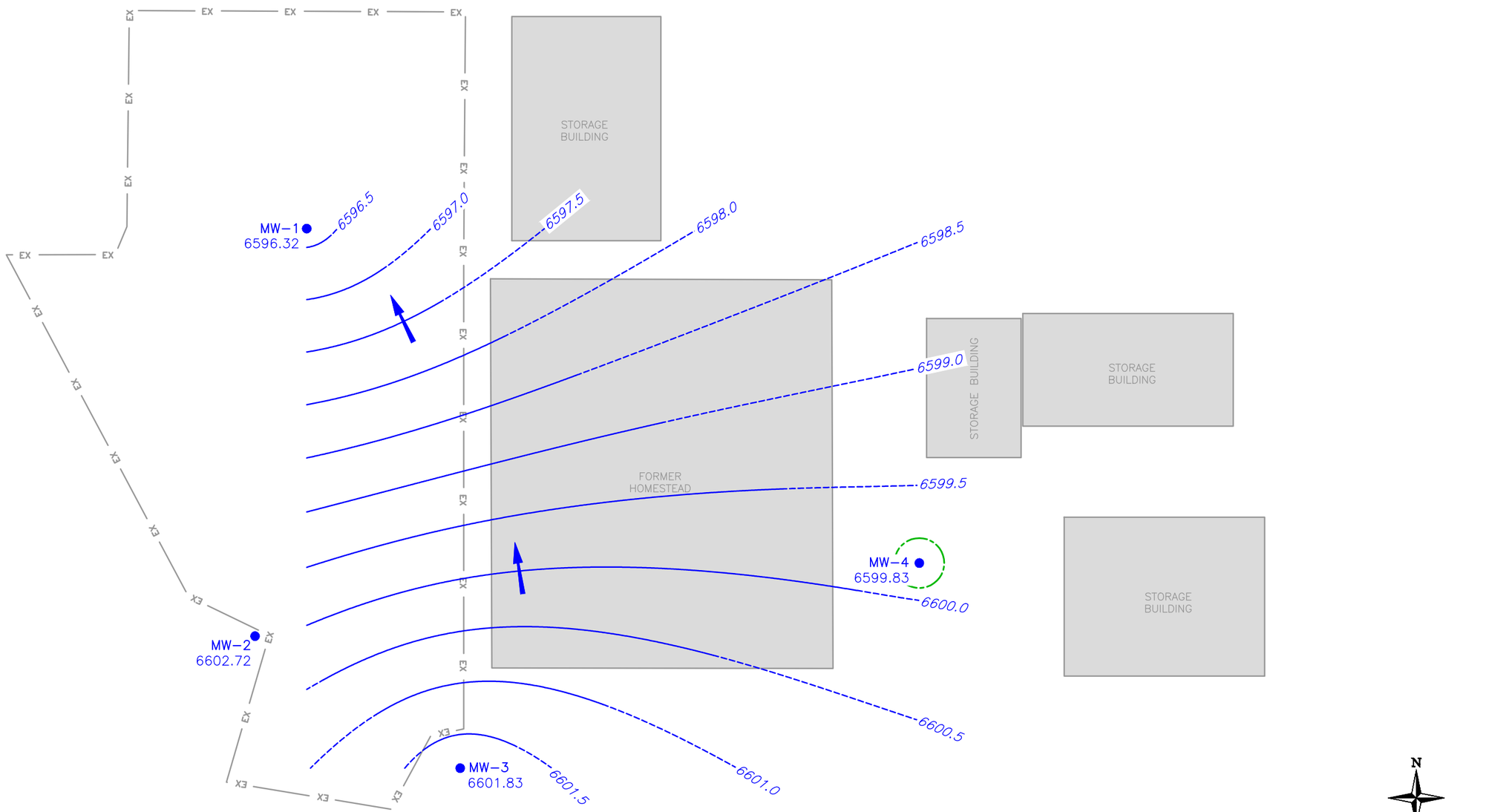


**NOTE:**
WELL MW-2 WAS NOT USED IN THE GENERATION OF CONTOURS FOR THIS REPORTING PERIOD.

## EXPLANATION

| | |
|---|---|
| MW-3 ● 6601.83 | MONITORING WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL) |
| 6601.5 | LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED) |
| ← | ESTIMATED GROUNDWATER FLOW DIRECTION |
| | DISSOLVED PCP PLUME |
| EX | EXCAVATION (2016) |
| | BUILDING OR OTHER STRUCTURE |
| FT AMSL | FEET ABOVE MEAN SEA LEVEL |

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Laramie, Wyoming 82070
www.trihydro.com
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**FIGURE 3**

**GROUNDWATER POTENTIOMETRIC SURFACE MAP**
**APRIL 2017**

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY**
**DIAMOND P RANCH CECRA FACILITY**
**WEST YELLOWSTONE, MONTANA**

| Drawn By: REP | Checked By: LD | Scale: 1" = 10' | Date: 4/25/17 | File: 776-PS-201704 |
|---|---|---|---|---|

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**ATTACHMENT A**

CleanHarbors
ENVIRONMENTAL SERVICES®

# Land Disposal Restriction Notification Form



Printed Date :Jul 06, 2016

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.

009735447FLE

Sales Order No: 1602084633-001

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1154478 | NON-WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : [signature] Print Name J. Darell

Title : Proj. Engineer Date : 07/10/16

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) UT 1602004633-001 SCPPW 2/24/2016 Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: MTR000208304
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 009735447 FLE

5. Generator's Name and Mailing Address
Montana Department of Environmental Quality
2365 Targhee Pass Road (US Highway 20)
West Yellowstone, MT 59758
Generator's Phone (406) 558-4850

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Aragonite LLC
11600 North Aptus Road
Grantsville, UT 84029
Facility's Phone (435) 884-3100

U.S. EPA ID Number: UTD981052377

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes | | |
|---|---|---|---|---|---|---|---|---|
| X | 1 RA3077, HAZARDOUS WASTE, SOLID, N.O.S., (PENTACHLOROPHENOL, USED OIL), 9, PG III | 001 | CM | 15 | Y | F032 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
2.CH115447 EP08171

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Signature: Month Day Year

GENERATOR

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

INT'L

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Signature: Month 7 Day 10 Year 16
Transporter 2 Printed/Typed Name: Signature: Month Day Year

TRANSPORTER

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month Day Year

DESIGNATED FACILITY

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Signature: Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

CleanHarbors
ENVIRONMENTAL SERVICES®

# Land Disposal Restriction Notification Form



Printed Date :Jul 06, 2016

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.
009735448FLE

Sales Order No: 1602084633-001

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1154478 | NON-WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : [signature] Print Name L. Darnell

Title : Project Engineer Date : 07/10/16

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) UT 1602084633-001 SC PRW 2/24/2015 Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: MTR000009304
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 009735448 FLE

5. Generator's Name and Mailing Address
Montana Department of Environmental Quality
2985 Targhee Pass Road (US Highway 20)
West Yellowstone, MT 59758
Generator's Phone: (406) 558-4850

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Aragonite LLC
11800 North Aptus Road
Grantsville, UT 84029
Facility's Phone: 435-882-5100
U.S. EPA ID Number: UTD981552177

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes | | |
|---|---|---|---|---|---|---|---|---|
| X | 1. RA3077, HAZARDOUS WASTE, SOLID, N.O.S., (PENTACHLOROPHENOL, USED OIL), 9, PG III | 1 | CM | 14 | Y | F032 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
1. CH1156478 ERG#171

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: [illegible] | Signature | Month: 07 | Day: 10 | Year: 16
Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) | U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name | Signature | Month | Day | Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

CleanHarbors
ENVIRONMENTAL SERVICES®

# Land Disposal Restriction Notification Form



Printed Date :Jul 06, 2016

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.

009735450FLE

Sales Order No: 1602084633-001

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1154478 | NON-WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : [signature] Print Name L. Domell

Title : Project Engineer Date : 07/08/14

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) UT 1602084633 001 SC PPW 2-24-2015

Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: MTR000209304
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 009735450 FLE

5. Generator's Name and Mailing Address
Montana Department of Environmental Quality
2665 Targhee Pass Road (US Highway 20)
West Yellowstone, MT 59758
Generator's Phone (406) 558-4850

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Aragonite LLC
11600 North Aunt Road
Grantsville, UT 84029
Facility's Phone: (435) 884-8160
U.S. EPA ID Number: UTD981652177

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes | | |
|---|---|---|---|---|---|---|---|---|
| X | 1. NA3077, HAZARDOUS WASTE, SOLID, N.O.S., (PENTACHLOROPHENOL, USED OIL), 9, PG III | 1 | CM | 13 | Y | F032 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
L.CH1154076 ERG#171 CHRT=3114

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Michael Walker | Signature | Month: 7 | Day: 9 | Year: 16
Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name | Signature | Month | Day | Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

**GENERATOR'S INITIAL COPY**

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

CleanHarbors
ENVIRONMENTAL SERVICES®

# Land Disposal Restriction Notification Form



Printed Date :Jul 06, 2016

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.

009735449FLE

Sales Order No: 1602084633-001

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1154478 | NON-WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : [signature] Print Name L. Darne4

Title : Project Engineer Date : 8 Jul 16

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) UT 1802084633-001 SC PPW 2/24/2015 Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: MTR000208334
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 009735449 FLE

5. Generator's Name and Mailing Address
Montana Department of Environmental Quality
2965 Yellowstone Park Road (US Highway 20)
West Yellowstone, MT 59758
Generator's Phone (406) 582-4000

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc.
U.S. EPA ID Number: MAD039322260

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Aragonite LLC
11600 North Aptus Road
Grantsville, UT 84029
Facility's Phone: (801) 884-9400
U.S. EPA ID Number: UTD981562177

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes | | |
|---|---|---|---|---|---|---|---|---|
| X | 1. NA3077, HAZARDOUS WASTE, SOLID, N.O.S., (PENTACHLOROPHENOL, USED OIL), 9, PG III | 001 | CM | 12 | Y | F032 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
LPCH1124478 BOX#171

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: [illegible] Signature: [illegible] Month: [illegible] Day: [illegible] Year: 16

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Don Stokes Signature: [illegible] Month: 7 Day: 8 Year: 16
Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name Signature Month Day Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

CleanHarbors
ENVIRONMENTAL SERVICES®

# Land Disposal Restriction Notification Form



Printed Date :Jul 06, 2016

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.

009735451FLE

Sales Order No: 1602084633-001

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1154478 | NON-WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : [signature] Print Name Z. Darrell

Title : Date : 07/05/16

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) UT1602084633-001 SC PPW 2/24/2015 Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: MTR000028204
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3715
4. Manifest Tracking Number: 009735451 FLE

5. Generator's Name and Mailing Address
Montana Department of Environmental Quality
2869 Targhee Pass Road (US Highway 20)
West Yellowstone, MT 59758
Generator's Phone: 406-682-4263

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service Inc
U.S. EPA ID Number: MAD039322960

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Aragonite LLC
11600 North Aptus Road
Grantsville, UT 84029
Facility's Phone: 801-882-4000
U.S. EPA ID Number: UTD981552177

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes | | |
|---|---|---|---|---|---|---|---|---|
| X | 1. NA3077, HAZARDOUS WASTE, SOLID, N.O.S., (PENTACHLOROPHENOL, USED OIL), 9, PG III | 001 | CM | 015 | Y | F032 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
1. CH1124473 ERG#171

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: [illegible] Signature: [illegible] Month: [illegible] Day: [illegible] Year: [illegible]

**GENERATOR**

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

**INT'L**

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Victor Wells Signature: [illegible] Month: 7 Day: 18 Year: 16
Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

**TRANSPORTER**

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Signature: Month: Day: Year:

**DESIGNATED FACILITY**

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

# INVOICE
## Invoice No 1001469460

**TASK 1602084633-001 - T&D (CH1154478 / CCRK)**

| Manifest Info | Item ID | Description | Manifest Qty | Manifest UOM | Billing Qty | Billing UOM | Unit Price | Amount |
|---|---|---|---|---|---|---|---|---|
| | | **08 Jul 2016** | | | | | | |
| 009735449FLE 1 | DISPSL / CCRK | soil contaminated with PCP (pentachlorophenol) CH1154478 | 27,500 | LBS | 27,760.000 | LBS | 0.2600 | $7,217.60 |
| | FEE-DISP | Utah Hazardous Waste for Disposal | | | 13.880 | T | 35.0000 | $485.80 |
| 009735449FLE | TRAN | TRANSPORTATION | | | 1.000 | EA | 3,000.0000 | $3,000.00 |
| 009735450FLE 1 | DISPSL / CCRK | soil contaminated with PCP (pentachlorophenol) CH1154478 | 27,500 | LBS | 22,800.000 | LBS | 0.2600 | $5,928.00 |
| | FEE-DISP | Utah Hazardous Waste for Disposal | | | 11.400 | T | 35.0000 | $399.00 |
| 009735450FLE | TRAN | TRANSPORTATION | | | 1.000 | EA | 3,000.0000 | $3,000.00 |
| 009735451FLE 1 | DISPSL / CCRK | soil contaminated with PCP (pentachlorophenol) CH1154478 | 27,500 | LBS | 24,480.000 | LBS | 0.2600 | $6,364.80 |
| | FEE-DISP | Utah Hazardous Waste for Disposal | | | 12.240 | T | 35.0000 | $428.40 |
| 009735451FLE | TRAN | TRANSPORTATION | | | 1.000 | EA | 3,000.0000 | $3,000.00 |
| | ROLLWASH | Washout of Rolloff, Intermodal or Dump Trailer | | | 3.000 | EA | 256.0000 | $768.00 |
| | | **10 Jul 2016** | | | | | | |
| 009735447FLE 1 | DISPSL / CCRK | soil contaminated with PCP (pentachlorophenol) CH1154478 | 27,500 | LBS | 1.000 | MIN | 5,520.0000 | $5,520.00 |
| | FEE-DISP | Utah Hazardous Waste for Disposal | | | 7.560 | T | 35.0000 | $264.60 |
| 009735447FLE | TRAN | TRANSPORTATION | | | 1.000 | EA | 3,000.0000 | $3,000.00 |
| 009735448FLE 1 | DISPSL / CCRK | soil contaminated with PCP (pentachlorophenol) CH1154478 | 27,500 | LBS | 24,440.000 | LBS | 0.2600 | $6,354.40 |
| | FEE-DISP | Utah Hazardous Waste for Disposal | | | 12.220 | T | 35.0000 | $427.70 |
| 009735448FLE | TRAN | TRANSPORTATION | | | 1.000 | EA | 3,000.0000 | $3,000.00 |
| | ROLLWASH | Washout of Rolloff, Intermodal or Dump Trailer | | | 2.000 | EA | 256.0000 | $512.00 |
| | FEE | Recovery Fee | | | 49,670.300 | EA | 0.1000 | $4,967.03 |
| | | | | | | | **SUBTOTAL** | **$54,637.33** |
| | | | | | | | **TAX** | **$0.00** |
| | | | | | | | **TASK TOTAL** | **$54,637.33** |

**TASK 1602084633-002 - ROLLOFF BINS & ACCESSORIALS**

| Manifest Info | Item ID | Description | Manifest Qty | Manifest UOM | Billing Qty | Billing UOM | Unit Price | Amount |
|---|---|---|---|---|---|---|---|---|
| | | **07 Jul 2016** | | | | | | |
| | EO | Equipment Operator | | | 4.000 | HR | 0.0000 | No Charge |
| | EO | Equipment Operator | | | 8.000 | HR | 0.0000 | No Charge |
| | LINRO | Rolloff Poly Liner | | | 5.000 | EA | 68.0000 | $340.00 |
| | DROP | Drop off fee | | | 2.000 | EA | 2,250.0000 | $4,500.00 |
| | | **08 Jul 2016** | | | | | | |
| | EO | Equipment Operator | | | 8.000 | HR | 0.0000 | No Charge |
| | EOOT | Equipment Operator, Overtime | | | 6.000 | HR | 0.0000 | No Charge |

# INVOICE
## Invoice No 1001469460

**TASK 1602084633-002 - ROLLOFF BINS & ACCESSORIALS**

| Manifest Info | Item ID | Description | Manifest Qty | Manifest UOM | Billing Qty | Billing UOM | Unit Price | Amount |
|---|---|---|---|---|---|---|---|---|
| | DROP | Drop off fee | | | 1.000 | EA | 2,250.0000 | $2,250.00 |
| | | **11 Jul 2016** | | | | | | |
| | ROLLOFF | Container Rental: #CHRT25114<br>07/07/2016 - 07/11/2016 | | | 5.000 | DAY | 10.0000 | $50.00 |
| | ROLLOFF | Container Rental: #CHRT27259<br>07/08/2016 - 07/11/2016 | | | 4.000 | DAY | 10.0000 | $40.00 |
| | ROLLOFF | Container Rental: #CHRT25331<br>07/07/2016 - 07/11/2016 | | | 5.000 | DAY | 10.0000 | $50.00 |
| | | **12 Jul 2016** | | | | | | |
| | ROLLOFF | Container Rental: #CHRT25196<br>07/07/2016 - 07/12/2016 | | | 6.000 | DAY | 10.0000 | $60.00 |
| | ROLLOFF | Container Rental: #CHRT27268<br>07/08/2016 - 07/12/2016 | | | 5.000 | DAY | 10.0000 | $50.00 |
| | FEE | Recovery Fee | | | 7,340.000 | EA | 0.1000 | $734.00 |
| | | | | | | | **SUBTOTAL** | **$8,074.00** |
| | | | | | | | **TAX** | **$0.00** |
| | | | | | | | **TASK TOTAL** | **$8,074.00** |

# INVOICE
**Invoice No 1001469460**

**REMIT TO:**
Clean Harbors Env. Services
PO Box 3442
Boston, MA 02241-3442

EIN: 04-2698999

**OFFICE:**
Clean Harbors Environmental Service, Inc.
2150 North 470 East
Tooele, UT 84074
(435) 843-4840

*If you have any questions regarding this invoice, please contact your customer service representative at the telephone number listed above*

**SOLD TO:**
Daryl Jensen
Trihydro Corporation
2707 Broadwater Ave
Helena, MT 59601 - 0000

**JOB SITE/GENERATOR:**
Montana Department of Environmental Quality
2865 Targhee Pass Road (US Highway 20)
West Yellowstone, MT 59758 - 0000

**Job Description: T&D (CH1154478 / CCRK)**

**** Payable in USD funds ****

| Last Service Date | Invoice No | Customer | Branch | Sales Order | Purchase Order | Terms |
|---|---|---|---|---|---|---|
| 11 Jul 2016 | 1001469460 | TR33545 | UT | 1602084633 | 16-178WO-GC | NET 15 DAYS |

| Last Service Date | Task | Task Type | Description | Total |
|---|---|---|---|---|
| 10 Jul 2016 | 1602084633-001 | DISPOSAL | T&D (CH1154478 / CCRK) | $54,637.33 |
| 12 Jul 2016 | 1602084633-002 | GENERAL | ROLLOFF BINS & ACCESSORIALS | $8,074.00 |

| | | |
|---|---|---|
| | **SUBTOTAL** | **$62,711.33** |
| | **TAX** | **$0.00** |
| **PLEASE PAY THIS AMOUNT →** | **INVOICE TOTAL** | **$62,711.33** |
| **REMIT PAYMENT BY →** | **DUE DATE** | **12 Aug 2016** |

Interest will be charged at a rate of 1.5% per month for all past due amounts.

Invoice Date: 28 Jul 2016

**PLEASE RETURN A COPY OF INVOICE WITH PAYMENT - THANK YOU**

R 2162609

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 79 1702921598 SC PPW 5 30/2017 Form Approved. OMB No. 2050-0039

**UNIFORM HAZARDOUS WASTE MANIFEST**

| 1. Generator ID Number | 2. Page 1 of | 3. Emergency Response Phone | 4. Manifest Tracking Number |
|---|---|---|---|
| MTR000209304 | 1 | (800) 483-3718 | 010307174 FLE |

5. Generator's Name and Mailing Address
[illegible] Department of Environmental Quality
[illegible] Pa[illegible] Broadway
[illegible]lone, MT 597[illegible]
Generator's Phone: (406) [illegible]

Generator's Site Address (if different than mailing address)
SAME
2707 Broadwater Ave.
Hel[illegible], MT. 59601

6. Transporter 1 Company Name
[illegible] Environmental [illegible]s Inc
U.S. EPA ID Number
MAD039322250

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
[illegible]rbor A[illegible]onite LLC
[illegible]orth Aptus Road
[illegible] UT 840[illegible]
Facility's Phone: (435) 824-8[illegible]
U.S. EPA ID Number
UTD981552177

| 9a. HM | 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any)) | 10. Containers No. | 10. Containers Type | 11. Total Quantity | 12. Unit Wt./Vol. | 13. Waste Codes |
|---|---|---|---|---|---|---|
| X | 1. 2,4 - [illegible] HAZARDOUS WASTE, LIQUID, N.O.S., [illegible]CHLOR PHENOL), 9, PG III | 001 | DF | 00025 | G | F032 |
| | 2. | | | | | |
| | 3. | | | | | |
| | 4. | | | | | |

14 Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month 06 | Day 14 | Year 17

**INT'L**

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

**TRANSPORTER**

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Anthony C. Ramelo | Signature | Month 06 | Day 14 | Year 17
Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

**DESIGNATED FACILITY**

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name | Signature | Month | Day | Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

[illegible]ors has the appropriate permits for and will accept the waste the generator is shipping

# Land Disposal Restriction Notification Form



Printed Date :Jun 12, 2017

## MANIFEST INFORMATION

Generator : Montana Department of Environmental Quality

Address: 2865 Targhee Pass Road (US Highway 20)
West Yellowstone,MT 59758

EPA ID #: M T R 0 0 0 2 0 9 3 0 4

Manifest Tracking Info.

010307174FLE

Sales Order No: 1702921598

## LINE ITEM INFORMATION

| Line Item: | Page No: | Profile No: | Treatability Group: | LDR Disposal Category |
|---|---|---|---|---|
| 1. | 1 | CH1451751 | WASTEWATER | 2 (This is subject to LDR.) |

| EPA Waste Code | EPA Waste SubCategory |
|---|---|
| F032 | NONE |

| Certification | Applies to Manifest Line Items |
|---|---|
| Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. | 1. |

Waste analysis data, where available, is attached.

Signature : _____ Print Name L. Durrell

Title : Engineer Date : 6/14/17

**ATTACHMENT B**

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00668879 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/08/16 | 07/08/16 | 14:11 | 14:42 | | |

| REFERENCE | ORIGIN |
|---|---|
| TRL | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 35520 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 10040 | LB | |
| Net Weight | 25480 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 12.74 | TON | Contaminated Soil | 27.000 | 344.00 | 0.00 | 344.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 344.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | | |
|---|---|---|---|
| 01 | 00668878 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/08/16 | 07/08/16 | 14:10 | 14:42 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 9038A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 75260 | LB |
| Scale 2 Tare Wt. | 34280 | LB |
| Net Weight | 40980 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 20.49 | TON | Contaminated Soil | 27.000 | 553.00 | 0.00 | 553.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment DEMPSEY CREEK

| NET AMOUNT |
|---|
| 553.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669229 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 14:00 | 14:42 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 84180 | LB |
| Scale 2 Tare Wt. | 37900 | LB |
| Net Weight | 46280 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 23.14 | TON | Contaminated Soil | 27.000 | 625.00 | 0.00 | 625.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 625.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669230 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 14:01 | 14:43 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 31000 | LB |
| Scale 2 Tare Wt. | 9900 | LB |
| Net Weight | 21100 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 10.55 | TON | Contaminated Soil | 27.000 | 285.00 | 0.00 | 285.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 285.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WWCTL TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00668972 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 07:44 | 08:32 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 83260 | LB |
| Scale 2 Tare Wt. | 37960 | LB |
| Net Weight | 45300 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 22.65 | TON | Contaminated Soil | 27.000 | 612.00 | 0.00 | 612.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment REPOSE EXCAVATION

| NET AMOUNT |
|---|
| 612.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00668973 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 07:45 | 08:33 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 33620 | LB |
| Scale 2 Tare Wt. | 9860 | LB |
| Net Weight | 23760 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 11.88 | TON | Contaminated Soil | 27.000 | 321.00 | 0.00 | 321.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 321.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669246 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 14:12 | 14:46 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 9038A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 82380 | LB |
| Scale 2 Tare Wt. | 34440 | LB |
| Net Weight | 47940 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 23.97 | TON | Contaminated Soil | 27.000 | 647.00 | 0.00 | 647.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment DEMPSEY CREEK

| NET AMOUNT |
|---|
| 647.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WINSTAR TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669247 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 14:13 | 14:47 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 34860 | LB |
| Scale 2 Tare Wt. | 9880 | LB |
| Net Weight | 24980 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 12.49 | TON | Contaminated Soil | 27.000 | 337.00 | 0.00 | 337.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 337.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHE |

WW6T1 TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00668974 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 07:45 | 08:30 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 9038A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 77040 | LB |
| Scale 2 Tare Wt. | 36280 | LB |
| Net Weight | 40760 | LB |

Inbound - Charge ticket

| QTY | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 20.38 | TON | Contaminated Soil | 27.000 | 550.00 | 0.00 | 550.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment DEMPSEY CREEK

| NET AMOUNT |
|---|
| 550.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO |
| |

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00668975 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/09/16 | 07/09/16 | 07:46 | 08:30 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 32160 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 10200 | LB | |
| Net Weight | 21960 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 10.98 | TON | Contaminated Soil | 27.000 | 296.00 | 0.00 | 296.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

| NET AMOUNT |
|---|
| 296.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669338 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/11/16 | 07/11/16 | 08:27 | 09:08 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 9038A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 73800 | LB |
| Scale 2 Tare Wt. | 34540 | LB |
| Net Weight | 39260 | LB |

Inbound - Charge ticket

| QTY | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 19.63 | TON | Contaminated Soil | 27.000 | 530.00 | 0.00 | 530.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment DEMPSY CREEK CONSTRUCTION

| NET AMOUNT |
|---|
| 530.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669339 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/11/16 | 07/11/16 | 08:28 | 09:09 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 31860 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 10500 | LB | |
| Net Weight | 21360 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 10.68 | TON | Contaminated Soil | 27.000 | 288.00 | 0.00 | 288.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment DEMPSY CREEK CONSTR

| NET AMOUNT |
|---|
| 288.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669328 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/11/16 | 07/11/16 | 08:05 | 09:11 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691A | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 82980 | LB |
| Scale 2 Tare Wt. | 38060 | LB |
| Net Weight | 44920 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 22.46 | TON | Contaminated Soil | 27.000 | 606.00 | 0.00 | 606.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment REPOSE EXCAVATION

| NET AMOUNT |
|---|
| 606.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00669329 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 07/11/16 | 07/11/16 | 08:06 | 09:11 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 29460 | LB |
| Scale 2 Tare Wt. | 11720 | LB |
| Net Weight | 17740 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 8.87 | TON | Contaminated Soil | 27.000 | 239.00 | 0.00 | 239.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment REPOSE EXCAVATION

| NET AMOUNT |
|---|
| 239.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00683117 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 09/12/16 | 09/12/16 | 14:27 | 14:46 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691ATR | |

| | | |
|---|---|---|
| Scale 1 Gross Wt. | 33060 | LB |
| Scale 2 Tare Wt. | 9780 | LB |
| Net Weight | 23280 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 11.64 | TON | Contaminated Soil | 27.000 | 314.00 | 0.00 | 314.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment REPOSE EXCAV

| NET AMOUNT |
|---|
| 314.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WWCT1 TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6367 SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00683116 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 09/12/16 | 09/12/16 | 14:25 | 14:45 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691A | |

| | | |
|---|---|---|
| Scale 2 Gross Wt. | 80460 | LB |
| Scale 2 Tare Wt. | 37900 | LB |
| Net Weight | 42560 | LB |

Inbound - Charge ticket

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 21.28 | TON | Contaminated Soil | 27.000 | 575.00 | 0.00 | 575.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment REPOSE EXCAV

| NET AMOUNT |
|---|
| 575.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

SIGNATURE

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00695388 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 11/12/16 | 11/12/16 | 12:09 | 12:40 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 3691A | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 83020 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 36980 | LB | |
| Net Weight | 46040 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 23.02 | TON | Contaminated Soil | 27.000 | 622.00 | 0.00 | 622.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment WASTE TRACKING

| NET AMOUNT |
|---|
| 622.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WW6T1 TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE _____

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00695389 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 11/12/16 | 11/12/16 | 12:10 | 12:40 | | |

| REFERENCE | ORIGIN |
|---|---|
| PUP | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 28680 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 9700 | LB | |
| Net Weight | 18980 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 9.49 | TON | Contaminated Soil | 27.000 | 256.00 | 0.00 | 256.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment WASTE TRACKING

| NET AMOUNT |
|---|
| 256.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WW6T1 TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE _____

LOGAN LANDFILL
PO BOX 461
THREE FORKS, MT 59752

000329 Trihydro Corporation
1252 Commerce Dr
Laramie WY 82070

| SITE | TICKET | GRID | WEIGHMASTER |
|---|---|---|---|
| 01 | 00695381 | | 86 |

| DATE IN | DATE OUT | TIME IN | TIME OUT | VEHICLE | ROLL OFF |
|---|---|---|---|---|---|
| 11/12/16 | 11/12/16 | 11:59 | 12:17 | | |

| REFERENCE | ORIGIN |
|---|---|
| 28 9114A | |

| | | | |
|---|---|---|---|
| Scale 1 Gross Wt. | 85700 | LB | Inbound - Charge ticket |
| Scale 2 Tare Wt. | 45800 | LB | |
| Net Weight | 39900 | LB | |

| QTY. | UNIT | DESCRIPTION | RATE | EXTENSION | FEE | TOTAL |
|---|---|---|---|---|---|---|
| 19.95 | TON | Contaminated Soil | 27.000 | 539.00 | 0.00 | 539.00 |

Winter hours 11/1-4/30 Mon-Sat 7:30-4:30
Summer hours 5/1-10/31 M-F 7:00-5:00, Sat 7-4:30.
406-582-2495

Comment TRIHYDRO WASTE TRACKING

| NET AMOUNT |
|---|
| 539.00 |
| TENDERED |
| |
| CHANGE |
| |
| CHECK NO. |
| |

WW6T1 TO REORDER CONTACT CAROLINA SOFTWARE (910) 799-6767 SIGNATURE

DEQ
Montana Department
of Environmental Quality

July 1, 2016

*Via Email*

Andrew Vann
Trihydro Corporation
1252 Commerce Drive
Laramie, WY 82070

Subject: Diamond P Ranch CECRA Facility, West Yellowstone, Montana – Disposal Approval/No Longer Contained In Determination

Dear Andrew:

The Montana Department of Environmental Quality (DEQ) received an email dated June 24, 2016, from Trihydro Corporation providing analytical data, disposal facility correspondence, and a memorandum requesting a no longer contained-in determination for pentachlorophenol (PCP) in soil to be excavated and disposed offsite as part of an interim remedial action at the Diamond P Ranch CECRA Facility (Facility). DEQ has elected to treat the PCP-contaminated soil at this Facility as F032 listed RCRA hazardous waste.

For the soil in question, a total of 18 characterization samples were collected, of which all were analyzed for RCRA 8 metals, polycyclic aromatic hydrocarbons (PAHs), and PCP. Seven of the 20 samples were analyzed for extractable petroleum hydrocarbons (EPH), and nine of 20 samples were analyzed for dioxins/furans. PCP was detected in 16 of the samples with concentrations ranging from 0.0064 milligrams per kilogram (mg/kg) to 60 mg/kg.

In comparing the PCP detected concentrations for soil samples to the universal treatment standards, all detected concentrations (ranging from 0.0064 mg/kg to 60 mg/kg) were below the acceptable level of 74 mg/kg. Each soil sample was also below the construction worker direct contact site-specific screening level (SSSL) for PCP. However, four of the 18 samples exceeded both the PCP residential direct contact and leaching to groundwater SSSLs for the Facility of 5.0 mg/kg and 0.68 mg/kg, respectively. Three additional samples exceeded only the PCP leaching to groundwater SSSL for the Facility. Finally, four of the nine samples analyzed for dioxins/furans exceeded the residential direct contact SSSL of 34.4 nanograms per kilogram (ng/kg), leaching to groundwater SSSL of 66.64 ng/kg, and construction worker direct contact SSSL of 455 ng/kg. One sample exceeded only the dioxins/furans residential direct contact SSSL of 34.4 ng/kg.

As a result of these exceedances, Trihydro provided additional information from the proposed offsite disposal facility, Gallatin Solid Waste Management District (GSWMD) Logan Landfill.

On June 24 and June 29, 2016, Jim Simon, District Manager of GSWMD, verified in writing that the contaminated soil will be disposed at the Logan Landfill in the active Class II cell lined with 60 mil high-density polyethylene and geo-synthetc bentonite pad that includes a leachate collection system where leachate is managed through evaporation and recirculation to prevent contaminants leaching to groundwater. In addition, Mr. Simon stated that the contaminated soil will be covered with municipal solid waste and compacted. The contaminated soil and overlying compacted municipal solid waste will then be covered with daily cover soil as per the facility operation and maintenance and DEQ Class II facility requirements. Such covering of the contaminated soil will prevent direct contact for the soil contaminants discussed above.

Based on previous information submitted by Trihydro, DEQ understands that the GSWMD Logan Landfill finds the existing site data suitable for characterization and is not requiring the collection of additional data.

After review of the analytical data and based on the information provided with Trihydro's June 24, 2016, email, DEQ has made a no longer contained-in determination for the PCP-impacted soil so long as that soil is disposed as outlined above and in Trihydro's memo of June 24, 2016, at the GSWMD Logan Landfill. DEQ's determination does not mean that the disposal facility is permitted to or required to accept the soil. This determination is limited to disposal at this facility and should another disposal facility be proposed, this contained-in determination is void and a separate DEQ determination must be requested. In addition, DEQ requires that final receipts for the waste disposal (i.e., waste manifests or bills of lading) be provided to DEQ to verify the final destination of the waste. Please provide those final receipts with the summary report that's described in Task 11 of Task Order No. 25.

As previously reported by Trihydro and discussed with DEQ, some soil at the Facility exceeds PCP land disposal restriction limits. This hazardous soil is not the subject of the request for a no longer contained-in determination and is planned for appropriate disposal as hazardous waste. Therefore, the no longer contained-in determination request is specific to the soil that is identified to have detected PCP at concentrations below the LDR level of 74 mg/kg as documented in Table 1 analytical results provided with the no longer contained-in request memo.

Please call me if you have questions.

Sincerely,

Travis Erny

Travis Erny
State Superfund Project Officer

cc: Cynthia Brooks, DEQ Legal

DEQ
Montana Department of Environmental Quality

September 9, 2016

*Via Email*

Andrew Vann
Trihydro Corporation
1252 Commerce Drive
Laramie, WY 82070

Subject: Diamond P Ranch CECRA Facility – Disposal Approval and No Longer Contained-In Determination for Additional Soils Excavation

Dear Andrew:

The Montana Department of Environmental Quality (DEQ) received an email dated August 30, 2016, from Trihydro Corporation providing analytical data, disposal facility correspondence, and a memorandum requesting a no longer contained-in determination for pentachlorophenol (PCP) in soil to be excavated and disposed offsite as part of an ongoing interim remedial action at the Diamond P Ranch CECRA Facility (Facility). DEQ has elected to treat the PCP-contaminated soil at this Facility as F032 listed RCRA hazardous waste.

Two characterization samples were collected to confirm that the original excavation removed soils exceeding site-specific screening levels (SSSLs). As such, the samples were only analyzed for contaminants whose concentrations exceeded SSSLs and therefore required excavation. As such, the samples were analyzed for extractable petroleum hydrocarbons (EPH) fractions, polycyclic aromatic hydrocarbons (PAHs), PCP and dioxins/furans. PCP was detected in both of the samples with concentrations of 0.19 milligrams per kilogram (mg/kg) and 0.49 mg/kg.

In comparing the PCP detected concentrations for soil samples to the universal treatment standards, all detected concentrations (see above) were below the acceptable level of 74 mg/kg. Each soil sample was also below the residential direct contact SSSL for PCP (5 mg/kg) as well as the leaching-based SSSL (0.68 mg/kg). One of the two samples (concentration of 0.222 mg/kg) exceeded the residential direct contact PAH TEQ SSCL of 0.1 mg/kg). Both samples (concentrations of 170 nanograms per kilogram (ng/kg) and 360 ng/kg) contained dioxin/furan concentrations exceeding the residential direct contact SSSL of 34.4 ng/kg and the leaching to groundwater SSSL of 66.64 ng/kg, but were below the construction worker direct contact SSSL of 455 ng/kg.

As a result of these exceedances, Trihydro provided additional information from the proposed offsite disposal facility, Gallatin Solid Waste Management District (GSWMD) Logan Landfill. On August 30, 2016, Jim Simon, District Manager of GSWMD, verified in writing that the

additional contaminated soil may be disposed at the Logan Landfill, as was the previous soil from the Diamond P Ranch Facility. As previously identified for the original soil disposed, the additional soil will be disposed in the active Class II cell lined with 60 mil high-density polyethylene and geo-synthetc bentonite pad that includes a leachate collection system where leachate is managed through evaporation and recirculation to prevent contaminants leaching to groundwater. Mr. Simon previously agreed, and Trihydro reiterated for this additional soil, that the contaminated soil will be covered with municipal solid waste and compacted. The contaminated soil and overlying compacted municipal solid waste will then be covered with daily cover soil as per the facility operation and maintenance and DEQ Class II facility requirements. Such covering of the contaminated soil will prevent direct contact for the soil contaminants discussed above.

Based on the email exchange between Trihydro and the GSWMD Logal Landfill, as submitted by Trihydro, DEQ understands that the GSWMD Logan Landfill finds the existing site data suitable for characterization and is not requiring the collection of additional data.

After review of the analytical data and based on the information provided with Trihydro's August 30, 2016, email, DEQ has made a no longer contained-in determination for the PCP-impacted soil so long as that soil is disposed as outlined above and in Trihydro's memo of August 30, 2016, at the GSWMD Logan Landfill. DEQ's determination does not mean that the disposal facility is permitted to or required to accept the soil. This determination is limited to disposal at this facility and should another disposal facility be proposed, this contained-in determination is void and a separate DEQ determination must be requested. In addition, DEQ requires that final receipts for the waste disposal (i.e., waste manifests or bills of lading) be provided to DEQ to verify the final destination of the waste. Please provide those final receipts with the summary report that's described in Task 11 of Task Order No. 25.

Please call me if you have questions.

Sincerely,

Moriah Bucy

Moriah Bucy
State Superfund Section Manager

cc: Cynthia Brooks, DEQ Legal

DEQ
Montana Department of Environmental Quality

November 11, 2016

*Via Email*

Andrew Vann
Trihydro Corporation
1252 Commerce Drive
Laramie, WY 82070

Subject: Diamond P Ranch CECRA Facility – Disposal Approval and No Longer Contained-In Determination for Additional Soils Excavation

Dear Andrew:

The Montana Department of Environmental Quality (DEQ) received an email dated November 9, 2016, from Trihydro Corporation providing analytical data and a memorandum requesting a no longer contained-in determination for pentachlorophenol (PCP) in soil to be excavated and disposed offsite as part of an ongoing interim remedial action at the Diamond P Ranch CECRA Facility (Facility). Trihydro also provided an updated data table and the associated data validation report, as well as further clarification about disposal of contaminated soil on November 11, 2016. DEQ has elected to treat the PCP-contaminated soil at this Facility as F032 listed RCRA hazardous waste.

One characterization sample was collected from the north edge of the excavation to confirm that the additional excavation in September 2016 removed soils exceeding site-specific screening levels (SSSLs). As such, the sample was only analyzed for contaminants whose concentrations exceeded SSSLs and therefore required excavation; therefore, the sample was analyzed for extractable petroleum hydrocarbons (EPH) fractions, polycyclic aromatic hydrocarbons (PAHs), PCP and dioxins/furans. PCP was detected in the sample at a concentration of 0.052 milligrams per kilogram (mg/kg).

In comparing the PCP detected concentration in the soil sample to the universal treatment standards, the detected concentration (see above) was below the acceptable level of 74 mg/kg. The detected concentration was also below the residential direct contact SSSL for PCP (5 mg/kg) as well as the leaching-based SSSL (0.68 mg/kg). The detected PAH TEQ concentration in the sample (0.464 mg/kg) exceeded the residential direct contact PAH TEQ SSCL of 0.1 mg/kg. The dioxin TEQ concentration of 330 nanograms per kilogram (ng/kg) exceeds the residential direct contact SSSL of 34.4 ng/kg and the leaching to groundwater SSSL of 66.64 ng/kg, but was below the construction worker direct contact SSSL of 455 ng/kg. The detected concentrations for all three EPH fractions were well below their respective direct contact or leaching-based SSCLs.

As a result of the PAH TEQ and dioxin TEQ exceedances, Trihydro provided additional information from the proposed offsite disposal facility, Gallatin Solid Waste Management District (GSWMD) Logan Landfill. Jim Simon, District Manager of GSWMD, has twice before (with each of the previous acceptances of the waste) verified in writing that the contaminated soil from the Facility may be disposed at the Logan Landfill. As previously identified for the original soil disposed, the additional soil will be disposed in the active Class II cell lined with 60 mil high-density polyethylene and geo-synthetc bentonite pad that includes a leachate collection system where leachate is managed through evaporation and recirculation to prevent contaminants leaching to groundwater. As previously agreed to by Mr. Simon for both of the previous disposal actions and consistent with DEQs requirements, the contaminated soil will be covered with municipal solid waste and compacted. The contaminated soil and overlying compacted municipal solid waste will then be covered with daily cover soil as per the facility operation and maintenance and DEQ Class II facility requirements. Such covering of the contaminated soil will prevent direct contact for the soil contaminants discussed above.

Based on the previous email exchanges between Trihydro and the GSWMD Logan Landfill, as submitted by Trihydro, and based on Trihydro's November 11, 2016, email to DEQ reiterating Trihydro's request to have the waste buried at the GSWMD Logan Landfill. DEQ further understands that, consistent with previous disposal arrangements, the GSWMD Logan Landfill finds the existing site data suitable for characterization and is not requiring the collection of additional data.

After review of the analytical data and based on the information provided with Trihydro's November 9, 2016, email, DEQ has made a no longer contained-in determination for the PCP-impacted soil so long as that soil is disposed as outlined above and in Trihydro's memo of November 9, 2016, at the GSWMD Logan Landfill. DEQ's determination does not mean that the disposal facility is permitted to or required to accept the soil. This determination is limited to disposal at this facility and should another disposal facility be proposed, this contained-in determination is void and a separate DEQ determination must be requested. In addition, DEQ requires that final receipts for the waste disposal (i.e., waste manifests or bills of lading) be provided to DEQ to verify the final destination of the waste. Please provide those final receipts with the summary report that's described in Task 11 of Task Order No. 25.

Please call me if you have questions.

Sincerely,

Moriah Bucy
State Superfund Section Manager

cc: Cynthia Brooks, DEQ Legal

**ATTACHMENT C**

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Friday, July 8, 2016 | | |
| **Temperature** | 50-70 °F | **Work Day** | 1 |
| **Sky** | Clear | **Work Start** | 600 |
| **Wind** | Light (1-10 mph) | **Work Stop** | 2015 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Aaron Roesler - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| Cat 315C excavator | 1 |
| Belly dump truck with pup | 2 |
| New Holland LS 190 skid steer | 1 |

**Health and Safety Comments**

Tailgate Safety Meeting: Horses and riders in the area; Work to be done around ranch's schedule; Traffic/driving, tourists on roads, sightseeing.

Work was stopped periodically to allow riders and horses to pass by safely.

**Record of Samples Collected**

No samples were collected this day.

**Work Activities Conducted**

Repose Excavation began excavation of impacted area west of the homestead house. Clean Harbors delivered five roll off containers to the site. All five roll offs were loaded with soil expected to be hazardous. Approximately 69 yards of hazardous soil was loaded in the roll offs. Three of the roll offs were loaded while still on the trucks and removed from the site by Clean Harbors. The remaining two were loaded and will be removed on Sunday.

One load (belly dump trailer and pup, approximately 35 tons) was loaded with nonhazardous soil and taken to the Logan Landfill. Both trailers and pups were loaded at the end of the day and will go to the landfill first thing in the morning.

With permission from the property owner, one shrub was removed and a spruce tree was trimmed to allow access for trucks.

**Deviation from approved plans:**

| | |
|---|---|
| **Work conducted in accordance with approved plans?** | Yes |

Photo Date: 7/8/2016

Direction: East

Description: Excavation area prior to work.

Photo Date: 7/8/2016

Direction: Northwest

Description: Repose excavating hazardous area. Live loading roll off on the the truck.

Photo Date: 7/8/2016

Direction: North

Description: Riders preparing to leave for a trail ride. Work was stopped at various times to allow riders to pass.

Photo Date: 7/8/2016

Direction: Northeast

Description: Excavation of hazardous area. "Wet" area in center is believed to be primary source area.

Photo Date: 7/8/2016

Direction: East

Description: Excavation west of homestead house.

Photo Date: 7/8/2016

Direction: West

Description: Loaded roll-off container.

Photo Date: 7/8/2016

Direction: East

Description: Excavation area at end of the day.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Saturday, July 9, 2016 | | |
| **Temperature** | 70-85 °F | **Work Day** | 2 |
| **Sky** | Clear | **Work Start** | 500 |
| **Wind** | Moderate (11-25 mph) | **Work Stop** | 1300 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Aaron Roesler - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| Cat 315C excavator | 1 |
| Belly dump truck with pup | 2 |
| New Holland LS 190 skid steer | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Driving, expect more traffic on the weekend. |
| **Record of Samples Collected** | No samples were collected this day. |
| **Work Activities Conducted** | Repose delivered the loads from yesterday to the landfill and resumed excavation. Repose coordinated return to the ranch to be between rides. Repose excavated and loaded two more loads of nonhazardous material. Both loads were delivered to the Logan Landfill. Approximately, 140 tons of material was taken to the landfill. It appears that there is about two loads of material remaining to be excavated. The excavation reached about 20 feet below ground surface. There was no sign of groundwater. A clay layer is visible from about 8 ft bgs to past the bottom of the excavation. |

**Deviation from approved plans:**

**Work conducted in accordance**

**Deviation from approved plans:**

**with approved plans?**

Photo Date: 7/9/2016

Direction: South

Description: Repose loading belly dump trailer with nonhazardous material.

Photo Date: 7/9/2016

Direction: Northeast

Description: Excavation area.

Photo Date: 7/9/2016

Direction: North

Description: Excavation area.

Photo Date: 7/9/2016

Direction: North

Description: Excavation area west of homestead.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Sunday, July 10, 2016 | | |
| **Temperature** | 50-70 °F | **Work Day** | 3 |
| **Sky** | Overcast | **Work Start** | 1015 |
| **Wind** | Light (1-10 mph) | **Work Stop** | 1500 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Aaron Roesler - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| Cat 315C excavator | 1 |
| Belly dump truck with pup | 2 |
| New Holland LS 190 skid steer | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Thunderstorms forecasted; Rain overnight, watch for muddy conditions, slips/trips/falls. |
| **Record of Samples Collected** | No samples were collected this day. |
| **Work Activities Conducted** | Two Clean Harbors drivers removed the remaining two roll-off containers.<br><br>Repose excavated the pond on the south side of the highway. The excavated material was stockpiled and will be used to backfill the excavation. Backfill of the excavation is expected to be done for several weeks, until confirmation sampling is completed and approved. |

| | Deviation from approved plans: |
|---|---|
| **Work conducted in accordance with approved plans?** | Yes |

Photo Date: 7/10/2016

Direction: North

Description: Open excavation.

Photo Date: 7/10/2016

Direction: West

Description: Roll-off containers to be removed by Clean Harbors.

Photo Date: 7/10/2016

Direction: East

Description: Repose excavating and stockpiling material from the pond. To be used as backfill.

Photo Date: 7/10/2016

Direction: West

Description: Repose excavating pond area and stockpiling.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Monday, July 11, 2016 | | |
| **Temperature** | 32-50 °F | **Work Day** | 4 |
| **Sky** | Overcast | **Work Start** | 530 |
| **Wind** | Moderate (11-25 mph) | **Work Stop** | 1000 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Aaron Roesler - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| Cat 315C excavator | 1 |
| Belly dump truck with pup | 2 |
| New Holland LS 190 skid steer | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Rain continued overnight, wet muddy conditions, wet roads. |
| **Record of Samples Collected** | Trihydro collected confirmation samples from the excavation. Four surface samples [DIAP-S-WEST (0-2), DIAP-S-NORTH (0-2), DIAP-S-SOUTH (0-2), and DIAP-S-EAST (0-2)]. Four subsurface samples were collected [DIAP-SS-WEST (2-20), DIAP-SS-NORTH (2-20), DIAP-SS-SOUTH (2-20), and DIAP-SS-EAST (2-20)]. |
| **Work Activities Conducted** | Repose completed the excavation and loaded two loads (trailers and pups) for the landfill. The deepest point of the excavation is approximately 20 feet below ground surface. Confirmation samples were collected from the excavation. The sample locations and extents of excavation were GPSed. Barrier fence was placed around the excavation. Repose delivered loads to the Logan Landfill and began demobing equipment on Tuesday. |

| | Deviation from approved plans: |
|---|---|
| **Work conducted in accordance** | Yes |

**Deviation from approved plans:**

**with approved plans?**

Photo Date: 7/11/2016

Direction: East

Description: Completed excavation.

Photo Date: 7/11/2016

Direction: North

Description: Completed excavation.

Photo Date: 7/11/2016

Direction: North

Description: Completed excavation.

Photo Date: 7/11/2016

Direction: East

Description: Completed excavation with barrier fence in place.

Photo Date: 7/11/2016

Direction: North

Description: Excavation with barrier fence.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Monday, September 12, 2016 | | |
| **Temperature** | 32-50 °F | **Work Day** | 1 |
| **Sky** | Overcast | **Work Start** | 600 |
| **Wind** | Light (1-10 mph) | **Work Stop** | 1700 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Aaron Roesler - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |
| Jeff Tramke - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| Cat 312C excavator | 1 |
| End dump truck | 1 |
| New Holland LS 190 skid steer | 1 |
| John Deere skid steer | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Watch for pedestrians, riders, tourists; Traffic crossing highway; Contaminants in soil; Muddy conditions, slips/trips/falls. |
| **Record of Samples Collected** | Trihydro collected confirmation soil samples from the additional excavations to the north and south. Also, groundwater samples were collected from wells MW-3 and MW-4. |
| **Work Activities Conducted** | Repose excavation excavated additional surface material to the north and south. An area approximately 6 by 25 feet was excavated to the north and an area 8 by 12 was excavated to the south. The south excavation was to a depth of 2 feet. The north excavation was limited due to a monitoring well and the depth ranged from about 1 to 2 feet and sloped to the center of the excavation. Repose began backfill of the excavation using material stockpiled from the pond at the Diamond P Ranch. Worked was stopped at about 1310 because the contractor hit an overhead power line with the raised bed of the end dump truck. There were no injuries. The damage was limited to the broken line, one pole was broken, and a small amount of |

damaged to the roof of the homestead house when the pole leaned against it. Repose lowered the power pole to the ground so that it would not pose a danger in the future. Backfill resumed at about 1510. Work was stopped again at 1600 due to the rain and snow creating muddy conditions. The dump truck began have trouble crossing the field near the pond. The remaining 4 to 5 truckloads necessary to complete the backfill will be done on Tuesday.

**Deviation from approved plans:**

| | |
|---|---|
| **Work conducted in accordance with approved plans?** | Yes |

Photo Date: 9/12/2016

Direction: East

Description: Excavation before additional excavation and backfill.

Photo Date: 9/12/2016

Direction: North

Description: Additional excavation to the north.

Photo Date: 9/12/2016

Direction: West

Description: Additional excavation to the south.

Photo Date: 9/12/2016

Direction: East

Description: Power line the was hit by the dump truck.

Photo Date: 9/12/2016

Direction: East

Description: Broken power pole leaning against the homestead building.

Photo Date: 9/12/2016

Direction: North

Description: Excavation at the end of the day. Backfill about 90%.

Photo Date: 9/12/2016

Direction: East

Description: Excavation at end of the day. Backfill about 90%.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Tuesday, September 13, 2016 | | |
| **Temperature** | 32-50 °F | **Work Day** | 2 |
| **Sky** | Overcast | **Work Start** | 800 |
| **Wind** | Light (1-10 mph) | **Work Stop** | 1500 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Jeff Tamkce - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |

| Equipment Present Onsite | Count |
|---|---|
| John Deere 320 skid steer | 1 |
| End dump truck | 1 |
| New Holland LS 190 skid steer | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Reviewed incident from previous day; Overhead utilities; Stop, drop, and roll - Dump truck does not start forward until bed is completely down. |
| **Record of Samples Collected** | Trihydro collected groundwater sample from well MW-1. MW-2 did not have enough water to collect a sample. |
| **Work Activities Conducted** | Repose completed backfill of the excavation area. All of the material stockpiled from the Diamond P pond was used. The surface of the excavation was completed with road mix. Excess road mix was used to help start a road around the south of the homestead house.<br><br>Repose agreed to assist Diamond P with installing a buried power line to replace the damaged line. Repose will provide a mini excavator and operator as well as pay for wire and electrician's time. |

| | Deviation from approved plans: |
|---|---|
| **Work conducted in accordance with approved plans?** | Yes |

Photo Date: 9/13/2016

Direction: North

Description: Backfill remaining at start of day.

Photo Date: 9/13/2016

Direction: Southeast

Description: Repose placing backfill.

Photo Date: 9/13/2016

Direction: East

Description: A portion of road was built south of the homestead house road mix.

Photo Date: 9/13/2016

Direction: East

Description: Completed excavation area.

| | Name: | Company: | |
|---|---|---|---|
| **Report Created By** | Lucas Darnell | Trihydro Corporation | |
| **Date** | Saturday, November 12, 2016 | | |
| **Temperature** | 32-50 °F | **Work Day** | 1 |
| **Sky** | Clear | **Work Start** | 730 |
| **Wind** | Calm (<1 mph) | **Work Stop** | 1230 |

| Onsite Personnel (name/company) | Role |
|---|---|
| Jake Logan - Repose Excavation | Excavation Contractor |
| John Perkins - Repose Excavation | Excavation Contractor |
| Jim Magone - Repose Excavation | Truck driver |

| Equipment Present Onsite | Count |
|---|---|
| John Deere 320 skid steer | 1 |
| Belly dump truck | 2 |
| Cat 312C excavator | 1 |

| | |
|---|---|
| **Health and Safety Comments** | Tailgate Safety Meeting: Reviewed site and hazards; PPE |
| **Record of Samples Collected** | Trihydro collected four confirmation soil samples and one blind duplicate. |
| **Work Activities Conducted** | Repose excavated an area approximately 20 x 25 feet to the north of the original excavation. Three wood posts were removed as part of the excavation. The excavation was completed to a depth of approximately two feet. Approximately 55 tons of material was excavated and take to the Logan Landfill in Three Forks, MT. The excavation was backfilled once sampling was complete and the surface was finished with a road mix. Some minor improvements were made to the surrounding area at the request of the property owner. |

| | Deviation from approved plans: |
|---|---|
| **Work conducted in accordance with approved plans?** | Yes |

Photo Date: 11/11/2016

Direction: East

Description: Location of additional excavation.

Photo Date: 11/11/2016

Direction: North

Description: Repose excavating at Diamond P.

Photo Date: 11/11/2016

Direction: Northeast

Description: Completed excavation

Photo Date: 11/11/2016

Direction: Southeast

Description: Completed excavation.

Photo Date: 11/12/2016

Direction: East

Description: Completed and backfilled excavation.

West Yellowstone, MT 6/27/16

Diamond P Ranch / MDEQ

Sunny 80°

1000 LD and Aaron Rassler (Repose) arrive at Diamond P Ranch
- Met w/ Rex Portman
- Tour site, discuss scheduling, complexity, parking, times for rides
- Evaluate potential routes for brackets. Rex is willing to move a couple trailers to accommodate brackets

1110 Collect backfill samples from ditch

1130 Collect backfill samples from pond area.

1150 LD & AR offsite

Rex Portman
208 317 7498



West Yellowstone 7/08/16

Diamond P Ranch / MDEQ

Sunny 35° → Day 1

0600 LD arrive onsite
Repose Aaron, John
- Mark out excavation area

Safety meeting
- Rotors, work around roads schedule; Traffic/driving - comments

1000 Call from Clem Hutsons
- wanting to come onsite

1025 CH arrive
MT RO ~~207-317-8700~~ 0007-09304

1120 First rolloff leaving site full
- ~17 yds

1200 John offsite to ~~[illegible]~~ landfill with trailer and pump

1300 Discussed bringing bins to back to allow access for brackets.
- Rex would like stump removed and gave permission to burn spruce

1330 Second CH truck arrived. Waiting for hoses to leave before bringing onsite

cont

7/08/16
page 2

1410 Bringing rolloff onsite
1510 CH offsite
1300 Reposer starting to load belly dump from landfill
1720 CH driver called. Early and will wait for my call to come onsite
1730 - Reposer stopping to allow horses/riders to go out
1805 - Resume loading
- Notify CH driver to come onsite
1815 CH driver with sample arrives onsite
1845 CH driver offsite w/ loaded rolloff
1945 Both tractors and pups loaded to go to landfill in the morning
2015 LD and Reposer offsite
- Loaded tracks were stored along driveway



Diamond P Ranch / MDEQ
Sunny, breezy 71° → 80 Day 2
1000 LD arrives onsite
Reposer took trucks to landfill this morning. Should return around 1030
1050 Reposer onsite
- Stop work to allow riders to clear area
1130 AR offsite to landfill
1150 Excavated to ~19 ft. No sign of water
1200 JP drop site to landfill
- Approximately 1-2 truckloads remaining
- LD replace fence around excavation
1300 LD offsite

West Yellowstone, MT 7/10/16

Overcast, light rain 90 → 55 Day 3

Diamond P Ranch / MDEQ

1015 LD arrive onsite
Reposse Aaron, John
- Reposse plow to excavate and stockpile backfill/Pond berm
1100 CH (2) arrive to collect 2 remaining roll-offs
1205 First CH driven off site
1215 Second CH driven off site
1240 Reposse begin excavating/stockpiling pond ~~and~~ on south side of berm
1410 Excavator back to main excavation
1500 LD off site



West Yellowstone, MT 7/11/16

Diamond P Ranch / MDEQ

Rain 38 → Day 4

0530 LD arrive onsite
Reposse Aaron, John
- Safety meeting
- Rain, mud, wet roads
- Reposse resume excavation
0600 AR off site to landfill, then on to Dew Lodge. Will return later to demobe equipment
0620 JP off site to landfill
0630 LD begin collecting confirmation samples
BD-20160711 = DRAP-SS-EAST (2-20)
0800 GPS sample locations
- EAST sample locations would not collect GPS data. Too close to house

West Yellowstone, MT 9/12/16
Dennis ? Ranch / MDEQ
Overcast, light rain 40° → 45 Day 1
0600 LD onsite
Repose Arson
- remove fence, some wood & debris
- begin excavation area
0700 Repose John, Jeff
Safety meeting
- Pedestrians, riders, traffic on hwy, contaminants, mud
0715 Repose begin backfilling excavation
0750 Tri State Excavation (Chris) onsite w/ excavator (CAT 312C)
0810 Begin additional excavation on North side
1030 South and North additional excavation complete
1130 Arson Waste to landfill
1310 John hit overhead powerline with bed of dump truck
1320 Notify property owner - Rex
Notify CC
Notify H&S - Tony
- "live" end of wire is still on pole

cont



no safety concerns
- pole near homestead house is broken at the ground, leaning against house
1500 Repose remove broken power pole
1510 Repose resume backfill
1600 Stopping work
- road near pond has become very slick with rain/snow
1730 LD finish GW sampling at MW-3
BD-20160912-02 = MW-3
- 0600 hrs

Note:
BD-20160912-01 = DIAP-SS-S-F
sent

West Yellowstone, MT 9/13/16
Diamond P Ranch / MDEQ
Overcast 33° → Day 2

0800 LD arrive onsite
Repose to hauling trees
repositioned over on dump trucks
0830 setting up to collect GW
samples at MW-2, then MW-1
0845 MW-2 only has monitoring
water - unable to sample
move to MW-1
1030 Repose - John, Jeff onsite
- had been repositioned this
morning
1040 Safety Meeting
- Stop, drop, roll; overhead
power lines; details from yesterday
1050 Repose resume backfill
1150 Last load of backfill brought to
excavation
1230 Repose planning road mix
to complete surface
- using extra for "road"
south of homestead house
cont



9/13/16
page 2

1315 Property owner (Rex Portman)
sign property condition
form
- Discuss plan to resolve
damaged power line
- Repose will provide mini-ex
and labor to trench for
underground power line,
pay for supplies and
~~electricio~~ electrician time
1530 LD and Repose offsite
- Rex is comfortable with
just Repose coming Thursday
to trench. Triangle will
not be onsite
- LD pack samples for
lab/shipping
1930 Deliver samples to Energy
- Will ship GW drawn samples
to ALS on Wednesday

LD

West Yellowstone, MT 11/12/16
Diamond P Ranch / MDEQ
Clear 19°

0730 LD arrive onsite
Reprose John, Jon, John
Safety Meeting
- Site Hazards, PPE
0815 Begin aldebrand excavation
0915 Excavation complete
Sample
DD-20161112-01 = DEAP-3-S-WEST (0-2)
0945 Reprose begin backfilling excavation
1100 Property owner requested Reprose level out area west of excavation. Reprose graded the area to remove a hump and make it easier to drive
1215 Property owner approved of backfill and completion of work
1230 LD offsite



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| July 2016 | .INSPTX | .INSPTY |
|---|---|---|
| | 1519454.28936393 | 165405.82532412 |
| | 1519494.94640581 | 165405.89034205 |
| | 1519494.94640581 | 165363.67598142 |
| | 1519491.98622293 | 165363.01086183 |
| | 1519470.47913663 | 165375.44353524 |
| | 1519477.66323949 | 165371.98833489 |

| September 2016 | .INSPTX | .INSPTY |
|---|---|---|
| | 1519465.02590375 | 165409.92914651 |
| | 1519464.98270031 | 165405.84242469 |
| | 1519494.97947770 | 165409.71177871 |
| | 1519494.94640581 | 165405.89034205 |
| | 1519477.66323949 | 165371.98833489 |
| | 1519473.84821585 | 165358.93545695 |
| | 1519488.46881242 | 165356.53338444 |
| | 1519491.98622293 | 165363.01086183 |

| November 2016 | .INSPTX | .INSPTY |
|---|---|---|
| | 1519465.21199784 | 165427.53225743 |
| | 1519495.10261444 | 165427.41610092 |
| | 1519494.97947770 | 165409.71177871 |
| | 1519465.02590375 | 165409.92914651 |

Montana State Plane Zone, US Foot

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

**LOW - FLOW PURGING /SAMPLING FORM**

**PROJECT NAME:** Donald P Ranch
**PROJECT NO.:**
**WELL NO.:** MW-1 **WELL DIAMETER:** 2
**SAMPLER:** L Dowell
**DATE:** 9/13/16
**WEATHER CONDITIONS** 32° Overcast

**Sampling Device:** Bladder Pump GT Rental 3518
**Make/Model:** Centurion 5357 Geo Control Pro
**Serial Number:**

**Water Quality Inst.:** YSI ProDss
**Make/Model:** 5007
**Serial Number:**

**Tubing Type:** O Teflon O Poly O Other **Decontamination:** O Decontaminated Water Meter O Decontaminated Flow Through Cell
**Depth to Water (ft-bmp):** 21.21 **Total Well Depth (ft-bpm):** 27.25 **Depth to Pump Inlet(ft-bmp):**

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| Stabilization Criteria | | | ±0.5 | ±10% | ±10% or less over 10 NTUs | | | | |
| 1. 0914 | | | 6.83 | 326.2 | 19.0 | 6.1 | 9.65 | 76.2 | 21.26 |
| 2. 0917 | | | 6.75 | 330.5 | 9.2 | 6.2 | 9.39 | 60.8 | 21.26 |
| 3. 0920 | | | 6.77 | 331.8 | 4.8 | 6.3 | 9.31 | 64.6 | 21.29 |
| 4. 0923 | | | 6.79 | 332.5 | 4.5 | 6.4 | 9.30 | 73.2 | 21.29 |
| 5. 0926 | | | 6.80 | 332.0 | 1.7 | 6.3 | 9.30 | 73.4 | 21.29 |
| 6. 0929 | | | 6.81 | 331.7 | 1.3 | 6.4 | 9.30 | 76.2 | 21.30 |
| 7. 0932 | | | 6.82 | 331.5 | 0.8 | 6.4 | 9.31 | 76.7 | 21.31 |
| 8. 0935 | Sampled | | | | | | | | |
| 9. | | | | | | | | | |
| 10. | | | | | | | | | |
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**Sample ID:** MW-1 **SampleClarity/Color/Odor:** Clear
**Sample Time:** 0935 **QAQC Samples Collected:** ☒ No O Yes:
**Comments:**

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

**LOW - FLOW PURGING /SAMPLING FORM**

**PROJECT NAME:** Diamond P Ranch
**PROJECT NO.:**
**WELL NO.:** MW-2 **WELL DIAMETER:** 2
**SAMPLER:** L. Dunn
**DATE:** 9/13/16
**WEATHER CONDITIONS** Overcast 34°

| | |
|---|---|
| **Sampling Device:** | **Water Quality Inst.:** |
| **Make/Model:** | **Make/Model:** |
| **Serial Number:** | **Serial Number:** |

**Tubing Type:** O Teflon O Poly O Other **Decontamination:** O Decontaminated Water Meter O Decontaminated Flow Through Cell
**Depth to Water (ft-bmp):** ~~17.85~~ 17.51 **Total Well Depth (ft-bpm):** 18.35 **Depth to Pump Inlet(ft-bmp):**

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| Stabilization Criteria | | | ±0.5 | ±10% | 10% or less than 10 NTUs | | | | |
| 1. No sample collected due to lack of water | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
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| 18. | | | | | | | | | |

| | |
|---|---|
| **Sample ID:** | **SampleClarity/Color/Odor:** |
| **Sample Time:** | **QAQC Samples Collected:** O No O Yes: |

**Comments:**

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

**LOW - FLOW PURGING /SAMPLING FORM**

**PROJECT NAME:** Dominel P Ranch
**PROJECT NO.:**
**WELL NO.:** MW-3 **WELL DIAMETER:** 2
**SAMPLER:** L Dunn
**DATE:** 9/12/16
**WEATHER CONDITIONS** Rain

**Sampling Device:** Geotech Rental 3575
**Make/Model:** Controller Geo Control Pro #5357
**Serial Number:**

**Water Quality Inst.:** YSI Pro DSS 5007
**Make/Model:**
**Serial Number:**

**Tubing Type:** O Teflon O Poly O Other **Decontamination:** O Decontaminated Water Meter O Decontaminated Flow Through Cell
**Depth to Water (ft-bmp):** 18.21 **Total Well Depth (ft-bpm):** 25.36 **Depth to Pump Inlet(ft-bmp):**

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | µS/cm Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| Stabilization Criteria | | | | | ±10 or less than 10 NTUs | | | | ~~18.32~~ |
| 1. 1526 | | | 7.36 | 324.5 | 20.5 | 6.0 | 10.66 | 80.9 | 18.32 |
| 2. 1529 | | | 7.10 | 326.3 | 25.5 | 6.2 | 10.00 | 93.3 | 18.44 |
| 3. 1533 | | | 6.74 | 307.2 | 48.9 | 6.3 | 9.54 | 92.5 | 18.53 |
| 4. 1536 | | | 6.75 | 304.3 | 53.7 | 6.3 | 9.92 | 92.4 | 18.54 |
| 5. 1539 | | | 6.74 | 303.1 | 58.4 | 6.3 | 9.93 | 92.2 | 18.54 |
| 6. 1542 | | | 6.73 | 297.2 | 74.3 | 6.3 | 10.00 | 96.4 | 18.54 |
| 7. 1545 | | | 6.73 | 290.8 | 92. | | | | |
| 8. 1553 | | | | | | | | | |
| 9. 1555 | | | 6.74 | 274.0 | 151.0 | 6.4 | 10.36 | 82.2 | 18.42 |
| 10. 1601 | | | 6.74 | 269.0 | 201.5 | 6.3 | 10.36 | 84.0 | 18.55 |
| 11. 1604 | | | 6.73 | 272.0 | 223.5 | 6.3 | 10.34 | 86.2 | 18.55 |
| 12. 1607 | | | 6.74 | 270.0 | 234.3 | 6.3 | 10.37 | 87.0 | 18.59 |
| 13. 1610 | | | 6.74 | 267.7 | 2 | 6.3 | 10.40 | 88.0 | 18.61 |
| 14. 1615 | Sampled | | | | | | | | |
| 15. | | | | | | | | | |
| 16. | | | | | | | | | |
| 17. | | | | | | | | | |
| 18. | | | | | | | | | |

**Sample ID:** MW-3 **SampleClarity/Color/Odor:** Clear No Odor
**Sample Time:** 1615 **QAQC Samples Collected:** O No ~~O~~ Yes: BD-20160912-02
**Comments:**

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

**LOW - FLOW PURGING /SAMPLING FORM**

**PROJECT NAME:** Dormont P Park
**PROJECT NO.:**
**WELL NO.:** MW-4 **WELL DIAMETER:** 2
**SAMPLER:** L Dunell
**DATE:** 09/12/16
**WEATHER CONDITIONS** Rain

**Sampling Device:** Grasbech Bladder Pump
**Make/Model:** Rental 3515
**Serial Number:** Controller 5357 Geochemical Pu

**Water Quality Inst.:** YSI ProDSS
**Make/Model:** II 5007
**Serial Number:**

**Tubing Type:** O Teflon O Poly O Other **Decontamination:** O Decontaminated Water Meter O Decontaminated Flow Through Cell
**Depth to Water (ft-bmp):** 16.72 **Total Well Depth (ft-bpm):** 25.41 **Depth to Pump Inlet(ft-bmp):**

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | µS/cm ~~mS/m~~ Cond. ~~(mS/m)~~ | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| Stabilization Criteria | | | ±0.5 | ±10% | ±10 or if less than 10 NTUs | | | | |
| 1. 1147 | | | 7.03 | 403.1 | 66.6 | 5.9 | 10.10 | 90.8 | 18.93 |
| 2. 1155 | | | 6.56 | 403.2 | 40.7 | 5.8 | 9.83 | 89.5 | 19.55 |
| 3. 1200 | | | 6.87 | 401.8 | 56.8 | 5.8 | 9.76 | 88.1 | 19.61 |
| 4. 1205 | | | 6.89 | 400.9 | 65.1 | 5.8 | 9.75 | 86.4 | 19.59 |
| 5. 1208 | | | 6.90 | 400.8 | 63.2 | 5.8 | 9.73 | 85.5 | 19.59 |
| 6. 1213 | | | 6.91 | 400.8 | 56.5 | 5.8 | 9.71 | 84.7 | 19.57 |
| 7. 1216 | | | 6.95 | 399.9 | 52.2 | 5.8 | 9.69 | 82.6 | 19.60 |
| 8. 1219 | | | 6.97 | 400.3 | 52.9 | 5.8 | 9.69 | 77.9 | 19.61 |
| 9. 1225 | Sampled | | | | | | | | |
| 10. | | | | | | | | | |
| 11. | | | | | | | | | |
| 12. | | | | | | | | | |
| 13. | | | | | | | | | |
| 14. | | | | | | | | | |
| 15. | | | | | | | | | |
| 16. | | | | | | | | | |
| 17. | | | | | | | | | |
| 18. | | | | | | | | | |

**Sample ID:** MW-4 **SampleClarity/Color/Odor:** Clear No Odor
**Sample Time:** **QAQC Samples Collected:** O No O Yes:
**Comments:**

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

# LOW - FLOW PURGING /SAMPLING FORM

PROJECT NAME: Donnel P
PROJECT NO.:
WELL NO.: MW-1 WELL DIAMETER:
SAMPLER: LD
DATE: 4/24/17
WEATHER CONDITIONS Snow

| | | | |
|---|---|---|---|
| Sampling Device: | Geotech Bladder Pump | Water Quality Inst.: | YSI EXO |
| Make/Model: | Aqua-Tab 5503 | Make/Model: | |
| Serial Number: | Contact 5755 | Serial Number: | |

Tubing Type: O Teflon O Poly O Other Decontamination: O Decontaminated Water Meter O Decontaminated Flow Through Cell
1.85-1 Depth to Water (ft-bmp): 23.79 Total Well Depth (ft-bpm): Depth to Pump Inlet(ft-bmp):

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | mS/cm | | | | | |
| 1. 1135 | | | ~~7.57~~ | 0.1546 | 9.61 | 18.16 | | 243.0 | 23.95 |
| 2. 1140 | | | 7.57 | 0.1540 | | 18.16 | 2.04 | 243 | |
| 3. | | | | | | | | | |
| 4. 1202 | | | 6.56 | .1532 | 73.5 | 4.30 | 7.35 | 66.3 | 23.90 |
| 5. 1205 | | | 6.55 | .1556 | 105.9 | 5.44 | 7.29 | 67.2 | 23.91 |
| 6. 1208 | | | 6.55 | 0.1579 | 70.1 | 5.89 | 7.26 | 67.9 | 23.90 |
| 7. 1211 | | | 6.55 | .1565 | 71.21 | 5.93 | 7.26 | 69.6 | |
| 8. 1214 | | | 6.55 | 0.1592 | 73.22 | 5.95 | 7.26 | 70.3 | 23.90 |
| 9. 1217 | | | 6.55 | 0.1592 | 68.01 | 5.92 | 7.25 | 70.7 | 23.90 |
| 10. 1220 | | | 6.56 | 0.1589 | 72.00 | 5.92 | 7.25 | 71.4 | 23.91 |
| 11. 1223 | | | 6.56 | 0.1590 | 98.80 | 5.95 | 7.24 | 72.2 | |
| 12. 1226 | | 2 gal | 6.56 | 0.1595 | 98.63 | 5.95 | 7.24 | 72.6 | 23.93 |
| 13. | | | | | | | | | |
| 14. | | | | | | | | | |
| 15. | | | | | | | | | |
| 16. | | | | | | | | | |
| 17. | | | | | | | | | |
| 18. | | | | | | | | | |

| | | | |
|---|---|---|---|
| Sample ID: | MW-1 | SampleClarity/Color/Odor: | Clear No odor |
| Sample Time: | 1230 | QAQC Samples Collected: | O No O Yes: |

Comments:

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

# LOW - FLOW PURGING /SAMPLING FORM

PROJECT NAME: Dimmit P

PROJECT NO.:

WELL NO.: MW-1 WELL DIAMETER:

SAMPLER:

DATE:

WEATHER CONDITIONS

| | |
|---|---|
| Sampling Device: | Water Quality Inst.: |
| Make/Model: | Make/Model: |
| Serial Number: | Serial Number: |

Tubing Type: O Teflon O Poly O Other Decontamination: O Decontaminated Water Meter O Decontaminated Flow Through Cell

Depth to Water (ft-bmp): 18.26 Total Well Depth (ft-bpm): 18.35 Depth to Pump Inlet(ft-bmp):

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| 1 | Not Sampled | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
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| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |

| | |
|---|---|
| Sample ID: | SampleClarity/Color/Odor: |
| Sample Time: | QAQC Samples Collected: O No O Yes: |

Comments:

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

LOW - FLOW PURGING /SAMPLING FORM

PROJECT NAME: Diamond P Ranch

PROJECT NO.:

WELL NO.: MW-3 WELL DIAMETER:

SAMPLER: LD

DATE: 4/24/17

WEATHER CONDITIONS Snow 38°

| | |
|---|---|
| Sampling Device: | Water Quality Inst.: |
| Make/Model: | Make/Model: |
| Serial Number: | Serial Number: |

Tubing Type: O Teflon O Poly O Other Decontamination: O Decontaminated Water Meter O Decontaminated Flow Through Cell

Depth to Water (ft-bmp): 20.32 Total Well Depth (ft-bpm):_____ Depth to Pump Inlet(ft-bmp):

| | Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | mS/cm | | | | | |
| 1 | 1329 | | | 6.70 | .1763 | 7.92 | 5.52 | 9.35 | 69.7 | 20.49 |
| 2 | 1333 | | | 6.56 | .1766 | 7.46 | 5.64 | 9.30 | 73.8 | 20.48 |
| 3 | 1336 | | | 6.52 | .1765 | 11.54 | 5.64 | 9.34 | 75.2 | |
| 4 | 1339 | | | 6.52 | .1742 | 12.56 | 5.67 | 9.30 | 76.1 | 20.45 |
| 5 | 1342 | | | 6.52 | 0.1727 | 11.65 | 5.72 | 9.42 | 78.3 | |
| 6 | 1345 | | | 6.53 | 0.1713 | 10.90 | 5.74 | 9.12 | 79.6 | 20.46 |
| 7 | 1349 | | | 6.54 | 0.1700 | 11.06 | 5.65 | 9.44 | 80.8 | 20.43 |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
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| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |

| | | | |
|---|---|---|---|
| Sample ID: | MW-3 | SampleClarity/Color/Odor: | Clear, No Odor |
| Sample Time: | 1350 | QAQC Samples Collected: O No O Yes: | |

Comments:

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

LOW - FLOW PURGING /SAMPLING FORM

PROJECT NAME: Donald P Ranch

PROJECT NO.:

WELL NO.: MW-21 WELL DIAMETER:

SAMPLER: LD

DATE: 4/24/17

WEATHER CONDITIONS Snow

| | |
|---|---|
| Sampling Device: | Water Quality Inst.: |
| Make/Model: | Make/Model: |
| Serial Number: | Serial Number: |

Tubing Type: O Teflon O Poly O Other Decontamination: O Decontaminated Water Meter O Decontaminated Flow Through Cell

Depth to Water (ft-bmp): _____ Total Well Depth (ft-bpm): _____ Depth to Pump Inlet(ft-bmp):

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | mS/cm | | | | | |
| 1 1510 | | | 6.69 | .2731 | 112 | 5.23 | 8.26 | 72.5 | |
| 2 1513 | | | 6.68 | .2734 | 70.9 | 5.05 | 8.53 | 72.0 | 22.68 |
| 3. 1516 | | | 6.68 | .2737 | 39.4 | 5.02 | 8.22 | 71.2 | 22.68 |
| 4 1519 | | | 6.68 | .2738 | 32.98 | 5.152 | 8.23 | 70.9 | 22.68 |
| 5. 1522 | | | 6.69 | .2739 | 25.33 | 5.20 | 8.23 | 70.7 | 22.70 |
| 6 1525 | | | 6.69 | .2740 | 24.06 | 5.22 | 8.23 | 70.5 | 22.73 |
| 7 1530 | | | | | | | | | |
| 8. | | | | | | | | | |
| 9. | | | | | | | | | |
| 10 | | | | | | | | | |
| 11. | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |

| | |
|---|---|
| Sample ID: MW-4 | SampleClarity/Color/Odor: Clear, No odor |
| Sample Time: 1530 | QAQC Samples Collected: O No ☒ Yes: |

Comments: BD-20170424

Page _____ of _____

| Casing Diameter" | Gallons per Foot | Liters per Foot |
|---|---|---|
| 2 | 0.163 | 0.617 |
| 4 | 0.653 | 8.110 |

**LOW - FLOW PURGING /SAMPLING FORM**

**PROJECT NAME:** Diamond P Ranch

**PROJECT NO.:**

**WELL NO.:** 14 ouse **WELL DIAMETER:**

**SAMPLER:** LD

**DATE:** 7/24/17

**WEATHER CONDITIONS** Overcast

| | |
|---|---|
| **Sampling Device:** | **Water Quality Inst.:** |
| **Make/Model:** | **Make/Model:** |
| **Serial Number:** | **Serial Number:** |

**Tubing Type:** O Teflon O Poly O Other **Decontamination:** O Decontaminated Water Meter O Decontaminated Flow Through Cell

**Depth to Water (ft-bmp):** _____ **Total Well Depth (ft-bpm):**_____ **Depth to Pump Inlet(ft-bmp):**

| Time | Purge Rate (lpm) | Volume Purged (Liters) | pH | Cond. (mS/m) | Turbidity (NTUs) | Temp (°C) | DO (mg/L) | ORP (mV) | DTW (ft-bmp) |
|---|---|---|---|---|---|---|---|---|---|
| Stabilization Criteria: | | | ± 0.5 | mS/cm ±10% | ±10% or less than 10 NTU's | -- | | -- | -- |
| 1. 1609 | | | 7.26 | .3462 | 0.86 | 6.04 | 7.32 | 104.4 | |
| 2. 1612 | | | 7.30 | .3480 | 1.06 | 6.127 | 7.31 | 94.5 | |
| 3. 1615 | | | 7.34 | .3475 | 1.39 | 6.15 | 7.14 | 89.6 | |
| 4. 1618 | | | 7.35 | 0.3464 | 2.62 | 6.2 | 7.28 | 81.5 | |
| 5. 1621 | | | 7.37 | 0.3455 | 5.72 | 6.18 | 7.22 | 78.4 | |
| 6. 1625 | | | 7.37 | 0.3453 | 4.51 | 6.21 | 7.17 | 76.4 | |
| 7. | | | | | | | | | |
| 8. | | | | | | | | | |
| 9. | | | | | | | | | |
| 10. | | | | | | | | | |
| 11. | | | | | | | | | |
| 12. | | | | | | | | | |
| 13. | | | | | | | | | |
| 14. | | | | | | | | | |
| 15. | | | | | | | | | |
| 16. | | | | | | | | | |
| 17. | | | | | | | | | |
| 18. | | | | | | | | | |

| | |
|---|---|
| **Sample ID:** 140425 | **SampleClarity/Color/Odor:** Clear, No Odor |
| **Sample Time:** 1630 | **QAQC Samples Collected:** O No O Yes: |

**Comments:**

# Photo Log
# Diamond P Ranch

Photo Key: 62

Riders preparing to leave for a trail ride. Work was stopped at various times to allow riders to pass.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 7/8/2016 |
| Direction: | North |

Photo Key: 61

Repose excavating hazardous area. Live loading roll off on the the truck.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 7/8/2016 |
| Direction: | Northwest |

Photo Key: 60

Excavation area prior to work.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 7/8/2016 |
| Direction: | East |

Photo Key: 65

Loaded roll-off container.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 7/8/2016 |
| Direction: | West |

# Photo Log
## Diamond P Ranch

Photo Key: 64

Excavation west of homestead house.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/8/2016
Direction: East

Photo Key: 63

Excavation of hazardous area. "Wet" area in center is believed to be primary source area.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/8/2016
Direction: Northeast

Photo Key: 66

Excavation area at end of the day.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/8/2016
Direction: East

Photo Key: 59

Excavation area west of homestead.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/9/2016
Direction: North

# Photo Log
## Diamond P Ranch

Photo Key: 58

Excavation area.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/9/2016
Direction: North

Photo Key: 57

Excavation area.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/9/2016
Direction: Northeast

Photo Key: 56

Repose loading belly dump trailer with nonhazardous material.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/9/2016
Direction: South

Photo Key: 55

Repose excavating pond area and stockpiling.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/10/2016
Direction: West

# Photo Log
## Diamond P Ranch

Photo Key: 54

Repose excavating and stockpiling material from the pond. To be used as backfill.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/10/2016
Direction: East

Photo Key: 53

Roll-off containers to be removed by Clean Harbors.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/10/2016
Direction: West

Photo Key: 52

Open excavation.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/10/2016
Direction: North

Photo Key: 51

Excavation with barrier fence.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/11/2016
Direction: North

# Photo Log
## Diamond P Ranch

Photo Key: 50

Completed excavation with barrier fence in place.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/11/2016
Direction: East

Photo Key: 49

Completed excavation.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/11/2016
Direction: North

Photo Key: 48

Completed excavation.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/11/2016
Direction: North

Photo Key: 47

Completed excavation.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 7/11/2016
Direction: East

# Photo Log
## Diamond P Ranch

Photo Key: 73

Excavation at end of the day. Backfill about 90%.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 9/12/2016
Direction: East

Photo Key: 72

Excavation at the end of the day. Backfill about 90%.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 9/12/2016
Direction: North

Photo Key: 71

Broken power pole leaning against the homestead building.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 9/12/2016
Direction: East

Photo Key: 70

Power line the was hit by the dump truck.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 9/12/2016
Direction: East

# Photo Log
## Diamond P Ranch

Photo Key: 69

Additional excavation to the south.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/12/2016 |
| Direction: | West |

Photo Key: 68

Additional excavation to the north.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/12/2016 |
| Direction: | North |

Photo Key: 67

Excavation before additional excavation and backfill.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/12/2016 |
| Direction: | East |

Photo Key: 77

Completed excavation area.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/13/2016 |
| Direction: | East |

# Photo Log
## Diamond P Ranch

Photo Key: 76

A portion of road was built south of the homestead house road mix.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/13/2016 |
| Direction: | East |

Photo Key: 75

Repose placing backfill.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/13/2016 |
| Direction: | Southeast |

Photo Key: 74

Backfill remaining at start of day.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 9/13/2016 |
| Direction: | North |

Photo Key: 81

Completed excavation.

| | |
|---|---|
| Project: | Diamond P Ranch |
| Taken By: | Lucas Darnell |
| Date: | 11/11/2016 |
| Direction: | Southeast |

# Photo Log
## Diamond P Ranch

Photo Key: 80

Completed excavation

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 11/11/2016
Direction: Northeast

Photo Key: 79

Repose excavating at Diamond P.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 11/11/2016
Direction: North

Photo Key: 78

Location of additional excavation.

Project: Diamond P Ranch
Taken By: Lucas Darnell
Date: 11/11/2016
Direction: East

PROPERTY CONDITION FORM

Trihydro Corporation is performing interim remediation activities as part of the Montana Department of Environmental Quality Diamond P Ranch Project. This form, along with photographs taken by Trihydro, will document site conditions prior to work, as well as agreements related to site condition following restoration.

Property Owner Rex Portman

Address 2665 Turpher Pass Hwy, W. Yellowstone, MT 59758

Description of work to be performed Excavation of PCP impacted soils

Utilities in work area One buried electrical service line - Removed

Structures/features to be undisturbed Homestead house

Structures/features to be moved/replaced Temporary road south of house, Reclaimed after backfill

Structures/features to be removed and replaced

Landscaping to be replaced Tree branches removed, shrubs removed - not replaced

Owner signature (prior to work) _____ Date _____

Trihydro signature _____ Date 9/13/16

Work was completed to owner's satisfaction: _____ Date 9/13/16

- power line to homestead house to be trenched - coordinating w/ Repose

**ATTACHMENT D**

**(PLEASE SEE ATTACHED CD)**

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: ALS Environmental |
| Project Name: Diamond P Ranch | Sample Matrix: Water |
| Project Number: 776-029-001 Task 0010 | Sample Start Date: 09/12/2016 |
| Date Validated: 10/17/2016 | Sample End Date: 09/13/2016 |
| Parameters Included:<br>▪ Dioxins by Test Methods for Evaluating Solid Waste (SW-846) Method 8290 | |
| Laboratory Project ID: E1600910 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by ALS Environmental in Houston, Texas, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- LCS/LCSD samples
- Organic system monitoring compounds (surrogates) / labeled standards

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LCSD percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| MW-1 | E1600910-001 |
| MW-3 | E1600910-002 |
| MW-4 | E1600910-003 |
| BD-20160912-02 | E1600910-004 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ○ Initial and Continuing Calibrations (Item 9)
- ⊗ Laboratory Blanks (Item 11)
- ○ MS/MSD (Item 13)
- ✓ LCS/LCSD (Item 15)
- ✓ System Monitoring Compounds (i.e., Surrogates)/Labeled Standards (Item 17)
- ○ Field, Equipment, and Trip Blanks (Item 18)
- ✓ Field Duplicates (Item 20)
- ○ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999
- The USEPA CLP National Functional Guidelines for Chlorinated Dibenzo-*p*-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review, document number EPA-540-R-11-016, September 2011, was referenced for review of CDDs and CDFs.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data that would be qualified with more than one flag were assigned one qualifier based on the severity; however, all reasons for qualification were retained. Data that would be qualified with both J+ and J- flags were evaluated based on validation criteria and assigned the appropriate flag. The hierarchy of qualifiers from the most to least severe is as follows:

- R > JB/U > NJ > J+/J- > J/UJ

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| JB | Estimated concentration due to blank contamination |
| U | Evaluated to be undetected at the reporting limit |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 104 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory identified the following non-conformances regarding the analytical data in this report.<br>Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for extraction batch EQ1600425. The batch quality control criteria were met.<br>Samples analyzed on the DB-5MSUI column were analyzed under conditions where sufficient separation between 2,3,7,8-TCDF and its closest eluter was achieved. Confirmation of this result was not required. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>U – Compound was analyzed for but was not detected (ND).<br>J – Estimated value. The reported concentration is below the Method Reporting Limit (MRL).<br>B – Indicates the associated analyte was found in the method blank at > 1/10$^{th}$ the reported value.<br>K – The ion abundance ratio between the primary and secondary ions were outside of the theoretical acceptance limits. The concentration of this analyte should be considered as an estimate. **Analytical results with the K laboratory flag were assigned J qualifiers as Estimated Maximum Possible Concentrations.**<br>Y – Isotopically labeled standard recovery outside of acceptance limits. In all cases, the signal-to-noise ratios are greater than 10:1, making the recoveries acceptable. | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. Dilutions were not applied for the analyses reported in this data set. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | Yes |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at 5.4°C as noted on the Cooler Receipt Form. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | Yes |
| Comments: The samples were extracted/digested and analyzed within method-specific holding times. | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The results were reported in concentration units of picograms per liter (pg/L). These units were acceptable for the sample matrix and the analyses requested. | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | No |
| Comments: Initial and continuing calibration data were not included as part of this data set. | |
| 10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? | N/A |
| Comments: Calibration data were not included as part of this data set. | |
| 11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? | Yes |
| Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. | |
| 12. Were target analytes reported as not detected in the laboratory blanks? | No |

Comments: Target analytes were reported as not detected in the laboratory blank for batch EQ1600425 with the following exceptions.

| Method | Analyte | Batch | Concentration (pg/L) |
|---|---|---|---|
| **8290** | **1,2,3,4,6,7,8-HpCDD** | **EQ1600425** | **3.26** |
| **8290** | **OCDD** | **EQ1600425** | **9.07** |
| 8290 | 1,2,3,6,7,8-HxCDF | EQ1600425 | 1.21 |
| 8290 | 1,2,3,7,8,9-HxCDF | EQ1600425 | 1.92 |
| 8290 | 2,3,4,6,7,8-HxCDF | EQ1600425 | 1.96 |
| **8290** | **1,2,3,4,6,7,8-HpCDF** | **EQ1600425** | **2.31** |
| **8290** | **Total Hepta-Dioxins** | **EQ1600425** | **3.26** |
| 8290 | Total Hexa-Furans | EQ1600425 | 1.96 |
| **8290** | **Total Hepta-Furans** | **EQ1600425** | **3.75** |

**Detections of the identified analytes in the associated samples that were less than the blank results or less than the applicable reporting limits were assigned U qualifiers. Detections of the identified analytes in the associated samples that were greater than the reporting limits but less than 10 times the blank results were assigned JB qualifiers.** Non-detections of the identified analytes in the associated samples and detections that were above the reporting limit and greater than ten times the blank concentration did not require qualification

| | |
|---|---|
| 13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? | No |
| Comments: The total number of matrix spike samples prepared was not equal to at least 5% of the total number of samples. Matrix spike samples were not prepared for the analytical batch reported in this data set. Analytical accuracy and precision was evaluated using results from LCS/LCSD analyses. | |
| 14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? | N/A |
| Comments: Matrix spike samples were not prepared for the analytical batch reported in this data set. | |
| 15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? | Yes |
| Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples. | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? | Yes |
| Comments: The LCS and LCSD percent recoveries and LCS/LCSD RPD values were within data validation and laboratory QC limits. | |
| 17. Were surrogate recoveries within laboratory QC limits? | No |
| Comments: The reported recoveries for the isotopically labeled internal and recovery standards were within laboratory QC limits for the submitted samples.<br>Qualification of sample data was not required based on labeled standard recovery non-conformances in QC samples as the environmental samples were evaluated based on sample-specific surrogate recoveries. | |
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.<br>Sample BD-20160912-02 was collected as a field duplicate of sample MW-3. | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | Yes |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values met the data validation criteria. | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: MW-3<br>Field Duplicate Sample ID: BD-20160912-02 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result (pg/L)** | **Duplicate Result (pg/L)** | **Relative Percent Difference (RPD)** |
| 8290 | 1,2,3,4,6,7,8-HpCDD | 11.8 | 5.53 | 72.4% +/-RL |
| 8290 | 1,2,3,4,6,7,8-HpCDF | ND (26.0) | 2.55 | DL |
| 8290 | OCDD | 64.4 | 41.2 | 43.9% +/-RL |
| 8290 | Total HpCDD | 11.8 | 6.74 | 54.6% +/-RL |
| 8290 | Total HpCDF | 6.26 | 4.90 | 24.4% +/-RL |

Field duplicate RPD control limits are not to exceed 30% for water as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

DL - Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. No data were qualified since the detection was within two times the reporting limit.

+/-RL = Indicates that the detections in the samples are within two times the reporting limit. No qualification of data is required.

**DATA QUALIFICATION SUMMARY**

| Abbreviation | Reason |
|---|---|
| EMPC | The reported concentration is the Estimated Maximum Possible Concentration (EPMC). |
| MBD | Method blank detection |
| MDLRL | Flagged by the laboratory: The result was greater than the MDL but less than the RL. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8-HpCDD | 8290 | MW-1 | E1600910-001 | 11.2 | 28 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDD | 8290 | MW-3 | E1600910-002 | 11.8 | 26 | pg/L | U | MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDD | 8290 | MW-4 | E1600910-003 | 13.9 | 23.6 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDD | 8290 | BD-20160912-02 | E1600910-004 | 5.53 | 26.9 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | MW-1 | E1600910-001 | 3.04 | 28 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | BD-20160912-02 | E1600910-004 | 2.55 | 26.9 | pg/L | U | EMPC, MBD, MDLRL |
| OCDD | 8290 | MW-1 | E1600910-001 | 72 | 56 | pg/L | JB | MBD |
| OCDD | 8290 | MW-3 | E1600910-002 | 64.4 | 52 | pg/L | JB | MBD |
| OCDD | 8290 | BD-20160912-02 | E1600910-004 | 41.2 | 53.8 | pg/L | U | MBD, MDLRL |
| OCDF | 8290 | MW-4 | E1600910-003 | 15.9 | 47.3 | pg/L | J | MDLRL |
| Total HpCDD | 8290 | MW-3 | E1600910-002 | 11.8 | 26 | pg/L | U | MBD, MDLRL |
| Total HpCDD | 8290 | BD-20160912-02 | E1600910-004 | 6.74 | 26.9 | pg/L | U | MBD, MDLRL |
| Total HpCDF | 8290 | MW-3 | E1600910-002 | 6.26 | 26 | pg/L | U | MBD, MDLRL |
| Total HpCDF | 8290 | BD-20160912-02 | E1600910-004 | 4.9 | 26.9 | pg/L | U | MBD, MDLRL |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: ALS Environmental |
| Project Name: Diamond P Ranch | Sample Matrix: Water |
| Project Number: 776-029-001 Task 0010 | Sample Start Date: 04/24/2017 |
| Date Validated: 06/05/2017 | Sample End Date: 04/24/2017 |
| Parameters Included:<br>▪ Dioxins by Test Methods for Evaluating Solid Waste (SW-846) Method 8290 | |
| Laboratory Project ID: E1700409 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by ALS Environmental in Houston, Texas, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- LCS/LCSD samples
- Organic system monitoring compounds (surrogates) / labeled standards

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LCSD percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| MW-1 | E1700409-001 |
| MW-3 | E1700409-002 |
| MW-4 | E1700409-003 |
| HOUSE | E1700409-004 |
| BD-20170424 | E1700409-005 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ○ Initial and Continuing Calibrations (Items 9 and 10)
- ⊗ Laboratory Blanks (Items 11 and 12)
- ○ Matrix Spike (MS) and Matrix Spike Duplicate (MSD) (Items 13 and 14)
- ✓ LCS/LCSD (Items 15 and 16)
- ⊗ System Monitoring Compounds (i.e., Surrogates)/Labeled Standards (Item 17)
- ○ Field, Equipment, and Trip Blanks (Items 18 and 19)
- ⊗ Field Duplicates (Items 20 and 21)
- ○ Laboratory Duplicates (Item 22)
- ○ Data Relationships (Item 23)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-2016-002, September 2016 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- The USEPA CLP National Functional Guidelines for High Resolution Superfund Methods Data Review, document number EPA-542-B-16-001, April 2016, was referenced for review of chlorinated dibenzodioxins (CDD) and chlorinated dibenzofurans (CDF).
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Trihydro Data Validation Variance Documentation, February 2017.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data that would be qualified with more than one flag were assigned one qualifier based on the severity; however, all reasons for qualification were retained. Data that would be qualified with both J+ and J- flags were evaluated based on validation criteria and assigned the appropriate flag. The hierarchy of qualifiers from the most to least severe is as follows:

- R > JB/U > NJ > J+/J- > J/UJ

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| UJ | Estimated reporting limit |
| U | Evaluated to be undetected at the reporting limit |
| JB | Estimated concentration due to blank contamination |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 130 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory identified the following non-conformances regarding the analytical data in this report.<br>The Method Blank EQ1700171-01 contained low levels of various compounds below the Method Reporting Limit (MRL). The associated compounds in the samples are flagged with 'B' flags where the sample result is less than ten times the level detected in the method blank.<br>Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The matrix spike recovery for 2378-TCDD on the LCS DLCS samples is high due to the low labeled standard recoveries which causes a slight high bias for the native standard. The relative percent differences (RPD) are within control limits. The samples are non detect for TCDD.<br>The recoveries for the clean up standard, 37Cl-2,3,7,8-TCDD are outside control limits in some samples. The sample results are not affected since this labeled standard is provided as a means of demonstrating that both the sample extraction and subsequent cleanup steps performed as expected, and is not used in quantitation of target analytes.<br>Quantification of the native 2,3,7,8-substituted congeners is based on isotopic dilution, which automatically corrects for variation in extraction efficiency and provides accurate values even with poor recovery. Samples that had recoveries of labeled standards outside the acceptance limits are qualified with 'Y' flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1 and detection limits were below the Method Reporting Limits. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory?<br>If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>U – Compound was analyzed for but was not detected (ND).<br>J – Estimated value. The reported concentration is below the Method Reporting Limit (MRL).<br>B – Indicates the associated analyte was found in the method blank at > 1/10$^{th}$ the reported value.<br>K – The ion abundance ratio between the primary and secondary ions were outside of the theoretical acceptance limits. The concentration of this analyte should be considered as an estimate. **Analytical results with the K laboratory flag were assigned J qualifiers as Estimated Maximum Possible Concentrations.**<br>Y – Isotopically labeled standard recovery outside of acceptance limits. In all cases, the signal-to-noise ratios are greater than 10:1, making the recoveries acceptable. | |
| 3. Were sample CoC forms and custody procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits were reviewed and appeared to be acceptable.<br>The detection limits appeared to be acceptable. Dilutions were not applied for the analyses reported in this data set. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 6. Were samples received in good condition within method-specified requirements? | Yes |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at 4.3°C as noted on the *Cooler Receipt Form* and in the Case Narrative. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | Yes |
| Comments: The samples were extracted/digested and analyzed within method-specific holding times. | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The results were reported in concentration units of picograms per liter (pg/L). These units were acceptable for the sample matrix and the analyses requested. | |
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | No |
| Comments: Initial and continuing calibration data were not included as part of this data set. | |
| 10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? | N/A |
| Comments: Calibration data were not included as part of this data set. | |
| 11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? | Yes |
| Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. | |
| 12. Were target analytes reported as not detected in the laboratory blanks? | No |

Comments: Target analytes were reported as not detected in the laboratory blank for extraction batch 286892 with the following exceptions.

| Method | Analyte | Concentration (pg/L) |
|---|---|---|
| **8290** | **1,2,3,6,7,8-HxCDD** | **0.746** |
| **8290** | **1,2,3,4,6,7,8-HpCDD** | **3.34** |
| **8290** | **OCDD** | **31.9** |

**Detections of the identified analytes in the associated samples that were less than the blank results or less than the applicable reporting limits were assigned U qualifiers. Detections of the identified analytes in the associated samples that were greater than the reporting limits but less than 10 times the blank results were assigned JB qualifiers.** Non-detections of the identified analytes in the associated samples and detections that were above the reporting limit and greater than ten times the blank concentration did not require qualification.

| | |
|---|---|
| 13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? | No |
| Comments: The total number of matrix spike samples prepared was not equal to at least 5% of the total number of samples. Matrix spike samples were not prepared for the analytical batch reported in this data set. Analytical accuracy and precision was evaluated using results from LCS/LCSD analyses. | |
| 14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? | N/A |
| Comments: Matrix spike samples were not prepared for the analyses reported in this data set. | |

**VALIDATION CRITERIA CHECKLIST**

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? — Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? — No

Comments: The LCS and LCSD percent recoveries and LCS/LCSD RPD values were within data validation and laboratory QC limits, with the following exception.

The LCS and LCSD recoveries for 2,3,7,8-TCDD were outside the acceptance limits of 70-130% at 161% and 155%, respectively, indicating potential high bias. Qualification of the 2,3,7,8-TCDD results was not required since the analyte was not detected in the associated samples.

17. Were surrogate recoveries within laboratory QC limits? — No

Comments: The reported recoveries for the isotopically labeled internal and recovery standards were within laboratory QC limits for the submitted samples, with the following exceptions.

| Method | Labeled Standard | Sample | Labeled Standard Recovery | QC Limits |
|---|---|---|---|---|
| **8290** | **$^{13}$C-2,3,7,8-TCDD** | **MW-1** | **36%** | **40-135%** |
| **8290** | **$^{13}$C-2,3,7,8-TCDD** | **MW-3** | **22%** | **40-135%** |
| **8290** | **$^{13}$C-2,3,7,8-TCDF** | **MW-3** | **38%** | **40-135%** |
| **8290** | **$^{13}$C-2,3,7,8-TCDD** | **MW-4** | **31%** | **40-135%** |
| **8290** | **$^{13}$C-2,3,7,8-TCDD** | **HOUSE** | **34%** | **40-135%** |
| **8290** | **$^{13}$C-2,3,7,8-TCDD** | **BD-20170424** | **33%** | **40-135%** |

**The target analytes associated with the non-conforming labelled standards were not detected in the identified samples and the results were assigned UJ qualifiers.**

Recoveries of labeled standards were noted in QC samples but qualification of sample data was not required based on labeled standard recovery non-conformances in QC samples as the environmental samples were evaluated based on sample-specific surrogate recoveries.

18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? — No

Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set.

19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? — N/A

Comments: Trip, field, and equipment blank samples were not collected for this sample set.

20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? — Yes

Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.

Sample BD-20170424 was collected as a field duplicate of sample MW-4.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-30% for water samples, with the following exception.<br>**The RPD values for total HpCDD, total HpCDF, and total TEQ exceeded the data validation limit of 30% at 98.4%, 37.6%, and 83.4%, respeciively. The total HpCDD, total HpCDF, and total TEQ results for the parent and field duplicate samples, MW-4 and BD-20170424 were assigned J qualifiers due to evidence of poor precision.** | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |
| 23. Were the following data relationships realistic and acceptable? | |
| • Target analytes were reported by more than one method (e.g., 8260/8270, EPH/8270) and the results were in agreement? | N/A |
| Comments: Target analytes were not reported by more than one method in this data set. | |
| • Both total and dissolved metals analyses were performed and the total metals results were greater than or equal to the dissolved metals results? | N/A |
| Comments: Total metals were not analyzed for the samples in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: MW-4<br>Field Duplicate Sample ID: BD-20170424 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result (pg/L)** | **Duplicate Result (pg/L)** | **Relative Percent Difference (RPD)** |
| 8290 | 1,2,3,4,6,7,8-HpCDD | 119 | 91.0 | 26.7% |
| 8290 | 1,2,3,4,6,7,8-HpCDF | 23.1 | 13.8 | 50.4% +/-RL |
| 8290 | 1,2,3,4,7,8,9-HpCDF | 5.76 | 2.98 | 63.6% +/-RL |
| 8290 | 1,2,3,4,7,8-HxCDD | 3.41 | ND (25.4) | DL |
| 8290 | 1,2,3,4,7,8-HxCDF | 3.38 | 2.11 | 46.3% +/-RL |
| 8290 | 1,2,3,6,7,8-HxCDD | 6.18 | 3.06 | 67.5% +/-RL |
| 8290 | 1,2,3,6,7,8-HxCDF | 3.26 | 1.31 | 85.3% +/-RL |
| 8290 | 1,2,3,7,8,9-HxCDD | 5.45 | 3.42 | 45.8% +/-RL |
| 8290 | 1,2,3,7,8,9-HxCDF | 2.79 | 1.29 | 73.5% +/-RL |
| 8290 | 1,2,3,7,8-PeCDD | 1.79 | ND (25.4) | DL |
| 8290 | 1,2,3,7,8-PeCDF | 4.26 | ND (25.4) | DL |
| 8290 | 2,3,4,6,7,8-HxCDF | 3.52 | 2.23 | 44.9% +/-RL |
| 8290 | 2,3,4,7,8-PeCDF | 3.70 | 1.43 | 88.5% +/-RL |
| 8290 | OCDD | 1340 | 1030 | 26.2% |
| 8290 | OCDF | 132 | 99.6 | 28.0% |
| **8290** | **Total HpCDD** | **119** | **40.5** | **98.4%** |
| **8290** | **Total HpCDF** | **88.5** | **60.5** | **37.6%** |
| 8290 | Total HxCDD | 11.6 | ND (25.4) | DL |
| 8290 | Total HxCDF | ND (28.5) | 7.67 | DL |
| 8290 | Total PeCDF | 3.70 | ND (25.4) | DL |
| **8290** | **Total TEQ** | **7.75** | **3.19** | **83.4%** |

Field duplicate RPD control limits are not to exceed 30% for water as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

DL – Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. Data were not qualified since the detection was within two times the reporting limit. Non-detected results are indicated above with the applicable reporting limit as ND (RL).

**The RPD values for total HpCDD, total HpCDF, and total TEQ exceeded the data validation limit of 30% at 98.4%, 37.6%, and 83.4%, respeciively. The total HpCDD, total HpCDF, and total TEQ results for the parent and field duplicate samples, MW-4 and BD-20170424 were assigned J qualifiers due to evidence of poor precision.**

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| MBD | Method blank detection |
| LR-SUR | The surrogate percent recovery was less than the lower acceptable limit indicating a possible low bias. |
| ERPD-FD | High field duplicate RPD. |
| EMPC | The reported concentration is the Estimated Maximum Possible Concentration (EPMC). |
| MDLRL | Flagged by the laboratory: The result was greater than the MDL but less than the RL. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8-HpCDD | 8290 | MW-1 | E1700409-001 | 5.54 | 27.3 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDD | 8290 | MW-3 | E1700409-002 | 9.45 | 25.8 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDD | 8290 | HOUSE | E1700409-004 | 11.9 | 26.4 | pg/L | U | MBD, MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | MW-1 | E1700409-001 | 2.66 | 27.3 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | MW-3 | E1700409-002 | 2.67 | 25.8 | pg/L | J | MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | MW-4 | E1700409-003 | 23.1 | 28.5 | pg/L | J | MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | HOUSE | E1700409-004 | 3.04 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | BD-20170424 | E1700409-005 | 13.8 | 25.4 | pg/L | J | MDLRL |
| 1,2,3,4,7,8,9-HpCDF | 8290 | MW-1 | E1700409-001 | 1.52 | 27.3 | pg/L | J | MDLRL |
| 1,2,3,4,7,8,9-HpCDF | 8290 | MW-3 | E1700409-002 | 1.76 | 25.8 | pg/L | J | MDLRL |
| 1,2,3,4,7,8,9-HpCDF | 8290 | MW-4 | E1700409-003 | 5.76 | 28.5 | pg/L | J | MDLRL |
| 1,2,3,4,7,8,9-HpCDF | 8290 | HOUSE | E1700409-004 | 2.6 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8,9-HpCDF | 8290 | BD-20170424 | E1700409-005 | 2.98 | 25.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8-HxCDD | 8290 | MW-4 | E1700409-003 | 3.41 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8-HxCDD | 8290 | HOUSE | E1700409-004 | 2.41 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8-HxCDF | 8290 | MW-4 | E1700409-003 | 3.38 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8-HxCDF | 8290 | HOUSE | E1700409-004 | 2.01 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,4,7,8-HxCDF | 8290 | BD-20170424 | E1700409-005 | 2.11 | 25.4 | pg/L | J | MDLRL |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,6,7,8-HxCDD | 8290 | MW-4 | E1700409-003 | 6.18 | 28.5 | pg/L | U | MBD, MDLRL |
| 1,2,3,6,7,8-HxCDD | 8290 | HOUSE | E1700409-004 | 2.4 | 26.4 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,6,7,8-HxCDD | 8290 | BD-20170424 | E1700409-005 | 3.06 | 25.4 | pg/L | U | EMPC, MBD, MDLRL |
| 1,2,3,6,7,8-HxCDF | 8290 | MW-1 | E1700409-001 | 1.9 | 27.3 | pg/L | J | MDLRL |
| 1,2,3,6,7,8-HxCDF | 8290 | MW-4 | E1700409-003 | 3.26 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,6,7,8-HxCDF | 8290 | HOUSE | E1700409-004 | 2.53 | 26.4 | pg/L | J | MDLRL |
| 1,2,3,6,7,8-HxCDF | 8290 | BD-20170424 | E1700409-005 | 1.31 | 25.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8,9-HxCDD | 8290 | MW-4 | E1700409-003 | 5.45 | 28.5 | pg/L | J | MDLRL |
| 1,2,3,7,8,9-HxCDD | 8290 | HOUSE | E1700409-004 | 3.42 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8,9-HxCDD | 8290 | BD-20170424 | E1700409-005 | 3.42 | 25.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8,9-HxCDF | 8290 | MW-4 | E1700409-003 | 2.79 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8,9-HxCDF | 8290 | HOUSE | E1700409-004 | 3.14 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8,9-HxCDF | 8290 | BD-20170424 | E1700409-005 | 1.29 | 25.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8-PeCDD | 8290 | MW-4 | E1700409-003 | 1.79 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8-PeCDD | 8290 | HOUSE | E1700409-004 | 3.14 | 26.4 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8-PeCDF | 8290 | MW-4 | E1700409-003 | 4.26 | 28.5 | pg/L | J | EMPC, MDLRL |
| 1,2,3,7,8-PeCDF | 8290 | HOUSE | E1700409-004 | 2.42 | 26.4 | pg/L | J | MDLRL |
| 2,3,4,6,7,8-HxCDF | 8290 | MW-4 | E1700409-003 | 3.52 | 28.5 | pg/L | J | EMPC, MDLRL |
| 2,3,4,6,7,8-HxCDF | 8290 | HOUSE | E1700409-004 | 3.31 | 26.4 | pg/L | J | MDLRL |
| 2,3,4,6,7,8-HxCDF | 8290 | BD-20170424 | E1700409-005 | 2.23 | 25.4 | pg/L | J | EMPC, MDLRL |
| 2,3,4,7,8-PeCDF | 8290 | MW-4 | E1700409-003 | 3.7 | 28.5 | pg/L | J | MDLRL |
| 2,3,4,7,8-PeCDF | 8290 | HOUSE | E1700409-004 | 1.52 | 26.4 | pg/L | J | EMPC, MDLRL |
| 2,3,4,7,8-PeCDF | 8290 | BD-20170424 | E1700409-005 | 1.43 | 25.4 | pg/L | J | EMPC, MDLRL |
| 2,3,7,8-TCDD | 8290 | MW-1 | E1700409-001 | ND | 7.66 | pg/L | UJ | LR-SUR |
| 2,3,7,8-TCDD | 8290 | MW-3 | E1700409-002 | ND | 9.67 | pg/L | UJ | LR-SUR |
| 2,3,7,8-TCDD | 8290 | MW-4 | E1700409-003 | ND | 5.84 | pg/L | UJ | LR-SUR |
| 2,3,7,8-TCDD | 8290 | HOUSE | E1700409-004 | ND | 5.29 | pg/L | UJ | LR-SUR |
| 2,3,7,8-TCDD | 8290 | BD-20170424 | E1700409-005 | ND | 5.08 | pg/L | UJ | LR-SUR |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 8290 | MW-3 | E1700409-002 | ND | 8.85 | pg/L | UJ | LR-SUR |
| OCDD | 8290 | MW-1 | E1700409-001 | 57.1 | 54.6 | pg/L | JB | EMPC, MBD |
| OCDD | 8290 | MW-3 | E1700409-002 | 68.2 | 51.6 | pg/L | JB | MBD |
| OCDD | 8290 | HOUSE | E1700409-004 | 89.3 | 52.9 | pg/L | JB | MBD |
| OCDF | 8290 | MW-1 | E1700409-001 | 4.39 | 54.6 | pg/L | J | EMPC, MDLRL |
| OCDF | 8290 | HOUSE | E1700409-004 | 10.2 | 52.9 | pg/L | J | EMPC, MDLRL |
| Total HpCDD | 8290 | MW-4 | E1700409-003 | 119 | 28.5 | pg/L | J | ERPD-FD |
| Total HpCDD | 8290 | HOUSE | E1700409-004 | 21.6 | 26.4 | pg/L | J | MDLRL |
| Total HpCDD | 8290 | BD-20170424 | E1700409-005 | 40.5 | 25.4 | pg/L | J | ERPD-FD |
| Total HpCDF | 8290 | MW-1 | E1700409-001 | 3.03 | 27.3 | pg/L | J | MDLRL |
| Total HpCDF | 8290 | MW-3 | E1700409-002 | 4.43 | 25.8 | pg/L | J | MDLRL |
| Total HpCDF | 8290 | MW-4 | E1700409-003 | 88.5 | 28.5 | pg/L | J | ERPD-FD |
| Total HpCDF | 8290 | BD-20170424 | E1700409-005 | 60.5 | 25.4 | pg/L | J | ERPD-FD |
| Total HxCDD | 8290 | MW-4 | E1700409-003 | 11.6 | 28.5 | pg/L | J | MDLRL |
| Total HxCDD | 8290 | HOUSE | E1700409-004 | 3.84 | 26.4 | pg/L | J | MDLRL |
| Total HxCDF | 8290 | MW-1 | E1700409-001 | 1.9 | 27.3 | pg/L | J | MDLRL |
| Total HxCDF | 8290 | HOUSE | E1700409-004 | 5.84 | 26.4 | pg/L | J | MDLRL |
| Total HxCDF | 8290 | BD-20170424 | E1700409-005 | 7.67 | 25.4 | pg/L | J | MDLRL |
| Total PeCDF | 8290 | MW-4 | E1700409-003 | 3.7 | 28.5 | pg/L | J | MDLRL |
| Total PeCDF | 8290 | HOUSE | E1700409-004 | 2.42 | 26.4 | pg/L | J | MDLRL |
| Total TEQ | 8290 | MW-4 | E1700409-003 | 7.75 | | pg/L | J | ERPD-FD |
| Total TEQ | 8290 | BD-20170424 | E1700409-005 | 3.19 | | pg/L | J | ERPD-FD |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories |
| Project Name: Diamond P Ranch | Sample Matrix: Soil |
| Project Number: 776-029-001 Task 0006 | Sample Start Date: 06/23/2016 |
| Date Validated: 07/25/2016 | Sample End Date: 06/27/2016 |
| Parameters Included:<br>▪ Total Metals by Test Method for Evaluating Solid Waste (SW-846) Methods 6010B and 6020<br>▪ Total Mercury by SW-846 Method 7471B<br>▪ Soil Moisture ASTM International Method D2974 | |
| Laboratory Project ID: H16060524 | |
| Data Validator: Lisa Phillips, Environmental Scientist | |
| Reviewer: Charles Ballek, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Laboratory duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS) and laboratory fortified blank (LFB) samples

Method compliance was established by reviewing sample integrity, holding times, detection limits, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| DIAP-BKFL-TPSL | H16060524-001 |
| DIAP-BKFL-DITCH | H16060524-002 |
| DIAP-BKFL-POND | H16060524-003 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 10)
- ✓ MS/MSD (Item 12)
- ✓ LCS and LFB (Item 14)
- ○ System Monitoring Compounds (i.e., Surrogates) (Item 16)
- ○ Field, Equipment, and Trip Blanks (Item 17)
- ○ Field Duplicates (Item 19)
- ✓ Laboratory Duplicates (Item 21)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above.

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 27 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

**VALIDATION CRITERIA CHECKLIST**

1. Was the report free of non-conformances identified by the laboratory? No

Comments:

The laboratory noted the following non-conformances regarding the analytical data.

Relinquished time from client does not match received time by laboratory.

2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. No

Comments: The laboratory used the following data qualification flags with this data set.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

3. Were sample CoC forms and procedures complete? No

Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt with the following exception.

The laboratory noted a small time difference from when the cooler was relinquished to when the laboratory received it. The difference may be attributed to rounding and no further action was required.

4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? Yes

Comments: The detection limits appeared to be acceptable. The following dilutions were applied.

| Method | Samples | Analyte(s) | Dilution Factor |
|---|---|---|---|
| 6010B | DIAP-BKFL-DITCH, DIAP-BKFL-POND, DIAP-BKFL-TPSL | Barium | 5 |
| 6020 | DIAP-BKFL-DITCH, DIAP-BKFL-POND, DIAP-BKFL-TPSL | Metals | 10 |

5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? Yes

Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC.

6. Were samples received in good condition within method-specified requirements? Yes

Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at 4.2°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*. The laboratory noted that the shipping containers were sealed and custody seals were present.

7. Were samples extracted/digested and analyzed within method-specified or technical holding times? Yes

Comments: The samples were digested and analyzed within method-specific holding times.

8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. Yes

Comments: The results were reported in concentration units of milligrams per kilogram (mg/kg). Soil moisture was reported as percent by weight (wt%). These units were acceptable for the sample matrix and the analyses requested. The analytical results for the soil samples were reported on a dry weight basis.

**VALIDATION CRITERIA CHECKLIST**

9. Did the laboratory provide any specific initial and/or continuing calibration results? Yes

Comments: Limited initial and continuing calibration summary data were included as part of this data set.

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: Limited initial and continuing calibration data were reviewed and the results are within acceptable limits. Partial interference check summary results were also included in the QC Summary Report with acceptable results. Full calibration and interference check reports and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. Laboratory blank samples were not prepared or required for soil moisture by Method D2974.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exception.

| Method | Analyte | Batch | Concentration (mg/kg) |
|---|---|---|---|
| 6020 | Silver | 33457 | 2 |

Silver was not detected in the associated samples and the results did not require qualification.

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 6010B | Barium | 33457 | Not Associated |
| 6010B | Barium | 33457 | DIAP-BKFL-TPSL |
| 6020 | Metals | 33457 | Not Associated |
| 6020 | Metals | 33457 | DIAP-BKFL-TPSL |
| 7471B | Mercury | 33471 | DIAP-BKFL-TPSL |

Not Associated – The MS sample source was not associated with this project.
Matrix spike analyses were not required for soil moisture analyses by Method D2974.
Post digestion spikes were prepared for Method 6010B batch 33457 from sample DIAP-BKFL-TPSL and a sample that was not associated with the project and for Method 6020 batch 33457 from sample DIAP-BKFL-TPSL.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? Yes

Comments: The MS/MSD percent recoveries and RPDs for project samples were within data validation and laboratory QC limits.

Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? | Yes |
| Comments: The LCS and LFB percent recoveries were within data validation and laboratory QC limits. | |
| 17. Were surrogate recoveries within laboratory QC limits? | N/A |
| Comments: Surrogates are not included for metals analysis. | |
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10 of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: Field duplicate samples were not collected as part of this sample set. | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: Field duplicate samples were not collected as part of this sample set. | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | Yes |
| Comments: A laboratory duplicate sample was prepared for soil moisture by Method D2974 batch R116497 from sample DIAP-BKFL-TPSL. The RPD value for this duplicate analysis was within the laboratory acceptance limits. | |

**DATA QUALIFICATION SUMMARY**

Data qualifiers were not applied as a result of this validation

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories / Pace Analytical |
| Project Name: Diamond P Ranch | Sample Matrix: Soil |
| Project Number: 776-029-001 Task 0006 | Sample Start Date: 07/11/2016 |
| Date Validated: 08/04/2016 | Sample End Date: 07/11/2016 |
| Parameters Included:<br>▪ Semivolatile Organics (SVOC) by Test Method for Evaluating Solid Waste (SW-846) Method 8270C<br>▪ Pentachlorophenol by SW-846 Method 8151A<br>▪ Total Extractable Hydrocarbons (TEH) by SW-846 Method 8015M<br>▪ Extractable Petroleum Hydrocarbons (EPH) by Massachusetts Department of Environmental Protection (MADEP) Method MA-EPH<br>▪ Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) bySW-846 Method 8290<br>▪ Soil Moisture ASTM International Method D2974 | |
| Laboratory Project ID: H16070159/10355420 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana with data from Pace Analytical Services in Minneapolis, Minnesota, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Laboratory duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS)

Method compliance was established by reviewing sample integrity, holding times, detection limits, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| DIAP-S-EAST (0-2) | H16070159-001 / 10355420001 |
| DIAP-SS-East (2-20) | H16070159-002 / 10355420002 |
| DIAP-S-SOUTH (0-2) | H16070159-003 / 10355420003 |
| DIAP-SS-SOUTH (2-20) | H16070159-004 / 10355420004 |
| DIAP-S-WEST (0-2) | H16070159-005 / 10355420005 |
| DIAP-SS-WEST (2-20) | H16070159-006 / 10355420006 |
| DIAP-S-NORTH (0-2) | H16070159-007 / 10355420007 |
| DIAP-SS-NORTH (2-20) | H16070159-008 / 10355420008 |
| BD-20160711 | H16070159-009 / 10355420009 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ⊗ Laboratory Qualifiers / Interferences (Item 2)
- ✓ CoC Documentation (Item 3)
- ⊗ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 10)
- ⊗ MS/MSD (Item 12)
- ✓ LCS (Item 14)
- ✓ System Monitoring Compounds (i.e., Surrogates) (Item 16)
- ○ Field, Equipment, and Trip Blanks (Item 17)
- ⊗ Field Duplicates (Item 19)
- ✓ Laboratory Duplicates (Item 21)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- The USEPA CLP National Functional Guidelines for Chlorinated Dibenzo-*p*-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review, document number EPA-540-R-11-016, September 2011, was referenced for review of CDDs and CDFs.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

# Tier II Data Validation Report Summary

- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data that would be qualified with more than one flag were assigned one qualifier based on the severity; however, all reasons for qualification were retained. Data that would be qualified with both J+ and J- flags were evaluated based on validation criteria and assigned the appropriate flag. The hierarchy of qualifiers from the most to least severe is as follows:

- R > JB/U > NJ > J+/J- > J/UJ

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| J+ | The result is an estimated concentration, but may be biased high |
| UJ | Estimated reporting limit |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 369 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory noted the following non-conformances regarding the analytical data.<br>A significant portion of the hydrocarbons measured in the EPH Screening analysis for samples DIAP-S-SOUTH (0-2), DIAP-S-WEST (0-2), and DIAP-SS-NORTH (2-20) were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>S – Spike recovery outside of advisory limits.<br>Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.<br>* = 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.<br>EMPC - Estimated Maximum Possible Concentration. **Analyte results identified as EMPC were assigned J+ qualifiers.**<br>J – Estimated value. **Analyte results with laboratory J qualifiers were assigned J qualifiers as estimated because the concentrations were below the calibration range.**<br>I – Interference present. **Analyte results with laboratory I qualifiers were assigned J qualifiers.**<br>P – PCDE Interference. **Analyte results with laboratory P qualifiers were assigned J qualifiers.**<br>E – Exceeds calibration range. **Analyte results with laboratory E qualifiers were assigned J qualifiers.**<br>D – Result obtained from analysis of diluted sample<br>Nn – Value obtained from additional analysis | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>The laboratory noted that the shipping containers were sealed and custody seals were present. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. The following dilutions were applied.<br>Method 8151A: Dilution factors of 4-200 times were applied to select samples for the analysis of pentachlorophenol.<br>Method 8290: Sample DIAP-S-SOUTH (0-2) was diluted by a factor of 10 times for the analysis of some dioxin/furan analytes and dilutions of 20 times were applied for the analyses of samples DIAP-S-EAST (0-2), DIAP-SS-East (2-20), and BD-20160711. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | No |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at 2.1°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*.<br>The samples were subcontracted to Pace Analytical for analysis by Method 8290. The samples were received at Pace in good condition with a cooler temperature of 0.1°C. The cooler temperature below 2.0°C was judged as acceptable since the laboratory did not report the sample containers as broken or frozen. | |

**VALIDATION CRITERIA CHECKLIST**

7. Were samples extracted/digested and analyzed within method-specified or technical holding times? No

Comments: The samples were digested and analyzed within method-specific holding times with the following exception.

**The extraction of sample DIAP-SS-SOUTH (2-20) for EPH by Method MA-EPH was performed approximately 9.25 hours after the expiration of the method defined 14 day holding time. The analytes reported from this analysis were not detected in the sample and the results were assigned UJ qualifiers.**

8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. Yes

Comments: The results were reported in concentration units of milligrams per kilogram (mg/kg) and nanograms per kilogram (ng/kg). Soil moisture was reported as percent by weight (wt%). These units were acceptable for the sample matrix and the analyses requested.

The analytical results for the soil samples were reported on a dry weight basis.

9. Did the laboratory provide any specific initial and/or continuing calibration results? Yes

Comments: Limited continuing calibration summary data for Method MA-EPH and Method 8015M analyses were included as part of this data set.

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: The limited continuing calibration data were reviewed and the results are within acceptable limits. Full calibration reports and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. Laboratory blank samples were not prepared or required for soil moisture by Method D2974.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exceptions.

| Method | Analyte | Batch | Concentration (ng/kg) |
|---|---|---|---|
| 8290 | 1,2,3,4,6,7,8-HpCDD | 18356 | 0.21 |
| 8290 | 1,2,3,4,6,7,8-HpCDF | 18356 | 0.33 |
| 8290 | 1,2,3,4,7,8,9-HpCDF | 18356 | 0.19 |
| 8290 | 1,2,3,4,7,8-HxCDD | 18356 | 0.071 |
| 8290 | 1,2,3,6,7,8-HxCDD | 18356 | 0.078 |
| 8290 | OCDD | 18356 | 2.4 |
| 8290 | OCDF | 18356 | 3.4 |
| 8290 | Total HpCDD | 18356 | 0.37 |
| 8290 | Total HpCDF | 18356 | 1.3 |
| 8290 | Total HxCDD | 18356 | 0.15 |

The listed analytes were detected in the associated samples at concentrations greater than 10 times the blank levels and qualification of sample data was not required.

**VALIDATION CRITERIA CHECKLIST**

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| MA-EPH | EPH | 33677 | Not Associated |
| 8015M | TEH | 33547 | Not Associated |
| 8151A | Pentachlorophenol | B_100862 | DIAP-S-EAST (0-2)* |
| 8270C | SVOC | B_100906 | DIAP-S-SOUTH (0-2) |
| 8290 | TCDD/TCDF | 18356 | DIAP-SS-WEST (2-20) |

Not Associated – The MS sample source was not associated with this project.

* - The matrix spike results for Method 8151A included this laboratory note: *Because the sample amount was significantly higher than the spike amount, the MS and MSD spike samples are calculated as Duplicate samples.*

Matrix spike analyses were not required for soil moisture analyses by Method D2974.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? No

Comments: The percent recoveries and RPDs for MS/MSDs prepared from project samples were within data validation and laboratory QC limits or were not applicable because the unspiked sample concentration was greater than four times the spike added with the following exceptions.

| Method | Analyte | Batch | MS Recovery | MSD Recovery | MS/MSD QC Limits |
|---|---|---|---|---|---|
| **8207C** | **Dibenzo(a,h)anthracene** | **B_100906** | **122%** | **124%** | **63-113%** |
| **8207C** | **Indeno(1,2,3-cd)pyrene** | **B_100906** | **146%** | **145%** | **57-119%** |

**Dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were detected in the associated samples and the results were assigned J+ qualifiers due to evidence of potential high bias.** Dibenzo(a,h)anthracene was not detected in sample DIAP-S-WEST (0-2) and that result did not require qualification based on these MS/MSD results.

Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS percent recoveries were within data validation and laboratory QC limits.

17. Were surrogate recoveries within laboratory QC limits? Yes

Comments: The surrogate recoveries in the analyses of the submitted samples were within laboratory QC limits.

Qualification of sample data was not required based on surrogate non-conformances in QC samples as the environmental samples were evaluated based on sample-specific surrogate recoveries.

The Method 8290 internal standard recoveries were within the acceptance limits.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10 of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples. Sample BD-20160711 was collected as a field duplicate of sample DIAP-SS-East (2-20). | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within data validation QC limits of 0-50% for soil samples, with the following exceptions.<br>**The RPD values for C9-C18 aliphatics, C19-C36 aliphatics, total extractable hydrocarbons (Methods MA-EPH and 8015M), 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,7,8-PeCDD exceeded the data validation QC limit of 50% for soil which was evidence of poor precision. The results for these analytes were qualified as J for the parent and field duplicate samples DIAP-SS-East (2-20) and BD-20160711.**<br>**The RPD value for C11-C22 aromatics exceeded 100% and the results for this analyte were assigned J qualifiers if detected in the associated samples and UJ if not detected due to evidence of extremely poor precision.** | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | Yes |
| Comments: A laboratory duplicate sample was prepared for soil moisture by Method D2974 batch R116770 from sample BD-20160711. The RPD value for this duplicate analysis was within the laboratory acceptance limits.<br>The matrix spike and matrix spike duplicate for Method 8151A batch B_100862 prepared from sample DIAP-S-EAST (0-2) were presented as laboratory duplicates with the note "*Because the sample amount was significantly higher than the spike amount, the MS and MSD spike samples are calculated as Duplicate samples.*" The reported RPD values for these samples were within the laboratory limits | |

**FIELD DUPLICATE SUMMARY**

| Client Sample ID: DIAP-SS-East (2-20)<br>Field Duplicate Sample ID: BD-20160711 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| **MA-EPH** | **C11-C22, Aromatic, Adjusted** | **39 mg/kg-dry** | **159 mg/kg-dry** | **121.2%** |
| **MA-EPH** | **C19-C36, Aliphatic, Adjusted** | **294 mg/kg-dry** | **764 mg/kg-dry** | **88.8%** |
| **MA-EPH** | **C9-C18, Aliphatic, Adjusted** | **58 mg/kg-dry** | **173 mg/kg-dry** | **99.6%** |
| **MA-EPH** | **Total Extractable Hydrocarbons** | **411 mg/kg-dry** | **1160 mg/kg-dry** | **95.4%** |
| **SW8015M** | **Total Extractable Hydrocarbons** | **494 mg/kg-dry** | **1240 mg/kg-dry** | **86.0%** |
| SW8151A | Pentachlorophenol | 11 mg/kg-dry | 15 mg/kg-dry | 30.8% |
| 8290 | 1,2,3,4,6,7,8-HpCDD | 11000 ng/kg | 18000 ng/kg | 48.3% |
| 8290 | 1,2,3,4,6,7,8-HpCDF | 8800 ng/kg | 13000 ng/kg | 38.5% |
| 8290 | 1,2,3,4,7,8,9-HpCDF | 740 ng/kg | 1100 ng/kg | 39.1% |
| **8290** | **1,2,3,4,7,8-HxCDD** | **37 ng/kg** | **64 ng/kg** | **53.5%** |
| 8290 | 1,2,3,4,7,8-HxCDF | 160 ng/kg | 230 ng/kg | 35.9% |
| 8290 | 1,2,3,6,7,8-HxCDD | 480 ng/kg | 750 ng/kg | 43.9% |
| 8290 | 1,2,3,6,7,8-HxCDF | 110 ng/kg | 170 ng/kg | 42.9% |
| **8290** | **1,2,3,7,8,9-HxCDD** | **99 ng/kg** | **180 ng/kg** | **58.1%** |
| 8290 | 1,2,3,7,8,9-HxCDF | 75 ng/kg | 110 ng/kg | 37.8% |
| **8290** | **1,2,3,7,8-PeCDD** | **11 ng/kg** | **19 ng/kg** | **53.3%** |
| 8290 | 1,2,3,7,8-PeCDF | 21 ng/kg | 32 ng/kg | 41.5% |
| 8290 | 2,3,4,6,7,8-HxCDF | 210 ng/kg | 320 ng/kg | 41.5% |
| 8290 | 2,3,4,7,8-PeCDF | 58 ng/kg | 88 ng/kg | 41.1% |
| 8290 | 2,3,7,8-TCDD | 0.28 ng/kg | 0.40 ng/kg | 35.3% +/-RL |
| 8290 | 2,3,7,8-TCDF | 6.5 ng/kg | 9.3 ng/kg | 35.4% |
| 8290 | OCDD | 110000 ng/kg | 160000 ng/kg | 37.0% |
| 8290 | OCDF | 68000 ng/kg | 94000 ng/kg | 32.1% |
| 8290 | Total HpCDD | 17000 ng/kg | 28000 ng/kg | 48.9% |
| 8290 | Total HpCDF | 37000 ng/kg | 56000 ng/kg | 40.9% |
| 8290 | Total HxCDD | 1500 ng/kg | 2400 ng/kg | 46.2% |
| 8290 | Total HxCDF | 7200 ng/kg | 10000 ng/kg | 32.6% |
| 8290 | Total PeCDD | 87 ng/kg | 140 ng/kg | 46.7% |
| 8290 | Total PeCDF | 1000 ng/kg | 1600 ng/kg | 46.2% |
| 8290 | Total TCDD | 16 ng/kg | 24 ng/kg | 40.0% |
| 8290 | Total TCDF | 130 ng/kg | 200 ng/kg | 42.4% |
| 8290 | WHO 2005 TEQ | 400 ng/kg | 620 ng/kg | 43.1% |
| D2974 | Soil Moisture | 15.1 WT% | 14.9 WT% | 1.3% |

Field duplicate RPD control limits are not to exceed 50% for soil as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

| Client Sample ID: DIAP-SS-East (2-20)<br>Field Duplicate Sample ID: BD-20160711 |
| --- |
| **The RPD values for C9-C18 Aliphatics, C19-C36 Aliphatics, Total Extractable Hydrocarbons (Methods MA-EPH and 8015M), 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,7,8-PeCDD exceeded the data validation QC limit of 50% for soil which was evidence of poor precision. The results for these analytes were qualified as J for the parent and field duplicate samples DIAP-SS-East (2-20) and BD-20160711.**<br>**The RPD value for C11-C22 Aromatics exceeded 100% and the results for this analyte were assigned J qualifiers if detected in the associated samples and UJ if not detected due to evidence of extremely poor precision.** |

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| INT-ISO | Interfering substances affected isotope ratios and accurate identification and quantitation of the target analyte. |
| INT-PCDE | Interference from polychlorinated diphenyl ethers affected accurate identification and quantitation of the target analyte. |
| EMPC | The reported concentration is the Estimated Maximum Possible Concentration (EPMC). |
| EBL | Flagged as estimated by the laboratory. |
| BCAL | The result is below the instrument calibration range. |
| ECAL | The result exceeds the calibration range. |
| HT-EX | Sample was extracted outside of the method holding time. |
| HR-MS | The MS and/or MSD percent recovery was greater than the upper acceptable limit indicating possible matrix interference. |
| ERPD-FD | High field duplicate RPD. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,4,6,7,8-HpCDD | 8290 | H16070159-007B | 10355420007 | 4000 | 0.41 | ng/kg | J | EBL, ECAL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | H16070159-006B | 10355420006 | 3200 | 1.7 | ng/kg | J | EBL, ECAL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | H16070159-007B | 10355420007 | 3300 | 1.2 | ng/kg | J | EBL, ECAL |
| 1,2,3,4,6,7,8-HpCDF | 8290 | H16070159-008B | 10355420008 | 2100 | 0.93 | ng/kg | J | EBL, ECAL |
| 1,2,3,4,7,8-HxCDD | 8290 | H16070159-002B | 10355420002 | 37 | 0.69 | ng/kg | J | ERPD-FD |
| 1,2,3,4,7,8-HxCDD | 8290 | H16070159-005B | 10355420005 | 3.1 | 0.47 | ng/kg | J+ | EBL, EMPC, INT-ISO |
| 1,2,3,4,7,8-HxCDD | 8290 | H16070159-006B | 10355420006 | 3.3 | 0.34 | ng/kg | J | BCAL, EBL |
| 1,2,3,4,7,8-HxCDD | 8290 | H16070159-009B | 10355420009 | 64 | 1 | ng/kg | J | ERPD-FD |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-001B | 10355420001 | 210 | 1.2 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-002B | 10355420002 | 110 | 0.76 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-003B | 10355420003 | 180 | 1.1 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-004B | 10355420004 | 37 | 0.65 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-006B | 10355420006 | 24 | 0.85 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-007B | 10355420007 | 120 | 0.69 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-008B | 10355420008 | 19 | 0.61 | ng/kg | J+ | EMPC, INT-PCDE |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,6,7,8-HxCDF | 8290 | H16070159-009B | 10355420009 | 170 | 1.9 | ng/kg | J+ | EMPC, INT-PCDE |
| 1,2,3,7,8,9-HxCDD | 8290 | H16070159-002B | 10355420002 | 99 | 0.82 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8,9-HxCDD | 8290 | H16070159-009B | 10355420009 | 180 | 0.69 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8,9-HxCDF | 8290 | H16070159-005B | 10355420005 | 3 | 0.81 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-002B | 10355420002 | 11 | 0.27 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-004B | 10355420004 | 3.8 | 0.23 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-005B | 10355420005 | 1.6 | 0.29 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-006B | 10355420006 | 1.8 | 0.24 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-008B | 10355420008 | 1.9 | 0.31 | ng/kg | J+ | EBL, EMPC, INT-ISO |
| 1,2,3,7,8-PeCDD | 8290 | H16070159-009B | 10355420009 | 19 | 0.16 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8-PeCDF | 8290 | H16070159-004B | 10355420004 | 4.1 | 0.32 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDF | 8290 | H16070159-005B | 10355420005 | 1.3 | 0.73 | ng/kg | J+ | EBL, EMPC, INT-ISO |
| 1,2,3,7,8-PeCDF | 8290 | H16070159-006B | 10355420006 | 1.7 | 0.62 | ng/kg | J | BCAL, EBL |
| 1,2,3,7,8-PeCDF | 8290 | H16070159-008B | 10355420008 | 1.7 | 0.58 | ng/kg | J | BCAL, EBL |
| 2,3,4,7,8-PeCDF | 8290 | H16070159-005B | 10355420005 | 3.1 | 0.46 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDD | 8290 | H16070159-001B | 10355420001 | 1.2 | 0.17 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDD | 8290 | H16070159-002B | 10355420002 | 0.28 | 0.23 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDD | 8290 | H16070159-003B | 10355420003 | 0.6 | 0.42 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDD | 8290 | H16070159-007B | 10355420007 | 1.1 | 0.59 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDD | 8290 | H16070159-009B | 10355420009 | 0.4 | 0.34 | ng/kg | J | BCAL, EBL |
| 2,3,7,8-TCDF | 8290 | H16070159-005B | 10355420005 | 0.5 | 0.45 | ng/kg | J | BCAL, EBL |
| OCDD | 8290 | H16070159-001B | 10355420001 | 150000 | 3.5 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-002B | 10355420002 | 110000 | 2.7 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-003B | 10355420003 | 72000 | 1.4 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-004B | 10355420004 | 18000 | 0.66 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-006B | 10355420006 | 14000 | 0.49 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-007B | 10355420007 | 27000 | 0.62 | ng/kg | J | EBL, ECAL |
| OCDD | 8290 | H16070159-008B | 10355420008 | 9100 | 0.31 | ng/kg | J | EBL, ECAL |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| OCDD | 8290 | H16070159-009B | 10355420009 | 160000 | 3.1 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-002B | 10355420002 | 68000 | 2 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-004B | 10355420004 | 3400 | 0.33 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-006B | 10355420006 | 26000 | 0.41 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-007B | 10355420007 | 8400 | 0.55 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-008B | 10355420008 | 17000 | 0.25 | ng/kg | J | EBL, ECAL |
| OCDF | 8290 | H16070159-009B | 10355420009 | 94000 | 2.4 | ng/kg | J | EBL, ECAL |
| Total HpCDD | 8290 | H16070159-007B | 10355420007 | 7100 | 0.41 | ng/kg | J | EBL, ECAL |
| Total HpCDF | 8290 | H16070159-006B | 10355420006 | 13000 | 2.3 | ng/kg | J | EBL, ECAL |
| Total HpCDF | 8290 | H16070159-007B | 10355420007 | 7500 | 1.9 | ng/kg | J | EBL, ECAL |
| Total HpCDF | 8290 | H16070159-008B | 10355420008 | 8400 | 1.4 | ng/kg | J | EBL, ECAL |
| Total HpCDF | 8290 | H16070159-009B | 10355420009 | 56000 | 13 | ng/kg | J | EBL, ECAL |
| Total HxCDF | 8290 | H16070159-002B | 10355420002 | 7200 | 1.3 | ng/kg | J | EBL, ECAL |
| Total HxCDF | 8290 | H16070159-009B | 10355420009 | 10000 | 2.1 | ng/kg | J | EBL, ECAL |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-S-EAST (0-2) | H16070159-001 | 159 | 15 | mg/kg-dry | J | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-SS-East (2-20) | H16070159-002 | 39 | 12 | mg/kg-dry | J | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-S-SOUTH (0-2) | H16070159-003 | ND | 12 | mg/kg-dry | UJ | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-SS-SOUTH (2-20) | H16070159-004 | ND | 24 | mg/kg-dry | UJ | ERPD-FD, HT-EX |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-S-WEST (0-2) | H16070159-005 | ND | 11 | mg/kg-dry | UJ | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-SS-WEST (2-20) | H16070159-006 | ND | 12 | mg/kg-dry | UJ | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-S-NORTH (0-2) | H16070159-007 | 43 | 13 | mg/kg-dry | J | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | DIAP-SS-NORTH (2-20) | H16070159-008 | ND | 12 | mg/kg-dry | UJ | ERPD-FD |
| C11-C22, Aromatic, Adjusted | MA-EPH | BD-20160711 | H16070159-009 | 159 | 12 | mg/kg-dry | J | ERPD-FD |
| C19-C36, Aliphatic, Adjusted | MA-EPH | DIAP-SS-East (2-20) | H16070159-002 | 294 | 12 | mg/kg-dry | J | ERPD-FD |
| C19-C36, Aliphatic, Adjusted | MA-EPH | DIAP-SS-SOUTH (2-20) | H16070159-004 | ND | 24 | mg/kg-dry | UJ | HT-EX |
| C19-C36, Aliphatic, Adjusted | MA-EPH | BD-20160711 | H16070159-009 | 764 | 12 | mg/kg-dry | J | ERPD-FD |
| C9-C18, Aliphatic, Adjusted | MA-EPH | DIAP-SS-East (2-20) | H16070159-002 | 58 | 12 | mg/kg-dry | J | ERPD-FD |
| C9-C18, Aliphatic, Adjusted | MA-EPH | DIAP-SS-SOUTH (2-20) | H16070159-004 | ND | 24 | mg/kg-dry | UJ | HT-EX |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| C9-C18, Aliphatic, Adjusted | MA-EPH | BD-20160711 | H16070159-009 | 173 | 12 | mg/kg-dry | J | ERPD-FD |
| Total Extractable Hydrocarbons | MA-EPH | DIAP-SS-East (2-20) | H16070159-002 | 411 | 12 | mg/kg-dry | J | ERPD-FD |
| Total Extractable Hydrocarbons | MA-EPH | DIAP-SS-SOUTH (2-20) | H16070159-004 | ND | 24 | mg/kg-dry | UJ | HT-EX |
| Total Extractable Hydrocarbons | MA-EPH | BD-20160711 | H16070159-009 | 1160 | 12 | mg/kg-dry | J | ERPD-FD |
| Total Extractable Hydrocarbons | SW8015M | DIAP-SS-East (2-20) | H16070159-002 | 494 | 12 | mg/kg-dry | J | ERPD-FD |
| Total Extractable Hydrocarbons | SW8015M | BD-20160711 | H16070159-009 | 1240 | 12 | mg/kg-dry | J | ERPD-FD |
| Dibenzo(a,h)anthracene | SW8270C | DIAP-S-EAST (0-2) | H16070159-001 | 0.037 | 0.0048 | mg/kg-dry | J+ | HR-MS |
| Dibenzo(a,h)anthracene | SW8270C | DIAP-S-SOUTH (0-2) | H16070159-003 | 0.008 | 0.0042 | mg/kg-dry | J+ | HR-MS |
| Dibenzo(a,h)anthracene | SW8270C | DIAP-S-NORTH (0-2) | H16070159-007 | 0.033 | 0.0042 | mg/kg-dry | J+ | HR-MS |
| Indeno(1,2,3-cd)pyrene | SW8270C | DIAP-S-EAST (0-2) | H16070159-001 | 0.13 | 0.0048 | mg/kg-dry | J+ | HR-MS |
| Indeno(1,2,3-cd)pyrene | SW8270C | DIAP-S-SOUTH (0-2) | H16070159-003 | 0.024 | 0.0042 | mg/kg-dry | J+ | HR-MS |
| Indeno(1,2,3-cd)pyrene | SW8270C | DIAP-S-WEST (0-2) | H16070159-005 | 0.0091 | 0.0036 | mg/kg-dry | J+ | HR-MS |
| Indeno(1,2,3-cd)pyrene | SW8270C | DIAP-S-NORTH (0-2) | H16070159-007 | 0.19 | 0.0042 | mg/kg-dry | J+ | HR-MS |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories |
| Project Name: Diamond P Ranch | Sample Matrix: Soil |
| Project Number: 776-029-001 Task 0006 | Sample Start Date: 08/10/2016 |
| Date Validated: 08/29/2016 | Sample End Date: 08/10/2016 |
| Parameters Included:<br>▪ Total Metals by Test Method for Evaluating Solid Waste (SW-846) Methods 6010B and 6020<br>▪ Total Mercury by SW-846 Method 7471B<br>▪ Soil Moisture ASTM International Method D2974 | |
| Laboratory Project ID: H16080248 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Laboratory duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS) and laboratory fortified blank (LFB) samples

Method compliance was established by reviewing sample integrity, holding times, detection limits, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

**SAMPLE NUMBERS TABLE**

| Client Sample ID | Laboratory Sample Number |
|---|---|
| DIAP-BKFL-01 | H16080248-001 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 11)
- ✓ MS/MSD (Item 13)
- ✓ LCS and LFB (Item 15)
- ○ System Monitoring Compounds (i.e., Surrogates) (Item 17)
- ○ Field, Equipment, and Trip Blanks (Item 18)
- ○ Field Duplicates (Item 20)
- ✓ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives.

Data were not qualified as a result of this validation.

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 9 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | Yes |
| Comments: The laboratory did not identify non-conformances regarding the analytical data in this report. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>S - Spike recovery outside of advisory limits.<br>N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test. | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt with the following exception.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. The following dilutions were applied.<br>Sample DIAP-BKFL-01 was diluted by a factor of 5 times for the Method 6010B analysis of barium. A dilution factor of 50 times was applied for the analysis of the target metals analyzed by Method 6020. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | Yes |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at 5.3°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | Yes |
| Comments: The samples were digested and analyzed within method-specific holding times. | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The results were reported in concentration units of milligrams per kilogram (mg/kg). Soil moisture was reported as percent by weight (wt%). These units were acceptable for the sample matrix and the analyses requested.<br>The analytical results for the soil samples were reported on a dry weight basis. | |
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | Yes |
| Comments: Limited initial and continuing calibration summary data were included as part of this data set. | |

**VALIDATION CRITERIA CHECKLIST**

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: Limited initial and continuing calibration data were reviewed and the results are within acceptable limits. Partial interference check summary results for Method 6010B were also included in the QC Summary Report with acceptable results. Full calibration and interference check reports and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. Laboratory blank samples were not prepared or required for soil moisture by Method D2974.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exceptions.

Silver was detected in the method blank for Method 6020 batch 33992 at a concentration of 0.3 mg/kg.

Mercury was detected in the method blank for Method 7171B batch 34013 at a concentration of 0.01 mg/kg.

Silver and mercury were not detected in the associated sample, DIAP-BKFL-01, and the results did not require qualification.

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 6010B | Barium | 33992 | Not Associated |
| 6020 | Metals | 33992 | Not Associated |
| 7471B | Mercury | 34013 | Not Associated |

Not Associated – The MS sample source was not associated with this project.

Matrix spike analyses were not required for soil moisture analyses by Method D2974.

Post digestion spikes and serial dilutions were prepared for Method 6010B and Method 6020 batch 33992 from a sample that was not associated with the project.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? N/A

Comments: Recoveries and RPDs for MS/MSDs, post digestion spikes, and serial dilutions prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS and LFB percent recoveries were within data validation and laboratory QC limits.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 17. Were surrogate recoveries within laboratory QC limits? | N/A |
| Comments: Analysis of surrogates was not required for metals analyses. | |
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: Field duplicate samples were not collected as part of this sample set. | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | N/A |
| Comments: Field duplicate samples were not collected as part of this sample set. | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | Yes |
| Comments: A laboratory duplicate sample was prepared for soil moisture by Method D2974 batch R117999 from sample DIAP-BKFL-01. The RPD value for this duplicate analysis was within the laboratory acceptance limits. | |

**DATA QUALIFICATION SUMMARY**

Data qualifiers were not applied as a result of this validation

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories |
| Project Name: Diamond P Ranch | Sample Matrix: Water |
| Project Number: 776-029-001 Task 0010 | Sample Start Date: 09/12/2016 |
| Date Validated: 09/30/2016 | Sample End Date: 09/13/2016 |
| Parameters Included:<br>▪ Semivolatile Organic Compounds (SVOC) by Test Method for Evaluating Solid Waste Method 8270C<br>▪ Pentachlorophenol by SW-846 Method 8151A<br>▪ Total Extractable Petroleum Hydrocarbons (EPH) by SW-846 Method 8015M<br>▪ Dissolved Metals by SW-846 Method 6020<br>▪ Dissolved Mercury by SW-846 Method 7470A | |
| Laboratory Project ID: H16090282 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS) and laboratory fortified blank (LFB) samples
- Organic system monitoring compounds (surrogates)

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| MW-1 | H16090282-001 |
| MW-3 | H16090282-002 |
| MW-4 | H16090282-003 |
| BD-20160912-02 | H16090282-004 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ⊗ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 11)
- ⊗ MS/MSD (Item 13)
- ✓ LCS and LFB (Item 15)
- ✓ System Monitoring Compounds (i.e., Surrogates) (Item 17)
- ○ Field, Equipment, and Trip Blanks (Item 18)
- ✓ Field Duplicates (Item 20)
- ○ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J- | The result is an estimated concentration, but may be biased low |
| UJ | Estimated reporting limit |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 108 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | Yes |
| Comments: The laboratory did not identify non-conformances regarding the analytical data in this report. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>S - Spike recovery outside of advisory limits. | |
| 3. Were sample CoC forms and procedures complete? | No |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt with the following exception.<br>The laboratory noted that the sample ID and collection date and time were not entered on the label for one sample bottle for sample MW-3. The ID and collection information from the CoC was used for entry in the laboratory information system.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. Dilutions were not applied for the analyses reported in this data set. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | No |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within and outside the recommended temperature range of 4°C ± 2°C at 0.7°C to 2.4°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*. The cooler temperatures below 2.0°C were judged as acceptable since the laboratory did not report the sample containers as broken or frozen. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | No |
| Comments: The samples were extracted/digested and analyzed within method-specific holding times with the following exceptions.<br>**The extractions for total extractable hydrocarbons by Method 8015M were performed 1 to 2 days after expiration of the 7 day holding time. The target analyte was not detected in the samples and the results were assigned UJ qualifiers to indicate estimated detection limits.** | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The results were reported in concentration units of micrograms per liter (µg/L) and milligrams per liter (mg/L). These units were acceptable for the sample matrix and the analyses requested. | |
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | Yes |
| Comments: Limited initial and continuing calibration summary data were included as part of this data set. | |

**VALIDATION CRITERIA CHECKLIST**

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: Limited initial and continuing calibration data were reviewed and the results were within the acceptance limits. Full calibration and interference check reports and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exceptions.

Mercury was detected in the method blank for Method 7470A batch 34479 at a concentration of 0.000001 mg/L. Mercury was not detected in the associated samples and qualification of the results was not required.

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 6020 | Metals | R118686 | MW-1 |
| 6020 | Arsenic | R118783 | Not Associated |
| 7470A | Mercury | 34479 | MW-3 |
| 8015M | EPH | 34498 | Not Associated |
| 8151A | Pentachlorophenol | B_102764 | MW-4 |
| 8270C | SVOC | B_102784 | MW-1 and MW-3 |

Not Associated – The MS sample source was not associated with this project.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? No

Comments: The percent recoveries and RPDs for MS/MSDs prepared from project samples were within data validation and laboratory QC limits with the following exception.

**The reported recovery for pentachlorophenol in the MSD for Method 8151A batch B_102764 was outside the laboratory acceptance limits of 61-122% at 59%. The non-detect results in the associated samples in the batch were assigned UJ qualifiers and the detection of pentachlorophenol in sample MW-4 was qualified J- due to evidence of potential low bias.**

Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? | Yes |
| Comments: The LCS and LFB percent recoveries were within data validation and laboratory QC limits. | |
| 17. Were surrogate recoveries within laboratory QC limits? | Yes |
| Comments: The surrogate recoveries were within laboratory QC limits. | |
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.<br>Sample BD-20160912-02 was collected as a field duplicate of sample MW-3. | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | Yes |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-30% for water samples. | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: MW-3<br>Field Duplicate Sample ID: BD-20160912-02 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result (mg/L)** | **Duplicate Result (mg/L)** | **Relative Percent Difference (RPD)** |
| 6020 | Arsenic | 0.002 | 0.002 | 0.0% |
| Field duplicate RPD control limits are not to exceed 30% for water as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013. | | | | |

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| HT-EX | Sample was extracted outside of the method holding time. |
| LR-MS | The MS and/or MSD percent recovery was less than the lower acceptable limit indicating possible matrix interference. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | SW8151A | MW-1 | H16090282-001 | ND | 0.1 | µg/L | UJ | LR-MS |
| Pentachlorophenol | SW8151A | MW-3 | H16090282-002 | ND | 0.1 | µg/L | UJ | LR-MS |
| Pentachlorophenol | SW8151A | MW-4 | H16090282-003 | 1.2 | 0.1 | µg/L | J- | LR-MS |
| Pentachlorophenol | SW8151A | BD-20160912-02 | H16090282-004 | ND | 0.1 | µg/L | UJ | LR-MS |
| Total Extractable Hydrocarbons | SW8015M | MW-1 | H16090282-001 | ND | 300 | µg/L | UJ | HT-EX |
| Total Extractable Hydrocarbons | SW8015M | MW-3 | H16090282-002 | ND | 322 | µg/L | UJ | HT-EX |
| Total Extractable Hydrocarbons | SW8015M | MW-4 | H16090282-003 | ND | 329 | µg/L | UJ | HT-EX |
| Total Extractable Hydrocarbons | SW8015M | BD-20160912-02 | H16090282-004 | ND | 303 | µg/L | UJ | HT-EX |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories / Pace Analytical |
| Project Name: Diamond P Ranch | Sample Matrix: Soil |
| Project Number: 776-029-001 Task 0007 | Sample Start Date: 09/12/2016 |
| Date Validated: 11/10/2016 | Sample End Date: 09/12/2016 |
| Parameters Included:<br>▪ Semivolatile Organic Compounds (SVOC) by Test Method for Evaluating Solid Waste (SW-846) Method 8270C<br>▪ Dioxins by SW-846 Method 8290<br>▪ Pentachlorophenol by SW-846 Method 8151A<br>▪ Total Extractable Petroleum Hydrocarbons (EPH) by SW-846 Method 8015M<br>▪ Extractable Petroleum Hydrocarbons (EPH) by Massachusetts Department of Environmental Protection (MADEP) Method MA-EPH<br>▪ Soil Moisture by SW-846 Method 3550C | |
| Laboratory Project ID: H16090301 / 10362722 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, with additional results from Energy Laboratories in Billings, Montana and Pace Analytical in Minneapolis, Minnesota, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS)
- Organic system monitoring compounds (surrogates)
- Isotopically labeled internal and recovery standards

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS percent recoveries against method-specific requirements.

## Tier II Data Validation Report Summary

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

**SAMPLE NUMBERS TABLE**

| Client Sample ID | Laboratory Sample Number | |
|---|---|---|
| DIAP-SS-N-F (3.0) | H16090301-001 | 10362722001 |
| DIAP-S-North-01 (0-2) | H16090301-002 | 10362722002 |
| DIAP-S-South-01 (0-2) | H16090301-003 | 10362722003 |
| DIAP-SS-S-F (2.0) | H16090301-004 | 10362722004 |
| BD-20160912-01 | H16090301-005 | 10362722005 |
| DIAP-SRC-E (6) | H16090301-006 | 10362722006 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 11)
- ⊗ MS/MSD (Item 13)
- ✓ LCS (Item 15)
- ⊗ System Monitoring Compounds (i.e., Surrogates) and Isotopically Labeled Internal and Recovery Standards (Item 17)
- ○ Field, Equipment, and Trip Blanks (Item 18)
- ⊗ Field Duplicates (Item 20)
- ○ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| J+ | The result is an estimated concentration, but may be biased high |
| J- | The result is an estimated concentration, but may be biased low |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 236 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory identified the following non-conformances regarding the analytical data in this report.<br>A significant portion of the hydrocarbons measured in the EPH Screening analysis for sample DIAP-S-North-01 (0-2) were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>* – The result exceeds the MCL.<br>S – Spike recovery outside of advisory limits.<br>R – RPD exceeds advisory limits.<br>J – Estimated value<br>E – Exceeds calibration range<br>I – Interference present<br>D – Result obtained from analysis of diluted sample | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. The following dilutions were applied for the analyses reported in this data set.<br><u>Method 8015M:</u> Sample DIAP-SRC-E (6) was diluted by a factor of 2 times for the analysis of total extractable hydrocarbons.<br><u>Method 8151A:</u> A dilution of 5000 times was applied to sample DIAP-SRC-E (6) for the analysis of pentachlorophenol.<br><u>Method 8290:</u> Sample DIAP-S-North-01 (0-2) was diluted by a factor of 10 times for the analysis of dioxins and furans and sample DIAP-SRC-E (6) was diluted by a factor of 50 times. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | No |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC with the following exceptions.<br>As stated in the *Work Order Receipt Checklist*, the project manager cancelled the analyses of metals and specified the Method 8270 analyses for samples DIAP-S-North-01 (0-2), DIAP-S-South-01 (0-2), and DIAP-SRC-E (6) only. No further action was required. | |
| 6. Were samples received in good condition within method-specified requirements? | No |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within and outside the recommended temperature range of 4°C ± 2°C at 0.7°C to 2.4°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*. The cooler temperatures below 2.0°C were judged as acceptable since the laboratory did not report the sample containers as broken or frozen. | |

**VALIDATION CRITERIA CHECKLIST**

7. Were samples extracted/digested and analyzed within method-specified or technical holding times? Yes

Comments: The samples were extracted and analyzed within method-specific holding times.

8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. Yes

Comments: The results were reported in concentration units of nanograms per kilogram (ng/kg) and milligrams per kilogram (mg/kg). These units were acceptable for the sample matrix and the analyses requested. The results for the soil samples were reported on a dry weight basis.

9. Did the laboratory provide any specific initial and/or continuing calibration results? Yes

Comments: Limited continuing calibration summary data for Methods MA-EPH, 8015M, 8151A, and 8270C were included as part of this data set.

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: The limited continuing calibration data were reviewed and the results were within the acceptance limits. Full calibration results and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exceptions.

Naphthalene was detected in the method blank for Method 8270C batch B_103331 at a concentration of 0.00867 mg/kg. Naphthalene was not detected in the associated samples and qualification of the results was not required.

OCDD was detected in the method blank for Method 8290 batch 18654 at a concentration of 0.40 ng/kg. OCDD was detected in the associated samples at concentrations greater than 10 times the blank level and qualification of the results was not required.

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| MA-EPH | EPH | 34538 | Not Associated |
| 8015M | EPH | 34440 | Not Associated |
| 8151A | Pentachlorophenol | B_102845 | BD-20160912-01 |
| 8270C | SVOC | B_102906 | Not Associated |
| 8270C | SVOC | B_103331 | Not Associated |
| 8290 | Dioxin | 18654 | Not Prepared |

Not Associated – The MS sample source was not associated with this project.

Not Prepared – Matrix spikes were not prepared for this batch.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? | No |
| Comments: The percent recoveries and RPDs for MS/MSDs prepared from project samples were within data validation and laboratory QC limits with the following exception.<br>**The reported recoveries for pentachlorophenol in the MS and MSD for Method 8151A batch B_102845 were outside the laboratory acceptance limits of 51-103% at 39% and 38%, respectively. Pentachlorophenol was detected in the associated samples in the batch and the results were assigned J- due to evidence of potential low bias.**<br>Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed. | |
| 15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? | Yes |
| Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples. | |
| 16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? | Yes |
| Comments: The LCS percent recoveries were within laboratory QC limits. | |
| 17. Were surrogate recoveries within laboratory QC limits? | No |
| Comments: The surrogate and isotopically labeled standard recoveries were within QC limits with the following exception.<br>**The recovery of the Method MA-EPH surrogate 1-chloro-octadecane was outside the acceptance limits of 40-140% for sample DIAP-SRC-E (6) at 257%. The associated target analytes, C9 to C18 Aliphatics and C19 to C36 Aliphatics, were detected in this samples and the results were assigned J+ qualifiers due to evidence of potential high bias.**<br>Qualification of sample data was not required based on surrogate non-conformances in QC samples as the environmental samples were evaluated based on their specific surrogate recoveries. | |
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.<br>Sample BD-20160912-01 was collected as a field duplicate of sample DIAP-SS-S-F (2.0). | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-50% for soil samples with exceptions.<br>**Several analytes were identified with RPDs of 50% or greater and the results for those analytes were assigned J qualifiers in the parent and duplicate samples, DIAP-SS-S-F (2.0) and BD-20160912-01, due to evidence of poor precision.** | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: DIAP-SS-S-F (2.0)<br>Field Duplicate Sample ID: BD-20160912-01 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| SW8015M | Total Extractable Hydrocarbons | 18 mg/kg-dry | 17 mg/kg-dry | 5.7% +/-RL |
| SW8151A | Pentachlorophenol | 0.011 mg/kg-dry | 0.0074 mg/kg-dry | 39.1% |
| SW 3550C | Soil Moisture | 5.7 WT% | 6.2 WT% | 8.4% |
| **8290** | **1,2,3,4,6,7,8-HpCDD** | **330 ng/kg** | **550 ng/kg** | **50.0%** |
| **8290** | **1,2,3,4,6,7,8-HpCDF** | **290 ng/kg** | **490 ng/kg** | **51.3%** |
| **8290** | **1,2,3,4,7,8,9-HpCDF** | **17 ng/kg** | **31 ng/kg** | **58.3%** |
| 8290 | 1,2,3,4,7,8-HxCDD | 2.4 ng/kg | 3.9 ng/kg | 47.6% |
| **8290** | **1,2,3,4,7,8-HxCDF** | **5.7 ng/kg** | **11 ng/kg** | **63.5%** |
| **8290** | **1,2,3,6,7,8-HxCDD** | **15 ng/kg** | **27 ng/kg** | **57.1%** |
| 8290 | 1,2,3,6,7,8-HxCDF | 7.4 ng/kg | 11 ng/kg | 39.1% |
| 8290 | 1,2,3,7,8,9-HxCDD | 5.9 ng/kg | 9.3 ng/kg | 44.7% |
| **8290** | **1,2,3,7,8,9-HxCDF** | **2.4 ng/kg** | **4.4 ng/kg** | **58.8%** |
| 8290 | 1,2,3,7,8-PeCDD | 0.97 ng/kg | 1.3 ng/kg | 29.1% |
| 8290 | 1,2,3,7,8-PeCDF | 1.1 ng/kg | 1.6 ng/kg | 37.0% |
| 8290 | 2,3,4,6,7,8-HxCDF | 10 ng/kg | 16 ng/kg | 46.2% |
| **8290** | **2,3,4,7,8-PeCDF** | **2.1 ng/kg** | **3.8 ng/kg** | **57.6%** |
| 8290 | 2,3,7,8-TCDF | 0.41 ng/kg | 0.57 ng/kg | 32.7% |
| 8290 | OCDD | 2600 ng/kg | 4300 ng/kg | 49.3% |
| **8290** | **OCDF** | **1300 ng/kg** | **2600 ng/kg** | **66.7%** |
| **8290** | **Total HpCDD** | **520 ng/kg** | **880 ng/kg** | **51.4%** |
| **8290** | **Total HpCDF** | **910 ng/kg** | **1700 ng/kg** | **60.5%** |
| 8290 | Total HxCDD | 68 ng/kg | 110 ng/kg | 47.2% |
| 8290 | Total HxCDF | 300 ng/kg | 430 ng/kg | 35.6% |
| **8290** | **Total PeCDD** | **3.5 ng/kg** | **7.0 ng/kg** | **66.7%** |
| 8290 | Total PeCDF | 56 ng/kg | 83 ng/kg | 38.8% |
| 8290 | Total TCDD | 0.37 ng/kg | 0.54 ng/kg | 37.4% |
| 8290 | Total TCDF | 6.3 ng/kg | 9.8 ng/kg | 43.5% |

Field duplicate RPD control limits are not to exceed 50% for soil as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

**The identified analytes with RPDs of 50% or greater were assigned J qualifiers in the parent and duplicate samples, DIAP-SS-S-F (2.0) and BD-20160912-01, due to evidence of poor precision.**

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| LR-MS | The MS and/or MSD percent recovery was less than the lower acceptable limit indicating possible matrix interference. |
| HR-SUR | The surrogate percent recovery was greater than the upper acceptable limit indicating a possible high bias. |
| ERPD-FD | High field duplicate RPD. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| C19-C36, Aliphatic, Adjusted | MA-EPH | DIAP-SRC-E (6) | H16090301-006 | 2860 | 57 | mg/kg-dry | J+ | HR-SUR |
| C9-C18, Aliphatic, Adjusted | MA-EPH | DIAP-SRC-E (6) | H16090301-006 | 1210 | 57 | mg/kg-dry | J+ | HR-SUR |
| Pentachlorophenol | SW8151A | DIAP-SS-N-F (3.0) | H16090301-001 | 0.061 | 0.0022 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-S-North-01 (0-2) | H16090301-002 | 0.052 | 0.0022 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-S-South-01 (0-2) | H16090301-003 | 0.041 | 0.0021 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-SS-S-F (2.0) | H16090301-004 | 0.011 | 0.0021 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | BD-20160912-01 | H16090301-005 | 0.0074 | 0.0022 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-SRC-E (6) | H16090301-006 | 205 | 11 | mg/kg-dry | J- | LR-MS |
| 1,2,3,4,6,7,8-HpCDD | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 330 | 0.36 | ng/kg | J | ERPD-FD |
| 1,2,3,4,6,7,8-HpCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 290 | 0.51 | ng/kg | J | ERPD-FD |
| 1,2,3,4,7,8,9-HpCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 17 | 0.45 | ng/kg | J | ERPD-FD |
| 1,2,3,4,7,8-HxCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 5.7 | 0.48 | ng/kg | J | ERPD-FD |
| 1,2,3,6,7,8-HxCDD | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 15 | 0.39 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8,9-HxCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 2.4 | 0.73 | ng/kg | J | ERPD-FD |
| 2,3,4,7,8-PeCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 2.1 | 0.22 | ng/kg | J | ERPD-FD |
| OCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 1300 | 0.63 | ng/kg | J | ERPD-FD |
| Total HpCDD | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 520 | 0.36 | ng/kg | J | ERPD-FD |
| Total HpCDF | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 910 | 0.48 | ng/kg | J | ERPD-FD |
| Total PeCDD | 8290 | DIAP-SS-S-F (2.0) | 10362722004-R | 3.5 | 0.22 | ng/kg | J | ERPD-FD |
| 1,2,3,4,6,7,8-HpCDD | 8290 | BD-20160912-01 | 10362722005-R | 550 | 0.26 | ng/kg | J | ERPD-FD |
| 1,2,3,4,6,7,8-HpCDF | 8290 | BD-20160912-01 | 10362722005-R | 490 | 0.4 | ng/kg | J | ERPD-FD |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,4,7,8,9-HpCDF | 8290 | BD-20160912-01 | 10362722005-R | 31 | 0.59 | ng/kg | J | ERPD-FD |
| 1,2,3,4,7,8-HxCDF | 8290 | BD-20160912-01 | 10362722005-R | 11 | 0.47 | ng/kg | J | ERPD-FD |
| 1,2,3,6,7,8-HxCDD | 8290 | BD-20160912-01 | 10362722005-R | 27 | 0.31 | ng/kg | J | ERPD-FD |
| 1,2,3,7,8,9-HxCDF | 8290 | BD-20160912-01 | 10362722005-R | 4.4 | 0.39 | ng/kg | J | ERPD-FD |
| 2,3,4,7,8-PeCDF | 8290 | BD-20160912-01 | 10362722005-R | 3.8 | 0.19 | ng/kg | J | ERPD-FD |
| OCDF | 8290 | BD-20160912-01 | 10362722005-R | 2600 | 0.64 | ng/kg | J | ERPD-FD |
| Total HpCDD | 8290 | BD-20160912-01 | 10362722005-R | 880 | 0.26 | ng/kg | J | ERPD-FD |
| Total HpCDF | 8290 | BD-20160912-01 | 10362722005-R | 1700 | 0.49 | ng/kg | J | ERPD-FD |
| Total PeCDD | 8290 | BD-20160912-01 | 10362722005-R | 7 | 0.23 | ng/kg | J | ERPD-FD |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories / Pace Analytical |
| Project Name: Diamond P Ranch | Sample Matrix: Soil |
| Project Number: 776-029-001 Task 0006 | Sample Start Date: 11/12/2016 |
| Date Validated: 12/20/2016 | Sample End Date: 11/12/2016 |
| Parameters Included:<br>▪ Semivolatile Organic Compounds (SVOC) by Test Method for Evaluating Solid Waste (SW-846) Method 8270C<br>▪ Dioxins by SW-846 Method 8290<br>▪ Pentachlorophenol by SW-846 Method 8151A<br>▪ Total Extractable Petroleum Hydrocarbons (EPH) by SW-846 Method 8015M<br>▪ Total Metals by SW-846 Method 6020<br>▪ Total Mercury by SW-846 Method 7471B<br>▪ Soil Moisture by SW-846 Method 3550C | |
| Laboratory Project ID: H16110260 / 10370180 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, with additional results from Energy Laboratories in Billings, Montana and Pace Analytical in Minneapolis, Minnesota, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS) and laboratory fortified blanks (LFB)
- Organic system monitoring compounds (surrogates)
- Isotopically labeled internal and recovery standards

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

## Tier II Data Validation Report Summary

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

**SAMPLE NUMBERS TABLE**

| Client Sample ID | Laboratory Sample Number | |
|---|---|---|
| DIAP-3-S-East (0-2) | H16110260-001 | 10370180001 |
| DIAP-3-S-North (0-2) | H16110260-002 | 10370180002 |
| DIAP-3-S-West (0-2) | H16110260-003 | 10370180003 |
| DIAP-3-SS-F (2.0) | H16110260-004 | 10370180004 |
| BD-20161112-01 | H16110260-005 | 10370180005 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 11)
- ⊗ MS/MSD (Item 13)
- ✓ LCS/LFB (Item 15)
- ✓ System Monitoring Compounds (i.e., Surrogates) and Isotopically Labeled Internal and Recovery Standards (Item 17)
- ○ Field, Equipment, and Trip Blanks (Item 18)
- ⊗ Field Duplicates (Item 20)
- ○ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999
- The USEPA CLP National Functional Guidelines for High Resolution Superfund Methods Data Review, document number EPA 542-B-16-001, April 2016, was referenced for review of CDDs and CDFs.
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

# Tier II Data Validation Report Summary

- Trihydro Data Validation Variance Documentation, February 2016.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| J+ | The result is an estimated concentration, but may be biased high |
| J- | The result is an estimated concentration, but may be biased low |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 275 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory identified the following non-conformances regarding the analytical data in this report.<br>Method 8290: A laboratory method blank was prepared and analyzed with the sample batch as part of routine quality control procedures. The results show the blank to contain trace levels of selected congeners. These levels were below the calibration range of the method. The levels reported for the affected congeners in the associated field sample were higher than the corresponding blank levels by one or more orders of magnitude. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field samples. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory used the following data qualification flags with this data set.<br>J – Estimated value<br>U – Analyte not detected<br>I – Interference present<br>EMPC – Estimated Maximum Possible Concentration. **Results identified as EMPC were assigned J+ qualifiers to indicate estimated concentrations that may be biased high.**<br>S – Spike recovery outside of advisory limits.<br>E – Exceeds calibration range<br>A – The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated. | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>The laboratory noted that the shipping containers were sealed and custody seals were present and intact. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable.<br><u>Method 6020</u>: The submitted samples were diluted by factors of 10 for the analysis of metals. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Specify if any analytes reported by more than one method? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | No |
| Comments: Samples were received at Energy Laboratories on ice, in good condition, and with the cooler temperature outside the recommended temperature range of 4°C ± 2°C at -1.8°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*.<br>Portions of the samples designated for analysis by Method 8290 were repackaged and sent to Pace Analytical. Those samples were also received on ice, in good condition, and with the cooler temperature outside the recommended temperature range at -0.1°C as noted on the laboratory's *Sample Condition Upon Receipt Form*.<br>The cooler temperatures below 2.0°C were judged as acceptable since the laboratory did not report the sample containers as broken or frozen. | |

**VALIDATION CRITERIA CHECKLIST**

7. Were samples extracted/digested and analyzed within method-specified or technical holding times? Yes

Comments: The samples were extracted and analyzed within method-specific holding times.

8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. Yes

Comments: The analytical results were reported in concentration units of nanograms per kilogram (ng/kg), milligrams per kilogram (mg/kg), and weight percent (wt%). These units were acceptable for the sample matrix and the analyses requested. The results for the soil samples were reported on a dry weight basis.

9. Did the laboratory provide any specific initial and/or continuing calibration results? Yes

Comments: Limited continuing calibration summary data for Methods 6020, 7471B, 8015M, 8151A, and 8270C were included as part of this data set.

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: The limited continuing calibration data were reviewed and the results were within the acceptance limits. Full calibration results and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples.

12. Were target analytes reported as not detected in the laboratory blanks? No

Comments: Target analytes were reported as not detected in the laboratory blanks with the following exceptions.

| Method | Analyte | Batch | Concentration |
|---|---|---|---|
| 6020 | Arsenic | 35244 | 0.08 mg/kg |
| 6020 | Silver | 35244 | 0.07 mg/kg |
| 7471B | Mercury | 35363 | 0.002 mg/kg |
| 8290 | 2,3,7,8-TCDF | 18947 | 0.019 ng/kg |
| 8290 | Total HxCDD | 18947 | 0.030 ng/kg |
| 8290 | 1,2,3,4,6,7,8-HpCDF | 18947 | 0.0075 ng/kg |
| 8290 | Total HpCDF | 18947 | 0.0075 ng/kg |
| 8290 | Total HpCDD | 18947 | 0.0210 ng/kg |
| 8290 | OCDD | 18947 | 0.034 ng/kg |

The analytes identified above were not detected in the associated samples or the reported concentrations were greater than 10 times the blank levels. Qualification of sample data was not required based on the detections of target analytes in the laboratory blank samples.

**VALIDATION CRITERIA CHECKLIST**

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples, although MS samples were not prepared for all analyses. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 6020 | Metals | 35244 | Not Associated |
| 7471B | Mercury | 35363 | DIAP-3-S-East (0-2) |
| 8015M | EPH | 35295 | Not Associated |
| 8151A | Pentachlorophenol | B_104603 | DIAP-3-S-East (0-2) |
| 8270C | SVOC | B_104683 | DIAP-3-S-East (0-2) |
| 8290 | Dioxin | 18947 | Not Prepared |

Not Associated – The MS sample source was not associated with this project.

Not Prepared – Matrix spikes were not prepared for this batch.

A post digestion spike (PDS) was prepared for Method 6020 batch 35244 from a sample not associated with this project.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? No

Comments: The percent recoveries and RPDs for MS/MSDs prepared from project samples were within data validation and laboratory QC limits with the following exceptions.

**The reported recoveries for pentachlorophenol in the MS and MSD for Method 8151A batch B_104603 were outside the laboratory acceptance limits of 51-103% at 26% and 46%, respectively. Pentachlorophenol was detected in the associated samples in the batch and the results were assigned J- due to evidence of potential low bias.**

**The recovery for benzo(b)fluoranthene in the MSD for Method 8270C batch B_104683 was outside the laboratory acceptance limits of 50-128% at 138%. Benzo(b)fluoranthene was detected in the associated samples in the batch and the results were assigned J+ due to evidence of potential high bias.**

Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS percent recoveries were within laboratory QC limits.

17. Were surrogate recoveries within laboratory QC limits? Yes

Comments: The surrogate and isotopically labeled standard recoveries were within QC limits.

18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? No

Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.<br>Sample BD-20161112-01 was collected as a field duplicate of sample DIAP-3-S-West (0-2). | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-50% for soil samples with the following exceptions.<br>**The RPD values for chrysene, total PeCDD, and total TCDF exceeded the data validation limit of 50% for soil samples at 64.9%, 96.8%, and 93.6%, respectively. These analytes were assigned J qualifiers in the parent and duplicate samples, DIAP-3-S-West (0-2) and BD-20161112-01, due to evidence of poor precision.** | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: DIAP-3-S-West (0-2)<br>Field Duplicate Sample ID: BD-20161112-01 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| SW6020 | Arsenic, Total | 5 mg/kg | 5 mg/kg | 0.0% +/-RL |
| SW6020 | Barium, Total | 123 mg/kg | 115 mg/kg | 6.7% |
| SW6020 | Chromium, Total | 24 mg/kg | 23 mg/kg | 4.3% |
| SW6020 | Lead, Total | 12 mg/kg | 10 mg/kg | 18.2% |
| SW6020 | Selenium, Total | 1 mg/kg | 1 mg/kg | 0.0% +/-RL |
| SW8015M | Total Extractable Hydrocarbons | 18 mg/kg | 19 mg/kg | 5.4% +/-RL |
| SW8151A | Pentachlorophenol | 0.0039 mg/kg | 0.0026 mg/kg | 40.0% +/-RL |
| SW8270C | Benzo(a)anthracene | 0.0076 mg/kg | 0.0063 mg/kg | 18.7% +/-RL |
| SW8270C | Benzo(a)pyrene | 0.020 mg/kg | 0.015 mg/kg | 28.6% |
| SW8270C | Benzo(b)fluoranthene | 0.027 mg/kg | 0.019 mg/kg | 34.8% |
| SW8270C | Benzo(g,h,i)perylene | 0.010 mg/kg | 0.0087 mg/kg | 13.9% |
| SW8270C | Benzo(k)fluoranthene | 0.011 mg/kg | 0.0075 mg/kg | 37.8% |
| **SW8270C** | **Chrysene** | **0.010 mg/kg** | **0.0051 mg/kg** | **64.9%** |
| SW8270C | Dibenzo(a,h)anthracene | 0.01 mg/kg | 0.0095 mg/kg | 5.1% |
| SW8270C | Fluoranthene | 0.017 mg/kg | 0.011 mg/kg | 42.9% |
| SW8270C | Indeno(1,2,3-cd)pyrene | 0.022 mg/kg | 0.015 mg/kg | 37.8% |
| SW8270C | Pyrene | 0.016 mg/kg | 0.011 mg/kg | 37.0% |
| 8290 | 1,2,3,4,6,7,8-HpCDD | 210 ng/kg | 240 ng/kg | 13.3% |
| 8290 | 1,2,3,4,6,7,8-HpCDF | 120 ng/kg | 120 ng/kg | 0.0% |
| 8290 | 1,2,3,4,7,8,9-HpCDF | 4.6 ng/kg | 5.7 ng/kg | 21.4% |
| 8290 | 1,2,3,4,7,8-HxCDD | 2.4 ng/kg | 2.8 ng/kg | 15.4% |
| 8290 | 1,2,3,4,7,8-HxCDF | 2.9 ng/kg | 3.7 ng/kg | 24.2% |
| 8290 | 1,2,3,6,7,8-HxCDD | 7.4 ng/kg | 7.8 ng/kg | 5.3% |
| 8290 | 1,2,3,6,7,8-HxCDF | 3.9 ng/kg | 5.4 ng/kg | 32.3% |
| 8290 | 1,2,3,7,8,9-HxCDD | 4.4 ng/kg | 6.5 ng/kg | 38.5% |
| 8290 | 1,2,3,7,8,9-HxCDF | ND (0.42 ng/kg) | 0.55 ng/kg | DL |
| 8290 | 1,2,3,7,8-PeCDD | 0.88 ng/kg | 0.78 ng/kg | 12.0% +/-RL |
| 8290 | 2,3,4,6,7,8-HxCDF | 4.5 ng/kg | 5.9 ng/kg | 26.9% |
| 8290 | 2,3,4,7,8-PeCDF | 0.66 ng/kg | 0.87 ng/kg | 27.5% |
| 8290 | OCDD | 1600 ng/kg | 2200 ng/kg | 31.6% |
| 8290 | OCDF | 280 ng/kg | 340 ng/kg | 19.4% |
| 8290 | Total HpCDD | 390 ng/kg | 410 ng/kg | 5.0% |
| 8290 | Total HpCDF | 260 ng/kg | 270 ng/kg | 3.8% |
| 8290 | Total HxCDD | 58 ng/kg | 66 ng/kg | 12.9% |
| 8290 | Total HxCDF | 89 ng/kg | 110 ng/kg | 21.1% |

| Client Sample ID: DIAP-3-S-West (0-2)<br>Field Duplicate Sample ID: BD-20161112-01 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| **8290** | **Total PeCDD** | **4.6 ng/kg** | **1.6 ng/kg** | **96.8%** |
| 8290 | Total PeCDF | 37 ng/kg | 28 ng/kg | 27.7% |
| 8290 | Total TCDD | 1.3 ng/kg | 1.1 ng/kg | 16.7% |
| **8290** | **Total TCDF** | **2.5 ng/kg** | **6.9 ng/kg** | **93.6%** |
| SW 3550C | Soil Moisture | 16.4% | 16.0% | 2.5% |

Field duplicate RPD control limits are not to exceed 50% for soil as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

DL – Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. Data were not qualified since the detection was within two times the reporting limit. Non-detected results are indicated above with the applicable reporting limit as ND (RL).

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

**The RPD values for chrysene, total PeCDD, and total TCDF exceeded the data validation limit of 50% for soil samples at 64.9%, 96.8%, and 93.6%, respectively. These analytes were assigned J qualifiers in the parent and duplicate samples, DIAP-3-S-West (0-2) and BD-20161112-01, due to evidence of poor precision.**

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| EMPC | The reported concentration is the Estimated Maximum Possible Concentration (EPMC). |
| HR-MS | The MS and/or MSD percent recovery was greater than the upper acceptable limit indicating possible matrix interference. |
| LR-MS | The MS and/or MSD percent recovery was less than the lower acceptable limit indicating possible matrix interference. |
| ERPD-FD | High field duplicate RPD. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| **Data Set H16110260** | | | | | | | | |
| Benzo(b)fluoranthene | SW8270C | BD-20161112-01 | H16110260-005 | 0.019 | 0.0039 | mg/kg-dry | J+ | HR-MS |
| Benzo(b)fluoranthene | SW8270C | DIAP-3-S-East (0-2) | H16110260-001 | 0.2 | 0.0041 | mg/kg-dry | J+ | HR-MS |
| Benzo(b)fluoranthene | SW8270C | DIAP-3-S-North (0-2) | H16110260-002 | 0.02 | 0.0039 | mg/kg-dry | J+ | HR-MS |
| Benzo(b)fluoranthene | SW8270C | DIAP-3-SS-F (2.0) | H16110260-004 | 0.022 | 0.0039 | mg/kg-dry | J+ | HR-MS |
| Benzo(b)fluoranthene | SW8270C | DIAP-3-S-West (0-2) | H16110260-003 | 0.027 | 0.004 | mg/kg-dry | J+ | HR-MS |
| Chrysene | SW8270C | BD-20161112-01 | H16110260-005 | 0.0051 | 0.0039 | mg/kg-dry | J | ERPD-FD |
| Chrysene | SW8270C | DIAP-3-S-West (0-2) | H16110260-003 | 0.01 | 0.004 | mg/kg-dry | J | ERPD-FD |
| Pentachlorophenol | SW8151A | BD-20161112-01 | H16110260-005 | 0.0026 | 0.0024 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-3-S-East (0-2) | H16110260-001 | 0.016 | 0.0024 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-3-S-North (0-2) | H16110260-002 | 0.003 | 0.0024 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-3-SS-F (2.0) | H16110260-004 | 0.0088 | 0.0023 | mg/kg-dry | J- | LR-MS |
| Pentachlorophenol | SW8151A | DIAP-3-S-West (0-2) | H16110260-003 | 0.0039 | 0.0023 | mg/kg-dry | J- | LR-MS |
| **Data Set 10370180** | | | | | | | | |
| 1,2,3,4,7,8-HxCDD | 8290 | DIAP-3-S-East (0-2) | 10370180001 | 7.7 | 1.2 | ng/kg | J+ | EMPC |
| 1,2,3,4,7,8-HxCDF | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 2.9 | 0.48 | ng/kg | J+ | EMPC |
| 1,2,3,6,7,8-HxCDD | 8290 | DIAP-3-SS-F (2.0) | 10370180004 | 7.7 | 1.1 | ng/kg | J+ | EMPC |
| 1,2,3,6,7,8-HxCDF | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 3.9 | 0.37 | ng/kg | J+ | EMPC |
| 1,2,3,7,8,9-HxCDD | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 4.4 | 0.31 | ng/kg | J+ | EMPC |
| 1,2,3,7,8,9-HxCDD | 8290 | DIAP-3-SS-F (2.0) | 10370180004 | 5 | 1.1 | ng/kg | J+ | EMPC |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| 1,2,3,7,8,9-HxCDF | 8290 | DIAP-3-S-East (0-2) | 10370180001 | 1.3 | 0.63 | ng/kg | J+ | EMPC |
| 1,2,3,7,8,9-HxCDF | 8290 | BD-20161112-01 | 10370180005 | 0.55 | 0.55 | ng/kg | J+ | EMPC |
| 1,2,3,7,8-PeCDD | 8290 | DIAP-3-S-North (0-2) | 10370180002 | 1.1 | 0.65 | ng/kg | J+ | EMPC |
| 1,2,3,7,8-PeCDD | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 0.88 | 0.5 | ng/kg | J+ | EMPC |
| 2,3,4,7,8-PeCDF | 8290 | DIAP-3-S-North (0-2) | 10370180002 | 1.1 | 0.49 | ng/kg | J+ | EMPC |
| 2,3,4,7,8-PeCDF | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 0.66 | 0.39 | ng/kg | J+ | EMPC |
| 2,3,4,7,8-PeCDF | 8290 | BD-20161112-01 | 10370180005 | 0.87 | 0.42 | ng/kg | J+ | EMPC |
| Total PeCDD | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 4.6 | 0.5 | ng/kg | J | ERPD-FD |
| Total PeCDD | 8290 | BD-20161112-01 | 10370180005 | 1.6 | 0.59 | ng/kg | J | ERPD-FD |
| Total TCDF | 8290 | DIAP-3-S-West (0-2) | 10370180003 | 2.5 | 0.36 | ng/kg | J | ERPD-FD |
| Total TCDF | 8290 | BD-20161112-01 | 10370180005 | 6.9 | 0.96 | ng/kg | J | ERPD-FD |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: Energy Laboratories |
| Project Name: Diamond P Ranch | Sample Matrix: Water |
| Project Number: 776-029-001 Task 0010 | Sample Start Date: 04/24/2017 |
| Date Validated: 05/17/2017 | Sample End Date: 04/24/2017 |
| Parameters Included:<br>▪ Semivolatile Organic Compounds (SVOC) by Test Method for Evaluating Solid Waste Method 8270C<br>▪ Pentachlorophenol by SW-846 Method 8151A<br>▪ Total Extractable Petroleum Hydrocarbons (EPH) by SW-846 Method 8015M<br>▪ Dissolved Metals by SW-846 Method 6020<br>▪ Dissolved Mercury by SW-846 Method 7470A and Environmental Protection Agency (EPA) Method 245.1 | |
| Laboratory Project ID: H17040398 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Energy Laboratories in Helena, Montana, evaluating samples from the MDEQ Diamond P Ranch site located in West Yellowstone, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS) ) and laboratory fortified blank (LFB) samples
- Organic system monitoring compounds (surrogates)

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LFB percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

# Tier II Data Validation Report Summary

## SAMPLE NUMBERS TABLE

| Client Sample ID | Laboratory Sample Number |
|---|---|
| MW-1 | H17040398-001 |
| MW-3 | H17040398-002 |
| MW-4 | H17040398-003 |
| House | H17040398-004 |
| BD-20170424 | H17040398-005 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ✓ Initial and Continuing Calibrations (Items 9 and 10)
- ✓ Laboratory Blanks (Items 11 and 12)
- ✓ MS/MSD (Items 13 and 14)
- ✓ LCS and LFB (Items 15 and 16)
- ✓ System Monitoring Compounds (i.e., Surrogates) (Item 17)
- ○ Field, Equipment, and Trip Blanks (Items 18 and 19)
- ⊗ Field Duplicates (Items 20 and 21)
- ○ Laboratory Duplicates (Item 22)
- ○ Data Relationships (Item 23)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-2016-002, September 2016 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Methods Data Review, document number EPA-540-R-2016-001, September 2016 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

# Tier II Data Validation Report Summary

- Trihydro Data Validation Variance Documentation, February 2017.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 145 data points. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | Yes |
| Comments: The laboratory did not identify non-conformances regarding the analytical data in this report. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | Yes |
| Comments: The laboratory did not apply data qualification flags with this data set. | |
| 3. Were sample CoC forms and custody procedures complete? | Yes |
| Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt with the following exception.<br>The laboratory noted that the collection time was not entered for sample BD-20170424. The sample time was deliberately withheld to mask the identity and location of the field duplicate.<br>Custody seals were not present or required since the samples were delivered to the laboratory by field personnel and custody was maintained at all times. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits were reviewed and appeared to be acceptable.<br>Samples MW-4 and BD-20170424 were diluted by factors of 40 for the analysis of pentachlorophenol by Method 8151A. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |
| 6. Were samples received in good condition within method-specified requirements? | No |
| Comments: Samples were received on ice, in good condition, and with the cooler temperature within and outside the recommended temperature range of 4°C ± 2°C at 1.8°C to 5.0°C as noted on the CoC record and the laboratory *Work Order Receipt Checklist*. The cooler temperature below 2.0°C was judged as acceptable since the laboratory did not report the sample containers as broken or frozen.<br>Filtration and preservation of the samples for dissolved metals was performed at the laboratory. No further validation action was required. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | Yes |
| Comments: The samples were extracted/digested and analyzed within method-specific holding times. | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The results were reported in concentration units of micrograms per liter (µg/L) and milligrams per liter (mg/L). These units were acceptable for the sample matrix and the analyses requested. | |
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | Yes |
| Comments: Limited initial and continuing calibration summary data for Method 245.1, Method 6020, Method 8015M, Method 81581A, and Method 8270C were included as part of this data set. | |

**VALIDATION CRITERIA CHECKLIST**

10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? Yes

Comments: The limited initial and continuing calibration data were reviewed and the results were within the acceptance limits. Full calibration and interference check reports and raw data were not available for review to confirm the results. The laboratory did not note that any calibration verification results were outside acceptable limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples.

12. Were target analytes reported as not detected in the laboratory blanks? Yes

Comments: Target analytes were reported as not detected in the laboratory blanks.

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 245.1 | Mercury | 37039 | MW-4 and Not Associated |
| 6020 | Metals | R124681 | MW-1 |
| 7470A | Mercury | 37039 | MW-4 |
| 8015M | EPH | 37021 | Not Associated |
| 8151A | Pentachlorophenol | B_109020 | MW-1 |
| 8270C | SVOC | B_108984 | Not Associated |

Not Associated – The MS sample source was not associated with this project.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? Yes

Comments: The percent recoveries and RPDs for MS/MSDs prepared from project samples were within data validation and laboratory QC limits.

Recoveries and RPDs for MS/MSDs prepared from non-project samples were considered but data were not qualified based on these results since matrix similarity to project samples could not be guaranteed.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS and LFB samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS and LFB percent recoveries were within data validation and laboratory QC limits.

17. Were surrogate recoveries within laboratory QC limits? Yes

Comments: The surrogate recoveries were within laboratory QC limits.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | No |
| Comments: The number of trip, field, and equipment blanks collected did not equal at least 10% of the samples collected. Trip, field, and equipment blank samples were not collected for this sample set. | |
| 19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? | N/A |
| Comments: Trip, field, and equipment blank samples were not collected for this sample set. | |
| 20. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? | Yes |
| Comments: The number of field duplicates collected was equal to at least 10% of the number of samples.<br>Sample BD-20170424 was collected as a field duplicate of sample MW-4. | |
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | No |
| Comments: As indicated in the Field Duplicate Summary Table at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-30% for water samples, with the following exception.<br>**The RPD value for total extractable hydrocarbons exceeded the data validation limit of 30% at 44.6%. The EPH results for the parent and field duplicate samples, MW-4 and BD-20170424 were assigned J qualifiers due to evidence of poor precision.** | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | N/A |
| Comments: Laboratory duplicate samples were not prepared for the analyses reported in this data set. | |
| 23. Were the following data relationships realistic and acceptable? | |
| • Target analytes were reported by more than one method (e.g., 8260/8270, EPH/8270) and the results were in agreement? | N/A |
| Comments: Target analytes were not reported by more than one method in this data set. | |
| • Both total and dissolved metals analyses were performed and the total metals results were greater than or equal to the dissolved metals results? | N/A |
| Comments: Total metals were not analyzed for the samples in this data set. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: MW-4<br>Field Duplicate Sample ID: BD-20170424 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| SW6020 | Arsenic, Dissolved | 0.001 mg/L | 0.001 mg/L | 0.0% +/-RL |
| SW6020 | Barium, Dissolved | 0.06 mg/L | 0.06 mg/L | 0.0% +/-RL |
| **SW8015M** | **Total Extractable Hydrocarbons** | **982 µg/L** | **624 µg/L** | **44.6%** |
| SW8151A | Pentachlorophenol | 354 µg/L | 333 µg/L | 6.1% |

Field duplicate RPD control limits are not to exceed 30% for water as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

**The RPD value for total extractable hydrocarbons exceeded the data validation limit of 30% at 44.6%. The EPH results for the parent and field duplicate samples, MW-4 and BD-20170424 were assigned J qualifiers due to evidence of poor precision.**

**DATA QUALIFICATION SUMMARY**

| Abbreviation | Reason |
|---|---|
| ERPD-FD | High field duplicate RPD. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| Total Extractable Hydrocarbons | SW8015M | MW-4 | H17040398-003 | 982 | 300 | µg/L | J | ERPD-FD |
| Total Extractable Hydrocarbons | SW8015M | BD-20170424 | H17040398-005 | 624 | 300 | µg/L | J | ERPD-FD |

# Tier II Data Validation Report Summary

| | |
|---|---|
| Client: Montana Department of Environmental Quality (MDEQ) | Laboratory: ALS Environmental |
| Project Name: Milwaukee Roundhouse Remediation | Sample Matrix: Soil |
| Project Number: 776-019-003 Task 0005 | Sample Start Date: 10/10/2016 |
| Date Validated: 10/20/2016 | Sample End Date: 10/10/2016 |
| Parameters Included:<br>▪ Extractable Petroleum Hydrocarbons (EPH) by Massachusetts Department of Environmental Protection (MADEP) Method MA-EPH<br>▪ Volatile Organic Compounds (VOC) by Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste (SW-846) Method 8260<br>▪ Semivolatile Organic Compounds (SVOC) by SW-846 Method 8270<br>▪ Polychlorinated Biphenyls (PCB) by SW-846 Method 8082<br>▪ Total Metals by SW-846 Method 6020<br>▪ Total Mercury by SW-846 Method 7471A<br>▪ Soil Moisture by SW-846 Method 3550 | |
| Laboratory Project ID: HS16100416 | |
| Data Validator: Charles Ballek, Senior Chemist | |
| Reviewer: Mike Phillips, Senior Chemist | |

**DATA EVALUATION CRITERIA SUMMARY**

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the amended analytical data report package generated by ALS Group USA in Houston, Texas evaluating samples from the MDEQ Milwaukee Roundhouse site, located in Deer Lodge, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Laboratory duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- Laboratory control samples (LCS)
- Organic system monitoring compounds (surrogates)

Field accuracy was established by collecting and analyzing the following samples to monitor for possible ambient or cross contamination during sampling and transportation.

- Trip blanks

## Tier II Data Validation Report Summary

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable) percent recoveries, and LCS percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

**SAMPLE NUMBERS TABLE**

| Client Sample ID | Laboratory Sample Number |
|---|---|
| MRH-BKFL-306 | HS16100416-01 |
| MRH-BKFL-307 | HS16100416-02 |
| MRH-BKFL-308 | HS16100416-03 |
| MRH-BKFL-309 | HS16100416-04 |
| MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 |
| MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 |
| BD-20161010-01 | HS16100416-07 |
| TB-20161010-01 | HS16100416-08 |

# Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

**Validation Criteria**

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ○ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 11)
- ⊗ MS/MSD (Item 13)
- ✓ LCS (Item 15)
- ⊗ System Monitoring Compounds (i.e., Surrogates) (Item 17)
- ✓ Trip Blanks (Item 18)
- ✓ Field Duplicates (Item 20)
- ✓ Laboratory Duplicates (Item 22)

**Guidance References**

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- Data for inorganic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA-540-R-013-001, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Data Review, document number EPA 540-R-04-004, October 2004.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Project-specific Quality Assurance Project Plans (QAPP) data validation requirements, as applicable.
- Trihydro Data Validation Variance Documentation, February 2016.

# Tier II Data Validation Report Summary

**OVERALL DATA PACKAGE ASSESSMENT**

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

| Qualifier | Definition |
|---|---|
| J | Estimated concentration |
| J+ | The result is an estimated concentration, but may be biased high |
| UJ | Estimated reporting limit |

**Data Completeness**

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 182 data points excluding the trip blank sample. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 1. Was the report free of non-conformances identified by the laboratory? | No |
| Comments: The laboratory identified the following non-conformance related to the analytical data in the report.<br>Method MA-EPH:<br>• Due to sample matrix interferences, the surrogate recoveries for samples MRH-BKFL-306 and MRH-BKFL-TS-401 were outside of the established control limits.<br>• One or more surrogate recoveries for sample MRH-BKFL-307 were above the upper control limits. No target analytes were detected in the sample. The high surrogate recoveries did not impact the non-detect results for target analytes.<br>Method 8082:<br>• Due to sample matrix interferences, the surrogate recovery for sample MRH-BKFL-306 was outside of the established control limits.<br>Method 6020:<br>• Arsenic, Chromium, Selenium, and Silver failed in the MS but passed in the MSD and PDS.<br>• The MS and/or MSD recovery for barium was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. | |
| 2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define. | No |
| Comments: The laboratory applied the following data qualifier to results reported for this data set.<br>J – Analyte detected below quantitation limit<br>U – Analyzed but not detected above the MDL/SDL<br>S – Spike Recovery outside laboratory control limits<br>E – Value above quantitation range<br>O – Sample amount is > 4 times amount spiked<br>R – RPD above laboratory control limit | |
| 3. Were sample CoC forms and procedures complete? | Yes |
| Comments: The CoC record from field to laboratory was complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.<br>Custody seals were noted to be present and intact on the shipping container upon receipt at the laboratory. | |
| 4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable? | Yes |
| Comments: The detection limits appeared to be acceptable. Dilutions were not applied to the submitted samples for the analyses reported in this data set.<br>Final determination of the data quality based on detection limits will be determined by the project team. | |
| 5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? | Yes |
| Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC. | |

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 6. Were samples received in good condition within method-specified requirements? | Yes |
| Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C ± 2°C at a temperature of 2.6°C as noted on the *Sample Receipt Checklist*.<br>The laboratory indicated that the sample containers were intact and sufficient sample volume/mass was provided to complete the requested analyses. | |
| 7. Were samples extracted/digested and analyzed within method-specified or technical holding times? | Yes |
| Comments: The samples were extracted/digested and analyzed within method-specific holding times. | |
| 8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil. | Yes |
| Comments: The analytical results for the submitted samples were reported in concentration units of milligrams per liter (mg/L), milligrams per kilogram (mg/kg), and soil moisture was reported as percentage (%). Quality control samples utilized these units and also micrograms per liter (µg/L) and micrograms per kilogram (µg/kg). These units were acceptable for the sample matrices and the analyses requested. The results for the soil samples were reported on a dry weight basis. | |
| 9. Did the laboratory provide any specific initial and/or continuing calibration results? | No |
| Comments: Initial and continuing calibration data were not included as part of this data set. | |
| 10. If initial and/or continuing calibration results were provided, were the results within acceptable limits? | N/A |
| Comments: Initial and continuing calibration data were not included as part of this data set. | |
| 11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? | Yes |
| Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples. Method blanks were not required for soil moisture by Method 3550. | |
| 12. Were target analytes reported as not detected in the laboratory blanks? | Yes |
| Comments: Target analytes were not detected in the laboratory blanks at concentrations above the applicable method detection limits. | |

**VALIDATION CRITERIA CHECKLIST**

13. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples, although MS samples were not prepared for all analyses. The matrix spike sample source for each analytical batch in this sample set has been indicated below.

| Method | Analytes | Batch | MS Sample Source |
|---|---|---|---|
| 8082 | PCB | 108766a | Not Associated |
| 8082 | PCB | 108829a | Not Associated |
| MA-EPH | Extractable Petroleum Hydrocarbons | 108786 | MRA-J10-14-F (2.0) from data set HS16100415 |
| 6020 | Metals | 108759 | MRH-BKFL-306 |
| 7471A | Metals | 108782 | Not Associated |
| 8270 | SVOC | 108781 | MRH-BKFL-306 |
| 8260 | VOC | R282834 | Not Associated |
| 8260 | VOC | R282848 | MRA-J10-14-F (2.0) from data set HS16100415 |

Not Associated – The MS sample source was not associated with this project.

Post digestion spikes (PDS) and serial dilution analyses were prepared for Method 6020 batch 108759 from sample MRH-BKFL-306.

Matrix spike analyses were not prepared nor required for soil moisture analyses by Method 3550.

14. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits? No

Comments: The recoveries and RPD values for MS, MSD, PDS, and serial dilutions prepared from project samples were within data validation and laboratory QC limits or were not applicable because the unspiked amount was more than four times the spike added, with the following exceptions.

| Method | Analyte | Batch | MS Recovery | MSD Recovery | PDS Recovery | MS/MSD/ PDS QC Limits | MS/MSD RPD | RPD QC Limits |
|---|---|---|---|---|---|---|---|---|
| **6020** | **Arsenic** | **108759** | **74.0%** | **Acceptable** | **Acceptable** | **75-125%** | **Acceptable** | **20%** |
| **6020** | **Chromium** | **108759** | **72.7%** | **Acceptable** | **Acceptable** | **75-125%** | **Acceptable** | **20%** |
| **6020** | **Selenium** | **108759** | **73.8%** | **Acceptable** | **Acceptable** | **75-125%** | **Acceptable** | **20%** |
| **6020** | **Silver** | **108759** | **74.3%** | **Acceptable** | **Acceptable** | **75-125%** | **Acceptable** | **20%** |
| **8260** | **Benzene** | **R282848** | **59.1%** | **63.8%** | **N/A** | **79-122%** | **Acceptable** | **30%** |
| **8260** | **Naphthalene** | **R282848** | **12.1%** | **12.9%** | **N/A** | **71-128%** | **Acceptable** | **30%** |
| **8260** | **Trichloroethene** | **R282848** | **48.7%** | **53.1%** | **N/A** | **75-123%** | **Acceptable** | **30%** |

**The MS and/or MSD recoveries were less than the lower limit for acceptance indicating potential low biases for the listed analytes. The results for the Method 6020 parameters were assigned J qualifiers if detected and UJ if not detected in the associated samples in batch 108759.**

**Benzene, naphthalene, and trichloroethene were not detected in the associated samples analyzed in batch R282848 and the results were assigned UJ qualifiers indicating estimated detection limits.**

The percent recoveries and RPD values for MS/MSDs prepared from non-project samples were evaluated and considered but data were not qualified based on those results since matrix similarity to project samples could not be guaranteed.

**VALIDATION CRITERIA CHECKLIST**

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method? Yes

Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS percent recoveries were within laboratory QC limits. The laboratory did not analyze LCSDs for the analytical batches reported in this data set.

17. Were surrogate recoveries within laboratory QC limits? No

Comments: Surrogates recoveries for the submitted samples were within laboratory acceptance limits with the following exceptions.

| Method | Surrogate | Sample | Surrogate Recovery | QC Limits |
|---|---|---|---|---|
| SW8082 | Decachlorobiphenyl | MRH-BKFL-306 | 156% | 54-143% |
| MA_EPH | 2-Bromonaphthalene | MRH-BKFL-306 | 153% | 40-140% |
| MA_EPH | 2-Bromonaphthalene | MRH-BKFL-307 | 189% | 40-140% |
| MA_EPH | 2-Fluorobiphenyl | MRH-BKFL-307 | 173% | 40-140% |
| **MA_EPH** | **1-Chlorooctadecane** | **MRH-BKFL-TS-401 (0-0.5)** | **319%** | **40-140%** |

The Method 8082 target analyte, Aroclor 1260, was not detected in sample MRH-BKFL-306 and the result did not require qualification based on the surrogate implication of potential high bias.

**The Method MA-EPH target analyte C9-C18 Aliphatics was detected in sample MRH-BKFL-TS-401 (0-0.5) and the result was assigned a J+ qualifier due to evidence of potential high bias.** The target analyte C11-C22 aromatics, associated with surrogates 2-bromonaphthalene and 2-fluorobiphenyl, was not detected in samples MRH-BKFL-306 and MRH-BKFL-307 and those results did not require qualification.

Qualification of sample data was not required based on surrogate non-conformances in QC samples as the environmental samples were evaluated based on sample-specific surrogate recoveries.

18. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? No

Comments: The number of trip, field, and equipment blanks submitted in this sample set did not meet the QAPP requirement of one equipment blank per day of sampling. One trip blank sample, TB-20161010-01, was submitted with this sample set. This sample set was part of a larger sampling event and the evaluation of the overall collection frequency of these blanks will be evaluated by project staff.

19. Were target analytes reported as not detected in the trip blank, field blank, and/or equipment blank samples? Yes

Comments: Target analytes were not detected in the trip blank sample.

20. Was the number of field duplicates collected equal to at least 5% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit? Yes

Comments: The number of field duplicates collected was equal to at greater than 5% of the number of samples. One field duplicate sample was collected as a supplement to 6 environmental samples. This sample set was part of a larger sampling event and the evaluation of the overall collection frequency of field duplicates will be evaluated by project staff.

• Sample BD-20161010-01 was collected as a duplicate of sample MRH-BKFL-TS-400 (0-0.5).

| VALIDATION CRITERIA CHECKLIST | |
|---|---|
| 21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)? | Yes |
| Comments: As indicated in the Field Duplicate Summary Tables at the end of this report, field duplicate RPD values were within the data validation QC limits of 0-50% for soil samples. | |
| 22. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits? | Yes |
| Comments: A laboratory duplicate was prepared for soil moisture by Method 3550 for batch R282829 from sample BD-20161010-01.<br>The RPD values for the laboratory duplicates were within laboratory acceptance limits. | |

## FIELD DUPLICATE SUMMARY

| Client Sample ID: MRH-BKFL-TS-400(0-0.5)<br>Field Duplicate Sample ID: BD-20161010-01 | | | | |
|---|---|---|---|---|
| **Method** | **Analyte** | **Laboratory Result** | **Duplicate Result** | **Relative Percent Difference (RPD)** |
| SW6020 | Arsenic, Total | 16.3 mg/kg | 19.5 mg/kg | 17.9% |
| SW6020 | Barium, Total | 111 mg/kg | 126 mg/kg | 12.7% |
| SW6020 | Cadmium, Total | 0.863 mg/kg | 0.956 mg/kg | 10.2% +/-RL |
| SW6020 | Chromium, Total | 11.3 mg/kg | 14.8 mg/kg | 26.8% |
| SW6020 | Lead, Total | 12.1 mg/kg | 13.8 mg/kg | 13.1% |
| SW6020 | Selenium, Total | 0.459 mg/kg | 0.512 mg/kg | 10.9% +/-RL |
| SW6020 | Silver, Total | 0.160 mg/kg | 0.196 mg/kg | 20.2% +/-RL |
| SW7471A | Mercury, Total | 0.0319 mg/kg | 0.0292 mg/kg | 8.8% |
| EPA 3550 | Soil Moisture | 10.1 WT% | 9.67 WT% | 4.4% |

Field duplicate RPD control limits are not to exceed 50% for soil as established by USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.

+/-RL – Indicates that the detections in both of the samples were within two times the reporting limit. Qualification of data was not required.

## DATA QUALIFICATION SUMMARY

| Abbreviation | Reason |
|---|---|
| LR-MS | The MS and/or MSD percent recovery was less than the lower acceptable limit indicating possible matrix interference. |
| HR-SUR | The surrogate percent recovery was greater than the upper acceptable limit indicating a possible high bias. |
| MDLRL | Flagged by the laboratory: The result was greater than the MDL but less than the RL. |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| Arsenic, Total | SW6020 | MRH-BKFL-306 | HS16100416-01 | 2.55 | 0.494 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | MRH-BKFL-307 | HS16100416-02 | 2.24 | 0.481 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | MRH-BKFL-308 | HS16100416-03 | 1.66 | 0.488 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | MRH-BKFL-309 | HS16100416-04 | 2.76 | 0.48 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | 16.3 | 0.539 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 22.1 | 0.523 | mg/kg | J | LR-MS |
| Arsenic, Total | SW6020 | BD-20161010-01 | HS16100416-07 | 19.5 | 0.541 | mg/kg | J | LR-MS |
| Benzene | SW8260 | MRH-BKFL-306 | HS16100416-01 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | MRH-BKFL-307 | HS16100416-02 | ND | 0.005 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | MRH-BKFL-308 | HS16100416-03 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | MRH-BKFL-309 | HS16100416-04 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | ND | 0.0055 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | ND | 0.0053 | mg/kg | UJ | LR-MS |
| Benzene | SW8260 | BD-20161010-01 | HS16100416-07 | ND | 0.0055 | mg/kg | UJ | LR-MS |
| Benzo(a)pyrene | SW8270 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.0017 | 0.0036 | mg/kg | J | MDLRL |
| Benzo(b)fluoranthene | SW8270 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.0028 | 0.0036 | mg/kg | J | MDLRL |
| Benzo(k)fluoranthene | SW8270 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.002 | 0.0036 | mg/kg | J | MDLRL |
| C9-C18, Aliphatic, Adjusted | MA-EPH | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 103 | 5.49 | mg/kg | J+ | HR-SUR |
| Cadmium, Total | SW6020 | MRH-BKFL-306 | HS16100416-01 | 0.1 | 0.494 | mg/kg | J | MDLRL |
| Cadmium, Total | SW6020 | MRH-BKFL-307 | HS16100416-02 | 0.0897 | 0.481 | mg/kg | J | MDLRL |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| Cadmium, Total | SW6020 | MRH-BKFL-308 | HS16100416-03 | 0.0633 | 0.488 | mg/kg | J | MDLRL |
| Cadmium, Total | SW6020 | MRH-BKFL-309 | HS16100416-04 | 0.116 | 0.48 | mg/kg | J | MDLRL |
| Chromium, Total | SW6020 | MRH-BKFL-306 | HS16100416-01 | 4.17 | 0.494 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | MRH-BKFL-307 | HS16100416-02 | 3.66 | 0.481 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | MRH-BKFL-308 | HS16100416-03 | 2.75 | 0.488 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | MRH-BKFL-309 | HS16100416-04 | 4.98 | 0.48 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | 11.3 | 0.539 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 10.9 | 0.523 | mg/kg | J | LR-MS |
| Chromium, Total | SW6020 | BD-20161010-01 | HS16100416-07 | 14.8 | 0.541 | mg/kg | J | LR-MS |
| Chrysene | SW8270 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.0018 | 0.0036 | mg/kg | J | MDLRL |
| Indeno(1,2,3-cd)pyrene | SW8270 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.0029 | 0.0036 | mg/kg | J | MDLRL |
| Mercury, Total | SW7471A | MRH-BKFL-306 | HS16100416-01 | 0.00267 | 0.00369 | mg/kg | J | MDLRL |
| Mercury, Total | SW7471A | MRH-BKFL-307 | HS16100416-02 | 0.00259 | 0.00349 | mg/kg | J | MDLRL |
| Mercury, Total | SW7471A | MRH-BKFL-308 | HS16100416-03 | 0.00121 | 0.00356 | mg/kg | J | MDLRL |
| Mercury, Total | SW7471A | MRH-BKFL-309 | HS16100416-04 | 0.00269 | 0.00372 | mg/kg | J | MDLRL |
| Naphthalene | SW8260 | MRH-BKFL-306 | HS16100416-01 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | MRH-BKFL-307 | HS16100416-02 | ND | 0.005 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | MRH-BKFL-308 | HS16100416-03 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | MRH-BKFL-309 | HS16100416-04 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | ND | 0.0055 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | ND | 0.0053 | mg/kg | UJ | LR-MS |
| Naphthalene | SW8260 | BD-20161010-01 | HS16100416-07 | ND | 0.0055 | mg/kg | UJ | LR-MS |
| Selenium, Total | SW6020 | MRH-BKFL-306 | HS16100416-01 | 0.431 | 0.494 | mg/kg | J | LR-MS, MDLRL |
| Selenium, Total | SW6020 | MRH-BKFL-307 | HS16100416-02 | 0.336 | 0.481 | mg/kg | J | LR-MS, MDLRL |
| Selenium, Total | SW6020 | MRH-BKFL-308 | HS16100416-03 | 0.243 | 0.488 | mg/kg | J | LR-MS, MDLRL |
| Selenium, Total | SW6020 | MRH-BKFL-309 | HS16100416-04 | 0.43 | 0.48 | mg/kg | J | LR-MS, MDLRL |
| Selenium, Total | SW6020 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | 0.459 | 0.539 | mg/kg | J | LR-MS, MDLRL |
| Selenium, Total | SW6020 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.427 | 0.523 | mg/kg | J | LR-MS, MDLRL |

| Analyte | Method | Field Sample ID | Lab Sample ID | Result | Limit | Units | Reviewer Qualifier | DV Flag Reasons |
|---|---|---|---|---|---|---|---|---|
| Selenium, Total | SW6020 | BD-20161010-01 | HS16100416-07 | 0.512 | 0.541 | mg/kg | J | LR-MS, MDLRL |
| Silver, Total | SW6020 | MRH-BKFL-306 | HS16100416-01 | ND | 0.494 | mg/kg | UJ | LR-MS |
| Silver, Total | SW6020 | MRH-BKFL-307 | HS16100416-02 | ND | 0.481 | mg/kg | UJ | LR-MS |
| Silver, Total | SW6020 | MRH-BKFL-308 | HS16100416-03 | ND | 0.488 | mg/kg | UJ | LR-MS |
| Silver, Total | SW6020 | MRH-BKFL-309 | HS16100416-04 | ND | 0.48 | mg/kg | UJ | LR-MS |
| Silver, Total | SW6020 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | 0.16 | 0.539 | mg/kg | J | LR-MS, MDLRL |
| Silver, Total | SW6020 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | 0.189 | 0.523 | mg/kg | J | LR-MS, MDLRL |
| Silver, Total | SW6020 | BD-20161010-01 | HS16100416-07 | 0.196 | 0.541 | mg/kg | J | LR-MS, MDLRL |
| Trichloroethene | SW8260 | MRH-BKFL-306 | HS16100416-01 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | MRH-BKFL-307 | HS16100416-02 | ND | 0.005 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | MRH-BKFL-308 | HS16100416-03 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | MRH-BKFL-309 | HS16100416-04 | ND | 0.0051 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | MRH-BKFL-TS-400 (0-0.5) | HS16100416-05 | ND | 0.0055 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | MRH-BKFL-TS-401 (0-0.5) | HS16100416-06 | ND | 0.0053 | mg/kg | UJ | LR-MS |
| Trichloroethene | SW8260 | BD-20161010-01 | HS16100416-07 | ND | 0.0055 | mg/kg | UJ | LR-MS |

**Pace Analytical Services, Inc.**
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www.pacelabs.com

## Report Prepared for:

Wanda Johnson
Energy Laboratories
PO Box 5688
Helena MT 59604

# REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

**Report Prepared Date:**

November 3, 2016

## Report Information:

**Pace Project #: 10362722**
**Sample Receipt Date: 09/16/2016**
**Client Project #: H16090301**
**Client Sub PO #: H13238**
**State Cert #: 92**

### Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Joanne Richardson, your Pace Project Manager.

### This report has been reviewed by:

Joanne Richardson

November 03, 2016

Joanne Richardson,
(612) 607-6453
(612) 607-6444 (fax)

## Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

**Pace Analytical Services, Inc.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

## DISCUSSION

This report presents the results from the analyses performed on six samples submitted by a representative of Energy Laboratories, Inc. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were based on signal-to-noise measurements. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations at one-half of the reported concentrations. Per request, this report was revised to provide results from re-extractions and re-analyses of two field samples. The re-extractions of these two samples, H16090301-004B and H16090301-005B, were performed outside the 30-day hold time recommended in the method, therefore, the results reported for these two samples should be regarded as minimum possible concentrations.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The isotopically-labeled PCDD/PCDF internal standards in the sample extracts were recovered at 47-85%. Except for fifteen low values in Blank-52467, which were flagged "R" on the results table, the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates. Concentrations above the calibration range were flagged "E" and should also be regarded as estimates. Values obtained from analyses of diluted extracts were flagged "D".

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to contain trace levels of selected congeners. These levels were below the calibration range of the method. The levels reported for the affected congeners in the field samples were higher than the corresponding blank levels by one or more orders of magnitude. These results indicate that the sample processing steps did not contribute signficantly to the levels reported for the field samples.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard materials. The recoveries of the native compounds ranged from 87-116%. These results were within the 70-130% target range for the method. Matrix spikes were prepared with the extraction batches using sample materials from separate projects; results from these analyses will be provided upon request.



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Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Minnesota Laboratory Certifications

| Authority | Certificate # | Authority | Certificate # |
|---|---|---|---|
| A2LA | 2926.01 | Mississippi | MN00064 |
| Alabama | 40770 | Montana | 92 |
| Alaska | MN00064 | Nebraska | NE-OS-18-06 |
| Arizona | AZ0014 | Nevada | MN_00064_200 |
| Arkansas | 88-0680 | New Jersey (NE | MN002 |
| California | 01155CA | New York (NEL | 11647 |
| Colorado | MN00064 | North Carolina | 27700 |
| Connecticut | PH-0256 | North Dakota | R-036 |
| EPA Region 8 | 8TMS-Q | Ohio | 4150 |
| Florida (NELAP | E87605 | Oklahoma | D9922 |
| Georgia (DNR) | 959 | Oregon (ELAP) | MN200001-005 |
| Guam | 959 | Oregon (OREL | MN300001-001 |
| Hawaii | SLD | Pennsylvania | 68-00563 |
| Idaho | MN00064 | Puerto Rico | MN00064 |
| Illinois | 200012 | Saipan | MP0003 |
| Indiana | C-MN-01 | South Carolina | 74003001 |
| Indiana | C-MN-01 | Tennessee | TN02818 |
| Iowa | 368 | Texas | T104704192-08 |
| Kansas | E-10167 | Utah (NELAP) | MN00064 |
| Kentucky | 90062 | Virginia | 00251 |
| Louisiana | 03086 | Washington | C755 |
| Maine | 2007029 | West Virginia # | 9952C |
| Maryland | 322 | West Virginia D | 382 |
| Michigan | 9909 | Wisconsin | 999407970 |
| Minnesota | 027-053-137 | Wyoming | 8TMS-Q |

## REPORT OF LABORATORY ANALYSIS

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# Appendix A

Sample Management

**Energy Laboratories Inc**
3161 East Lyndale Avenue
Helena, MT 59601
(406) 442-0711

H16090301

# CHAIN-OF-CUSTODY RECORD


15-Sep-16

10362722

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

**Subcontractor:**
Pace Analytical-Minneapolis
1700 Elm St, Ste 200
Minneapolis, MN 55414
TEL: (612) 607-6331 FAX:
Acct #:

**Subcontractor's Client:**

Requested Tests

| Rush | Sample ID | Matrix | Collection Date | Bottle Type | DIOXIN-S-FULL-829 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | H16090301-001B | Soil | 09/12/16 09:00 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 001 |
| ☐ | H16090301-002B | Soil | 09/12/16 09:05 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 002 |
| ☐ | H16090301-003B | Soil | 09/12/16 09:30 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 003 |
| ☐ | H16090301-004B | Soil | 09/12/16 09:35 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 004 |
| ☐ | H16090301-005B | Soil | 09/12/16 09:40 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 005 |
| ☐ | H16090301-006B | Soil | 09/12/16 10:30 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 006 |

**Earliest Due Date:** 9/23/2016

**Comments:** PO# H13238. Please send results to wjohnson@energylab.com

QC Level:
**STD**

| | Date/Time | | |
|---|---|---|---|
| **Relinquished by:** | | **Received by:** | PACE 9-16-16 09:30 |
| **Relinquished by:** | 9/15/16 9:42 | **Received by:** | T=4.4 |

| Pace Analytical | Document Name: **Sample Condition Upon Receipt Form** | Document Revised: 02Aug2016 Page 1 of 2 |
|---|---|---|
| | Document No.: **F-MN-L-213-rev.17** | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Energy Lab

**Project #:** WO#: 10362722

10362722

**Courier:** ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

**Tracking Number:** 1Z 376 W9 70155994035

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☐ 151401163 ☐ B88A912167504 ☐ ~~151401164~~ ☐ B88A0143310098 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 4.5 **Cooler Temp Corrected (°C):** 4.4 **Biological Tissue Frozen?** ☐ Yes ☑ No ☐ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.1 **Date and Initials of Person Examining Contents:** 9-19-16

**USDA Regulated Soil** ( ☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☐ Yes | ☑ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☑ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☑ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☐ Yes | ☑ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☑ N/A | 11. Note if sediment is visible in the dissolved container |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL | ☑ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☑ N/A | 13. ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) | ☐ Yes | ☐ No | ☑ N/A | |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC | ☐ Yes | ☐ No | ☑ N/A | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** Nathan Boberg **Date:** 9/19/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
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# Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion



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# Appendix B

Sample Analysis  Summary

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-001B | | |
| Lab Sample ID | 10362722001 | | |
| Filename | Y160922A_11 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.1 g | Matrix | Soil |
| % Moisture | 11.8 | Dilution | NA |
| Dry Weight Extracted | 9.79 g | Collected | 09/12/2016 09:00 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 17:00 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.98 | ----- | 0.27 | J | 2,3,7,8-TCDF-13C | 2.00 | 69 |
| Total TCDF | 58.00 | ----- | 0.27 | | 2,3,7,8-TCDD-13C | 2.00 | 82 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 63 |
| 2,3,7,8-TCDD | ----- | 0.30 | 0.25 | IJ | 2,3,4,7,8-PeCDF-13C | 2.00 | 58 |
| Total TCDD | 7.30 | ----- | 0.25 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 67 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 71 |
| 1,2,3,7,8-PeCDF | 4.50 | ----- | 0.17 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 67 |
| 2,3,4,7,8-PeCDF | 5.60 | ----- | 0.13 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 68 |
| Total PeCDF | 300.00 | ----- | 0.15 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 70 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 |
| 1,2,3,7,8-PeCDD | 5.50 | ----- | 0.16 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 63 |
| Total PeCDD | 77.00 | ----- | 0.16 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 61 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 64 |
| 1,2,3,4,7,8-HxCDF | 29.00 | ----- | 0.35 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 71 |
| 1,2,3,6,7,8-HxCDF | 47.00 | ----- | 0.38 | | OCDD-13C | 4.00 | 59 |
| 2,3,4,6,7,8-HxCDF | 49.00 | ----- | 0.44 | | | | |
| 1,2,3,7,8,9-HxCDF | 4.10 | ----- | 0.31 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 1100.00 | ----- | 0.37 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 20.00 | ----- | 0.60 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 80 |
| 1,2,3,6,7,8-HxCDD | 61.00 | ----- | 0.53 | | | | |
| 1,2,3,7,8,9-HxCDD | 41.00 | ----- | 0.47 | | | | |
| Total HxCDD | 560.00 | ----- | 0.54 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1100.00 | ----- | 0.69 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 45.00 | ----- | 0.70 | | Equivalence: 65 ng/Kg | | |
| Total HpCDF | 2600.00 | ----- | 0.70 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 1700.00 | ----- | 0.25 | | | | |
| Total HpCDD | 2900.00 | ----- | 0.25 | | | | |
| OCDF | 2600.00 | ----- | 0.33 | | | | |
| OCDD | 12000.00 | ----- | 0.27 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
E = Exceeds calibration range
I = Interference present

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-002B | | |
| Lab Sample ID | 10362722002 | | |
| Filename | Y160922A_13 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 6.9 | Dilution | 10 |
| Dry Weight Extracted | 10.5 g | Collected | 09/12/2016 09:05 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 18:26 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 4.5 | ----- | 2.30 | JD | 2,3,7,8-TCDF-13C | 2.00 | 64 | D |
| Total TCDF | 270.0 | ----- | 2.30 | D | 2,3,7,8-TCDD-13C | 2.00 | 74 | D |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 55 | D |
| 2,3,7,8-TCDD | ND | ----- | 2.10 | D | 2,3,4,7,8-PeCDF-13C | 2.00 | 53 | D |
| Total TCDD | 18.0 | ----- | 2.10 | D | 1,2,3,7,8-PeCDD-13C | 2.00 | 60 | D |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 64 | D |
| 1,2,3,7,8-PeCDF | 22.0 | ----- | 1.30 | JD | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 66 | D |
| 2,3,4,7,8-PeCDF | 28.0 | ----- | 0.89 | JD | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 63 | D |
| Total PeCDF | 1600.0 | ----- | 1.10 | D | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 69 | D |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 | D |
| 1,2,3,7,8-PeCDD | 26.0 | ----- | 1.20 | JD | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 57 | D |
| Total PeCDD | 390.0 | ----- | 1.20 | D | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 63 | D |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 | D |
| 1,2,3,4,7,8-HxCDF | 160.0 | ----- | 2.80 | D | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 76 | D |
| 1,2,3,6,7,8-HxCDF | 230.0 | ----- | 2.30 | D | OCDD-13C | 4.00 | 67 | D |
| 2,3,4,6,7,8-HxCDF | 240.0 | ----- | 3.20 | D | | | | |
| 1,2,3,7,8,9-HxCDF | 22.0 | ----- | 3.60 | JD | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 5500.0 | ----- | 3.00 | D | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 83.0 | ----- | 4.20 | D | 2,3,7,8-TCDD-37Cl4 | 0.20 | 71 | D |
| 1,2,3,6,7,8-HxCDD | 350.0 | ----- | 4.60 | D | | | | |
| 1,2,3,7,8,9-HxCDD | 200.0 | ----- | 3.70 | D | | | | |
| Total HxCDD | 2900.0 | ----- | 4.10 | D | | | | |
| 1,2,3,4,6,7,8-HpCDF | 5700.0 | ----- | 2.60 | D | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 210.0 | ----- | 4.80 | D | Equivalence: 330 ng/Kg | | | |
| Total HpCDF | 13000.0 | ----- | 3.70 | D | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 8500.0 | ----- | 1.70 | D | | | | |
| Total HpCDD | 15000.0 | ----- | 1.70 | D | | | | |
| OCDF | 12000.0 | ----- | 2.50 | D | | | | |
| OCDD | 53000.0 | ----- | 3.50 | D | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
D = Result obtained from analysis of diluted sample

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-003B | | |
| Lab Sample ID | 10362722003 | | |
| Filename | Y160922A_09 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 5.4 | Dilution | NA |
| Dry Weight Extracted | 10.7 g | Collected | 09/12/2016 09:30 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 15:35 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.45 | ----- | 0.290 | J | 2,3,7,8-TCDF-13C | 2.00 | 69 |
| Total TCDF | 13.00 | ----- | 0.290 | | 2,3,7,8-TCDD-13C | 2.00 | 83 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 67 |
| 2,3,7,8-TCDD | ND | ----- | 0.220 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 63 |
| Total TCDD | 0.80 | ----- | 0.220 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 73 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | 1.90 | ----- | 0.110 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 66 |
| 2,3,4,7,8-PeCDF | 4.10 | ----- | 0.120 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 68 |
| Total PeCDF | 75.00 | ----- | 0.110 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 71 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 70 |
| 1,2,3,7,8-PeCDD | 1.10 | ----- | 0.150 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 62 |
| Total PeCDD | 6.90 | ----- | 0.150 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 64 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 |
| 1,2,3,4,7,8-HxCDF | 9.50 | ----- | 0.210 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 76 |
| 1,2,3,6,7,8-HxCDF | 9.30 | ----- | 0.280 | | OCDD-13C | 4.00 | 66 |
| 2,3,4,6,7,8-HxCDF | 14.00 | ----- | 0.240 | | | | |
| 1,2,3,7,8,9-HxCDF | 4.30 | ----- | 0.190 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 360.00 | ----- | 0.230 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 4.00 | ----- | 0.420 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 75 |
| 1,2,3,6,7,8-HxCDD | 29.00 | ----- | 0.470 | | | | |
| 1,2,3,7,8,9-HxCDD | 7.20 | ----- | 0.180 | | | | |
| Total HxCDD | 120.00 | ----- | 0.350 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 400.00 | ----- | 0.740 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 23.00 | ----- | 1.000 | | Equivalence: 23 ng/Kg | | |
| Total HpCDF | 1300.00 | ----- | 0.870 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 610.00 | ----- | 0.092 | | | | |
| Total HpCDD | 1000.00 | ----- | 0.092 | | | | |
| OCDF | 1900.00 | ----- | 0.570 | | | | |
| OCDD | 4800.00 | ----- | 0.430 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-004B | | |
| Lab Sample ID | 10362722004-R | | |
| Filename | Y161025A_10 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.7 g | Matrix | Soil |
| % Moisture | 6.0 | Dilution | NA |
| Dry Weight Extracted | 10.1 g | Collected | 09/12/2016 09:35 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y161025A_03 & Y161025A_21 | Extracted | 10/21/2016 19:15 |
| Method Blank ID | BLANK-52467 | Analyzed | 10/25/2016 18:48 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.41 | ---- | 0.20 | J | 2,3,7,8-TCDF-13C | 2.00 | 60 |
| Total TCDF | 6.30 | ---- | 0.20 | | 2,3,7,8-TCDD-13C | 2.00 | 76 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 57 |
| 2,3,7,8-TCDD | ND | ---- | 0.25 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 47 |
| Total TCDD | 0.37 | ---- | 0.25 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 59 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 55 |
| 1,2,3,7,8-PeCDF | 1.10 | ---- | 0.29 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 59 |
| 2,3,4,7,8-PeCDF | 2.10 | ---- | 0.22 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 61 |
| Total PeCDF | 56.00 | ---- | 0.25 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 52 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 68 |
| 1,2,3,7,8-PeCDD | 0.97 | ---- | 0.22 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 61 |
| Total PeCDD | 3.50 | ---- | 0.22 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 60 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 76 |
| 1,2,3,4,7,8-HxCDF | 5.70 | ---- | 0.48 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 83 |
| 1,2,3,6,7,8-HxCDF | 7.40 | ---- | 0.52 | | OCDD-13C | 4.00 | 71 |
| 2,3,4,6,7,8-HxCDF | 10.00 | ---- | 0.38 | | | | |
| 1,2,3,7,8,9-HxCDF | 2.40 | ---- | 0.73 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 300.00 | ---- | 0.53 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 2.40 | ---- | 0.38 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 72 |
| 1,2,3,6,7,8-HxCDD | 15.00 | ---- | 0.39 | | | | |
| 1,2,3,7,8,9-HxCDD | 5.90 | ---- | 0.38 | | | | |
| Total HxCDD | 68.00 | ---- | 0.38 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 290.00 | ---- | 0.51 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 17.00 | ---- | 0.45 | | Equivalence: 14 ng/Kg | | |
| Total HpCDF | 910.00 | ---- | 0.48 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 330.00 | ---- | 0.36 | | | | |
| Total HpCDD | 520.00 | ---- | 0.36 | | | | |
| OCDF | 1300.00 | ---- | 0.63 | | | | |
| OCDD | 2600.00 | ---- | 0.78 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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Minneapolis, MN 55414

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-005B | | |
| Lab Sample ID | 10362722005-R | | |
| Filename | Y161025A_11 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.7 g | Matrix | Soil |
| % Moisture | 5.7 | Dilution | NA |
| Dry Weight Extracted | 10.1 g | Collected | 09/12/2016 09:40 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y161025A_03 & Y161025A_21 | Extracted | 10/21/2016 19:15 |
| Method Blank ID | BLANK-52467 | Analyzed | 10/25/2016 19:29 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.57 | ---- | 0.17 | J | 2,3,7,8-TCDF-13C | 2.00 | 60 |
| Total TCDF | 9.80 | ---- | 0.17 | | 2,3,7,8-TCDD-13C | 2.00 | 77 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 57 |
| 2,3,7,8-TCDD | ND | ---- | 0.21 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 55 |
| Total TCDD | 0.54 | ---- | 0.21 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 65 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 68 |
| 1,2,3,7,8-PeCDF | 1.60 | ---- | 0.15 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 65 |
| 2,3,4,7,8-PeCDF | 3.80 | ---- | 0.19 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 66 |
| Total PeCDF | 83.00 | ---- | 0.17 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 66 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 74 |
| 1,2,3,7,8-PeCDD | 1.30 | ---- | 0.23 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 60 |
| Total PeCDD | 7.00 | ---- | 0.23 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 66 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 73 |
| 1,2,3,4,7,8-HxCDF | 11.00 | ---- | 0.47 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 81 |
| 1,2,3,6,7,8-HxCDF | 11.00 | ---- | 0.33 | | OCDD-13C | 4.00 | 69 |
| 2,3,4,6,7,8-HxCDF | 16.00 | ---- | 0.23 | | | | |
| 1,2,3,7,8,9-HxCDF | 4.40 | ---- | 0.39 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 430.00 | ---- | 0.35 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 3.90 | ---- | 0.18 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 72 |
| 1,2,3,6,7,8-HxCDD | 27.00 | ---- | 0.31 | | | | |
| 1,2,3,7,8,9-HxCDD | 9.30 | ---- | 0.31 | | | | |
| Total HxCDD | 110.00 | ---- | 0.27 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 490.00 | ---- | 0.40 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 31.00 | ---- | 0.59 | | Equivalence: 24 ng/Kg | | |
| Total HpCDF | 1700.00 | ---- | 0.49 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 550.00 | ---- | 0.26 | | | | |
| Total HpCDD | 880.00 | ---- | 0.26 | | | | |
| OCDF | 2600.00 | ---- | 0.64 | | | | |
| OCDD | 4300.00 | ---- | 0.56 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-006B | | |
| Lab Sample ID | 10362722006 | | |
| Filename | Y160922A_14 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 12.2 g | Matrix | Soil |
| % Moisture | 11.8 | Dilution | 50 |
| Dry Weight Extracted | 10.8 g | Collected | 09/12/2016 10:30 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 19:09 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 69 | ----- | 7.9 | D | 2,3,7,8-TCDF-13C | 2.00 | 67 | D |
| Total TCDF | 630 | ----- | 7.9 | D | 2,3,7,8-TCDD-13C | 2.00 | 80 | D |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 53 | D |
| 2,3,7,8-TCDD | ND | ----- | 10.0 | D | 2,3,4,7,8-PeCDF-13C | 2.00 | 49 | D |
| Total TCDD | 78 | ----- | 10.0 | D | 1,2,3,7,8-PeCDD-13C | 2.00 | 58 | D |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 76 | D |
| 1,2,3,7,8-PeCDF | 220 | ----- | 16.0 | JD | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 85 | D |
| 2,3,4,7,8-PeCDF | 590 | ----- | 8.7 | D | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 73 | D |
| Total PeCDF | 5300 | ----- | 12.0 | D | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 68 | D |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 | D |
| 1,2,3,7,8-PeCDD | 39 | ----- | 6.7 | JD | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 68 | D |
| Total PeCDD | 410 | ----- | 6.7 | D | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 72 | D |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 | D |
| 1,2,3,4,7,8-HxCDF | 1100 | ----- | 19.0 | D | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 85 | D |
| 1,2,3,6,7,8-HxCDF | 330 | ----- | 14.0 | D | OCDD-13C | 4.00 | 85 | D |
| 2,3,4,6,7,8-HxCDF | 990 | ----- | 18.0 | D | | | | |
| 1,2,3,7,8,9-HxCDF | 700 | ----- | 36.0 | D | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 44000 | ----- | 22.0 | D | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 140 | ----- | 22.0 | JD | 2,3,7,8-TCDD-37Cl4 | 0.20 | 89 | D |
| 1,2,3,6,7,8-HxCDD | 4400 | ----- | 18.0 | D | | | | |
| 1,2,3,7,8,9-HxCDD | 470 | ----- | 18.0 | D | | | | |
| Total HxCDD | 12000 | ----- | 19.0 | D | | | | |
| 1,2,3,4,6,7,8-HpCDF | 41000 | ----- | 6.0 | D | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 3300 | ----- | 11.0 | D | Equivalence: 2700 ng/Kg | | | |
| Total HpCDF | 260000 | ----- | 8.4 | ED | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 86000 | ----- | 7.0 | D | | | | |
| Total HpCDD | 130000 | ----- | 7.0 | D | | | | |
| OCDF | 370000 | ----- | 12.0 | ED | | | | |
| OCDD | 680000 | ----- | 15.0 | ED | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample

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# Method 8290 Blank Analysis Results

| | | | |
|---|---|---|---|
| Lab Sample ID | BLANK-52027 | Matrix | Solid |
| Filename | Y160921B_07 | Dilution | NA |
| Total Amount Extracted | 11.3 g | Extracted | 09/19/2016 17:10 |
| ICAL ID | Y160816A | Analyzed | 09/22/2016 01:40 |
| CCal Filename(s) | Y160921A_17 & Y160921B_17 | Injected By | SMT |

| **Native Isomers** | **Conc** ng/Kg | **EMPC** ng/Kg | **EDL** ng/Kg | **Internal Standards** | **ng's Added** | **Percent Recovery** |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.073 | 2,3,7,8-TCDF-13C | 2.00 | 70 |
| Total TCDF | ND | ----- | 0.073 | 2,3,7,8-TCDD-13C | 2.00 | 86 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 62 |
| 2,3,7,8-TCDD | ND | ----- | 0.064 | 2,3,4,7,8-PeCDF-13C | 2.00 | 56 |
| Total TCDD | ND | ----- | 0.064 | 1,2,3,7,8-PeCDD-13C | 2.00 | 69 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.056 | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 69 |
| 2,3,4,7,8-PeCDF | ND | ----- | 0.038 | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 70 |
| Total PeCDF | ND | ----- | 0.047 | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 70 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 70 |
| 1,2,3,7,8-PeCDD | ND | ----- | 0.150 | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 71 |
| Total PeCDD | ND | ----- | 0.150 | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 66 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 67 |
| 1,2,3,4,7,8-HxCDF | ND | ----- | 0.035 | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 73 |
| 1,2,3,6,7,8-HxCDF | ND | ----- | 0.042 | OCDD-13C | 4.00 | 53 |
| 2,3,4,6,7,8-HxCDF | ND | ----- | 0.038 | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.054 | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | ND | ----- | 0.042 | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ND | ----- | 0.110 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 79 |
| 1,2,3,6,7,8-HxCDD | ND | ----- | 0.130 | | | |
| 1,2,3,7,8,9-HxCDD | ND | ----- | 0.097 | | | |
| Total HxCDD | ND | ----- | 0.110 | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | ----- | 0.065 | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | ND | ----- | 0.100 | Equivalence: 0.15 ng/Kg | | |
| Total HpCDF | ND | ----- | 0.085 | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | ND | ----- | 0.190 | | | |
| Total HpCDD | ND | ----- | 0.190 | | | |
| OCDF | ND | ----- | 0.170 | | | |
| OCDD | 0.40 | ----- | 0.280 J | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value



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# Method 8290 Blank Analysis Results

| | | | |
|---|---|---|---|
| Lab Sample ID | BLANK-52467 | Matrix | Solid |
| Filename | Y161025A_06 | Dilution | NA |
| Total Amount Extracted | 10.5 g | Extracted | 10/21/2016 19:15 |
| ICAL ID | Y160816A | Analyzed | 10/25/2016 16:02 |
| CCal Filename(s) | Y161025A_03 & Y161025A_21 | Injected By | SMT |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 1.30 | | 2,3,7,8-TCDF-13C | 2.00 | 7 R |
| Total TCDF | ND | ----- | 1.30 | | 2,3,7,8-TCDD-13C | 2.00 | 9 R |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 7 R |
| 2,3,7,8-TCDD | ND | ----- | 1.60 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 8 R |
| Total TCDD | ND | ----- | 1.60 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 9 R |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 10 R |
| 1,2,3,7,8-PeCDF | ND | ----- | 1.20 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 10 R |
| 2,3,4,7,8-PeCDF | ND | ----- | 0.92 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 13 R |
| Total PeCDF | ND | ----- | 1.10 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 13 R |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 12 R |
| 1,2,3,7,8-PeCDD | ND | ----- | 1.20 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 11 R |
| Total PeCDD | ND | ----- | 1.20 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 14 R |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 18 R |
| 1,2,3,4,7,8-HxCDF | ND | ----- | 0.83 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 20 R |
| 1,2,3,6,7,8-HxCDF | ND | ----- | 0.85 | | OCDD-13C | 4.00 | 22 R |
| 2,3,4,6,7,8-HxCDF | ND | ----- | 0.83 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 1.30 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | ND | ----- | 0.96 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ND | ----- | 1.00 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 69 |
| 1,2,3,6,7,8-HxCDD | ND | ----- | 0.97 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | ----- | 0.70 | | | | |
| Total HxCDD | ND | ----- | 0.90 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ----- | 1.1 | 1.00 | IJ | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | ND | ----- | 1.10 | | Equivalence: 2.0 ng/Kg | | |
| Total HpCDF | ND | ----- | 1.10 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | ND | ----- | 1.10 | | | | |
| Total HpCDD | 1.3 | ----- | 1.10 | J | | | |
| OCDF | ND | ----- | 1.20 | | | | |
| OCDD | 4.3 | ----- | 1.60 | J | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value
R = Recovery outside target range
I = Interference present

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# Method 8290 Laboratory Control Spike Results

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-52028 | | |
| Filename | Y160921B_03 | Matrix | Solid |
| Total Amount Extracted | 10.6 g | Dilution | NA |
| ICAL ID | Y160816A | Extracted | 09/19/2016 17:10 |
| CCal Filename(s) | Y160921A_17 & Y160921B_17 | Analyzed | 09/21/2016 22:49 |
| Method Blank ID | BLANK-52027 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.21 | 106 | 2,3,7,8-TCDF-13C | 2.0 | 69 |
| Total TCDF | | | | 2,3,7,8-TCDD-13C | 2.0 | 86 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.0 | 63 |
| 2,3,7,8-TCDD | 0.20 | 0.18 | 92 | 2,3,4,7,8-PeCDF-13C | 2.0 | 58 |
| Total TCDD | | | | 1,2,3,7,8-PeCDD-13C | 2.0 | 69 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.0 | 71 |
| 1,2,3,7,8-PeCDF | 1.0 | 1.0 | 103 | 1,2,3,6,7,8-HxCDF-13C | 2.0 | 71 |
| 2,3,4,7,8-PeCDF | 1.0 | 1.1 | 109 | 2,3,4,6,7,8-HxCDF-13C | 2.0 | 70 |
| Total PeCDF | | | | 1,2,3,7,8,9-HxCDF-13C | 2.0 | 72 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.0 | 70 |
| 1,2,3,7,8-PeCDD | 1.0 | 0.96 | 96 | 1,2,3,6,7,8-HxCDD-13C | 2.0 | 69 |
| Total PeCDD | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.0 | 66 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.0 | 64 |
| 1,2,3,4,7,8-HxCDF | 1.0 | 1.1 | 107 | 1,2,3,4,6,7,8-HpCDD-13C | 2.0 | 72 |
| 1,2,3,6,7,8-HxCDF | 1.0 | 1.0 | 101 | OCDD-13C | 4.0 | 51 |
| 2,3,4,6,7,8-HxCDF | 1.0 | 0.99 | 99 | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | 0.95 | 95 | 1,2,3,4-TCDD-13C | 2.0 | NA |
| Total HxCDF | | | | 1,2,3,7,8,9-HxCDD-13C | 2.0 | NA |
| 1,2,3,4,7,8-HxCDD | 1.0 | 1.1 | 115 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 81 |
| 1,2,3,6,7,8-HxCDD | 1.0 | 1.2 | 115 | | | |
| 1,2,3,7,8,9-HxCDD | 1.0 | 1.1 | 114 | | | |
| Total HxCDD | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.0 | 1.0 | 103 | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.0 | 1.1 | 106 | | | |
| Total HpCDF | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.0 | 1.0 | 103 | | | |
| Total HpCDD | | | | | | |
| OCDF | 2.0 | 2.2 | 108 | | | |
| OCDD | 2.0 | 2.2 | 111 | | | |

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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# Method 8290 Laboratory Control Spike Results

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-52468 | | |
| Filename | Y161025A_04 | Matrix | Solid |
| Total Amount Extracted | 11.0 g | Dilution | NA |
| ICAL ID | Y160816A | Extracted | 10/21/2016 19:15 |
| CCal Filename(s) | Y161025A_03 & Y161025A_21 | Analyzed | 10/25/2016 14:39 |
| Method Blank ID | BLANK-52467 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.21 | 107 | 2,3,7,8-TCDF-13C | 2.0 | 68 |
| Total TCDF | | | | 2,3,7,8-TCDD-13C | 2.0 | 83 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.0 | 68 |
| 2,3,7,8-TCDD | 0.20 | 0.17 | 87 | 2,3,4,7,8-PeCDF-13C | 2.0 | 63 |
| Total TCDD | | | | 1,2,3,7,8-PeCDD-13C | 2.0 | 78 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.0 | 67 |
| 1,2,3,7,8-PeCDF | 1.0 | 1.0 | 105 | 1,2,3,6,7,8-HxCDF-13C | 2.0 | 69 |
| 2,3,4,7,8-PeCDF | 1.0 | 1.1 | 112 | 2,3,4,6,7,8-HxCDF-13C | 2.0 | 71 |
| Total PeCDF | | | | 1,2,3,7,8,9-HxCDF-13C | 2.0 | 73 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.0 | 67 |
| 1,2,3,7,8-PeCDD | 1.0 | 0.94 | 94 | 1,2,3,6,7,8-HxCDD-13C | 2.0 | 71 |
| Total PeCDD | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.0 | 75 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.0 | 80 |
| 1,2,3,4,7,8-HxCDF | 1.0 | 1.1 | 115 | 1,2,3,4,6,7,8-HpCDD-13C | 2.0 | 88 |
| 1,2,3,6,7,8-HxCDF | 1.0 | 1.1 | 108 | OCDD-13C | 4.0 | 78 |
| 2,3,4,6,7,8-HxCDF | 1.0 | 1.0 | 103 | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | 1.1 | 106 | 1,2,3,4-TCDD-13C | 2.0 | NA |
| Total HxCDF | | | | 1,2,3,7,8,9-HxCDD-13C | 2.0 | NA |
| 1,2,3,4,7,8-HxCDD | 1.0 | 1.2 | 115 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 78 |
| 1,2,3,6,7,8-HxCDD | 1.0 | 1.1 | 112 | | | |
| 1,2,3,7,8,9-HxCDD | 1.0 | 1.2 | 116 | | | |
| Total HxCDD | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.0 | 1.1 | 105 | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.0 | 1.0 | 102 | | | |
| Total HpCDF | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.0 | 1.0 | 101 | | | |
| Total HpCDD | | | | | | |
| OCDF | 2.0 | 2.1 | 104 | | | |
| OCDD | 2.0 | 2.1 | 106 | | | |

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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May 17, 2017

**Analytical Report for Service Request No:** E1700409

Lucas Darnell
Trihydro Corporation
2707 Broadwater Avenue
Helena, MT 59601

## Laboratory Results for: Diamond P Ranch - West Yellowstone/776-029-001

Dear Lucas:

Enclosed are the results of the sample(s) submitted to our laboratory on April 26, 2017. For your reference, these analyses have been assigned our service request number **E1700409**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct number is 284-575-2284. You may also contact me via email at Nicole.Brown@alsglobal.com.

Respectfully submitted,

**ALS Group USA Corp. dba ALS Environmental**

Nicole Brown
Senior Project Manager

Page 1 of _____

*For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.*

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| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request No.:** | E1700409 |
| **Project:** | Diamond P Ranch – West Yellowstone / 776-029-001 | **Date Received:** | 04/26/17 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Five water samples were received for analysis at ALS Environmental in Houston on 04/26/17.

The samples were received at 4.3 °C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

### Data Validation Notes and Discussion

### B flags – Method Blanks

The Method Blank EQ1700171-01 contained low levels of various compounds below the Method Reporting Limit (MRL). The associated compounds in the samples are flagged with 'B' flags where the sample result is less than ten times the level detected in the method blank

### MS/MSD

EQ1700171: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The matrix spike recovery for 2378-TCDD on the LCS DLCS samples is high due to the low labeled standard recoveries which causes a slight high bias for the native standard. The relative percent differences (RPD) are within control limits. The samples are non detect for TCDD.

### Y flags – Clean up Standard

The recoveries for the clean up standard, 37Cl-2,3,7,8-TCDD are outside control limits in some samples. The sample results are not affected since this labeled standard is provided as a means of demonstrating that both the sample extraction and subsequent cleanup steps performed as expected, and is not used in quantitation of target analytes.

### Y flags – Labeled Standards

Quantification of the native 2,3,7,8-substituted congeners is based on isotopic dilution, which automatically corrects for variation in extraction efficiency and provides accurate values even with poor recovery. Samples that had recoveries of labeled standards outside the acceptance limits are qualified with 'Y' flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1 and detection limits were below the Method Reporting Limits.

**K flags**

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

**Detection Limits**

Detection limits are calculated for each analyte in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

**The TEQ Summary results for each sample have been calculated by ALS/Houston to include:**

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** Trihydro Corporation **Service Request:**E1700409
**Project:** Diamond P Ranch - West Yellowstone/776-029-001

## SAMPLE CROSS-REFERENCE

| SAMPLE | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E1700409-001 | MW-1 | 4/24/2017 | 1230 |
| E1700409-002 | MW-3 | 4/24/2017 | 1350 |
| E1700409-003 | MW-4 | 4/24/2017 | 1530 |
| E1700409-004 | HO SE | 4/24/2017 | 1630 |
| E1700409-005 | BD-20170424 | 4/24/2017 | 0000 |

# Service Request Summary

**Folder #:** **E1700409**
Client Name: Trihydro Corporation
Project Name: Diamond P Ranch - West Yellowstone
Project Number: 776-029-001

**Report To:** Lucas Darnell
Trihydro Corporation
2707 Broadwater Avenue
Helena, MT 59601
SA
Phone Number: 406-558-4853
Cell Number:
Fax Number:
E-mail: ldarnell trihydro.com

Project Chemist: Corey randits
Originating Lab: HO STON
Logged By: C RANDITS
Date Received: 04/26/17
Internal Due Date: 5/17/2017
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number: 776-029-001
EDD: No EDD Specified

10 1000 ml- lass Bottle NM AMBER Teflon Liner npreserved
**Location:** EHRMS-WIC 2E, E-Disposed
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HO ST ON<br>PCDD PCDF/8290 |
|---|---|---|---|---|
| E1700409-001 | MW-1 | Water | 04/24/17 1230 | II |
| E1700409-002 | MW-3 | Water | 04/24/17 1350 | II |
| E1700409-003 | MW-4 | Water | 04/24/17 1530 | II |
| E1700409-004 | HO SE | Water | 04/24/17 1630 | II |
| E1700409-005 | BD-20170424 | Water | 04/24/17 0000 | II |

# Data Qualifiers

## HRMS Qualifier Set

B Indicates the associated analyte was found in the method blank at >1/10th the reported value.
E Estimated value. The reported concentration is above the calibration range of the instrument.
H Sample extracted and/or analyzed out of suggested holding time.
J Estimated value. The reported concentration is below the MRL.
K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits.The concentration of this analyte should be considered as an estimate.
P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.
Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.
S Signal saturated detector. Result reported from dilution.
U Compound was analyzed for, but was not detected (ND).
X See Case Narrative.
Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.
i The MDL/MRL have been elevated due to a matrix interference.

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

ALS Environmental

# State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| American Association for Laboratory Accreditation | 2897.01 | 11/30/2017 |
| Arizona Department of Health Services | AZ0793 | 5/27/2017 |
| Arkansas Department of Environmental Quality | 17-027-0 | 3/27/2018 |
| California Department of Health Services | 2452 | 4/30/2018 |
| Florida Department of Health | E87611 | 6/30/2017 |
| Illinois Environmental Protection Agency | 004112 | 5/9/2018 |
| Kansas Department of Health and Environment | E-10406 | 7/31/2017 |
| Louisiana Department of Environmental Quality | 03048 | 6/30/2017 |
| Louisiana Department of Health and Hospitals | LA150026 | 12/31/2017 |
| Maine Center for Disease Control and Prevention | 2014019 | 6/5/2018 |
| Maryland Department of the Environment | 343 | 6/30/2017 |
| Michigan Depratment of Environmental Quality | 9971 | 6/5/2018 |
| Minnesota Department of Health | 840911 | 12/31/2017 |
| Nevada Department of Concervation and Natural Resources | TX014112013-2 | 7/31/2017 |
| New Jersey Department of Environmental Protection | NLC140001 | 6/30/2017 |
| New York Department of Health | 11707 | 3/31/2018 |
| Oklahoma Department of Environmental Quality | 2014 124 | 8/21/2017 |
| Oregon Environmental Laboratory Accreditation Program | TX200002-009 | 3/24/2018 |
| Pennsylvania Department of Environmental Protection | 68-03441 | 6/30/2017 |
| Tennessee Department of Environment and Concervation | 04016 | 6/30/2017 |
| Texas Commision on Environmental Quality | TX104704231-17-18 | 6/30/2017 |
| United States Department of Agriculture | P330-14-00067 | 6/19/2018 |
| Utah Department of Health Environmental Laboratory Certification | TX02694 | 7/31/2017 |
| Washington Department of Health | c819 | 11/14/2017 |
| West Virginia Department of Environmental Protection | 347 | 6/30/2017 |

# ALS ENVIRONMENTAL – Houston
## Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1700409 DB-5MSUI SPB-Octyl

**First Level - Data Processing** - to be filled by person generating the forms

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/16/17 | GC | 001 |

**Second Level - Data Review** – to be filled by person doing peer review

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/16/17 | LKL | 001 |

# ALS ENVIRONMENTAL – Houston
## Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1700409 DB-5MSUI SPB-Octyl

**First Level - Data Processing** - to be filled by person generating the forms

| Date: 05/16/17 | Analyst: | Samples: 002 |
|---|---|---|
| | | |
| | | |

**Second Level - Data Review** – to be filled by person doing peer review

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/16/17 | LKL | 002 |
| | | |

# ALS ENVIRONMENTAL – Houston
## Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1700409 DB-5MSUI SPB-Octyl

**First Level - Data Processing** - to be filled by person generating the forms

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/11/17 | LKL | 003, 004 |
| | | |

**Second Level - Data Review** – to be filled by person doing peer review

| Date: | Analyst: | Samples: |
|---|---|---|
| 5/11/17 | KN | 003, 004 |
| | | |

# ALS ENVIRONMENTAL – Houston
## Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1700409 DB-5MSUI SPB-Octyl

**First Level - Data Processing** - to be filled by person generating the forms

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/15/17 | JC | 005 |

**Second Level - Data Review** – to be filled by person doing peer review

| Date: | Analyst: | Samples: |
|---|---|---|
| 05/15/17 | LKL | 005 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# CHAIN OF CUSTODY - HRGC/HRMS - LABORATORY ANALYSIS REPORT FORM

ALS Environmental 10450 Stancliff Road, Suite 210, Houston, TX 77099 | 713.266.1599 | alsusa.hrms@alsglobal.com | www.alsglobal.com

DATE 4/24/17 PAGE 1 OF 1

Project Name: Diamond P Ranch

Project #:

Company/Address: Trihydro Corporation
2707 Broadwater Ave
Helena, MT 59602 Phone: 406 555 4150

Report to: Andrew Vann / Charlie Bullock

| SAMPLE I.D. | DATE | TIME | SAMPLE MATRIX | Number of Containers | 8290 | 1613B | 1613 TCDD only | 1668 WHO | 1668 Full List | | | | | | | | | REMARKS / SAMPLE LOCATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 4/24/17 | 1230 | W | 2 | X | | | | | | | | | | | | | |
| MW-3 | | 1350 | W | 2 | X | | | | | | | | | | | | | |
| MW-4 | | 1530 | W | 2 | X | | | | | | | | | | | | | |
| HOUSE | | 1630 | W | 2 | X | | | | | | | | | | | | | |
| BD-20170424 | | – | W | 2 | X | | | | | | | | | | | | | |

RELINQUISHED BY:
Signature: [signature]
Printed Name: L. Darnell
Firm: Trihydro
Date/Time: 4/25/17/0900

RECEIVED BY:
Signature: [signature]
Printed Name: I Woods
Firm: ALS
Date/Time: 4-26-17 8:35

TURNAROUND REQUIREMENTS
Dioxin Rush.....5 days
Dioxin Rush.....10 days
Dioxin STD.....15 days
Contact lab for available TAT on PCBs

DELIVERABLES
___ I. Analytical Report
___ II. Analytical Report + QC
___ IV. Data Validation Report (includes all raw data)

INVOICE INFORMATION:
P.O. #
Bill to:

SAMPLE RECEIPT
Opened by:
Inspected by:
Date:
Time:

RELINQUISHED BY:
Signature:
Printed Name:
Firm:
Date/Time:

RECEIVED BY:
Signature:
Printed Name:
Firm:
Date/Time:

Comments/Special Instructions:

Sampler's Signature [signature]

E1700409 5
Trihydro Corporation
Dioxin Groundwater Analysis

DISTRIBUTION: WHITE - Laboratory Copy; YELLOW - Client Copy

ALS Environmental

# Cooler Receipt Form

Project Chemist NB

Client/Project Tri hydro

Thermometer ID SMO 04

Date/Time Received: 4-26-17 8:35 Initials: SW Date/Time Logged in: 4-26-17 Initials SW

1. Method of delivery: ○ US Mail ☑ Fed Ex ○ UPS ○ DHL ○ Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ☑ Yes ○ No
   Were they intact? ☑ Yes ○ No ○ N/A
   Were they signed and dated? ☑ Yes ○ No ○ N/A
   If yes, how many and where? 1 seal
4. Packing Material: ○ Inserts ○ Baggies ☑ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp °C | Temp Blank? |
|---|---|---|---|---|---|---|
| 6355 5188 1402 | | 4-26-17 | 4pm | SW | 3.7/4.3 | ☑ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E1700409 5

Trihydro Corporation
Dioxin Groundwater Analysis

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 286892 **Prep WorkFlow:** OrgExtDioxAq-30 **Status:** Prepped
**Team:** Semivoa GCMS/JGHOSH **Prep Method:** Method Sep Funnel/Jar **Prep Date/Time:** 5/2/17 10:00 AM

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E1700311-001RE | 2220732 001 | .01 | 8290/PCDD PCDF | 7 | x | Water | 749mL | Clear |
| 2 | E1700311-002RE | 2220732 002 | .01 | 8290/PCDD PCDF | 7 | x | Water | 771mL | Clear |
| 3 | E1700409-001 | MW-1 | .01 | 8290/PCDD PCDF | 6 | x | Water | 915mL | Clear |
| 4 | E1700409-002 | MW-3 | .01 | 8290/PCDD PCDF | 6 | x | Water | 969mL | Clear |
| 5 | E1700409-003 | MW-4 | .01 | 8290/PCDD PCDF | 7 | x | Water | 878mL | Off white |
| 6 | E1700409-004 | HOUSE | .01 | 8290/PCDD PCDF | 7 | x | Water | 946mL | Clear |
| 7 | E1700409-005 | BD-20170424 | .01 | 8290/PCDD PCDF | 7 | x | Water | 984mL | Off white |
| 8 | E1700429-001 | GW-1330 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 979mL | Light brown |
| 9 | E1700429-002 | GW-1346 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 973mL | Clear |
| 10 | E1700429-003 | GW-1349 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1009mL | Off white |
| 11 | E1700429-004 | GW-1352 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1021mL | Light brown |
| 12 | E1700429-005 | GW-1353 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1026mL | Light brown |
| 13 | E1700429-006 | GW-1345 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1039mL | Light brown |
| 14 | E1700429-007 | GW-1344 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1009mL | Off white |
| 15 | EQ1700171-01 | MB | | 8290/PCDD PCDF | 5 | x | Liquid | 1000mL | |
| 16 | EQ1700171-02 | LCS | | 8290/PCDD PCDF | 5 | x | Liquid | 1000mL | |
| 17 | EQ1700171-03 | DLCS | | 8290/PCDD PCDF | 5 | x | Liquid | 1000mL | |

**Spiking Solutions**

Name: 1613B Matrix Working Standard Inventory ID 180712 Logbook Ref: 180712 JG 04/20/17 NR Expires On: 10/17/2017

| | | | |
|---|---|---|---|
| EQ1700171-02 | 100.00µL | EQ1700171-03 | 100.00µL |

Name: 1613B Labeled Working Standard Inventory ID 180943 Logbook Ref: 180943 JG 05/01/2017 Expires On: 06/30/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E1700311-001 | 1,000.00µL | E1700311-002 | 1,000.00µL | E1700409-001 | 1,000.00µL | E1700409-002 | 1,000.00µL | E1700409-003 | 1,000.00µL | E1700409-004 | 1,000.00µL |
| E1700409-005 | 1,000.00µL | E1700429-001 | 1,000.00µL | E1700429-002 | 1,000.00µL | E1700429-003 | 1,000.00µL | E1700429-004 | 1,000.00µL | E1700429-005 | 1,000.00µL |
| E1700429-006 | 1,000.00µL | E1700429-007 | 1,000.00µL | EQ1700171-01 | 1,000.00µL | EQ1700171-02 | 1,000.00µL | EQ1700171-03 | 1,000.00µL | | |

Name: 8290/1613B Cleanup Working Standard Inventory ID 181049 Logbook Ref: TW 8 NG/ML 5/2/17 Expires On: 10/29/2017

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E1700311-001 | 100.00µL | E1700311-002 | 100.00µL | E1700409-001 | 100.00µL | E1700409-002 | 100.00µL | E1700409-003 | 100.00µL | E1700409-004 | 100.00µL |
| E1700409-005 | 100.00µL | E1700429-001 | 100.00µL | E1700429-002 | 100.00µL | E1700429-003 | 100.00µL | E1700429-004 | 100.00µL | E1700429-005 | 100.00µL |
| E1700429-006 | 100.00µL | E1700429-007 | 100.00µL | EQ1700171-01 | 100.00µL | EQ1700171-02 | 100.00µL | EQ1700171-03 | 100.00µL | | |

# *Preparation Information Benchsheet*

**Prep Run#:** 286892 **Prep WorkFlow:** OrgExtDioxAq-30 **Status:** Prepped
**Team:** Semivoa GCMS/JGHOSH **Prep Method:** Method Sep Funnel/Jar **Prep Date/Time:** 5/2/17 10:00 AM

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Sensafe Free Chlorine WTR CHK | LM 3/19/15 (79756) | Carbon, High Purity | CARBON TW 04/14/17 (180613) | Ethyl Acetate 99.9% Minimum EtOAc | AL 3/3/17 (179750) |
| Glass Wool | CID 12/22/16 (178182) | Hexanes 95% | 9262-03 (180607) | Dichloromethane (Methylene Chloride) 99.9% MeCl2 | JP 1/10/16 (178535) |
| Sodium Hydroxide 1N NaOH | sodium hydroxide (180303) | Sodium Sulfate Anhydrous Reagent Grade Na2SO4 | AL 3/6/17 2011359-07 (179771) | Tridecane (n-Tridecane) | AL 3/31/17 (180309) |
| ColorpHast pH-Indicator Strips | AL 8/17/16 (175089) | Silica Gel | AL 4/24/17 (180901) | sulfuric acid | sulfuric acid 42417 (180788) |
| Toluene 99.9% Minimum | JG 04/14/2017 (180610) | | | | |

## Preparation Steps

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Step: | Extraction | Step: | Acid Clean | Step: | Silica Gel Clean | Step: | Final Volume |
| Started: | 5/2/17 10:00 | Started: | 5/8/17 09:00 | Started: | 5/8/17 10:00 | Started: | 5/9/17 07:00 |
| Finished: | 5/2/17 14:30 | Finished: | 5/8/17 10:00 | Finished: | 5/8/17 14:00 | Finished: | 5/9/17 09:00 |
| By: | JGHOSH | By: | ALOPEZ | By: | ALOPEZ | By: | ALOPEZ |
| Comments | | Comments | | Comments | | Comments | |

Comments: _____

Reviewed By: JG Date: 05/11/2017

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

E1700409 20 of 52

# Analytical Results

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 12:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1700409-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/12/17 16:18 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 915mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509464 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509460 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 7.66 | 7.66 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 2.07 | 27.3 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 0.430 | 27.3 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 0.454 | 27.3 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 0.432 | 27.3 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 5.54**BJK** | | 1.29 | 27.3 | 1.52 | 1.000 | 1 |
| OCDD | 57.1**BK** | | 0.619 | 54.6 | 1.04 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 5.32 | 5.46 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 1.11 | 27.3 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 0.900 | 27.3 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 0.534 | 27.3 | | | 1 |
| 1,2,3,6,7,8-HxCDF | 1.90**J** | | 0.476 | 27.3 | 1.30 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 0.625 | 27.3 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 0.572 | 27.3 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | 2.66**JK** | | 0.492 | 27.3 | 1.23 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 1.52**J** | | 0.654 | 27.3 | 0.88 | 1.000 | 1 |
| OCDF | 4.39**JK** | | 3.30 | 54.6 | 0.56 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 12:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1700409-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/12/17 16:18 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 915mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509464 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509460 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 7.66 | 7.66 | | | 1 |
| Total Penta-Dioxins | ND | U | 2.07 | 27.3 | | | 1 |
| Total Hexa-Dioxins | ND | U | 0.439 | 27.3 | | | 1 |
| Total Hepta-Dioxins | ND | U | 1.29 | 27.3 | | | 1 |
| Total Tetra-Furans | ND | U | 5.32 | 5.46 | | | 1 |
| Total Penta-Furans | ND | U | 0.993 | 27.3 | | | 1 |
| Total Hexa-Furans | 1.90**J** | | 0.547 | 27.3 | 1.30 | | 1 |
| Total Hepta-Furans | 3.03**J** | | 0.587 | 27.3 | 0.91 | | 1 |

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 12:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-1 | **Units:** | Percent |
| **Lab Code:** | E1700409-001 | **Basis:** | NA |

## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/12/17 16:18 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 915mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509464 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509460 |

### Labeled Standard Results

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 718.684 | 36 | **Y** | 40-135 | 0.80 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1473.338 | 74 | | 40-135 | 1.64 | 1.178 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1459.434 | 73 | | 40-135 | 1.31 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1418.198 | 71 | | 40-135 | 1.28 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1563.051 | 78 | | 40-135 | 1.08 | 1.069 |
| 13C-OCDD | 4000 | 2615.279 | 65 | | 40-135 | 0.92 | 1.149 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1198.706 | 60 | | 40-135 | 0.79 | 0.992 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1635.463 | 82 | | 40-135 | 1.65 | 1.137 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 2013.273 | 101 | | 40-135 | 1.62 | 1.169 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1452.306 | 73 | | 40-135 | 0.52 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1558.721 | 78 | | 40-135 | 0.52 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1610.823 | 81 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1378.219 | 69 | | 40-135 | 0.52 | 0.987 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1324.404 | 66 | | 40-135 | 0.44 | 1.043 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1594.099 | 80 | | 40-135 | 0.45 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 470.511 | 59 | | 40-135 | NA | 1.020 |

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 12:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1700409-001 | **Basis:** | NA |

## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

**Analysis Method:** 8290

**Prep Method:** Method Sep Funnel/Jar

### Toxicity Equivalency Quotient

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 7.66 | 7.66 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 2.07 | 27.3 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.430 | 27.3 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 0.454 | 27.3 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 0.432 | 27.3 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **5.54** | 1.29 | 27.3 | 1 | 0.01 | 0.0554 |
| OCDD | **57.1** | 0.619 | 54.6 | 1 | 0.0003 | 0.0171 |
| 2,3,7,8-TCDF | ND | 5.32 | 5.46 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 1.11 | 27.3 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 0.900 | 27.3 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 0.534 | 27.3 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | **1.90** | 0.476 | 27.3 | 1 | 0.1 | 0.190 |
| 1,2,3,7,8,9-HxCDF | ND | 0.625 | 27.3 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 0.572 | 27.3 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | **2.66** | 0.492 | 27.3 | 1 | 0.01 | 0.0266 |
| 1,2,3,4,7,8,9-HpCDF | **1.52** | 0.654 | 27.3 | 1 | 0.01 | 0.0152 |
| OCDF | **4.39** | 3.30 | 54.6 | 1 | 0.0003 | 0.00132 |
| | Total TEQ | | | | | 0.306 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 13:50 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1700409-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/15/17 19:32 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 969mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509516 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509513 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 9.67 | 9.67 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 3.74 | 25.8 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 2.12 | 25.8 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 2.13 | 25.8 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 2.08 | 25.8 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 9.45**BJK** | | 1.03 | 25.8 | 1.84 | 1.000 | 1 |
| OCDD | 68.2**B** | | 2.38 | 51.6 | 0.87 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 8.85 | 8.85 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 3.00 | 25.8 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 2.47 | 25.8 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 1.46 | 25.8 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 1.25 | 25.8 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 1.95 | 25.8 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 1.52 | 25.8 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | 2.67**J** | | 0.630 | 25.8 | 1.04 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 1.76**J** | | 0.927 | 25.8 | 0.91 | 1.000 | 1 |
| OCDF | ND | U | 6.00 | 51.6 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 13:50 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1700409-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/15/17 19:32 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 969mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509516 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509513 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 9.67 | 9.67 | | | 1 |
| Total Penta-Dioxins | ND | U | 3.74 | 25.8 | | | 1 |
| Total Hexa-Dioxins | ND | U | 2.11 | 25.8 | | | 1 |
| Total Hepta-Dioxins | ND | U | 1.03 | 25.8 | | | 1 |
| Total Tetra-Furans | ND | U | 8.85 | 8.85 | | | 1 |
| Total Penta-Furans | ND | U | 2.71 | 25.8 | | | 1 |
| Total Hexa-Furans | ND | U | 1.51 | 25.8 | | | 1 |
| Total Hepta-Furans | 4.43**J** | | 0.790 | 25.8 | 1.04 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 13:50 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-3 | **Units:** | Percent |
| **Lab Code:** | E1700409-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/15/17 19:32 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 969mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509516 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509513 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 442.878 | 22 | **Y** | 40-135 | 0.78 | 1.020 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 804.968 | 40 | | 40-135 | 1.64 | 1.182 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 856.815 | 43 | | 40-135 | 1.24 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1062.474 | 53 | | 40-135 | 1.24 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 966.871 | 48 | | 40-135 | 1.03 | 1.069 |
| 13C-OCDD | 4000 | 1687.378 | 42 | | 40-135 | 0.91 | 1.148 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 751.015 | 38 | **Y** | 40-135 | 0.79 | 0.992 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 975.326 | 49 | | 40-135 | 1.58 | 1.141 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1190.566 | 60 | | 40-135 | 1.64 | 1.172 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 975.558 | 49 | | 40-135 | 0.53 | 0.970 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1249.933 | 62 | | 40-135 | 0.55 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1055.881 | 53 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1000.341 | 50 | | 40-135 | 0.55 | 0.987 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 902.338 | 45 | | 40-135 | 0.44 | 1.043 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 992.492 | 50 | | 40-135 | 0.46 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 317.798 | 40 | | 40-135 | NA | 1.020 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 13:50 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1700409-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** Method Sep Funnel/Jar

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 9.67 | 9.67 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 3.74 | 25.8 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 2.12 | 25.8 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 2.13 | 25.8 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 2.08 | 25.8 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **9.45** | 1.03 | 25.8 | 1 | 0.01 | 0.0945 |
| OCDD | **68.2** | 2.38 | 51.6 | 1 | 0.0003 | 0.0205 |
| 2,3,7,8-TCDF | ND | 8.85 | 8.85 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 3.00 | 25.8 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 2.47 | 25.8 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 1.46 | 25.8 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | ND | 1.25 | 25.8 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDF | ND | 1.95 | 25.8 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 1.52 | 25.8 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | **2.67** | 0.630 | 25.8 | 1 | 0.01 | 0.0267 |
| 1,2,3,4,7,8,9-HpCDF | **1.76** | 0.927 | 25.8 | 1 | 0.01 | 0.0176 |
| OCDF | ND | 6.00 | 51.6 | 1 | 0.0003 | |
| | Total TEQ | | | | | 0.159 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 15:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1700409-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 07:28 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 878mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509402 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 5.84 | 5.84 | | | 1 |
| 1,2,3,7,8-PeCDD | 1.79**JK** | | 1.47 | 28.5 | 3.71 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDD | 3.41**JK** | | 0.625 | 28.5 | 0.51 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 6.18**BJ** | | 0.646 | 28.5 | 1.30 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 5.45**J** | | 0.622 | 28.5 | 1.23 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 119 | | 0.372 | 28.5 | 1.05 | 1.000 | 1 |
| OCDD | 1340 | | 0.781 | 56.9 | 0.91 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 3.23 | 5.69 | | | 1 |
| 1,2,3,7,8-PeCDF | 4.26**JK** | | 0.905 | 28.5 | 1.11 | 1.001 | 1 |
| 2,3,4,7,8-PeCDF | 3.70**J** | | 0.784 | 28.5 | 1.56 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDF | 3.38**JK** | | 0.576 | 28.5 | 0.82 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 3.26**JK** | | 0.489 | 28.5 | 2.21 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 2.79**JK** | | 0.642 | 28.5 | 3.01 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 3.52**JK** | | 0.611 | 28.5 | 0.84 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 23.1**J** | | 0.699 | 28.5 | 0.97 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 5.76**J** | | 0.965 | 28.5 | 1.03 | 1.000 | 1 |
| OCDF | 132 | | 1.78 | 56.9 | 0.89 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 15:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1700409-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 07:28 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 878mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509402 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 5.84 | 5.84 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.47 | 28.5 | | | 1 |
| Total Hexa-Dioxins | 11.6**J** | | 0.631 | 28.5 | 1.30 | | 1 |
| Total Hepta-Dioxins | 119 | | 0.372 | 28.5 | 1.05 | | 1 |
| Total Tetra-Furans | ND | U | 3.23 | 5.69 | | | 1 |
| Total Penta-Furans | 3.70**J** | | 0.839 | 28.5 | 1.56 | | 1 |
| Total Hexa-Furans | ND | U | 0.573 | 28.5 | | | 1 |
| Total Hepta-Furans | 88.5 | | 0.850 | 28.5 | 0.97 | | 1 |

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 15:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-4 | **Units:** | Percent |
| **Lab Code:** | E1700409-003 | **Basis:** | NA |

## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 07:28 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 878mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509402 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

### Labeled Standard Results

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 615.274 | 31 | **Y** | 40-135 | 0.81 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1222.623 | 61 | | 40-135 | 1.59 | 1.175 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1047.228 | 52 | | 40-135 | 1.40 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1016.471 | 51 | | 40-135 | 1.21 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1081.912 | 54 | | 40-135 | 1.07 | 1.068 |
| 13C-OCDD | 4000 | 1856.770 | 46 | | 40-135 | 0.89 | 1.148 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 976.965 | 49 | | 40-135 | 0.80 | 0.993 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1364.122 | 68 | | 40-135 | 1.59 | 1.135 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1614.671 | 81 | | 40-135 | 1.60 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1027.107 | 51 | | 40-135 | 0.53 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1136.848 | 57 | | 40-135 | 0.53 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1138.099 | 57 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 956.046 | 48 | | 40-135 | 0.51 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 934.820 | 47 | | 40-135 | 0.44 | 1.042 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1102.017 | 55 | | 40-135 | 0.46 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 388.509 | 49 | | 40-135 | NA | 1.020 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 15:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1700409-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** Method Sep Funnel/Jar

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 5.84 | 5.84 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | **1.79** | 1.47 | 28.5 | 1 | 1 | 1.79 |
| 1,2,3,4,7,8-HxCDD | **3.41** | 0.625 | 28.5 | 1 | 0.1 | 0.341 |
| 1,2,3,6,7,8-HxCDD | **6.18** | 0.646 | 28.5 | 1 | 0.1 | 0.618 |
| 1,2,3,7,8,9-HxCDD | **5.45** | 0.622 | 28.5 | 1 | 0.1 | 0.545 |
| 1,2,3,4,6,7,8-HpCDD | **119** | 0.372 | 28.5 | 1 | 0.01 | 1.19 |
| OCDD | **1340** | 0.781 | 56.9 | 1 | 0.0003 | 0.402 |
| 2,3,7,8-TCDF | ND | 3.23 | 5.69 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | **4.26** | 0.905 | 28.5 | 1 | 0.03 | 0.128 |
| 2,3,4,7,8-PeCDF | **3.70** | 0.784 | 28.5 | 1 | 0.3 | 1.11 |
| 1,2,3,4,7,8-HxCDF | **3.38** | 0.576 | 28.5 | 1 | 0.1 | 0.338 |
| 1,2,3,6,7,8-HxCDF | **3.26** | 0.489 | 28.5 | 1 | 0.1 | 0.326 |
| 1,2,3,7,8,9-HxCDF | **2.79** | 0.642 | 28.5 | 1 | 0.1 | 0.279 |
| 2,3,4,6,7,8-HxCDF | **3.52** | 0.611 | 28.5 | 1 | 0.1 | 0.352 |
| 1,2,3,4,6,7,8-HpCDF | **23.1** | 0.699 | 28.5 | 1 | 0.01 | 0.231 |
| 1,2,3,4,7,8,9-HpCDF | **5.76** | 0.965 | 28.5 | 1 | 0.01 | 0.0576 |
| OCDF | **132** | 1.78 | 56.9 | 1 | 0.0003 | 0.0396 |
| | | Total TEQ | | | | 7.75 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 16:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | HOUSE | **Units:** | pg/L |
| **Lab Code:** | E1700409-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 08:16 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 946mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509403 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 1.85 | 5.29 | | | 1 |
| 1,2,3,7,8-PeCDD | 3.14**JK** | | 0.901 | 26.4 | 0.93 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDD | 2.41**JK** | | 0.243 | 26.4 | 2.74 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 2.40**BJK** | | 0.257 | 26.4 | 0.78 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 3.42**JK** | | 0.245 | 26.4 | 1.49 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 11.9**BJ** | | 0.218 | 26.4 | 0.92 | 1.000 | 1 |
| OCDD | 89.3**B** | | 0.441 | 52.9 | 0.93 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 0.824 | 5.29 | | | 1 |
| 1,2,3,7,8-PeCDF | 2.42**J** | | 0.395 | 26.4 | 1.32 | 1.001 | 1 |
| 2,3,4,7,8-PeCDF | 1.52**JK** | | 0.359 | 26.4 | 0.87 | 1.001 | 1 |
| 1,2,3,4,7,8-HxCDF | 2.01**JK** | | 0.317 | 26.4 | 1.53 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 2.53**J** | | 0.273 | 26.4 | 1.14 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 3.14**JK** | | 0.383 | 26.4 | 1.57 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 3.31**J** | | 0.350 | 26.4 | 1.20 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 3.04**JK** | | 0.156 | 26.4 | 1.52 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 2.60**JK** | | 0.213 | 26.4 | 1.32 | 1.000 | 1 |
| OCDF | 10.2**JK** | | 2.02 | 52.9 | 0.68 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 16:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | HOUSE | **Units:** | pg/L |
| **Lab Code:** | E1700409-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 08:16 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 946mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509403 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 1.85 | 5.29 | | | 1 |
| Total Penta-Dioxins | ND | U | 0.901 | 26.4 | | | 1 |
| Total Hexa-Dioxins | 3.84**J** | | 0.248 | 26.4 | 1.33 | | 1 |
| Total Hepta-Dioxins | 21.6**J** | | 0.218 | 26.4 | 1.15 | | 1 |
| Total Tetra-Furans | ND | U | 0.824 | 5.29 | | | 1 |
| Total Penta-Furans | 2.42**J** | | 0.375 | 26.4 | 1.32 | | 1 |
| Total Hexa-Furans | 5.84**J** | | 0.326 | 26.4 | 1.14 | | 1 |
| Total Hepta-Furans | ND | U | 0.189 | 26.4 | | | 1 |

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 16:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | HOUSE | **Units:** | Percent |
| **Lab Code:** | E1700409-004 | **Basis:** | NA |

## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 08:16 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 946mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509403 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

### Labeled Standard Results

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 689.403 | 34 | **Y** | 40-135 | 0.81 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1142.742 | 57 | | 40-135 | 1.61 | 1.175 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1252.700 | 63 | | 40-135 | 1.29 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1272.931 | 64 | | 40-135 | 1.30 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1199.348 | 60 | | 40-135 | 1.07 | 1.069 |
| 13C-OCDD | 4000 | 1817.149 | 45 | | 40-135 | 0.92 | 1.149 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1090.611 | 55 | | 40-135 | 0.79 | 0.993 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1294.847 | 65 | | 40-135 | 1.59 | 1.135 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1470.076 | 74 | | 40-135 | 1.60 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1261.594 | 63 | | 40-135 | 0.52 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1394.369 | 70 | | 40-135 | 0.53 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1338.009 | 67 | | 40-135 | 0.51 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1156.856 | 58 | | 40-135 | 0.51 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1039.067 | 52 | | 40-135 | 0.44 | 1.042 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1208.261 | 60 | | 40-135 | 0.44 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 451.103 | 56 | | 40-135 | NA | 1.020 |

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 16:30 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | HOUSE | **Units:** | pg/L |
| **Lab Code:** | E1700409-004 | **Basis:** | NA |

## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

**Analysis Method:** 8290

**Prep Method:** Method Sep Funnel/Jar

### Toxicity Equivalency Quotient

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 1.85 | 5.29 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | **3.14** | 0.901 | 26.4 | 1 | 1 | 3.14 |
| 1,2,3,4,7,8-HxCDD | **2.41** | 0.243 | 26.4 | 1 | 0.1 | 0.241 |
| 1,2,3,6,7,8-HxCDD | **2.40** | 0.257 | 26.4 | 1 | 0.1 | 0.240 |
| 1,2,3,7,8,9-HxCDD | **3.42** | 0.245 | 26.4 | 1 | 0.1 | 0.342 |
| 1,2,3,4,6,7,8-HpCDD | **11.9** | 0.218 | 26.4 | 1 | 0.01 | 0.119 |
| OCDD | **89.3** | 0.441 | 52.9 | 1 | 0.0003 | 0.0268 |
| 2,3,7,8-TCDF | ND | 0.824 | 5.29 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | **2.42** | 0.395 | 26.4 | 1 | 0.03 | 0.0726 |
| 2,3,4,7,8-PeCDF | **1.52** | 0.359 | 26.4 | 1 | 0.3 | 0.456 |
| 1,2,3,4,7,8-HxCDF | **2.01** | 0.317 | 26.4 | 1 | 0.1 | 0.201 |
| 1,2,3,6,7,8-HxCDF | **2.53** | 0.273 | 26.4 | 1 | 0.1 | 0.253 |
| 1,2,3,7,8,9-HxCDF | **3.14** | 0.383 | 26.4 | 1 | 0.1 | 0.314 |
| 2,3,4,6,7,8-HxCDF | **3.31** | 0.350 | 26.4 | 1 | 0.1 | 0.331 |
| 1,2,3,4,6,7,8-HpCDF | **3.04** | 0.156 | 26.4 | 1 | 0.01 | 0.0304 |
| 1,2,3,4,7,8,9-HpCDF | **2.60** | 0.213 | 26.4 | 1 | 0.01 | 0.0260 |
| OCDF | **10.2** | 2.02 | 52.9 | 1 | 0.0003 | 0.00306 |
| | | Total TEQ | | | | 5.80 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 00:00 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | BD-20170424 | **Units:** | pg/L |
| **Lab Code:** | E1700409-005 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 12:01 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 984mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509434 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509423 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 2.05 | 5.08 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 1.83 | 25.4 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 0.405 | 25.4 | | | 1 |
| 1,2,3,6,7,8-HxCDD | 3.06**BJK** | | 0.419 | 25.4 | 1.45 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 3.42**JK** | | 0.403 | 25.4 | 0.99 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 91.0 | | 0.403 | 25.4 | 1.20 | 1.000 | 1 |
| OCDD | 1030 | | 0.580 | 50.8 | 0.93 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 2.68 | 5.08 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 0.880 | 25.4 | | | 1 |
| 2,3,4,7,8-PeCDF | 1.43**JK** | | 0.758 | 25.4 | 0.95 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDF | 2.11**J** | | 0.298 | 25.4 | 1.22 | 1.001 | 1 |
| 1,2,3,6,7,8-HxCDF | 1.31**JK** | | 0.258 | 25.4 | 1.03 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 1.29**JK** | | 0.314 | 25.4 | 0.83 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 2.23**JK** | | 0.322 | 25.4 | 2.17 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 13.8**J** | | 0.258 | 25.4 | 1.02 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 2.98**JK** | | 0.298 | 25.4 | 1.33 | 1.000 | 1 |
| OCDF | 99.6 | | 2.02 | 50.8 | 0.80 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 00:00 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | BD-20170424 | **Units:** | pg/L |
| **Lab Code:** | E1700409-005 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 12:01 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 984mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509434 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509423 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 2.05 | 5.08 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.83 | 25.4 | | | 1 |
| Total Hexa-Dioxins | ND | U | 0.409 | 25.4 | | | 1 |
| Total Hepta-Dioxins | 40.5 | | 0.403 | 25.4 | 1.19 | | 1 |
| Total Tetra-Furans | ND | U | 2.68 | 5.08 | | | 1 |
| Total Penta-Furans | ND | U | 0.814 | 25.4 | | | 1 |
| Total Hexa-Furans | 7.67**J** | | 0.295 | 25.4 | 1.38 | | 1 |
| Total Hepta-Furans | 60.5 | | 0.287 | 25.4 | 1.02 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 00:00 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | BD-20170424 | **Units:** | Percent |
| **Lab Code:** | E1700409-005 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 12:01 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 984mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509434 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509423 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 651.593 | 33 | **Y** | 40-135 | 0.79 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1220.516 | 61 | | 40-135 | 1.58 | 1.178 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1057.016 | 53 | | 40-135 | 1.25 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1059.697 | 53 | | 40-135 | 1.27 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1196.453 | 60 | | 40-135 | 1.07 | 1.068 |
| 13C-OCDD | 4000 | 2167.042 | 54 | | 40-135 | 0.88 | 1.148 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1006.809 | 50 | | 40-135 | 0.79 | 0.993 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1339.166 | 67 | | 40-135 | 1.56 | 1.138 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1580.175 | 79 | | 40-135 | 1.62 | 1.169 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1065.810 | 53 | | 40-135 | 0.52 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1153.534 | 58 | | 40-135 | 0.52 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1214.868 | 61 | | 40-135 | 0.51 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 968.239 | 48 | | 40-135 | 0.53 | 0.987 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 967.487 | 48 | | 40-135 | 0.44 | 1.042 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1270.780 | 64 | | 40-135 | 0.43 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 415.356 | 52 | | 40-135 | NA | 1.020 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | 04/24/17 00:00 |
| **Sample Matrix:** | Water | **Date Received:** | 04/26/17 08:35 |
| **Sample Name:** | BD-20170424 | **Units:** | pg/L |
| **Lab Code:** | E1700409-005 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** Method Sep Funnel/Jar

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 2.05 | 5.08 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 1.83 | 25.4 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 0.405 | 25.4 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | **3.06** | 0.419 | 25.4 | 1 | 0.1 | 0.306 |
| 1,2,3,7,8,9-HxCDD | **3.42** | 0.403 | 25.4 | 1 | 0.1 | 0.342 |
| 1,2,3,4,6,7,8-HpCDD | **91.0** | 0.403 | 25.4 | 1 | 0.01 | 0.910 |
| OCDD | **1030** | 0.580 | 50.8 | 1 | 0.0003 | 0.309 |
| 2,3,7,8-TCDF | ND | 2.68 | 5.08 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 0.880 | 25.4 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | **1.43** | 0.758 | 25.4 | 1 | 0.3 | 0.429 |
| 1,2,3,4,7,8-HxCDF | **2.11** | 0.298 | 25.4 | 1 | 0.1 | 0.211 |
| 1,2,3,6,7,8-HxCDF | **1.31** | 0.258 | 25.4 | 1 | 0.1 | 0.131 |
| 1,2,3,7,8,9-HxCDF | **1.29** | 0.314 | 25.4 | 1 | 0.1 | 0.129 |
| 2,3,4,6,7,8-HxCDF | **2.23** | 0.322 | 25.4 | 1 | 0.1 | 0.223 |
| 1,2,3,4,6,7,8-HpCDF | **13.8** | 0.258 | 25.4 | 1 | 0.01 | 0.138 |
| 1,2,3,4,7,8,9-HpCDF | **2.98** | 0.298 | 25.4 | 1 | 0.01 | 0.0298 |
| OCDF | **99.6** | 2.02 | 50.8 | 1 | 0.0003 | 0.0299 |
| | | Total TEQ | | | | 3.19 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 19:21 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509441 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509436 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 2.98 | 5.00 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 1.20 | 25.0 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 0.346 | 25.0 | | | 1 |
| 1,2,3,6,7,8-HxCDD | 0.746**JK** | | 0.391 | 25.0 | 0.58 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 0.360 | 25.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 3.34**JK** | | 0.325 | 25.0 | 1.54 | 1.000 | 1 |
| OCDD | 31.9**JK** | | 0.653 | 50.0 | 0.73 | 1.001 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 1.53 | 5.00 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 0.981 | 25.0 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 0.856 | 25.0 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 0.251 | 25.0 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 0.234 | 25.0 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 0.275 | 25.0 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 0.272 | 25.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | ND | U | 0.203 | 25.0 | | | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 0.237 | 25.0 | | | 1 |
| OCDF | ND | U | 2.34 | 50.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 19:21 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509441 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509436 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 2.98 | 5.00 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.20 | 25.0 | | | 1 |
| Total Hexa-Dioxins | ND | U | 0.365 | 25.0 | | | 1 |
| Total Hepta-Dioxins | 3.24**J** | | 0.325 | 25.0 | 0.98 | | 1 |
| Total Tetra-Furans | ND | U | 1.53 | 5.00 | | | 1 |
| Total Penta-Furans | ND | U | 0.912 | 25.0 | | | 1 |
| Total Hexa-Furans | ND | U | 0.257 | 25.0 | | | 1 |
| Total Hepta-Furans | ND | U | 0.227 | 25.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | Percent |
| **Lab Code:** | EQ1700171-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/11/17 19:21 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509441 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509436 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 868.254 | 43 | | 40-135 | 0.80 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1598.174 | 80 | | 40-135 | 1.61 | 1.178 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1462.216 | 73 | | 40-135 | 1.29 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1400.490 | 70 | | 40-135 | 1.33 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1492.717 | 75 | | 40-135 | 1.06 | 1.068 |
| 13C-OCDD | 4000 | 2547.869 | 64 | | 40-135 | 0.89 | 1.148 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1357.118 | 68 | | 40-135 | 0.79 | 0.993 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1743.532 | 87 | | 40-135 | 1.61 | 1.137 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 2073.246 | 104 | | 40-135 | 1.64 | 1.168 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1432.093 | 72 | | 40-135 | 0.52 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1497.067 | 75 | | 40-135 | 0.53 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1597.243 | 80 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1307.539 | 65 | | 40-135 | 0.54 | 0.987 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1199.561 | 60 | | 40-135 | 0.44 | 1.042 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1594.683 | 80 | | 40-135 | 0.45 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 548.479 | 69 | | 40-135 | NA | 1.020 |

# Accuracy & Precision

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Analyzed:** | 05/10/17 |
| **Sample Matrix:** | Water | **Date Extracted:** | 05/02/17 |

## Duplicate Lab Control Sample Summary
## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Units:** | pg/L |
| **Prep Method:** | Method Sep Funnel/Jar | **Basis:** | NA |
| | | **Analysis Lot:** | 545319 |

| | Lab Control Sample EQ1700171-02 | | | Duplicate Lab Control Sample EQ1700171-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| 1,2,3,4,6,7,8-HpCDD | 952 | 1000 | 95 | 928 | 1000 | 93 | 70-130 | 3 | 25 |
| 1,2,3,4,7,8-HxCDD | 956 | 1000 | 96 | 944 | 1000 | 94 | 70-130 | 1 | 25 |
| 1,2,3,6,7,8-HxCDD | 973 | 1000 | 97 | 929 | 1000 | 93 | 70-130 | 5 | 25 |
| 1,2,3,7,8,9-HxCDD | 1040 | 1000 | 104 | 990 | 1000 | 99 | 70-130 | 5 | 25 |
| 1,2,3,7,8-PeCDD | 1100 | 1000 | 110 | 1070 | 1000 | 107 | 70-130 | 3 | 25 |
| 2,3,7,8-TCDD | 322 | 200 | 161 * | 310 | 200 | 155 * | 70-130 | 4 | 25 |
| OCDD | 2050 | 2000 | 102 | 1970 | 2000 | 99 | 70-130 | 4 | 25 |
| | | | | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 885 | 1000 | 88 | 888 | 1000 | 89 | 70-130 | <1 | 25 |
| 1,2,3,4,7,8,9-HpCDF | 917 | 1000 | 92 | 901 | 1000 | 90 | 70-130 | 2 | 25 |
| 1,2,3,4,7,8-HxCDF | 874 | 1000 | 87 | 883 | 1000 | 88 | 70-130 | <1 | 25 |
| 1,2,3,6,7,8-HxCDF | 789 | 1000 | 79 | 746 | 1000 | 75 | 70-130 | 6 | 25 |
| 1,2,3,7,8,9-HxCDF | 854 | 1000 | 85 | 833 | 1000 | 83 | 70-130 | 3 | 25 |
| 1,2,3,7,8-PeCDF | 835 | 1000 | 83 | 817 | 1000 | 82 | 70-130 | 2 | 25 |
| 2,3,4,6,7,8-HxCDF | 916 | 1000 | 92 | 903 | 1000 | 90 | 70-130 | 1 | 25 |
| 2,3,4,7,8-PeCDF | 759 | 1000 | 76 | 758 | 1000 | 76 | 70-130 | <1 | 25 |
| 2,3,7,8-TCDF | 187 | 200 | 94 | 180 | 200 | 90 | 70-130 | 4 | 25 |
| OCDF | 1890 | 2000 | 94 | 1960 | 2000 | 98 | 70-130 | 4 | 25 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:05 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509404 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 322 | | 2.36 | 5.00 | 0.81 | 1.001 | 1 |
| 1,2,3,7,8-PeCDD | 1100 | | 1.18 | 25.0 | 1.64 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDD | 956 | | 0.417 | 25.0 | 1.29 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 973 | | 0.429 | 25.0 | 1.30 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 1040 | | 0.414 | 25.0 | 1.28 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 952 | | 0.409 | 25.0 | 1.01 | 1.000 | 1 |
| OCDD | 2050 | | 0.613 | 50.0 | 0.87 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | 187 | | 1.24 | 5.00 | 0.72 | 1.000 | 1 |
| 1,2,3,7,8-PeCDF | 835 | | 1.23 | 25.0 | 1.50 | 1.001 | 1 |
| 2,3,4,7,8-PeCDF | 759 | | 1.03 | 25.0 | 1.51 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDF | 874 | | 0.382 | 25.0 | 1.20 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 789 | | 0.340 | 25.0 | 1.15 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 854 | | 0.432 | 25.0 | 1.19 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 916 | | 0.380 | 25.0 | 1.20 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 885 | | 0.779 | 25.0 | 1.00 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 917 | | 1.07 | 25.0 | 1.01 | 1.000 | 1 |
| OCDF | 1890 | | 1.79 | 50.0 | 0.88 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:05 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509404 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | 322 | | 2.36 | 5.00 | 0.81 | | 1 |
| Total Penta-Dioxins | 1100 | | 1.18 | 25.0 | 1.64 | | 1 |
| Total Hexa-Dioxins | 2970 | | 0.420 | 25.0 | 1.29 | | 1 |
| Total Hepta-Dioxins | 964 | | 0.409 | 25.0 | 0.94 | | 1 |
| Total Tetra-Furans | 187 | | 1.24 | 5.00 | 0.72 | | 1 |
| Total Penta-Furans | 1610 | | 1.12 | 25.0 | 1.50 | | 1 |
| Total Hexa-Furans | 3430 | | 0.381 | 25.0 | 1.20 | | 1 |
| Total Hepta-Furans | 1800 | | 0.943 | 25.0 | 1.00 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | Percent |
| **Lab Code:** | EQ1700171-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:05 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509404 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 460.088 | 23 | **Y** | 40-135 | 0.83 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 778.801 | 39 | **Y** | 40-135 | 1.61 | 1.176 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 870.113 | 44 | | 40-135 | 1.36 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 874.672 | 44 | | 40-135 | 1.29 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 816.101 | 41 | | 40-135 | 1.09 | 1.069 |
| 13C-OCDD | 4000 | 1276.059 | 32 | **Y** | 40-135 | 0.89 | 1.149 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 760.904 | 38 | **Y** | 40-135 | 0.80 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 856.305 | 43 | | 40-135 | 1.58 | 1.135 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1060.574 | 53 | | 40-135 | 1.58 | 1.166 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 853.549 | 43 | | 40-135 | 0.53 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 917.107 | 46 | | 40-135 | 0.53 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 939.084 | 47 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 846.626 | 42 | | 40-135 | 0.52 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 686.683 | 34 | **Y** | 40-135 | 0.45 | 1.043 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 803.480 | 40 | | 40-135 | 0.44 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 313.071 | 39 | **Y** | 40-135 | NA | 1.020 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:54 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509405 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 310 | | 2.35 | 5.00 | 0.81 | 1.001 | 1 |
| 1,2,3,7,8-PeCDD | 1070 | | 0.809 | 25.0 | 1.56 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDD | 944 | | 0.187 | 25.0 | 1.26 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 929 | | 0.200 | 25.0 | 1.28 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 990 | | 0.189 | 25.0 | 1.27 | 1.006 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 928 | | 0.292 | 25.0 | 1.03 | 1.000 | 1 |
| OCDD | 1970 | | 0.543 | 50.0 | 0.87 | 1.001 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | 180 | | 0.939 | 5.00 | 0.71 | 1.001 | 1 |
| 1,2,3,7,8-PeCDF | 817 | | 0.499 | 25.0 | 1.50 | 1.000 | 1 |
| 2,3,4,7,8-PeCDF | 758 | | 0.436 | 25.0 | 1.50 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDF | 883 | | 0.106 | 25.0 | 1.17 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 746 | | 0.0950 | 25.0 | 1.18 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 833 | | 0.126 | 25.0 | 1.16 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 903 | | 0.113 | 25.0 | 1.20 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 888 | | 0.624 | 25.0 | 1.02 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 901 | | 0.835 | 25.0 | 0.99 | 1.000 | 1 |
| OCDF | 1960 | | 2.04 | 50.0 | 0.87 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1700171-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:54 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509405 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | 311 | | 2.35 | 5.00 | 0.81 | | 1 |
| Total Penta-Dioxins | 1070 | | 0.809 | 25.0 | 1.56 | | 1 |
| Total Hexa-Dioxins | 2860 | | 0.192 | 25.0 | 1.26 | | 1 |
| Total Hepta-Dioxins | 928 | | 0.292 | 25.0 | 1.03 | | 1 |
| Total Tetra-Furans | 180 | | 0.939 | 5.00 | 0.71 | | 1 |
| Total Penta-Furans | 1570 | | 0.465 | 25.0 | 1.50 | | 1 |
| Total Hexa-Furans | 3360 | | 0.109 | 25.0 | 1.17 | | 1 |
| Total Hepta-Furans | 1790 | | 0.747 | 25.0 | 1.02 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1700409 |
| **Project:** | Diamond P Ranch - West Yellowstone/776-029-001 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | Percent |
| **Lab Code:** | EQ1700171-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 05/10/17 09:54 |
| **Prep Method:** | Method Sep Funnel/Jar | **Date Extracted:** | 5/2/17 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P509405 | **Blank File Name:** | P509441 |
| **ICAL Date:** | 12/15/16 | **Cal Ver. File Name:** | P509394 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 632.850 | 32 | **Y** | 40-135 | 0.80 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1049.161 | 52 | | 40-135 | 1.56 | 1.176 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1172.297 | 59 | | 40-135 | 1.32 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1119.907 | 56 | | 40-135 | 1.29 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1016.276 | 51 | | 40-135 | 1.08 | 1.069 |
| 13C-OCDD | 4000 | 1456.195 | 36 | **Y** | 40-135 | 0.90 | 1.148 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 991.457 | 50 | | 40-135 | 0.79 | 0.993 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1193.273 | 60 | | 40-135 | 1.60 | 1.135 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1377.465 | 69 | | 40-135 | 1.59 | 1.166 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1160.143 | 58 | | 40-135 | 0.52 | 0.971 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1273.582 | 64 | | 40-135 | 0.51 | 0.974 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1252.406 | 63 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1067.168 | 53 | | 40-135 | 0.51 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 886.981 | 44 | | 40-135 | 0.43 | 1.043 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1043.139 | 52 | | 40-135 | 0.44 | 1.082 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 416.234 | 52 | | 40-135 | NA | 1.020 |

October 03, 2016 Service Request No:E1600910

Lucas Darnell
Trihydro Corporation
2707 Broadwater Avenue
Helena, MT 59601

**Laboratory Results for: Diamond P Ranch**

Dear Lucas,

Enclosed are the results of the sample(s) submitted to our laboratory September 15, 2016
For your reference, these analyses have been assigned our service request number **E1600910.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 2279. You may also contact me via email at Arthi.Kodur@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Arthi Kodur
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 713 266 1599 | FAX +1 713 266 0130
ALS Group USA, Corp.
dba ALS Environmental

# Certificate of Analysis

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

**ALS ENVIRONMENTAL**

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request No.:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Received:** | 9/15/16 |
| **Sample Matrix:** | Water | | |

**ALS ENVIRONMENTAL NARRATIVE**

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

## Sample Receipt

Four water samples were received for analysis at ALS Environmental – Houston HRMS on 9/15/16.

The samples were received at 5.4°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

## Data Validation Notes and Discussion

### Method Blank

The Method Blank EQ1600425-01 contained low levels of various analytes above the EDL, but below the Method Reporting Limit (MRL).

The associated compounds in the samples, regardless of concentration, are flagged with 'B' flags, which may be <10 times the concentration in the MB.

### Precision and Accuracy

EQ1600425: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for this extraction batch. The batch quality control criteria were met.

### 2378-TCDF

Samples analyzed on the DB-5MSUI column were analyzed under conditions where sufficient separation between 2,3,7,8-TCDF and its closest eluter was achieved. Confirmation of this result was not required.

### Y flags – Labeled Standards

Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.

### K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

**Detection Limits**

Detection limits are calculated for each analyte in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

**The TEQ Summary results for each sample have been calculated by ALS ENVIRONMENTAL/Houston to include:**

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** Trihydro Corporation **Service Request:**E1600910
**Project:** Diamond P Ranch

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E1600910-001 | MW-1 | 9/13/2016 | 0935 |
| E1600910-002 | MW-3 | 9/12/2016 | 1615 |
| E1600910-003 | MW-4 | 9/12/2016 | 1225 |
| E1600910-004 | BD-20160912-02 | 9/12/2016 | |

# Service Request Summary

**Folder #:** **E1600910**
Client Name: Trihydro Corporation
Project Name: Diamond P Ranch
Project Number:

**Report To:** Lucas Darnell
Trihydro Corporation
2707 Broadwater Avenue
Helena, MT 59601
USA
Phone Number: 406-558-4853
Cell Number:
Fax Number:
E-mail: ldarnell@trihydro.com

Project Chemist: Arthi Kodur
Originating Lab: HOUSTON
Logged By: TWOODS
Date Received: 09/15/16
Internal Due Date: 9/30/2016
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number:
EDD: No EDD Specified

8 1000 ml-Glass Bottle NM AMBER Teflon Liner Unpreserved
**Location:** EHRMS-WIC 2D, E-Disposed
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON PCDD PCDF/8290 |
|---|---|---|---|---|
| E1600910-001 | MW-1 | Water | 09/13/16 0935 | II |
| E1600910-002 | MW-3 | Water | 09/12/16 1615 | II |
| E1600910-003 | MW-4 | Water | 09/12/16 1225 | II |
| E1600910-004 | BD-20160912-02 | Water | 09/12/16 | II |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E1600910** | Project Chemist: | Arthi Kodur |
| Client Name: | Trihydro Corporation | Originating Lab: | HOUSTON |
| Project Name: | Diamond P Ranch | Logged By: | TWOODS |
| Project Number: | | Date Received: | 09/15/16 |
| | | Internal Due Date: | 9/30/2016 |
| **Report To:** | Lucas Darnell | QAP: | LAB QAP |
| | Trihydro Corporation | Qualifier Set: | Lab Standard |
| | 2707 Broadwater Avenue | Formset: | Lab Standard |
| | Helena, MT 59601 | Merged?: | N |
| | USA | | |
| Phone Number: | 406-558-4853 | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ldarnell@trihydro.com | | |

8 1000 ml-Glass Bottle NM AMBER Teflon Liner Unpreserved

**Location:** EHRMS-WIC 2D, E-Disposed

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | PCDD PCDF/8290 | 4 | full list (ak 9/16/16) |

# Data Qualifiers

## HRMS Qualifier Set

B Indicates the associated analyte was found in the method blank at >1/10th the reported value.
E Estimated value. The reported concentration is above the calibration range of the instrument.
H Sample extracted and/or analyzed out of suggested holding time.
J Estimated value. The reported concentration is below the MRL.
K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits.The concentration of this analyte should be considered as an estimate.
P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.
Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.
S Signal saturated detector. Result reported from dilution.
U Compound was analyzed for, but was not detected (ND).
X See Case Narrative.
Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.
i The MDL/MRL have been elevated due to a matrix interference.

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

ALS Environmental

# State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| American Association for Laboratory Accreditation | 2897.01 | 11/30/2017 |
| Arizona Department of Health Services | AZ0793 | 5/27/2017 |
| Arkansas Department of Environmental Quality | 14-038-0 | 6/16/2017 |
| California Department of Health Services | 2452 | 2/28/2017 |
| Florida Department of Health | E87611 | 6/30/2017 |
| Hawaii Department of Health | TX02694 | 4/30/2017 |
| Illinois Environmental Protection Agency | 200057 | 5/9/2017 |
| Kansas Department of Health and Environment | E-10406 | 10/31/2016 |
| Louisiana Department of Environmental Quality | 03048 | 6/30/2017 |
| Louisiana Department of Health and Hospitals | LA150026 | 12/31/2016 |
| Maine Center for Disease Control and Prevention | 2014019 | 6/5/2018 |
| Maryland Department of the Environment | 343 | 6/30/2017 |
| Michigan Depratment of Environmental Quality | 9971 | 6/5/2018 |
| Minnesota Department of Health | 840911 | 12/31/2016 |
| Nebraska Department of Health and Human Services | NE-OS-25-13 | 4/30/2017 |
| Nevada Department of Concervation and Natural Resources | TX014112013-2 | 7/31/2017 |
| New Jersey Department of Environmental Protection | NLC140001 | 6/30/2017 |
| New Mexico Environment Department | TX02694 | 4/17/2017 |
| New York Department of Health | 11707 | 4/1/2017 |
| Oklahoma Department of Environmental Quality | 2014 124 | 8/21/2017 |
| Oregon Environmental Laboratory Accreditation Program | TX200002 | 3/24/2017 |
| Pennsylvania Department of Environmental Protection | 68-03441 | 6/30/2017 |
| Tennessee Department of Environment and Concervation | 04016 | 6/30/2017 |
| Texas Commision on Environmental Quality | TX104704216-14-5 | 6/30/2017 |
| United States Department of Agriculture | P330-14-00067 | 2/21/2017 |
| Utah Department of Health Environmental Laboratory Certification | TX02694 | 7/31/2017 |
| Washington Department of Health | c819 | 11/14/2016 |
| West Virginia Department of Environmental Protection | 347 | 6/30/2017 |

# ALS ENVIRONMENTAL – Houston
## Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1600910 DB-5MSUI SPB-Octyl

**First Level - Data Processing** - to be filled by person generating the forms

| Date: | Analyst: | Samples: |
|---|---|---|
| 09/30/16 | JR | -001, -002, -003, -004 |

**Second Level - Data Review** – to be filled by person doing peer review

| Date: | Analyst: | Samples: |
|---|---|---|
| 10/03/16 | LKL | 001-004 |

PEER REVIEW PAGE2015

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Chain of Custody Form

ALS Environmental

Page 1 of 1

COC ID: 123456

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- ☐ Houston, TX +1 281 530 5656
- ☐ Spring City, PA +1 610 948 4903
- ☐ Fort Collins, CO +1 970 490 1511
- ☐ Middletown, PA +1 717 944 5541
- ☐ York, PA +1 717 505 5280

ALS Project Manager: | Work Order #:

| Customer Information | | Project Information | | Parameter/Method Request for Analysis | |
|---|---|---|---|---|---|
| Purchase Order | | Project Name | Diamond P Ranch | A | Dioxins / Furans |
| Work Order | | Project Number | | B | |
| Company Name | Trihydro | Bill To Company | Trihydro | C | |
| Send Report To | Andrew Vann | Invoice Attn. | | D | |
| Address | 1252 Commerce Dr. Laramie, WY 82070 | Address | | E | |
| | | | | F | |
| City/State/Zip | | City/State/Zip | | G | |
| Phone | 307 745 7474 | Phone | | H | |
| Fax | | Fax | | I | |
| e-Mail Address | avann@trihydro.com | e-Mail Address | up@trihydro.com | J | |

E1600910 5
Trihydro Corporation
Dioxin Groundwater Analysis

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW-1 | 9/13/16 | 0935 | W | N | 2 | X | | | | | | | | | | |
| 2 | MW-3 | 9/13/16 | 1615 | W | N | 2 | X | | | | | | | | | | |
| 3 | MW-4 | 9/13/16 | 1225 | W | N | 2 | X | | | | | | | | | | |
| 4 | BD-20160912-02 | 9/13/16 | — | W | N | 2 | X | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Sampler(s): Please Print & Sign: Z. Durell

Shipment Method:

Required Turnaround Time: ☑ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

| Relinquished by: | Date: | Time: | Received by: | Notes: |
|---|---|---|---|---|
| | 9/14/16 | 0700 | | |
| Relinquished by: | Date: | Time: | Received by (Laboratory): Michele Brown for Jonna Nowlin | Cooler Temp. |
| Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory): | |

QC Package: (Check Box Below)
- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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# Cooler Receipt Form

ALS Environmental

Project Chemist: AK

Client/Project: Trihyd

Thermometer ID: SMO 04

Date/Time Received: 9-15-16 9:50 Initials: JW

Date/Time Logged in: 9/15/16 1520 Initials: MB

1. Method of delivery: ○ US Mail ✓ Fed Ex ○ UPS ○ DHL ○ Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ✓ Yes ○ No

Were they intact? ✓ Yes ○ No ○ N/A

Were they signed and dated? ✓ Yes ○ No ○ N/A

If yes, how many and where? 1 Seal

4. Packing Material: ○ Inserts ○ Baggies ○ Bubble Wrap ○ Gel Packs ○ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| 6786 7199 9860 | | 9-15-16 | 11:10 | JW | 5.4 | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E1600910 5
Trihydro Corporation
Dioxin Groundwater Analysis

Effective 10/04/2013

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
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**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 271339 **Prep WorkFlow:** OrgExtDioxAq-30 **Status:** Prepped
**Team:** Semivoa GCMS/JPHAN **Prep Method:** EPA 3510C **Prep Date/Time:** 9/21/16 10:00 AM

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E1600907-001 | AFR8002 | .01 | 8290A/PCDD PCDF | 4 | x | Water | 1050mL | Clear Colorless Liquid |
| 2 | E1600909-001 | TAS-16-MW01-221 | .02 | 8290/PCDD PCDF | 7 | x | Water | 878mL | Clear Colorless Liquid |
| 3 | E1600909-002 | TAS-16-MW101-222 | .02 | 8290/PCDD PCDF | 7 | x | Water | 909mL | Hazy Colorless Liquid |
| 4 | E1600910-001 | MW-1 | .02 | 8290/PCDD PCDF | 7 | x | Water | 893mL | Hazy Colorless Liquid |
| 5 | E1600910-002 | MW-3 | .02 | 8290/PCDD PCDF | 7 | x | Water | 961mL | Clear Colorless Liquid |
| 6 | E1600910-003 | MW-4 | .02 | 8290/PCDD PCDF | 7 | x | Water | 1058mL | Clear Colorless Liquid |
| 7 | E1600910-004 | BD-20160912-02 | .02 | 8290/PCDD PCDF | 7 | x | Water | 929mL | Clear Colorless Liquid |
| 8 | E1600915-001 | Effluent Composite | .01 | 8290/PCDD PCDF | 7 | x | Wastewater | 967mL | Turbid Yellow Liquid |
| 9 | E1600918-001 | 2175015 001 | .01 | 8290/PCDD PCDF | 6 | x | Ground Water | 1027mL | Turbid Yellow Liquid |
| 10 | E1600918-002 | 2175015 002 | .01 | 8290/PCDD PCDF | 6 | x | Ground Water | 1023mL | Turbid Yellow Liquid |
| 11 | E1600918-003 | 2175015 003 | .01 | 8290/PCDD PCDF | 7 | x | Ground Water | 1016mL | Clear Colorless Liquid |
| 12 | E1600918-004 | 2175015 004 | .01 | 8290/PCDD PCDF | 4 | x | Water | 1014mL | Clear Colorless Liquid |
| 13 | EQ1600425-01 | MB | | 8290A/PCDD PCDF | 5 | x | Liquid | 1000mL | |
| 14 | EQ1600425-02 | LCS | | 8290A/PCDD PCDF | 5 | x | Liquid | 1000mL | |
| 15 | EQ1600425-03 | DLCS | | 8290A/PCDD PCDF | 5 | x | Liquid | 1000mL | |
| 16 | K1610758-013 | Inf-20-20-7.5 (4) | .07 | 8290A/PCDD PCDF | 7 | x | Ground Water | 1034mL | Hazy Colorless Liquid |
| 17 | K1610758-014 | Eff-20-20-7.5 (4) | .07 | 8290A/PCDD PCDF | 7 | x | Ground Water | 1032mL | Hazy Colorless Liquid |
| 18 | K1611059-001 | Inf-40-10-5 | .10 | 8290A/PCDD PCDF | 7 | x | Ground Water | 1040mL | Cloudy Yellow Liquid |
| 19 | K1611059-002 | Eff-40-10-5 | .10 | 8290A/PCDD PCDF | 7 | x | Ground Water | 1011mL | Cloudy Yellow Liquid |

CID 9/27/16

# *Preparation Information Benchsheet*

**Prep Run#:** 271339 **Prep WorkFlow:** OrgExtDioxAq-30 **Status:** Prepped
**Team:** Semivoa GCMS/JPHAN **Prep Method:** EPA 3510C **Prep Date/Time:** 9/21/16 10:00 AM

**Spiking Solutions**

| Name: | 1613B Matrix Working Standard | Inventory ID | 175530 | Logbook Ref: | 175330 AL 9/7/16 2-20 ng/mL | Expires On: | 03/06/2017 |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ1600425-02 | 100.00µL | EQ1600425-02 | 100.00µL | EQ1600425-03 | 100.00µL | EQ1600425-03 | 100.00µL |

| Name: | 8290/1613B Cleanup Working Standard | Inventory ID | 175737 | Logbook Ref: | 175737 9/16/16 CID 8.0 ng/ml | Expires On: | 11/12/2016 |
|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E1600907-001 | 100.00µL | E1600909-001 | 100.00µL | E1600909-002 | 100.00µL | E1600910-001 | 100.00µL | E1600910-002 | 100.00µL | E1600910-003 | 100.00µL |
| E1600910-004 | 100.00µL | E1600915-001 | 100.00µL | E1600918-001 | 100.00µL | E1600918-002 | 100.00µL | E1600918-003 | 100.00µL | E1600918-004 | 100.00µL |
| EQ1600425-01 | 100.00µL | EQ1600425-01 | 100.00µL | EQ1600425-02 | 100.00µL | EQ1600425-02 | 100.00µL | EQ1600425-03 | 100.00µL | EQ1600425-03 | 100.00µL |
| K1610758-013 | 100.00µL | K1610758-014 | 100.00µL | K1611059-001 | 100.00µL | K1611059-002 | 100.00µL | | | | |

| Name: | 1613B Labeled Working Standard | Inventory ID | 175841 | Logbook Ref: | JP 175841 9/21/16 2-4 ng/mL | Expires On: | 01/18/2017 |
|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E1600907-001 | 1,000.00µL | E1600909-001 | 1,000.00µL | E1600909-002 | 1,000.00µL | E1600910-001 | 1,000.00µL | E1600910-002 | 1,000.00µL | E1600910-003 | 1,000.00µL |
| E1600910-004 | 1,000.00µL | E1600915-001 | 1,000.00µL | E1600918-001 | 1,000.00µL | E1600918-002 | 1,000.00µL | E1600918-003 | 1,000.00µL | E1600918-004 | 1,000.00µL |
| EQ1600425-01 | 1,000.00µL | EQ1600425-01 | 1,000.00µL | EQ1600425-02 | 1,000.00µL | EQ1600425-02 | 1,000.00µL | EQ1600425-03 | 1,000.00µL | EQ1600425-03 | 1,000.00µL |
| K1610758-013 | 1,000.00µL | K1610758-014 | 1,000.00µL | K1611059-001 | 1,000.00µL | K1611059-002 | 1,000.00µL | | | | |

**Preparation Materials**

| | | | | | |
|---|---|---|---|---|---|
| Sensafe Free Chlorine WTR CHK | LM 3/19/15 (79756) | Carbon, High Purity | AL 9/2/16 (175440) | Ethyl Acetate 99.9% Minimum EtOAc | AL 8/17/16 (175088) |
| Glass Wool | CIS 8/19/16 (175084) | Hexanes 95% | CID 9/14/16 (175700) | Dichloromethane (Methylene Chloride) 99.9% MeCl2 | CID 7/28/16 (174570) |
| Sodium Chloride Reagent Grade NaCl | C2-65-5 (38670) | Sodium Hydroxide Reagent Grade NaOH | 05/12/2016 CID (172369) | Sodium Sulfate Anhydrous Reagent Grade Na2SO4 | AL 06/28/16 (173644) |
| Tridecane (n-Tridecane) | AL 08/15/16 (174970) | ColorpHast pH-Indicator Strips | AL 8/17/16 (175089) | Silica Gel | CID 9/15/16 (175729) |
| sulfuric acid | CID 9/21/16 (175847) | Toluene 99.9% Minimum | AL 9/19/16 (175751) | | |

**Preparation Steps**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Step: | Extraction | Step: | Acid Clean | Step: | Silica Gel Clean | Step: | Final Volume |
| Started: | 9/21/16 10:00 | Started: | 9/23/16 07:10 | Started: | 9/23/16 11:00 | Started: | 9/27/16 08:40 |
| Finished: | 9/21/16 18:00 | Finished: | 9/23/16 07:20 | Finished: | 9/23/16 14:00 | Finished: | 9/27/16 09:05 |
| By: | JPHAN | By: | CDIAZ | By: | CDIAZ | By: | CDIAZ |
| Comments | | Comments | | Comments | | Comments | |

Comments: _____

# *Preparation Information Benchsheet*

**Prep Run#:** 271339 **Prep WorkFlow:** OrgExtDioxAq-30 **Status:** Prepped
**Team:** Semivoa GCMS/JPHAN **Prep Method:** EPA 3510C **Prep Date/Time:** 9/21/16 10:00 AM

Reviewed By: _____ Date: _____

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/13/16 09:35 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1600910-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 12:53 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 893mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404797 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 2.23 | 5.60 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 1.80 | 28.0 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 2.43 | 28.0 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 2.52 | 28.0 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 2.32 | 28.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 11.2**BJK** | | 6.11 | 28.0 | 1.35 | 1.000 | 1 |
| OCDD | 72.0**B** | | 3.91 | 56.0 | 0.83 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 3.57 | 5.60 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 2.46 | 28.0 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 2.60 | 28.0 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 2.14 | 28.0 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 1.97 | 28.0 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 2.58 | 28.0 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 2.07 | 28.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | 3.04**BJK** | | 2.58 | 28.0 | 0.84 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 2.85 | 28.0 | | | 1 |
| OCDF | ND | U | 11.6 | 56.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/13/16 09:35 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1600910-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 12:53 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 893mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404797 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 2.23 | 5.60 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.80 | 28.0 | | | 1 |
| Total Hexa-Dioxins | ND | U | 2.42 | 28.0 | | | 1 |
| Total Hepta-Dioxins | ND | U | 6.11 | 28.0 | | | 1 |
| Total Tetra-Furans | ND | U | 3.57 | 5.60 | | | 1 |
| Total Penta-Furans | ND | U | 2.52 | 28.0 | | | 1 |
| Total Hexa-Furans | ND | U | 2.17 | 28.0 | | | 1 |
| Total Hepta-Furans | ND | U | 2.71 | 28.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/13/16 09:35 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-1 | **Units:** | Percent |
| **Lab Code:** | E1600910-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 12:53 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 893mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404797 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1211.039 | 61 | | 40-135 | 0.79 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1489.193 | 74 | | 40-135 | 1.57 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1680.084 | 84 | | 40-135 | 1.22 | 0.991 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1639.889 | 82 | | 40-135 | 1.25 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1176.072 | 59 | | 40-135 | 1.04 | 1.065 |
| 13C-OCDD | 4000 | 1726.343 | 43 | | 40-135 | 0.88 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1282.727 | 64 | | 40-135 | 0.77 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1515.976 | 76 | | 40-135 | 1.58 | 1.127 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1499.777 | 75 | | 40-135 | 1.55 | 1.156 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1543.530 | 77 | | 40-135 | 0.51 | 0.973 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1640.319 | 82 | | 40-135 | 0.52 | 0.975 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1511.828 | 76 | | 40-135 | 0.50 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1633.325 | 82 | | 40-135 | 0.52 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1149.992 | 57 | | 40-135 | 0.44 | 1.040 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1310.983 | 66 | | 40-135 | 0.44 | 1.079 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 607.409 | 76 | | 40-135 | NA | 1.019 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/13/16 09:35 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-1 | **Units:** | pg/L |
| **Lab Code:** | E1600910-001 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** EPA 3510C

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 2.23 | 5.60 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 1.80 | 28.0 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 2.43 | 28.0 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 2.52 | 28.0 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 2.32 | 28.0 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **11.2** | 6.11 | 28.0 | 1 | 0.01 | 0.112 |
| OCDD | **72.0** | 3.91 | 56.0 | 1 | 0.0003 | 0.0216 |
| 2,3,7,8-TCDF | ND | 3.57 | 5.60 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 2.46 | 28.0 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 2.60 | 28.0 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 2.14 | 28.0 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | ND | 1.97 | 28.0 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDF | ND | 2.58 | 28.0 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 2.07 | 28.0 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | **3.04** | 2.58 | 28.0 | 1 | 0.01 | 0.0304 |
| 1,2,3,4,7,8,9-HpCDF | ND | 2.85 | 28.0 | 1 | 0.01 | |
| OCDF | ND | 11.6 | 56.0 | 1 | 0.0003 | |
| | Total TEQ | | | | | 0.164 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 16:15 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1600910-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 13:42 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 961mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404798 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 3.13 | 5.20 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 2.28 | 26.0 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 2.00 | 26.0 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 2.09 | 26.0 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 1.92 | 26.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 11.8**BJ** | | 4.61 | 26.0 | 1.02 | 1.000 | 1 |
| OCDD | 64.4**B** | | 1.22 | 52.0 | 0.81 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 2.61 | 5.20 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 2.04 | 26.0 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 2.02 | 26.0 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 1.71 | 26.0 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 1.50 | 26.0 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 2.06 | 26.0 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 1.64 | 26.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | ND | U | 2.27 | 26.0 | | | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 2.56 | 26.0 | | | 1 |
| OCDF | ND | U | 8.76 | 52.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 16:15 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1600910-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 13:42 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 961mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404798 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 3.13 | 5.20 | | | 1 |
| Total Penta-Dioxins | ND | U | 2.28 | 26.0 | | | 1 |
| Total Hexa-Dioxins | ND | U | 2.00 | 26.0 | | | 1 |
| Total Hepta-Dioxins | 11.8**J** | | 4.61 | 26.0 | 1.02 | | 1 |
| Total Tetra-Furans | ND | U | 2.61 | 5.20 | | | 1 |
| Total Penta-Furans | ND | U | 2.03 | 26.0 | | | 1 |
| Total Hexa-Furans | ND | U | 1.71 | 26.0 | | | 1 |
| Total Hepta-Furans | 6.26**J** | | 2.41 | 26.0 | 0.91 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 16:15 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-3 | **Units:** | Percent |
| **Lab Code:** | E1600910-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 13:42 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 961mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404798 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1307.753 | 65 | | 40-135 | 0.76 | 1.018 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1606.338 | 80 | | 40-135 | 1.58 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1887.777 | 94 | | 40-135 | 1.25 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1784.446 | 89 | | 40-135 | 1.24 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1325.409 | 66 | | 40-135 | 1.04 | 1.065 |
| 13C-OCDD | 4000 | 2106.251 | 53 | | 40-135 | 0.88 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1404.065 | 70 | | 40-135 | 0.77 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1605.755 | 80 | | 40-135 | 1.55 | 1.127 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1618.225 | 81 | | 40-135 | 1.54 | 1.155 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1713.392 | 86 | | 40-135 | 0.51 | 0.973 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1834.365 | 92 | | 40-135 | 0.51 | 0.976 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1688.070 | 84 | | 40-135 | 0.52 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1841.296 | 92 | | 40-135 | 0.49 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1272.509 | 64 | | 40-135 | 0.43 | 1.040 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1489.607 | 74 | | 40-135 | 0.42 | 1.079 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 639.088 | 80 | | 40-135 | NA | 1.019 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 16:15 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-3 | **Units:** | pg/L |
| **Lab Code:** | E1600910-002 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** EPA 3510C

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 3.13 | 5.20 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 2.28 | 26.0 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 2.00 | 26.0 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 2.09 | 26.0 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 1.92 | 26.0 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **11.8** | 4.61 | 26.0 | 1 | 0.01 | 0.118 |
| OCDD | **64.4** | 1.22 | 52.0 | 1 | 0.0003 | 0.0193 |
| 2,3,7,8-TCDF | ND | 2.61 | 5.20 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 2.04 | 26.0 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 2.02 | 26.0 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 1.71 | 26.0 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | ND | 1.50 | 26.0 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDF | ND | 2.06 | 26.0 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 1.64 | 26.0 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | ND | 2.27 | 26.0 | 1 | 0.01 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 2.56 | 26.0 | 1 | 0.01 | |
| OCDF | ND | 8.76 | 52.0 | 1 | 0.0003 | |
| | Total TEQ | | | | | 0.137 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 12:25 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1600910-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 14:31 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1058mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404799 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 3.13 | 4.73 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 3.06 | 23.6 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 2.29 | 23.6 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 2.39 | 23.6 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 2.19 | 23.6 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 13.9**BJK** | | 4.11 | 23.6 | 0.85 | 1.000 | 1 |
| OCDD | 131 | | 1.01 | 47.3 | 0.96 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 2.37 | 4.73 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 2.30 | 23.6 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 2.35 | 23.6 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 2.31 | 23.6 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 2.12 | 23.6 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 2.84 | 23.6 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 2.27 | 23.6 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | ND | U | 1.98 | 23.6 | | | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 2.31 | 23.6 | | | 1 |
| OCDF | 15.9**J** | | 6.52 | 47.3 | 0.80 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 12:25 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1600910-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 14:31 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1058mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404799 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 3.13 | 4.73 | | | 1 |
| Total Penta-Dioxins | ND | U | 3.06 | 23.6 | | | 1 |
| Total Hexa-Dioxins | ND | U | 2.29 | 23.6 | | | 1 |
| Total Hepta-Dioxins | ND | U | 4.11 | 23.6 | | | 1 |
| Total Tetra-Furans | ND | U | 2.37 | 4.73 | | | 1 |
| Total Penta-Furans | ND | U | 2.32 | 23.6 | | | 1 |
| Total Hexa-Furans | ND | U | 2.36 | 23.6 | | | 1 |
| Total Hepta-Furans | ND | U | 2.14 | 23.6 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 12:25 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-4 | **Units:** | Percent |
| **Lab Code:** | E1600910-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 14:31 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1058mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404799 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 985.205 | 49 | | 40-135 | 0.77 | 1.018 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1243.419 | 62 | | 40-135 | 1.56 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1438.056 | 72 | | 40-135 | 1.23 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1339.400 | 67 | | 40-135 | 1.25 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1032.070 | 52 | | 40-135 | 1.07 | 1.065 |
| 13C-OCDD | 4000 | 1687.787 | 42 | | 40-135 | 0.88 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1072.710 | 54 | | 40-135 | 0.76 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1227.226 | 61 | | 40-135 | 1.55 | 1.127 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1219.895 | 61 | | 40-135 | 1.62 | 1.155 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1291.711 | 65 | | 40-135 | 0.51 | 0.973 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1340.527 | 67 | | 40-135 | 0.51 | 0.976 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1233.632 | 62 | | 40-135 | 0.49 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1341.007 | 67 | | 40-135 | 0.52 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 985.778 | 49 | | 40-135 | 0.43 | 1.040 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1109.563 | 55 | | 40-135 | 0.44 | 1.079 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 525.022 | 66 | | 40-135 | NA | 1.019 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 12:25 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | MW-4 | **Units:** | pg/L |
| **Lab Code:** | E1600910-003 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** EPA 3510C

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 3.13 | 4.73 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 3.06 | 23.6 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 2.29 | 23.6 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 2.39 | 23.6 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 2.19 | 23.6 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **13.9** | 4.11 | 23.6 | 1 | 0.01 | 0.139 |
| OCDD | **131** | 1.01 | 47.3 | 1 | 0.0003 | 0.0393 |
| 2,3,7,8-TCDF | ND | 2.37 | 4.73 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 2.30 | 23.6 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 2.35 | 23.6 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 2.31 | 23.6 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | ND | 2.12 | 23.6 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDF | ND | 2.84 | 23.6 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 2.27 | 23.6 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | ND | 1.98 | 23.6 | 1 | 0.01 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 2.31 | 23.6 | 1 | 0.01 | |
| OCDF | **15.9** | 6.52 | 47.3 | 1 | 0.0003 | 0.00477 |
| | Total TEQ | | | | | 0.183 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | BD-20160912-02 | **Units:** | pg/L |
| **Lab Code:** | E1600910-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 15:20 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 929mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404800 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 2.48 | 5.38 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 1.25 | 26.9 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 1.79 | 26.9 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 1.82 | 26.9 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 1.69 | 26.9 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 5.53**BJK** | | 3.29 | 26.9 | 1.45 | 1.001 | 1 |
| OCDD | 41.2**BJ** | | 1.83 | 53.8 | 0.82 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 1.81 | 5.38 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 1.40 | 26.9 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 1.43 | 26.9 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 1.49 | 26.9 | | | 1 |
| 1,2,3,6,7,8-HxCDF | ND | U | 1.35 | 26.9 | | | 1 |
| 1,2,3,7,8,9-HxCDF | ND | U | 1.77 | 26.9 | | | 1 |
| 2,3,4,6,7,8-HxCDF | ND | U | 1.43 | 26.9 | | | 1 |
| 1,2,3,4,6,7,8-HpCDF | 2.55**BJK** | | 0.938 | 26.9 | 1.26 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 1.07 | 26.9 | | | 1 |
| OCDF | ND | U | 6.32 | 53.8 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | BD-20160912-02 | **Units:** | pg/L |
| **Lab Code:** | E1600910-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 15:20 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 929mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404800 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 2.48 | 5.38 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.25 | 26.9 | | | 1 |
| Total Hexa-Dioxins | ND | U | 1.77 | 26.9 | | | 1 |
| Total Hepta-Dioxins | 6.74**J** | | 3.29 | 26.9 | 0.97 | | 1 |
| Total Tetra-Furans | ND | U | 1.81 | 5.38 | | | 1 |
| Total Penta-Furans | ND | U | 1.42 | 26.9 | | | 1 |
| Total Hexa-Furans | ND | U | 1.49 | 26.9 | | | 1 |
| Total Hepta-Furans | 4.90**J** | | 1.01 | 26.9 | 1.11 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | BD-20160912-02 | **Units:** | Percent |
| **Lab Code:** | E1600910-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/29/16 15:20 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 929mL | **Instrument Name:** | E-HRMS-06 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P404800 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 04/28/16 | **Cal Ver. File Name:** | P404792 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1333.774 | 67 | | 40-135 | 0.77 | 1.018 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1613.345 | 81 | | 40-135 | 1.54 | 1.165 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1758.261 | 88 | | 40-135 | 1.25 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1686.196 | 84 | | 40-135 | 1.27 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1279.642 | 64 | | 40-135 | 1.04 | 1.065 |
| 13C-OCDD | 4000 | 2153.422 | 54 | | 40-135 | 0.88 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1334.229 | 67 | | 40-135 | 0.75 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1564.004 | 78 | | 40-135 | 1.56 | 1.127 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1562.595 | 78 | | 40-135 | 1.55 | 1.155 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1564.610 | 78 | | 40-135 | 0.50 | 0.973 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1644.468 | 82 | | 40-135 | 0.51 | 0.976 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1579.322 | 79 | | 40-135 | 0.50 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1655.322 | 83 | | 40-135 | 0.50 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1198.739 | 60 | | 40-135 | 0.42 | 1.040 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1409.425 | 70 | | 40-135 | 0.42 | 1.079 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 696.018 | 87 | | 40-135 | NA | 1.018 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | 09/12/16 |
| **Sample Matrix:** | Water | **Date Received:** | 09/15/16 09:50 |
| **Sample Name:** | BD-20160912-02 | **Units:** | pg/L |
| **Lab Code:** | E1600910-004 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

**Analysis Method:** 8290

**Prep Method:** EPA 3510C

**Toxicity Equivalency Quotient**

| Analyte Name | Result | DL | MRL | Dilution Factor | TEF | TEF - Adjusted Concentration |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 2.48 | 5.38 | 1 | 1 | |
| 1,2,3,7,8-PeCDD | ND | 1.25 | 26.9 | 1 | 1 | |
| 1,2,3,4,7,8-HxCDD | ND | 1.79 | 26.9 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDD | ND | 1.82 | 26.9 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDD | ND | 1.69 | 26.9 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDD | **5.53** | 3.29 | 26.9 | 1 | 0.01 | 0.0553 |
| OCDD | **41.2** | 1.83 | 53.8 | 1 | 0.0003 | 0.0124 |
| 2,3,7,8-TCDF | ND | 1.81 | 5.38 | 1 | 0.1 | |
| 1,2,3,7,8-PeCDF | ND | 1.40 | 26.9 | 1 | 0.03 | |
| 2,3,4,7,8-PeCDF | ND | 1.43 | 26.9 | 1 | 0.3 | |
| 1,2,3,4,7,8-HxCDF | ND | 1.49 | 26.9 | 1 | 0.1 | |
| 1,2,3,6,7,8-HxCDF | ND | 1.35 | 26.9 | 1 | 0.1 | |
| 1,2,3,7,8,9-HxCDF | ND | 1.77 | 26.9 | 1 | 0.1 | |
| 2,3,4,6,7,8-HxCDF | ND | 1.43 | 26.9 | 1 | 0.1 | |
| 1,2,3,4,6,7,8-HpCDF | **2.55** | 0.938 | 26.9 | 1 | 0.01 | 0.0255 |
| 1,2,3,4,7,8,9-HpCDF | ND | 1.07 | 26.9 | 1 | 0.01 | |
| OCDF | ND | 6.32 | 53.8 | 1 | 0.0003 | |
| | | Total TEQ | | | | 0.0932 |

2005 WHO TEFs, ND = 0

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 16:02 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506411 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | U | 1.62 | 5.00 | | | 1 |
| 1,2,3,7,8-PeCDD | ND | U | 1.35 | 25.0 | | | 1 |
| 1,2,3,4,7,8-HxCDD | ND | U | 0.539 | 25.0 | | | 1 |
| 1,2,3,6,7,8-HxCDD | ND | U | 0.561 | 25.0 | | | 1 |
| 1,2,3,7,8,9-HxCDD | ND | U | 0.517 | 25.0 | | | 1 |
| 1,2,3,4,6,7,8-HpCDD | 3.26**J** | | 1.74 | 25.0 | 1.15 | 1.000 | 1 |
| OCDD | 9.07**JK** | | 2.63 | 50.0 | 1.22 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | ND | U | 1.45 | 5.00 | | | 1 |
| 1,2,3,7,8-PeCDF | ND | U | 1.16 | 25.0 | | | 1 |
| 2,3,4,7,8-PeCDF | ND | U | 1.21 | 25.0 | | | 1 |
| 1,2,3,4,7,8-HxCDF | ND | U | 0.680 | 25.0 | | | 1 |
| 1,2,3,6,7,8-HxCDF | 1.21**JK** | | 0.640 | 25.0 | 1.62 | 1.001 | 1 |
| 1,2,3,7,8,9-HxCDF | 1.92**JK** | | 1.12 | 25.0 | 0.93 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 1.96**J** | | 0.695 | 25.0 | 1.06 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 2.31**J** | | 0.921 | 25.0 | 1.03 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | ND | U | 1.36 | 25.0 | | | 1 |
| OCDF | ND | U | 4.63 | 50.0 | | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 16:02 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506411 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | ND | U | 1.62 | 5.00 | | | 1 |
| Total Penta-Dioxins | ND | U | 1.35 | 25.0 | | | 1 |
| Total Hexa-Dioxins | ND | U | 0.539 | 25.0 | | | 1 |
| Total Hepta-Dioxins | 3.26**J** | | 1.74 | 25.0 | 1.15 | | 1 |
| Total Tetra-Furans | ND | U | 1.45 | 5.00 | | | 1 |
| Total Penta-Furans | ND | U | 1.19 | 25.0 | | | 1 |
| Total Hexa-Furans | 1.96**J** | | 0.750 | 25.0 | 1.06 | | 1 |
| Total Hepta-Furans | 3.75**J** | | 1.12 | 25.0 | 1.03 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | Percent |
| **Lab Code:** | EQ1600425-01 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 16:02 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506411 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1123.500 | 56 | | 40-135 | 0.78 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1167.118 | 58 | | 40-135 | 1.60 | 1.172 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1708.012 | 85 | | 40-135 | 1.26 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1716.755 | 86 | | 40-135 | 1.26 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1127.690 | 56 | | 40-135 | 1.07 | 1.066 |
| 13C-OCDD | 4000 | 1484.913 | 37 | **Y** | 40-135 | 0.89 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1185.934 | 59 | | 40-135 | 0.77 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1211.563 | 61 | | 40-135 | 1.57 | 1.133 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1176.753 | 59 | | 40-135 | 1.56 | 1.162 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1549.582 | 77 | | 40-135 | 0.51 | 0.972 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1704.971 | 85 | | 40-135 | 0.50 | 0.975 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1267.626 | 63 | | 40-135 | 0.51 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1609.478 | 80 | | 40-135 | 0.51 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1172.500 | 59 | | 40-135 | 0.45 | 1.041 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1169.669 | 58 | | 40-135 | 0.42 | 1.080 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 526.943 | 66 | | 40-135 | NA | 1.020 |

# Accuracy & Precision

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Analyzed:** | 09/28/16 |
| **Sample Matrix:** | Water | **Date Extracted:** | 09/21/16 |

## Duplicate Lab Control Sample Summary
## Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Units:** | pg/L |
| **Prep Method:** | EPA 3510C | **Basis:** | NA |
| | | **Analysis Lot:** | 516772 |

| | Lab Control Sample EQ1600425-02 | | | Duplicate Lab Control Sample EQ1600425-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| 1,2,3,4,6,7,8-HpCDD | 1040 | 1000 | 104 | 986 | 1000 | 99 | 70-130 | 5 | 25 |
| 1,2,3,4,7,8-HxCDD | 948 | 1000 | 95 | 968 | 1000 | 97 | 70-130 | 2 | 25 |
| 1,2,3,6,7,8-HxCDD | 944 | 1000 | 94 | 947 | 1000 | 95 | 70-130 | <1 | 25 |
| 1,2,3,7,8,9-HxCDD | 834 | 1000 | 83 | 863 | 1000 | 86 | 70-130 | 3 | 25 |
| 1,2,3,7,8-PeCDD | 1010 | 1000 | 101 | 1040 | 1000 | 104 | 70-130 | 2 | 25 |
| 2,3,7,8-TCDD | 197 | 200 | 98 | 192 | 200 | 96 | 70-130 | 2 | 25 |
| OCDD | 2460 | 2000 | 123 | 2300 | 2000 | 115 | 70-130 | 7 | 25 |
| | | | | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1000 | 1000 | 100 | 1050 | 1000 | 105 | 70-130 | 5 | 25 |
| 1,2,3,4,7,8,9-HpCDF | 967 | 1000 | 97 | 989 | 1000 | 99 | 70-130 | 2 | 25 |
| 1,2,3,4,7,8-HxCDF | 1060 | 1000 | 106 | 1090 | 1000 | 109 | 70-130 | 3 | 25 |
| 1,2,3,6,7,8-HxCDF | 1020 | 1000 | 102 | 1030 | 1000 | 103 | 70-130 | <1 | 25 |
| 1,2,3,7,8,9-HxCDF | 1030 | 1000 | 103 | 1010 | 1000 | 101 | 70-130 | 2 | 25 |
| 1,2,3,7,8-PeCDF | 987 | 1000 | 99 | 990 | 1000 | 99 | 70-130 | <1 | 25 |
| 2,3,4,6,7,8-HxCDF | 1010 | 1000 | 101 | 1010 | 1000 | 101 | 70-130 | <1 | 25 |
| 2,3,4,7,8-PeCDF | 1040 | 1000 | 104 | 1060 | 1000 | 106 | 70-130 | 2 | 25 |
| 2,3,7,8-TCDF | 198 | 200 | 99 | 209 | 200 | 104 | 70-130 | 5 | 25 |
| OCDF | 2180 | 2000 | 109 | 2320 | 2000 | 116 | 70-130 | 6 | 25 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 20:54 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506417 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 197 | | 0.996 | 5.00 | 0.76 | 1.001 | 1 |
| 1,2,3,7,8-PeCDD | 1010 | | 2.60 | 25.0 | 1.58 | 1.001 | 1 |
| 1,2,3,4,7,8-HxCDD | 948 | | 3.97 | 25.0 | 1.24 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 944 | | 4.22 | 25.0 | 1.22 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 834 | | 3.85 | 25.0 | 1.29 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 1040 | | 20.0 | 25.0 | 1.03 | 1.000 | 1 |
| OCDD | 2460 | | 11.4 | 50.0 | 0.86 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | 198 | | 1.06 | 5.00 | 0.74 | 1.001 | 1 |
| 1,2,3,7,8-PeCDF | 987 | | 2.10 | 25.0 | 1.55 | 1.000 | 1 |
| 2,3,4,7,8-PeCDF | 1040 | | 2.24 | 25.0 | 1.56 | 1.001 | 1 |
| 1,2,3,4,7,8-HxCDF | 1060 | | 4.28 | 25.0 | 1.24 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 1020 | | 4.14 | 25.0 | 1.26 | 1.001 | 1 |
| 1,2,3,7,8,9-HxCDF | 1030 | | 6.60 | 25.0 | 1.25 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 1010 | | 4.52 | 25.0 | 1.24 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 1000 | | 55.7 | 55.7 | 0.95 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 967 | | 76.5 | 76.5 | 1.06 | 1.000 | 1 |
| OCDF | 2180 | | 11.9 | 50.0 | 0.92 | 1.006 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 20:54 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506417 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | 197 | | 0.996 | 5.00 | 0.76 | | 1 |
| Total Penta-Dioxins | 1010 | | 2.60 | 25.0 | 1.58 | | 1 |
| Total Hexa-Dioxins | 2730 | | 4.01 | 25.0 | 1.24 | | 1 |
| Total Hepta-Dioxins | 1040 | | 20.0 | 25.0 | 1.03 | | 1 |
| Total Tetra-Furans | 198 | | 1.06 | 5.00 | 0.74 | | 1 |
| Total Penta-Furans | 2030 | | 2.17 | 25.0 | 1.55 | | 1 |
| Total Hexa-Furans | 4120 | | 4.74 | 25.0 | 1.24 | | 1 |
| Total Hepta-Furans | 1970 | | 65.1 | 65.1 | 0.95 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | Percent |
| **Lab Code:** | EQ1600425-02 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 20:54 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506417 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1284.846 | 64 | | 40-135 | 0.78 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1346.347 | 67 | | 40-135 | 1.58 | 1.172 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1943.921 | 97 | | 40-135 | 1.26 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1896.706 | 95 | | 40-135 | 1.28 | 0.993 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1329.597 | 66 | | 40-135 | 1.07 | 1.066 |
| 13C-OCDD | 4000 | 1724.393 | 43 | | 40-135 | 0.91 | 1.142 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1311.414 | 66 | | 40-135 | 0.79 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1402.230 | 70 | | 40-135 | 1.56 | 1.133 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1333.663 | 67 | | 40-135 | 1.56 | 1.162 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1767.581 | 88 | | 40-135 | 0.50 | 0.972 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1855.523 | 93 | | 40-135 | 0.51 | 0.975 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1504.627 | 75 | | 40-135 | 0.50 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1780.299 | 89 | | 40-135 | 0.50 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1316.866 | 66 | | 40-135 | 0.44 | 1.041 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1382.279 | 69 | | 40-135 | 0.45 | 1.080 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 577.165 | 72 | | 40-135 | NA | 1.020 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 21:43 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506418 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 192 | | 1.09 | 5.00 | 0.74 | 1.001 | 1 |
| 1,2,3,7,8-PeCDD | 1040 | | 2.09 | 25.0 | 1.56 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDD | 968 | | 3.93 | 25.0 | 1.27 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDD | 947 | | 4.09 | 25.0 | 1.24 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDD | 863 | | 3.77 | 25.0 | 1.23 | 1.007 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 986 | | 13.6 | 25.0 | 1.07 | 1.000 | 1 |
| OCDD | 2300 | | 9.45 | 50.0 | 0.84 | 1.000 | 1 |
| | | | | | | | |
| 2,3,7,8-TCDF | 209 | | 0.843 | 5.00 | 0.77 | 1.001 | 1 |
| 1,2,3,7,8-PeCDF | 990 | | 1.11 | 25.0 | 1.54 | 1.001 | 1 |
| 2,3,4,7,8-PeCDF | 1060 | | 1.13 | 25.0 | 1.54 | 1.000 | 1 |
| 1,2,3,4,7,8-HxCDF | 1090 | | 2.14 | 25.0 | 1.23 | 1.000 | 1 |
| 1,2,3,6,7,8-HxCDF | 1030 | | 1.94 | 25.0 | 1.23 | 1.000 | 1 |
| 1,2,3,7,8,9-HxCDF | 1010 | | 3.21 | 25.0 | 1.21 | 1.000 | 1 |
| 2,3,4,6,7,8-HxCDF | 1010 | | 2.05 | 25.0 | 1.27 | 1.000 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 1050 | | 25.9 | 25.9 | 1.03 | 1.000 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 989 | | 35.2 | 35.2 | 1.01 | 1.000 | 1 |
| OCDF | 2320 | | 5.54 | 50.0 | 0.88 | 1.005 | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | pg/L |
| **Lab Code:** | EQ1600425-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 21:43 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506418 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Native Analyte Results**

| Analyte Name | Result | Q | EDL | MRL | Ion Ratio | RRT | Dilution Factor |
|---|---|---|---|---|---|---|---|
| Total Tetra-Dioxins | 192 | | 1.09 | 5.00 | 0.74 | | 1 |
| Total Penta-Dioxins | 1040 | | 2.09 | 25.0 | 1.56 | | 1 |
| Total Hexa-Dioxins | 2780 | | 3.93 | 25.0 | 1.27 | | 1 |
| Total Hepta-Dioxins | 986 | | 13.6 | 25.0 | 1.07 | | 1 |
| Total Tetra-Furans | 209 | | 0.843 | 5.00 | 0.77 | | 1 |
| Total Penta-Furans | 2050 | | 1.12 | 25.0 | 1.54 | | 1 |
| Total Hexa-Furans | 4140 | | 2.26 | 25.0 | 1.23 | | 1 |
| Total Hepta-Furans | 2040 | | 30.2 | 30.2 | 1.03 | | 1 |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Trihydro Corporation | **Service Request:** | E1600910 |
| **Project:** | Diamond P Ranch | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | Percent |
| **Lab Code:** | EQ1600425-03 | **Basis:** | NA |

**Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 8290 | **Date Analyzed:** | 09/28/16 21:43 |
| **Prep Method:** | EPA 3510C | **Date Extracted:** | 9/21/16 |
| **Sample Amount:** | 1000mL | **Instrument Name:** | E-HRMS-07 |
| | | **GC Column:** | DB-5MSUI |
| **Data File Name:** | P506418 | **Blank File Name:** | P506411 |
| **ICAL Date:** | 07/10/16 | **Cal Ver. File Name:** | P506409 |

**Labeled Standard Results**

| Labeled Compounds | Spike Conc.(pg) | Conc. Found (pg) | % Rec | Q | Control Limits | Ion Ratio | RRT |
|---|---|---|---|---|---|---|---|
| 13C-2,3,7,8-TCDD | 2000 | 1075.527 | 54 | | 40-135 | 0.77 | 1.019 |
| 13C-1,2,3,7,8-PeCDD | 2000 | 1168.003 | 58 | | 40-135 | 1.58 | 1.172 |
| 13C-1,2,3,4,7,8-HxCDD | 2000 | 1715.399 | 86 | | 40-135 | 1.28 | 0.992 |
| 13C-1,2,3,6,7,8-HxCDD | 2000 | 1779.703 | 89 | | 40-135 | 1.25 | 0.994 |
| 13C-1,2,3,4,6,7,8-HpCDD | 2000 | 1128.674 | 56 | | 40-135 | 1.05 | 1.066 |
| 13C-OCDD | 4000 | 1389.588 | 35 | **Y** | 40-135 | 0.93 | 1.143 |
| | | | | | | | |
| 13C-2,3,7,8-TCDF | 2000 | 1083.039 | 54 | | 40-135 | 0.78 | 0.994 |
| 13C-1,2,3,7,8-PeCDF | 2000 | 1186.902 | 59 | | 40-135 | 1.56 | 1.133 |
| 13C-2,3,4,7,8-PeCDF | 2000 | 1172.220 | 59 | | 40-135 | 1.57 | 1.163 |
| 13C-1,2,3,4,7,8-HxCDF | 2000 | 1585.373 | 79 | | 40-135 | 0.50 | 0.972 |
| 13C-1,2,3,6,7,8-HxCDF | 2000 | 1705.491 | 85 | | 40-135 | 0.51 | 0.975 |
| 13C-1,2,3,7,8,9-HxCDF | 2000 | 1365.055 | 68 | | 40-135 | 0.50 | 1.008 |
| 13C-2,3,4,6,7,8-HxCDF | 2000 | 1641.639 | 82 | | 40-135 | 0.51 | 0.988 |
| 13C-1,2,3,4,6,7,8-HpCDF | 2000 | 1156.528 | 58 | | 40-135 | 0.44 | 1.041 |
| 13C-1,2,3,4,7,8,9-HpCDF | 2000 | 1231.882 | 62 | | 40-135 | 0.44 | 1.080 |
| | | | | | | | |
| 37Cl-2,3,7,8-TCDD | 800 | 490.534 | 61 | | 40-135 | NA | 1.020 |

ENERGY LABORATORIES
Trust our People. Trust our Data.
www.energylab.com
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

**Account Number:** H13197
**Invoice Number:** 11976
**Invoice Date:** 07/11/2016
**Purchase Order:**
**Invoice Total:** $300.00
**Amount Received:** $0.00
**Amount Due:** $300.00

Remit To: **Energy Laboratories, Inc.**
**PO Box 30975**
**Billings, MT 59107-0975**

H13197000011976000030000000000055245

**Detach and Return Stub with Payment**

Bill To: **Trihydro-Laramie**
**Attn: Accounts Payable**
**1252 Commerce Dr**
**Laramie, WY 82070-7000**

# INVOICE

**Invoice No.: 11976**

Invoice Date: *Jul 11, 2016*

Purchase Order:

Account Number: H13197

Net 30

From: ENERGY LABORATORIES
Trust our People. Trust our Data.

**Quote Id:** 1141
**Project Name:** Diamond P Ranch

| Item | Test Price | Rush | Discount | Price | Qty | Total |
|---|---|---|---|---|---|---|
| **Work Order: H16060524** | | | | | | |
| **Soil Samples** | | | | | | |
| Digestion, Mercury by CVAA | $11.00 | | | $11.00 | 3 | $33.00 |
| Digestion, Total Metals | $11.00 | | | $11.00 | 3 | $33.00 |
| Mercury in Solid By CVAA | $8.00 | | | $8.00 | 3 | $24.00 |
| Metals by ICP/ICPMS, Total | $70.00 | | | $70.00 | 3 | $210.00 |

**MISCELLANEOUS CHARGE SUMMARY:**
***Work Order:* H16060524**

| Item | Price | QTY | Total |
|---|---|---|---|
| | | | **$0.00** |

**Comments:**

| | |
|---|---|
| **Subtotal:** | **$300.00** |
| **Misc Charges:** | **$0.00** |
| **INVOICE TOTAL:** | **$300.00** |
| **Amount Received:** | **$0.00** |
| **AMOUNT DUE:** | **$300.00** |

# ANALYTICAL SUMMARY REPORT

July 08, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16060524 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 3 samples for Trihydro-Laramie on 6/28/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16060524-001 | DIAP-BKFL-TPSL | 06/23/16 10:30 | 06/28/16 | Soil | Metals by ICP/ICPMS, Total<br>Mercury in Solid By CVAA<br>Percent Moisture<br>Digestion, Total Metals<br>Digestion, Mercury by CVAA<br>Soil Preparation |
| H16060524-002 | DIAP-BKFL-DITCH | 06/27/16 11:10 | 06/28/16 | Soil | Metals by ICP/ICPMS, Total<br>Mercury in Solid By CVAA<br>Percent Moisture<br>Digestion, Total Metals<br>Digestion, Mercury by CVAA |
| H16060524-003 | DIAP-BKFL-POND | 06/27/16 11:30 | 06/28/16 | 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:

# LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16060524-001
**Client Sample ID:** DIAP-BKFL-TPSL

**Report Date:** 07/08/16
**Collection Date:** 06/23/16 10:30
**DateReceived:** 06/28/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 3.7 | wt% | | 0.2 | | D2974 | 07/03/16 10:02 / rgk |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 37 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:21 / dck |
| Barium | 165 | mg/kg-dry | | 5 | | SW6010B | 07/05/16 17:05 / sld |
| Cadmium | 1 | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:21 / dck |
| Chromium | 27 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:21 / dck |
| Lead | 20 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:21 / dck |
| Selenium | ND | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:21 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:21 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 07/01/16 11:51 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16060524-002
**Client Sample ID:** DIAP-BKFL-DITCH

**Report Date:** 07/08/16
**Collection Date:** 06/27/16 11:10
**DateReceived:** 06/28/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 3.8 | wt% | | 0.2 | | D2974 | 07/03/16 10:02 / rgk |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 5 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:37 / dck |
| Barium | 142 | mg/kg-dry | | 5 | | SW6010B | 07/05/16 17:30 / sld |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:37 / dck |
| Chromium | 27 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:37 / dck |
| Lead | 14 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:37 / dck |
| Selenium | ND | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:37 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:37 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 07/01/16 11:59 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16060524-003
**Client Sample ID:** DIAP-BKFL-POND

**Report Date:** 07/08/16
**Collection Date:** 06/27/16 11:30
**DateReceived:** 06/28/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 6.2 | wt% | | 0.2 | | D2974 | 07/03/16 10:02 / rgk |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 6 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:41 / dck |
| Barium | 179 | mg/kg-dry | | 5 | | SW6010B | 07/05/16 17:34 / sld |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:41 / dck |
| Chromium | 24 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:41 / dck |
| Lead | 17 | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:41 / dck |
| Selenium | ND | mg/kg-dry | | 1 | | SW6020 | 07/02/16 03:41 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 07/02/16 03:41 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 07/01/16 12:01 / 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

**Client:** Trihydro-Laramie **Report Date:** 07/08/16

**Project:** Diamond P Ranch **Work Order:** H16060524

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **D2974** | | | | | | | | | Batch: R116497 |
| **Lab ID:** | **H16060524-001ADUP** | Sample Duplicate | | | | Run: SOIL DRYING OVEN 2_16070 | | | 07/03/16 10:02 | |
| Moisture | | 3.46 | wt% | 0.20 | | | | 6.1 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/08/16

**Project:** Diamond P Ranch **Work Order:** H16060524

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6010B** | | | | | | | | | Analytical Run: ICP2-HE_160705B | |
| **Lab ID:** | **ICV** | | Initial Calibration Verification Standard | | | | | | | 07/05/16 10:41 | |
| Barium | | | 0.795 | mg/L | 0.10 | 99 | 90 | 110 | | | |
| **Lab ID:** | **ICSA** | | Interference Check Sample A | | | | | | | 07/05/16 11:20 | |
| Barium | | | -0.000370 | mg/L | 0.10 | | 0 | 0 | | | |
| **Lab ID:** | **ICSAB** | | Interference Check Sample AB | | | | | | | 07/05/16 11:24 | |
| Barium | | | 0.503 | mg/L | 0.10 | 101 | 80 | 120 | | | |
| **Method:** | **SW6010B** | | | | | | | | | Batch: 33457 | |
| **Lab ID:** | **MB-33457** | | Method Blank | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:04 | |
| Barium | | | ND | mg/kg | 0.02 | | | | | | |
| **Lab ID:** | **LFB-33457** | | Laboratory Fortified Blank | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:07 | |
| Barium | | | 45.0 | mg/kg | 1.0 | 91 | 80 | 120 | | | |
| **Lab ID:** | **LCS-33457** | | Laboratory Control Sample | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:11 | |
| Barium | | | 181 | mg/kg | 1.0 | 97 | 78.6 | 112.8 | | | |
| **Lab ID:** | **H16060495-001APDS** | | Post Digestion/Distillation Spike | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:51 | |
| Barium | | | 686 | mg/kg-dry | 1.0 | 86 | 75 | 125 | | | |
| **Lab ID:** | **H16060495-001AMS** | | Sample Matrix Spike | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:54 | |
| Barium | | | 504 | mg/kg-dry | 1.0 | | 75 | 125 | | | A |
| **Lab ID:** | **H16060495-001AMSD** | | Sample Matrix Spike Duplicate | | | | Run: ICP2-HE_160705B | | | 07/05/16 16:58 | |
| Barium | | | 486 | mg/kg-dry | 1.0 | | 75 | 125 | 3.7 | 20 | A |
| **Lab ID:** | **H16060524-001APDS** | | Post Digestion/Distillation Spike | | | | Run: ICP2-HE_160705B | | | 07/05/16 17:19 | |
| Barium | | | 401 | mg/kg-dry | 1.0 | 89 | 75 | 125 | | | |
| **Lab ID:** | **H16060524-001AMS** | | Sample Matrix Spike | | | | Run: ICP2-HE_160705B | | | 07/05/16 17:23 | |
| Barium | | | 213 | mg/kg-dry | 1.0 | 93 | 75 | 125 | | | |
| **Lab ID:** | **H16060524-001AMSD** | | Sample Matrix Spike Duplicate | | | | Run: ICP2-HE_160705B | | | 07/05/16 17:27 | |
| Barium | | | 228 | mg/kg-dry | 1.0 | 121 | 75 | 125 | 6.6 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/08/16

**Project:** Diamond P Ranch **Work Order:** H16060524

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | | Analytical Run: ICPMS204-B_160701B | |
| **Lab ID:** | **ICV STD** | 6 | Initial Calibration Verification Standard | | | | | | | | 07/02/16 00:56 |
| Arsenic | | | 0.0596 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| Cadmium | | | 0.0299 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| Chromium | | | 0.0598 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| Lead | | | 0.0586 | mg/L | 0.0010 | 98 | 90 | 110 | | | |
| Selenium | | | 0.0609 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Silver | | | 0.0293 | mg/L | 0.0010 | 98 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | | Batch: 33457 |
| **Lab ID:** | **MB-33457** | 6 | Method Blank | | | | Run: ICPMS204-B_160701B | | | | 07/02/16 02:04 |
| Arsenic | | | ND | mg/kg | 0.05 | | | | | | |
| Cadmium | | | ND | mg/kg | 0.2 | | | | | | |
| Chromium | | | ND | mg/kg | 0.8 | | | | | | |
| Lead | | | ND | mg/kg | 0.10 | | | | | | |
| Selenium | | | ND | mg/kg | 0.2 | | | | | | |
| Silver | | | 2 | mg/kg | 0.05 | | | | | | |
| **Lab ID:** | **LCS-33457** | 6 | Laboratory Control Sample | | | | Run: ICPMS204-B_160701B | | | | 07/02/16 02:08 |
| Arsenic | | | 174 | mg/kg | 1.0 | 89 | 71.4 | 105.1 | | | |
| Cadmium | | | 99.9 | mg/kg | 1.0 | 101 | 73.9 | 106.1 | | | |
| Chromium | | | 122 | mg/kg | 1.0 | 105 | 73.5 | 108.5 | | | |
| Lead | | | 108 | mg/kg | 1.0 | 103 | 74.4 | 108.6 | | | |
| Selenium | | | 201 | mg/kg | 1.0 | 99 | 71.2 | 110.2 | | | |
| Silver | | | 44.4 | mg/kg | 1.0 | 101 | 70.8 | 111.9 | | | |
| **Lab ID:** | **LFB-33457** | 6 | Laboratory Fortified Blank | | | | Run: ICPMS204-B_160701B | | | | 07/02/16 02:11 |
| Arsenic | | | 45.5 | mg/kg | 1.0 | 91 | 80 | 120 | | | |
| Cadmium | | | 22.4 | mg/kg | 1.0 | 90 | 80 | 120 | | | |
| Chromium | | | 46.5 | mg/kg | 1.0 | 94 | 80 | 120 | | | |
| Lead | | | 45.0 | mg/kg | 1.0 | 90 | 80 | 120 | | | |
| Selenium | | | 44.8 | mg/kg | 1.0 | 90 | 80 | 120 | | | |
| Silver | | | 24.8 | mg/kg | 1.0 | 91 | 80 | 120 | | | |
| **Lab ID:** | **H16060524-001APDS** | 6 | Post Digestion/Distillation Spike | | | | Run: ICPMS204-B_160701B | | | | 07/02/16 03:28 |
| Arsenic | | | 525 | mg/kg-dry | 1.0 | 94 | 75 | 125 | | | |
| Cadmium | | | 245 | mg/kg-dry | 1.0 | 94 | 75 | 125 | | | |
| Chromium | | | 535 | mg/kg-dry | 1.0 | 98 | 75 | 125 | | | |
| Lead | | | 543 | mg/kg-dry | 1.0 | 101 | 75 | 125 | | | |
| Selenium | | | 459 | mg/kg-dry | 1.0 | 89 | 75 | 125 | | | |
| Silver | | | 199 | mg/kg-dry | 1.0 | 77 | 75 | 125 | | | |
| **Lab ID:** | **H16060524-001AMS** | 6 | Sample Matrix Spike | | | | Run: ICPMS204-B_160701B | | | | 07/02/16 03:31 |
| Arsenic | | | 101 | mg/kg-dry | 1.0 | 124 | 75 | 125 | | | |
| Cadmium | | | 25.3 | mg/kg-dry | 1.0 | 93 | 75 | 125 | | | |
| Chromium | | | 77.3 | mg/kg-dry | 1.0 | 96 | 75 | 125 | | | |
| Lead | | | 68.4 | mg/kg-dry | 1.0 | 93 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/08/16

**Project:** Diamond P Ranch **Work Order:** H16060524

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | | | Batch: 33457 |
| **Lab ID:** | **H16060524-001AMS** | 6 | Sample Matrix Spike | | | | Run: ICPMS204-B_160701B | | | 07/02/16 03:31 | |
| Selenium | | | 47.5 | mg/kg-dry | 1.0 | 91 | 75 | 125 | | | |
| Silver | | | 27.4 | mg/kg-dry | 1.0 | 102 | 75 | 125 | | | |
| **Lab ID:** | **H16060524-001AMSD** | 6 | Sample Matrix Spike Duplicate | | | | Run: ICPMS204-B_160701B | | | 07/02/16 03:34 | |
| Arsenic | | | 89.2 | mg/kg-dry | 1.0 | 100 | 75 | 125 | 13 | 20 | |
| Cadmium | | | 25.4 | mg/kg-dry | 1.0 | 94 | 75 | 125 | 0.2 | 20 | |
| Chromium | | | 79.0 | mg/kg-dry | 1.0 | 100 | 75 | 125 | 2.1 | 20 | |
| Lead | | | 67.3 | mg/kg-dry | 1.0 | 91 | 75 | 125 | 1.6 | 20 | |
| Selenium | | | 47.9 | mg/kg-dry | 1.0 | 92 | 75 | 125 | 0.8 | 20 | |
| Silver | | | 26.2 | mg/kg-dry | 1.0 | 97 | 75 | 125 | 4.5 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/08/16

**Project:** Diamond P Ranch **Work Order:** H16060524

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW7471B** | | | | | | | | Analytical Run: HGCV201-H_160701A | | |
| **Lab ID:** | **ICV** | Initial Calibration Verification Standard | | | | | | | | 07/01/16 11:34 | |
| Mercury | | | 0.00100 | mg/kg | 0.50 | 100 | 90 | 110 | | | |
| **Lab ID:** | **CCV** | Continuing Calibration Verification Standard | | | | | | | | 07/01/16 11:36 | |
| Mercury | | | 0.0025 | mg/kg | 0.50 | 101 | 90 | 110 | | | |
| **Method:** | **SW7471B** | | | | | | | | | | Batch: 33471 |
| **Lab ID:** | **MB-33471** | Method Blank | | | | | Run: HGCV201-H_160701A | | | 07/01/16 11:40 | |
| Mercury | | | ND | mg/kg | 0.010 | | | | | | |
| **Lab ID:** | **LFB-33471** | Laboratory Fortified Blank | | | | | Run: HGCV201-H_160701A | | | 07/01/16 11:49 | |
| Mercury | | | 0.23 | mg/kg | 0.50 | 115 | 80 | 120 | | | |
| **Lab ID:** | **H16060524-001AMS** | Sample Matrix Spike | | | | | Run: HGCV201-H_160701A | | | 07/01/16 11:55 | |
| Mercury | | | 0.29 | mg/kg-dry | 0.50 | 111 | 80 | 120 | | | |
| **Lab ID:** | **H16060524-001AMSD** | Sample Matrix Spike Duplicate | | | | | Run: HGCV201-H_160701A | | | 07/01/16 11:57 | |
| Mercury | | | 0.30 | mg/kg-dry | 0.50 | 112 | 80 | 120 | | 20 | |
| **Lab ID:** | **LCS-33471** | Laboratory Control Sample | | | | | Run: HGCV201-H_160701A | | | 07/01/16 12:13 | |
| Mercury | | | 5.9 | mg/kg | 0.50 | 118 | 71 | 126.4 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# Work Order Receipt Checklist

## Trihydro-Laramie

## H16060524

Login completed by: Tracy L. Lorash

Reviewed by: BL2000\sdull

Reviewed Date: 6/29/2016

Date Received: 6/28/2016

Received by: wjj

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 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:

Relinquished time from client does not match received time by laboratory. tl 6/28/16

ENERGY LABORATORIES

# Chain of Custody and Analytical Request Record



**PLEASE PRINT (Provide as much information as possible.)**

Company Name: Trihydro Corporation

Report Mail Address (Required):
Andrew Vann
1252 Commerce Dr
Laramie, WY 82070
☐ No Hard Copy Email: avann@trihydro.com

Invoice Address (Required):
AP
1252 Commerce Dr
Laramie, WY 82070
☐ No Hard Copy Email: ap@trihydro.com

Project Name, PWS, Permit, Etc.: Diamond P Ranch

Sample Origin State: MT

EPA/State Compliance: Yes ☐ No ☐

Contact Name: Andrew Vann

Phone/Fax: 307 745 7474

Cell:

Sampler: (Please Print) L. Darnell

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order:

Special Report/Formats:
☐ DW
☐ POTW/WWTP
☐ State: _____
☐ Other: _____
☒ EDD/EDT (Electronic Data) Format: Trihydro
☐ LEVEL IV
☐ NELAC

ANALYSIS REQUESTED

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

SEE ATTACHED

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

| SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX | Metals (RCRA 8) |
|---|---|---|---|---|
| 1 DIAP-BKFL-TPSL | 6/23/16 | 1030 | SOIL | X |
| 2 DIAP-BKFL-DITCH | 6/27/16 | 1110 | SOIL | X |
| 3 DIAP-BKFL-POND | 6/27/16 | 1130 | SOIL | X |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |

Shipped by: hand del

Cooler ID(s): Y

Receipt Temp: 4.2 °C

On Ice: Y N

Custody Seal: On Bottle Y N; On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY H16060524

**Custody Record MUST be Signed**

Relinquished by (print): L. Darnell Date/Time: 6/28/16 0700 Signature:

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by Laboratory: Wanda Date/Time: 6-28-16 Signature:

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

# ANALYTICAL SUMMARY REPORT

July 28, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16070159 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 9 samples for Trihydro-Laramie on 7/11/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16070159-001 | DIAP-S-EAST (0-2) | 07/11/16 6:00 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16070159-002 | DIAP-SS-East (2-20) | 07/11/16 6:05 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction |
| H16070159-003 | DIAP-S-SOUTH (0-2) | 07/11/16 6:10 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |

# ANALYTICAL SUMMARY REPORT

| | | | | | |
|---|---|---|---|---|---|
| H16070159-004 | DIAP-SS-SOUTH (2-20) | 07/11/16 6:15 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction |
| H16070159-005 | DIAP-S-WEST (0-2) | 07/11/16 6:20 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16070159-006 | DIAP-SS-WEST (2-20) | 07/11/16 6:25 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction |
| H16070159-007 | DIAP-S-NORTH (0-2) | 07/11/16 6:30 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |

# ANALYTICAL SUMMARY REPORT

| | | | | | |
|---|---|---|---|---|---|
| H16070159-008 | DIAP-SS-NORTH (2-20) | 07/11/16 6:35 | 07/11/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Percent Moisture<br>Sonication Extraction |
| H16070159-009 | BD-20160711 | 07/11/16 6:00 | 07/11/16 | 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Work Order:** H16070159

**Report Date:** 07/28/16

# CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

Samples for Dioxin analysis were submitted to Pace Analytical. Attached are the results. wj 7/22/16

# LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-001
**Client Sample ID:** DIAP-S-EAST (0-2)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:00
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 31.8 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 1790 | mg/kg-dry | * | 15 | 200 | SW8015M | 07/15/16 07:11 / JRS |
| Surr: o-Terphenyl | 68.0 | %REC | | 40-140 | | SW8015M | 07/15/16 07:11 / 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 | | 15 | 200 | MA-EPH | 07/22/16 07:50 / JRS |
| C19 to C36 Aliphatics | 817 | mg/kg-dry | | 15 | 20000 | MA-EPH | 07/22/16 07:50 / JRS |
| Surr: 1-Chloro-octadecane | 61.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 07:50 / JRS |
| C11 to C22 Aromatics | 159 | mg/kg-dry | | 15 | 400 | MA-EPH | 07/22/16 08:32 / JRS |
| Total Extractable Hydrocarbons | 1020 | mg/kg-dry | | 15 | 2500 | MA-EPH | 07/22/16 08:32 / JRS |
| Surr: 2-Bromonaphthalene | 76.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 08:32 / JRS |
| Surr: 2-Fluorobiphenyl | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 08:32 / JRS |
| Surr: o-Terphenyl | 66.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 08:32 / JRS |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Anthracene | 0.0078 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Benzo(a)anthracene | 0.019 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Benzo(a)pyrene | 0.024 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Benzo(b)fluoranthene | 0.064 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Benzo(g,h,i)perylene | 0.089 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Benzo(k)fluoranthene | 0.050 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Chrysene | 0.039 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Dibenzo(a,h)anthracene | 0.037 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Fluoranthene | 0.054 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.13 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Phenanthrene | 0.014 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Pyrene | 0.056 | mg/kg-dry | | 0.0048 | | SW8270C | 07/20/16 17:59 / eli-b |
| Surr: 2-Fluorobiphenyl | 67.0 | %REC | | 47-110 | | SW8270C | 07/20/16 17:59 / eli-b |
| Surr: Nitrobenzene-d5 | 63.0 | %REC | | 43-105 | | SW8270C | 07/20/16 17:59 / eli-b |
| Surr: Terphenyl-d14 | 78.0 | %REC | | 51-117 | | SW8270C | 07/20/16 17:59 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 1.2 | mg/kg-dry | | 0.059 | | SW8151A | 07/20/16 11:53 / eli-b |
| Surr: DCAA | 51.0 | %REC | | 45-117 | | SW8151A | 07/19/16 20:22 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-002
**Client Sample ID:** DIAP-SS-East (2-20)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:05
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 15.1 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 494 | mg/kg-dry | * | 12 | 200 | SW8015M | 07/15/16 03:56 / JRS |
| Surr: o-Terphenyl | 90.0 | %REC | | 40-140 | | SW8015M | 07/15/16 03:56 / 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 | 58 | mg/kg-dry | | 12 | 200 | MA-EPH | 07/22/16 09:15 / JRS |
| C19 to C36 Aliphatics | 294 | mg/kg-dry | | 12 | 20000 | MA-EPH | 07/22/16 09:15 / JRS |
| Surr: 1-Chloro-octadecane | 96.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 09:15 / JRS |
| C11 to C22 Aromatics | 39 | mg/kg-dry | | 12 | 400 | MA-EPH | 07/22/16 09:58 / JRS |
| Total Extractable Hydrocarbons | 411 | mg/kg-dry | | 12 | 2500 | MA-EPH | 07/22/16 09:58 / JRS |
| Surr: 2-Bromonaphthalene | 57.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 09:58 / JRS |
| Surr: 2-Fluorobiphenyl | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 09:58 / JRS |
| Surr: o-Terphenyl | 93.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 09:58 / JRS |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 11 | mg/kg-dry | | 0.46 | | SW8151A | 07/20/16 10:48 / eli-b |
| Surr: DCAA | 63.0 | %REC | | 45-117 | | SW8151A | 07/19/16 15:59 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-003
**Client Sample ID:** DIAP-S-SOUTH (0-2)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:10
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 19.3 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 59 | mg/kg-dry | | 12 | 200 | SW8015M | 07/15/16 03:07 / JRS |
| Surr: o-Terphenyl | 85.0 | %REC | | 40-140 | | SW8015M | 07/15/16 03:07 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **EXTRACTABLE PETROLEUM HYDROCARBONS** | | | | | | | |
| C9 to C18 Aliphatics | ND | mg/kg-dry | | 12 | 200 | MA-EPH | 07/22/16 10:41 / JRS |
| C19 to C36 Aliphatics | ND | mg/kg-dry | | 12 | 20000 | MA-EPH | 07/22/16 10:41 / JRS |
| Surr: 1-Chloro-octadecane | 78.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 10:41 / JRS |
| C11 to C22 Aromatics | ND | mg/kg-dry | | 12 | 400 | MA-EPH | 07/22/16 11:24 / JRS |
| Total Extractable Hydrocarbons | 14 | mg/kg-dry | | 12 | 2500 | MA-EPH | 07/22/16 11:24 / JRS |
| Surr: 2-Bromonaphthalene | 70.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 11:24 / JRS |
| Surr: 2-Fluorobiphenyl | 87.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 11:24 / JRS |
| Surr: o-Terphenyl | 79.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 11:24 / JRS |
| - A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Benzo(a)anthracene | 0.0063 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Benzo(a)pyrene | 0.014 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Benzo(b)fluoranthene | 0.019 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Benzo(g,h,i)perylene | 0.0076 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Benzo(k)fluoranthene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Chrysene | 0.0068 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Dibenzo(a,h)anthracene | 0.0080 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Fluoranthene | 0.011 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.024 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Pyrene | 0.011 | mg/kg-dry | | 0.0042 | | SW8270C | 07/20/16 18:29 / eli-b |
| Surr: 2-Fluorobiphenyl | 81.0 | %REC | | 47-110 | | SW8270C | 07/20/16 18:29 / eli-b |
| Surr: Nitrobenzene-d5 | 70.0 | %REC | | 43-105 | | SW8270C | 07/20/16 18:29 / eli-b |
| Surr: Terphenyl-d14 | 101 | %REC | | 51-117 | | SW8270C | 07/20/16 18:29 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.49 | mg/kg-dry | | 0.010 | | SW8151A | 07/20/16 14:04 / eli-b |
| Surr: DCAA | 52.0 | %REC | | 45-117 | | SW8151A | 07/19/16 16:32 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-004
**Client Sample ID:** DIAP-SS-SOUTH (2-20)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:15
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 18.2 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 200 | SW8015M | 07/15/16 02:19 / JRS |
| Surr: o-Terphenyl | 78.0 | %REC | | 40-140 | | SW8015M | 07/15/16 02:19 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **EXTRACTABLE PETROLEUM HYDROCARBONS** | | | | | | | |
| C9 to C18 Aliphatics | ND | mg/kg-dry | | 24 | 200 | MA-EPH | 07/26/16 12:06 / JRS |
| C19 to C36 Aliphatics | ND | mg/kg-dry | | 24 | 20000 | MA-EPH | 07/26/16 12:06 / JRS |
| Surr: 1-Chloro-octadecane | 78.0 | %REC | | 40-140 | | MA-EPH | 07/26/16 12:06 / JRS |
| C11 to C22 Aromatics | ND | mg/kg-dry | | 24 | 400 | MA-EPH | 07/26/16 12:49 / JRS |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 24 | 2500 | MA-EPH | 07/26/16 12:49 / JRS |
| Surr: 2-Bromonaphthalene | 55.0 | %REC | | 40-140 | | MA-EPH | 07/26/16 12:49 / JRS |
| Surr: 2-Fluorobiphenyl | 76.0 | %REC | | 40-140 | | MA-EPH | 07/26/16 12:49 / JRS |
| Surr: o-Terphenyl | 73.0 | %REC | | 40-140 | | MA-EPH | 07/26/16 12:49 / JRS |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.16 | mg/kg-dry | | 0.0024 | | SW8151A | 07/20/16 14:37 / eli-b |
| Surr: DCAA | 67.0 | %REC | | 45-117 | | SW8151A | 07/20/16 14:37 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-005
**Client Sample ID:** DIAP-S-WEST (0-2)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:20
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 8.5 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 18 | mg/kg-dry | | 11 | 200 | SW8015M | 07/15/16 01:31 / JRS |
| Surr: o-Terphenyl | 90.0 | %REC | | 40-140 | | SW8015M | 07/15/16 01:31 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **EXTRACTABLE PETROLEUM HYDROCARBONS** | | | | | | | |
| C9 to C18 Aliphatics | ND | mg/kg-dry | | 11 | 200 | MA-EPH | 07/22/16 15:00 / JRS |
| C19 to C36 Aliphatics | ND | mg/kg-dry | | 11 | 20000 | MA-EPH | 07/22/16 15:00 / JRS |
| Surr: 1-Chloro-octadecane | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 15:00 / JRS |
| C11 to C22 Aromatics | ND | mg/kg-dry | | 11 | 400 | MA-EPH | 07/22/16 15:43 / JRS |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 11 | 2500 | MA-EPH | 07/22/16 15:43 / JRS |
| Surr: 2-Bromonaphthalene | 78.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 15:43 / JRS |
| Surr: 2-Fluorobiphenyl | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 15:43 / JRS |
| Surr: o-Terphenyl | 79.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 15:43 / JRS |
| - A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Benzo(a)anthracene | 0.0062 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Benzo(a)pyrene | 0.0091 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Benzo(b)fluoranthene | 0.013 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Benzo(g,h,i)perylene | 0.0066 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Benzo(k)fluoranthene | 0.0077 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Chrysene | 0.0051 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Dibenzo(a,h)anthracene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Fluoranthene | 0.013 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.0091 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Pyrene | 0.0095 | mg/kg-dry | | 0.0036 | | SW8270C | 07/19/16 01:52 / eli-b |
| Surr: 2-Fluorobiphenyl | 82.0 | %REC | | 47-110 | | SW8270C | 07/19/16 01:52 / eli-b |
| Surr: Nitrobenzene-d5 | 71.0 | %REC | | 43-105 | | SW8270C | 07/19/16 01:52 / eli-b |
| Surr: Terphenyl-d14 | 97.0 | %REC | | 51-117 | | SW8270C | 07/19/16 01:52 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.018 | mg/kg-dry | | 0.0022 | | SW8151A | 07/20/16 16:48 / eli-b |
| Surr: DCAA | 70.0 | %REC | | 45-117 | | SW8151A | 07/20/16 16:48 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-006
**Client Sample ID:** DIAP-SS-WEST (2-20)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:25
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 14.5 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 200 | SW8015M | 07/15/16 05:33 / JRS |
| Surr: o-Terphenyl | 88.0 | %REC | | 40-140 | | SW8015M | 07/15/16 05:33 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **EXTRACTABLE PETROLEUM HYDROCARBONS** | | | | | | | |
| C9 to C18 Aliphatics | ND | mg/kg-dry | | 12 | 200 | MA-EPH | 07/22/16 16:27 / JRS |
| C19 to C36 Aliphatics | ND | mg/kg-dry | | 12 | 20000 | MA-EPH | 07/22/16 16:27 / JRS |
| Surr: 1-Chloro-octadecane | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 16:27 / JRS |
| C11 to C22 Aromatics | ND | mg/kg-dry | | 12 | 400 | MA-EPH | 07/22/16 17:10 / JRS |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 2500 | MA-EPH | 07/22/16 17:10 / JRS |
| Surr: 2-Bromonaphthalene | 67.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 17:10 / JRS |
| Surr: 2-Fluorobiphenyl | 85.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 17:10 / JRS |
| Surr: o-Terphenyl | 82.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 17:10 / JRS |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.47 | mg/kg-dry | | 0.012 | | SW8151A | 07/20/16 13:31 / eli-b |
| Surr: DCAA | 60.0 | %REC | | 45-117 | | SW8151A | 07/19/16 18:11 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-007
**Client Sample ID:** DIAP-S-NORTH (0-2)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:30
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 21.0 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 248 | mg/kg-dry | * | 13 | 200 | SW8015M | 07/18/16 21:53 / JRS |
| Surr: o-Terphenyl | 86.0 | %REC | | 40-140 | | SW8015M | 07/18/16 21:53 / 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 | | 13 | 200 | MA-EPH | 07/22/16 17:53 / JRS |
| C19 to C36 Aliphatics | 71 | mg/kg-dry | | 13 | 20000 | MA-EPH | 07/22/16 17:53 / JRS |
| Surr: 1-Chloro-octadecane | 81.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 17:53 / JRS |
| C11 to C22 Aromatics | 43 | mg/kg-dry | | 13 | 400 | MA-EPH | 07/22/16 18:36 / JRS |
| Total Extractable Hydrocarbons | 124 | mg/kg-dry | | 13 | 2500 | MA-EPH | 07/22/16 18:36 / JRS |
| Surr: 2-Bromonaphthalene | 80.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 18:36 / JRS |
| Surr: 2-Fluorobiphenyl | 85.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 18:36 / JRS |
| Surr: o-Terphenyl | 87.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 18:36 / JRS |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Anthracene | 0.017 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Benzo(a)anthracene | 0.091 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Benzo(a)pyrene | 0.14 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Benzo(b)fluoranthene | 0.20 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Benzo(g,h,i)perylene | 0.055 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Benzo(k)fluoranthene | 0.057 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Chrysene | 0.10 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Dibenzo(a,h)anthracene | 0.033 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Fluoranthene | 0.20 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.19 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Phenanthrene | 0.056 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Pyrene | 0.21 | mg/kg-dry | | 0.0042 | | SW8270C | 07/19/16 02:22 / eli-b |
| Surr: 2-Fluorobiphenyl | 87.0 | %REC | | 47-110 | | SW8270C | 07/19/16 02:22 / eli-b |
| Surr: Nitrobenzene-d5 | 72.0 | %REC | | 43-105 | | SW8270C | 07/19/16 02:22 / eli-b |
| Surr: Terphenyl-d14 | 102 | %REC | | 51-117 | | SW8270C | 07/19/16 02:22 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.19 | mg/kg-dry | | 0.0025 | | SW8151A | 07/20/16 15:43 / eli-b |
| Surr: DCAA | 69.0 | %REC | | 45-117 | | SW8151A | 07/20/16 15:43 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-008
**Client Sample ID:** DIAP-SS-NORTH (2-20)

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:35
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 15.2 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 23 | mg/kg-dry | | 12 | 200 | SW8015M | 07/15/16 00:42 / JRS |
| Surr: o-Terphenyl | 91.0 | %REC | | 40-140 | | SW8015M | 07/15/16 00:42 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **EXTRACTABLE PETROLEUM HYDROCARBONS** | | | | | | | |
| C9 to C18 Aliphatics | ND | mg/kg-dry | | 12 | 200 | MA-EPH | 07/22/16 19:18 / JRS |
| C19 to C36 Aliphatics | ND | mg/kg-dry | | 12 | 20000 | MA-EPH | 07/22/16 19:18 / JRS |
| Surr: 1-Chloro-octadecane | 85.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 19:18 / JRS |
| C11 to C22 Aromatics | ND | mg/kg-dry | | 12 | 400 | MA-EPH | 07/22/16 20:01 / JRS |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 2500 | MA-EPH | 07/22/16 20:01 / JRS |
| Surr: 2-Bromonaphthalene | 66.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 20:01 / JRS |
| Surr: 2-Fluorobiphenyl | 83.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 20:01 / JRS |
| Surr: o-Terphenyl | 88.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 20:01 / JRS |
| - A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | | | | | | | |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.19 | mg/kg-dry | | 0.0024 | | SW8151A | 07/20/16 15:10 / eli-b |
| Surr: DCAA | 72.0 | %REC | | 45-117 | | SW8151A | 07/20/16 15:10 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16070159-009
**Client Sample ID:** BD-20160711

**Report Date:** 07/28/16
**Collection Date:** 07/11/16 06:00
**DateReceived:** 07/11/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 14.9 | wt% | | 0.2 | | D2974 | 07/13/16 16:56 / tjb |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 1240 | mg/kg-dry | * | 12 | 200 | SW8015M | 07/15/16 04:45 / JRS |
| Surr: o-Terphenyl | 82.0 | %REC | | 40-140 | | SW8015M | 07/15/16 04:45 / 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 | 173 | mg/kg-dry | | 12 | 200 | MA-EPH | 07/22/16 20:44 / JRS |
| C19 to C36 Aliphatics | 764 | mg/kg-dry | | 12 | 20000 | MA-EPH | 07/22/16 20:44 / JRS |
| Surr: 1-Chloro-octadecane | 102 | %REC | | 40-140 | | MA-EPH | 07/22/16 20:44 / JRS |
| C11 to C22 Aromatics | 159 | mg/kg-dry | | 12 | 400 | MA-EPH | 07/22/16 21:27 / JRS |
| Total Extractable Hydrocarbons | 1160 | mg/kg-dry | | 12 | 2500 | MA-EPH | 07/22/16 21:27 / JRS |
| Surr: 2-Bromonaphthalene | 75.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 21:27 / JRS |
| Surr: 2-Fluorobiphenyl | 84.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 21:27 / JRS |
| Surr: o-Terphenyl | 86.0 | %REC | | 40-140 | | MA-EPH | 07/22/16 21:27 / JRS |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 15 | mg/kg-dry | | 0.47 | | SW8151A | 07/20/16 11:21 / eli-b |
| Surr: DCAA | 69.0 | %REC | | 45-117 | | SW8151A | 07/19/16 19:49 / 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.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **D2974** | | | | | | | | Batch: R116770 | |
| **Lab ID:** | **H16070159-009ADUP** | Sample Duplicate | | | | Run: EXTRACT OV 2_160713A | | | 07/13/16 16:56 | |
| Moisture | | 14.1 | wt% | 0.20 | | | | 5.2 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 33677 |
| **Lab ID: MB-33677-33547** | 20 | Method Blank | | | | Run: HHP_160720A | | | | 07/20/16 12:35 |
| 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 | 77 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 78 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 92 | 40 | 140 | | | |
| **Lab ID: MB-33677-33547** | 3 | Method Blank | | | | Run: HHP_160721A | | | | 07/21/16 16:05 |
| C9 to C18 Aliphatics | | ND | mg/kg-dry | 10 | | | | | | |
| C19 to C36 Aliphatics | | ND | mg/kg-dry | 10 | | | | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 89 | 40 | 140 | | | |
| **Lab ID: LCS-33677-33547** | 17 | Laboratory Control Sample | | | | Run: HHP_160721A | | | | 07/22/16 02:07 |
| C9 to C18 Aliphatics | | 24.9 | mg/kg-dry | 10 | 62 | 40 | 140 | | | |
| C19 to C36 Aliphatics | | 41.8 | mg/kg-dry | 10 | 78 | 40 | 140 | | | |
| n-Nonane | | 2.06 | mg/kg-dry | 0.17 | 31 | 30 | 140 | | | |
| n-Decane | | 2.98 | mg/kg-dry | 0.17 | 45 | 40 | 140 | | | |
| n-Dodecane | | 3.72 | mg/kg-dry | 0.17 | 56 | 40 | 140 | | | |
| n-Tetradecane | | 4.44 | mg/kg-dry | 0.17 | 67 | 40 | 140 | | | |
| n-Hexadecane | | 4.68 | mg/kg-dry | 0.17 | 70 | 40 | 140 | | | |
| n-Octadecane | | 5.06 | mg/kg-dry | 0.17 | 76 | 40 | 140 | | | |
| n-Nonadecane | | 5.26 | mg/kg-dry | 0.17 | 79 | 40 | 140 | | | |
| n-Eicosane | | 5.37 | mg/kg-dry | 0.17 | 81 | 40 | 140 | | | |
| n-Docosane | | 5.41 | mg/kg-dry | 0.17 | 81 | 40 | 140 | | | |
| n-Tetracosane | | 5.55 | mg/kg-dry | 0.17 | 83 | 40 | 140 | | | |
| n-Hexacosane | | 5.62 | mg/kg-dry | 0.17 | 84 | 40 | 140 | | | |
| n-Octacosane | | 5.46 | mg/kg-dry | 0.17 | 82 | 40 | 140 | | | |
| n-Triacontane | | 5.79 | mg/kg-dry | 0.17 | 87 | 40 | 140 | | | |
| n-Hexatriacontane | | 3.02 | mg/kg-dry | 0.17 | 45 | 40 | 140 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 79 | 40 | 140 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 33677 |
| **Lab ID: H16070009-006AMS** | 17 | Sample Matrix Spike | | | | Run: HHP_160721A | | | | 07/22/16 04:58 |
| C9 to C18 Aliphatics | | 2490 | mg/kg-dry | 11 | -172 | 40 | 140 | | | S |
| C19 to C36 Aliphatics | | 2160 | mg/kg-dry | 11 | -259 | 40 | 140 | | | S |
| n-Nonane | | 3.44 | mg/kg-dry | 0.18 | 48 | 30 | 140 | | | |
| n-Decane | | 14.3 | mg/kg-dry | 0.18 | 198 | 40 | 140 | | | S |
| n-Dodecane | | 33.0 | mg/kg-dry | 0.18 | 459 | 40 | 140 | | | S |
| n-Tetradecane | | 47.0 | mg/kg-dry | 0.18 | 653 | 40 | 140 | | | S |
| n-Hexadecane | | 36.4 | mg/kg-dry | 0.18 | 506 | 40 | 140 | | | S |
| n-Octadecane | | 26.8 | mg/kg-dry | 0.18 | 373 | 40 | 140 | | | S |
| n-Nonadecane | | 28.3 | mg/kg-dry | 0.18 | 393 | 40 | 140 | | | S |
| n-Eicosane | | 22.0 | mg/kg-dry | 0.18 | 305 | 40 | 140 | | | S |
| n-Docosane | | 14.0 | mg/kg-dry | 0.18 | 194 | 40 | 140 | | | S |
| n-Tetracosane | | 9.50 | mg/kg-dry | 0.18 | 132 | 40 | 140 | | | |
| n-Hexacosane | | 8.33 | mg/kg-dry | 0.18 | 116 | 40 | 140 | | | |
| n-Octacosane | | 6.48 | mg/kg-dry | 0.18 | 90 | 40 | 140 | | | |
| n-Triacontane | | 6.25 | mg/kg-dry | 0.18 | 87 | 40 | 140 | | | |
| n-Hexatriacontane | | 5.90 | mg/kg-dry | 0.18 | 82 | 40 | 140 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.18 | 259 | 40 | 140 | | | S |
| **Lab ID: H16070009-006AMSD** | 17 | Sample Matrix Spike Duplicate | | | | Run: HHP_160721A | | | | 07/22/16 06:24 |
| C9 to C18 Aliphatics | | 2860 | mg/kg-dry | 11 | 671 | 40 | 140 | 14 | 20 | S |
| C19 to C36 Aliphatics | | 2350 | mg/kg-dry | 11 | 62 | 40 | 140 | 8.2 | 20 | |
| n-Nonane | | 3.91 | mg/kg-dry | 0.18 | 54 | 30 | 140 | 13 | 30 | |
| n-Decane | | 15.8 | mg/kg-dry | 0.18 | 219 | 40 | 140 | 10 | 20 | S |
| n-Dodecane | | 37.4 | mg/kg-dry | 0.18 | 520 | 40 | 140 | 12 | 20 | S |
| n-Tetradecane | | 54.8 | mg/kg-dry | 0.18 | 762 | 40 | 140 | 15 | 20 | S |
| n-Hexadecane | | 38.9 | mg/kg-dry | 0.18 | 541 | 40 | 140 | 6.5 | 20 | S |
| n-Octadecane | | 28.4 | mg/kg-dry | 0.18 | 395 | 40 | 140 | 5.7 | 20 | S |
| n-Nonadecane | | 30.5 | mg/kg-dry | 0.18 | 424 | 40 | 140 | 7.4 | 20 | S |
| n-Eicosane | | 23.7 | mg/kg-dry | 0.18 | 329 | 40 | 140 | 7.5 | 20 | S |
| n-Docosane | | 14.8 | mg/kg-dry | 0.18 | 206 | 40 | 140 | 5.9 | 20 | S |
| n-Tetracosane | | 10.2 | mg/kg-dry | 0.18 | 142 | 40 | 140 | 7.0 | 20 | S |
| n-Hexacosane | | 8.62 | mg/kg-dry | 0.18 | 120 | 40 | 140 | 3.4 | 20 | |
| n-Octacosane | | 6.85 | mg/kg-dry | 0.18 | 95 | 40 | 140 | 5.6 | 20 | |
| n-Triacontane | | 6.73 | mg/kg-dry | 0.18 | 94 | 40 | 140 | 7.4 | 20 | |
| n-Hexatriacontane | | 6.08 | mg/kg-dry | 0.18 | 85 | 40 | 140 | 3.1 | 20 | |
| Surr: 1-Chloro-octadecane | | | | 0.18 | 277 | 40 | 140 | | | S |
| **Lab ID: LCS-33677-33547** | 19 | Laboratory Control Sample | | | | Run: HHP_160721A | | | | 07/22/16 02:50 |
| C11 to C22 Aromatics | | 91.1 | mg/kg-dry | 10 | 80 | 40 | 140 | | | |
| Naphthalene | | 4.32 | mg/kg-dry | 0.17 | 65 | 40 | 140 | | | |
| 2-MethylNaphthalene | | 4.20 | mg/kg-dry | 0.17 | 63 | 40 | 140 | | | |
| Acenaphthylene | | 4.87 | mg/kg-dry | 0.17 | 73 | 40 | 140 | | | |
| Acenaphthene | | 5.14 | mg/kg-dry | 0.17 | 77 | 40 | 140 | | | |
| Fluorene | | 4.62 | mg/kg-dry | 0.17 | 69 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 33677 |
| **Lab ID: LCS-33677-33547** | 19 | Laboratory Control Sample | | | | Run: HHP_160721A | | | 07/22/16 02:50 | |
| Phenanthrene | | 5.27 | mg/kg-dry | 0.17 | 79 | 40 | 140 | | | |
| Anthracene | | 5.53 | mg/kg-dry | 0.17 | 83 | 40 | 140 | | | |
| Fluoranthene | | 5.78 | mg/kg-dry | 0.17 | 87 | 40 | 140 | | | |
| Pyrene | | 5.69 | mg/kg-dry | 0.17 | 85 | 40 | 140 | | | |
| Benzo(a)Anthracene | | 5.59 | mg/kg-dry | 0.17 | 84 | 40 | 140 | | | |
| Chrysene | | 3.93 | mg/kg-dry | 0.17 | 59 | 40 | 140 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 11.8 | mg/kg-dry | 0.17 | 89 | 40 | 140 | | | |
| Benzo(a)Pyrene | | 5.82 | mg/kg-dry | 0.17 | 87 | 40 | 140 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 10.7 | mg/kg-dry | 0.17 | 81 | 40 | 140 | | | |
| Benzo(g,h,I)perylene | | 5.52 | mg/kg-dry | 0.17 | 83 | 40 | 140 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 57 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 81 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 84 | 40 | 140 | | | |
| **Lab ID: H16070009-006AMS** | 19 | Sample Matrix Spike | | | | Run: HHP_160721A | | | 07/22/16 05:41 | |
| C11 to C22 Aromatics | | 839 | mg/kg-dry | 11 | -59 | 40 | 140 | | | S |
| Naphthalene | | 0.271 | mg/kg-dry | 0.18 | -47 | 40 | 140 | | | S |
| 2-MethylNaphthalene | | 15.2 | mg/kg-dry | 0.18 | 119 | 40 | 140 | | | |
| Acenaphthylene | | 6.16 | mg/kg-dry | 0.18 | 80 | 40 | 140 | | | |
| Acenaphthene | | 6.32 | mg/kg-dry | 0.18 | 59 | 40 | 140 | | | |
| Fluorene | | 8.32 | mg/kg-dry | 0.18 | 112 | 40 | 140 | | | |
| Phenanthrene | | 6.72 | mg/kg-dry | 0.18 | 76 | 40 | 140 | | | |
| Anthracene | | 7.24 | mg/kg-dry | 0.18 | 89 | 40 | 140 | | | |
| Fluoranthene | | 6.86 | mg/kg-dry | 0.18 | 90 | 40 | 140 | | | |
| Pyrene | | 6.49 | mg/kg-dry | 0.18 | 85 | 40 | 140 | | | |
| Benzo(a)Anthracene | | 5.90 | mg/kg-dry | 0.18 | 82 | 40 | 140 | | | |
| Chrysene | | 3.98 | mg/kg-dry | 0.18 | 53 | 40 | 140 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 12.0 | mg/kg-dry | 0.18 | 84 | 40 | 140 | | | |
| Benzo(a)Pyrene | | 5.97 | mg/kg-dry | 0.18 | 83 | 40 | 140 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 10.9 | mg/kg-dry | 0.18 | 76 | 40 | 140 | | | |
| Benzo(g,h,I)perylene | | 5.45 | mg/kg-dry | 0.18 | 76 | 40 | 140 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.18 | 95 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.18 | 66 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.18 | 101 | 40 | 140 | | | |
| **Lab ID: H16070009-006AMSD** | 19 | Sample Matrix Spike Duplicate | | | | Run: HHP_160721A | | | 07/22/16 07:07 | |
| C11 to C22 Aromatics | | 804 | mg/kg-dry | 11 | -87 | 40 | 140 | 4.3 | 20 | S |
| Naphthalene | | 0.176 | mg/kg-dry | 0.18 | -49 | 40 | 140 | | 40 | S |
| 2-MethylNaphthalene | | 16.0 | mg/kg-dry | 0.18 | 131 | 40 | 140 | 5.2 | 20 | |
| Acenaphthylene | | 6.62 | mg/kg-dry | 0.18 | 87 | 40 | 140 | 7.3 | 20 | |
| Acenaphthene | | 7.11 | mg/kg-dry | 0.18 | 70 | 40 | 140 | 12 | 20 | |
| Fluorene | | 9.00 | mg/kg-dry | 0.18 | 121 | 40 | 140 | 7.8 | 20 | |
| Phenanthrene | | 7.18 | mg/kg-dry | 0.18 | 82 | 40 | 140 | 6.6 | 20 | |
| Anthracene | | 6.86 | mg/kg-dry | 0.18 | 84 | 40 | 140 | 5.4 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 33677 |
| **Lab ID: H16070009-006AMSD** | 19 | Sample Matrix Spike Duplicate | | | | Run: HHP_160721A | | | 07/22/16 07:07 | |
| Fluoranthene | | 7.28 | mg/kg-dry | 0.18 | 96 | 40 | 140 | 5.8 | 20 | |
| Pyrene | | 7.02 | mg/kg-dry | 0.18 | 92 | 40 | 140 | 7.8 | 20 | |
| Benzo(a)Anthracene | | 6.45 | mg/kg-dry | 0.18 | 90 | 40 | 140 | 8.9 | 20 | |
| Chrysene | | 4.30 | mg/kg-dry | 0.18 | 58 | 40 | 140 | 7.7 | 20 | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 13.1 | mg/kg-dry | 0.18 | 92 | 40 | 140 | 8.6 | 20 | |
| Benzo(a)Pyrene | | 6.44 | mg/kg-dry | 0.18 | 89 | 40 | 140 | 7.6 | 20 | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 11.9 | mg/kg-dry | 0.18 | 84 | 40 | 140 | 9.4 | 20 | |
| Benzo(g,h,I)perylene | | 6.01 | mg/kg-dry | 0.18 | 84 | 40 | 140 | 9.7 | 20 | |
| Surr: 2-Bromonaphthalene | | | | 0.18 | 11 | 40 | 140 | | | S |
| Surr: 2-Fluorobiphenyl | | | | 0.18 | 68 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.18 | 105 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R117038 | |
| **Lab ID: CCV_0721GC118r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 00:41 | |
| n-Nonane | | 6.63 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| n-Decane | | 6.59 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| n-Dodecane | | 7.11 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| n-Tetradecane | | 7.14 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| n-Hexadecane | | 7.06 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Octadecane | | 7.05 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Nonadecane | | 7.04 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Eicosane | | 7.05 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Docosane | | 6.90 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Tetracosane | | 6.95 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Hexacosane | | 6.97 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Octacosane | | 6.92 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Triacontane | | 6.73 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| n-Hexatriacontane | | 6.02 | mg/kg-dry | 0.17 | 90 | 75 | 125 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 104 | 75 | 125 | | | |
| **Lab ID: CCV_0721GC119r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 01:24 | |
| Naphthalene | | 6.75 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 6.68 | mg/kg-dry | 0.17 | 100 | 75 | 125 | | | |
| Acenaphthylene | | 6.76 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Acenaphthene | | 6.66 | mg/kg-dry | 0.17 | 100 | 75 | 125 | | | |
| Fluorene | | 6.85 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Phenanthrene | | 6.59 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| Anthracene | | 6.72 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Fluoranthene | | 6.64 | mg/kg-dry | 0.17 | 100 | 75 | 125 | | | |
| Pyrene | | 6.62 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 6.51 | mg/kg-dry | 0.17 | 98 | 75 | 125 | | | |
| Chrysene | | 6.68 | mg/kg-dry | 0.17 | 100 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 13.2 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 6.55 | mg/kg-dry | 0.17 | 98 | 75 | 125 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 13.2 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| Benzo(g,h,I)perylene | | 6.60 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 93 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 91 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 98 | 40 | 140 | | | |
| **Lab ID: CCV_0721GC119r-W** | 18 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 01:24 | |
| Naphthalene | | 202 | ug/L | 5.0 | 101 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 201 | ug/L | 5.0 | 100 | 75 | 125 | | | |
| Acenaphthylene | | 203 | ug/L | 5.0 | 101 | 75 | 125 | | | |
| Acenaphthene | | 200 | ug/L | 5.0 | 100 | 75 | 125 | | | |
| Fluorene | | 206 | ug/L | 5.0 | 103 | 75 | 125 | | | |
| Phenanthrene | | 198 | ug/L | 5.0 | 99 | 75 | 125 | | | |
| Anthracene | | 202 | ug/L | 5.0 | 101 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R117038 | |
| **Lab ID: CCV_0721GC119r-W** | 18 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 01:24 | |
| Fluoranthene | | 199 | ug/L | 5.0 | 100 | 75 | 125 | | | |
| Pyrene | | 199 | ug/L | 5.0 | 99 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 195 | ug/L | 5.0 | 98 | 75 | 125 | | | |
| Chrysene | | 201 | ug/L | 5.0 | 100 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 396 | ug/L | 5.0 | 99 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 196 | ug/L | 5.0 | 98 | 75 | 125 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 397 | ug/L | 5.0 | 99 | 75 | 125 | | | |
| Benzo(g,h,I)perylene | | 198 | ug/L | 5.0 | 99 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 5.0 | 93 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 5.0 | 91 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 5.0 | 98 | 40 | 140 | | | |
| **Lab ID: CCV_0721GC136r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 13:34 | |
| n-Nonane | | 6.98 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Decane | | 6.95 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Dodecane | | 6.91 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Tetradecane | | 6.97 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Hexadecane | | 6.87 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| n-Octadecane | | 6.86 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| n-Nonadecane | | 6.85 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| n-Eicosane | | 6.87 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| n-Docosane | | 6.72 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| n-Tetracosane | | 6.92 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Hexacosane | | 6.79 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| n-Octacosane | | 6.75 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| n-Triacontane | | 6.59 | mg/kg-dry | 0.17 | 99 | 75 | 125 | | | |
| n-Hexatriacontane | | 6.07 | mg/kg-dry | 0.17 | 91 | 75 | 125 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 101 | 75 | 125 | | | |
| **Lab ID: CCV_0721GC152r-W** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/23/16 00:18 | |
| n-Nonane | | 215 | ug/L | 5.0 | 108 | 30 | 125 | | | |
| n-Decane | | 217 | ug/L | 5.0 | 109 | 75 | 125 | | | |
| n-Dodecane | | 214 | ug/L | 5.0 | 107 | 75 | 125 | | | |
| n-Tetradecane | | 216 | ug/L | 5.0 | 108 | 75 | 125 | | | |
| n-Hexadecane | | 213 | ug/L | 5.0 | 107 | 75 | 125 | | | |
| n-Octadecane | | 213 | ug/L | 5.0 | 106 | 75 | 125 | | | |
| n-Nonadecane | | 212 | ug/L | 5.0 | 106 | 75 | 125 | | | |
| n-Eicosane | | 213 | ug/L | 5.0 | 106 | 75 | 125 | | | |
| n-Docosane | | 208 | ug/L | 5.0 | 104 | 75 | 125 | | | |
| n-Tetracosane | | 210 | ug/L | 5.0 | 105 | 75 | 125 | | | |
| n-Hexacosane | | 211 | ug/L | 5.0 | 105 | 75 | 125 | | | |
| n-Octacosane | | 210 | ug/L | 5.0 | 105 | 75 | 125 | | | |
| n-Triacontane | | 206 | ug/L | 5.0 | 103 | 75 | 125 | | | |
| n-Hexatriacontane | | 203 | ug/L | 5.0 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R117038 | |
| **Lab ID: CCV_0721GC152r-W** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/23/16 00:18 | |
| Surr: 1-Chloro-octadecane | | | | 5.0 | 105 | 75 | 125 | | | |
| **Lab ID: CCV_0721GC137r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 07/22/16 14:17 | |
| Naphthalene | | 6.92 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 6.86 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Acenaphthylene | | 6.93 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| Acenaphthene | | 6.84 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Fluorene | | 7.00 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| Phenanthrene | | 6.76 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Anthracene | | 6.92 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| Fluoranthene | | 6.79 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Pyrene | | 6.80 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 6.68 | mg/kg-dry | 0.17 | 100 | 75 | 125 | | | |
| Chrysene | | 6.87 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 13.6 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 6.73 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 13.6 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Benzo(g,h,I)perylene | | 6.78 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 95 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 93 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 100 | 40 | 140 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R117115 | |
| **Lab ID: CCV_0725GC102r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/26/16 10:40 | |
| n-Nonane | | 7.14 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| n-Decane | | 7.06 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Dodecane | | 7.11 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| n-Tetradecane | | 7.23 | mg/kg-dry | 0.17 | 108 | 75 | 125 | | | |
| n-Hexadecane | | 7.08 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Octadecane | | 7.06 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Nonadecane | | 7.05 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Eicosane | | 7.07 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| n-Docosane | | 6.92 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Tetracosane | | 6.96 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Hexacosane | | 6.99 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Octacosane | | 6.98 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Triacontane | | 6.95 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| n-Hexatriacontane | | 7.57 | mg/kg-dry | 0.17 | 114 | 75 | 125 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 104 | 75 | 125 | | | |
| **Lab ID: CCV_0725GC103r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 07/26/16 11:23 | |
| Naphthalene | | 7.18 | mg/kg-dry | 0.17 | 108 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 6.93 | mg/kg-dry | 0.17 | 104 | 75 | 125 | | | |
| Acenaphthylene | | 7.10 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Acenaphthene | | 7.07 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Fluorene | | 7.53 | mg/kg-dry | 0.17 | 113 | 75 | 125 | | | |
| Phenanthrene | | 6.75 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Anthracene | | 7.40 | mg/kg-dry | 0.17 | 111 | 75 | 125 | | | |
| Fluoranthene | | 7.05 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Pyrene | | 7.04 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 6.82 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Chrysene | | 7.18 | mg/kg-dry | 0.17 | 108 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 14.0 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 6.95 | 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 | | 6.87 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 93 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 97 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | | Batch: 33547 |
| **Lab ID: MB-33547** | 2 | Method Blank | | | | Run: HHP2_160711A | | | | 07/11/16 18:54 |
| Total Extractable Hydrocarbons | | ND | mg/kg-dry | 10 | | | | | | |
| Surr: o-Terphenyl | | | | 0.17 | 93 | 40 | 140 | | | |
| **Lab ID: LCS-33547** | 2 | Laboratory Control Sample | | | | Run: HHP2_160711A | | | | 07/11/16 19:43 |
| Total Extractable Hydrocarbons | | 179.8 | mg/kg-dry | 10 | 87 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 90 | 40 | 140 | | | |
| **Lab ID: H16070009-006AMS** | 2 | Sample Matrix Spike | | | | Run: HHP2_160711A | | | | 07/12/16 07:03 |
| Total Extractable Hydrocarbons | | 6614 | mg/kg-dry | 11 | -51 | 60 | 140 | | | S |
| Surr: o-Terphenyl | | | | 0.18 | 46 | 40 | 140 | | | |
| **Lab ID: H16070009-006AMSD** | 2 | Sample Matrix Spike Duplicate | | | | Run: HHP2_160711A | | | | 07/12/16 08:42 |
| Total Extractable Hydrocarbons | | 7085 | mg/kg-dry | 11 | 161 | 60 | 140 | 6.9 | 20 | S |
| Surr: o-Terphenyl | | | | 0.18 | 46 | 40 | 140 | | | |
| **Method: SW8015M** | | | | | | | | | | Analytical Run: R116832 |
| **Lab ID: CCV_0714GC415r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | | 07/14/16 22:17 |
| n-Nonane | | 6.782 | mg/kg-dry | | 102 | 75 | 125 | | | |
| n-Decane | | 6.818 | mg/kg-dry | | 102 | 75 | 125 | | | |
| n-Dodecane | | 6.811 | mg/kg-dry | | 102 | 75 | 125 | | | |
| n-Tetradecane | | 6.878 | mg/kg-dry | | 103 | 75 | 125 | | | |
| n-Hexadecane | | 6.737 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Octadecane | | 6.741 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Nonadecane | | 6.780 | mg/kg-dry | | 102 | 75 | 125 | | | |
| n-Eicosane | | 6.733 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Docosane | | 6.721 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Tetracosane | | 6.749 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Hexacosane | | 6.700 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Octacosane | | 6.737 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Triacontane | | 6.726 | mg/kg-dry | | 101 | 75 | 125 | | | |
| n-Hexatriacontane | | 6.513 | mg/kg-dry | | 98 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 103 | 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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | Analytical Run: R116923 | |
| **Lab ID: CCV_0718GC415r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 07/18/16 21:05 | |
| n-Nonane | | 6.450 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Decane | | 6.480 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Dodecane | | 6.499 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Tetradecane | | 6.582 | mg/kg-dry | | 99 | 75 | 125 | | | |
| n-Hexadecane | | 6.432 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Octadecane | | 6.437 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Nonadecane | | 6.473 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Eicosane | | 6.427 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Docosane | | 6.414 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Tetracosane | | 6.441 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Hexacosane | | 6.390 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Octacosane | | 6.429 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Triacontane | | 6.411 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Hexatriacontane | | 6.196 | mg/kg-dry | | 93 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 98 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8151A** | | | | | | | | | Batch: B_100862 | |
| **Lab ID: LCS-100862** | 2 | Laboratory Control Sample | | | | Run: SUB-B264142 | | | 07/19/16 12:09 | |
| Pentachlorophenol | | 0.0670 | mg/kg | 0.0020 | 67 | 51 | 103 | | | |
| Surr: DCAA | | | | 0.0020 | 52 | 45 | 117 | | | |
| **Lab ID: MB-100862** | 2 | Method Blank | | | | Run: SUB-B264142 | | | 07/19/16 12:42 | |
| Pentachlorophenol | | ND | mg/kg | 0.0020 | | | | | | |
| Surr: DCAA | | | | 0.0020 | 58 | 45 | 117 | | | |
| **Lab ID: H16070159-001A** | | Sample Duplicate | | | | Run: SUB-B264142 | | | 07/20/16 12:26 | |
| Pentachlorophenol | | 1.16 | mg/kg-dry | 0.058 | -45 | | | 5.4 | 40 | S |
| **Lab ID: H16070159-001A** | | Sample Duplicate | | | | Run: SUB-B264142 | | | 07/20/16 12:59 | |
| Pentachlorophenol | | 1.45 | mg/kg-dry | 0.057 | 155 | | | 17 | 40 | S |

- Because the sample amount was significantly higher than the spike amount, the MS and MSD spike samples are calculated as Duplicate samples.

**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:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_100906 | |
| **Lab ID: MB-100906** | 20 | Method Blank | | | | Run: SUB-B264004 | | | 07/19/16 00:51 | |
| 2-Methylnaphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthylene | | ND | mg/kg | 0.0033 | | | | | | |
| Anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(b)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(g,h,i)perylene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(k)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Chrysene | | ND | mg/kg | 0.0033 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluorene | | ND | mg/kg | 0.0033 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Naphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Phenanthrene | | ND | mg/kg | 0.0033 | | | | | | |
| Pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 80 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 68 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 93 | 51 | 117 | | | |
| **Lab ID: LCS-100906** | 20 | Laboratory Control Sample | | | | Run: SUB-B264004 | | | 07/19/16 01:22 | |
| 2-Methylnaphthalene | | 0.151 | mg/kg | 0.0033 | 91 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.154 | mg/kg | 0.0033 | 92 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.160 | mg/kg | 0.0033 | 96 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.175 | mg/kg | 0.0033 | 105 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.179 | mg/kg | 0.0033 | 107 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.180 | mg/kg | 0.0033 | 108 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.193 | mg/kg | 0.0033 | 116 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.144 | mg/kg | 0.0033 | 86 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.147 | mg/kg | 0.0033 | 88 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.165 | mg/kg | 0.0033 | 99 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.187 | mg/kg | 0.0033 | 112 | 63 | 113 | 0.0 | 40 | |
| Fluoranthene | | 0.170 | mg/kg | 0.0033 | 102 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.167 | mg/kg | 0.0033 | 100 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.181 | mg/kg | 0.0033 | 108 | 57 | 119 | 0.0 | 40 | |
| Naphthalene | | 0.137 | mg/kg | 0.0033 | 82 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.156 | mg/kg | 0.0033 | 93 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.187 | mg/kg | 0.0033 | 112 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 86 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 80 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 96 | 51 | 117 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 07/28/16

**Project:** Diamond P Ranch **Work Order:** H16070159

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_100906 | |
| **Lab ID: H16070159-003A** | 20 | Sample Matrix Spike | | | | Run: SUB-B264070 | | | 07/20/16 18:59 | |
| 2-Methylnaphthalene | | 0.186 | mg/kg-dry | 0.0042 | 87 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.176 | mg/kg-dry | 0.0042 | 83 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.179 | mg/kg-dry | 0.0042 | 84 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.189 | mg/kg-dry | 0.0042 | 89 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.221 | mg/kg-dry | 0.0042 | 101 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.238 | mg/kg-dry | 0.0042 | 106 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.246 | mg/kg-dry | 0.0042 | 107 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.197 | mg/kg-dry | 0.0042 | 89 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.206 | mg/kg-dry | 0.0042 | 97 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.193 | mg/kg-dry | 0.0042 | 87 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.268 | mg/kg-dry | 0.0042 | 122 | 63 | 113 | 0.0 | 40 | S |
| Fluoranthene | | 0.194 | mg/kg-dry | 0.0042 | 86 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.184 | mg/kg-dry | 0.0042 | 86 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.335 | mg/kg-dry | 0.0042 | 146 | 57 | 119 | 0.0 | 40 | S |
| Naphthalene | | 0.152 | mg/kg-dry | 0.0042 | 71 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.170 | mg/kg-dry | 0.0042 | 80 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.219 | mg/kg-dry | 0.0042 | 98 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0042 | 80 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0042 | 72 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0042 | 99 | 51 | 117 | | | |
| **Lab ID: H16070159-003A** | 20 | Sample Matrix Spike Duplicate | | | | Run: SUB-B264070 | | | 07/20/16 19:30 | |
| 2-Methylnaphthalene | | 0.185 | mg/kg-dry | 0.0042 | 87 | 54 | 113 | 0.4 | 40 | |
| Acenaphthene | | 0.170 | mg/kg-dry | 0.0042 | 80 | 54 | 111 | 3.1 | 40 | |
| Acenaphthylene | | 0.171 | mg/kg-dry | 0.0042 | 80 | 53 | 113 | 5.0 | 40 | |
| Anthracene | | 0.183 | mg/kg-dry | 0.0042 | 86 | 66 | 109 | 3.1 | 40 | |
| Benzo(a)anthracene | | 0.208 | mg/kg-dry | 0.0042 | 95 | 51 | 121 | 6.1 | 40 | |
| Benzo(a)pyrene | | 0.225 | mg/kg-dry | 0.0042 | 99 | 62 | 114 | 5.8 | 40 | |
| Benzo(b)fluoranthene | | 0.232 | mg/kg-dry | 0.0042 | 100 | 50 | 128 | 5.6 | 40 | |
| Benzo(g,h,i)perylene | | 0.202 | mg/kg-dry | 0.0042 | 91 | 62 | 116 | 2.4 | 40 | |
| Benzo(k)fluoranthene | | 0.214 | mg/kg-dry | 0.0042 | 101 | 47 | 127 | 4.1 | 40 | |
| Chrysene | | 0.183 | mg/kg-dry | 0.0042 | 83 | 56 | 119 | 4.9 | 40 | |
| Dibenzo(a,h)anthracene | | 0.272 | mg/kg-dry | 0.0042 | 124 | 63 | 113 | 1.6 | 40 | S |
| Fluoranthene | | 0.182 | mg/kg-dry | 0.0042 | 80 | 70 | 115 | 6.5 | 40 | |
| Fluorene | | 0.173 | mg/kg-dry | 0.0042 | 81 | 53 | 118 | 6.1 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.332 | mg/kg-dry | 0.0042 | 145 | 57 | 119 | 1.0 | 40 | S |
| Naphthalene | | 0.144 | mg/kg-dry | 0.0042 | 68 | 50 | 109 | 5.1 | 40 | |
| Phenanthrene | | 0.159 | mg/kg-dry | 0.0042 | 75 | 63 | 116 | 7.2 | 40 | |
| Pyrene | | 0.212 | mg/kg-dry | 0.0042 | 94 | 62 | 113 | 3.3 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0042 | 79 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0042 | 74 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0042 | 99 | 51 | 117 | | | |

**Qualifiers:**

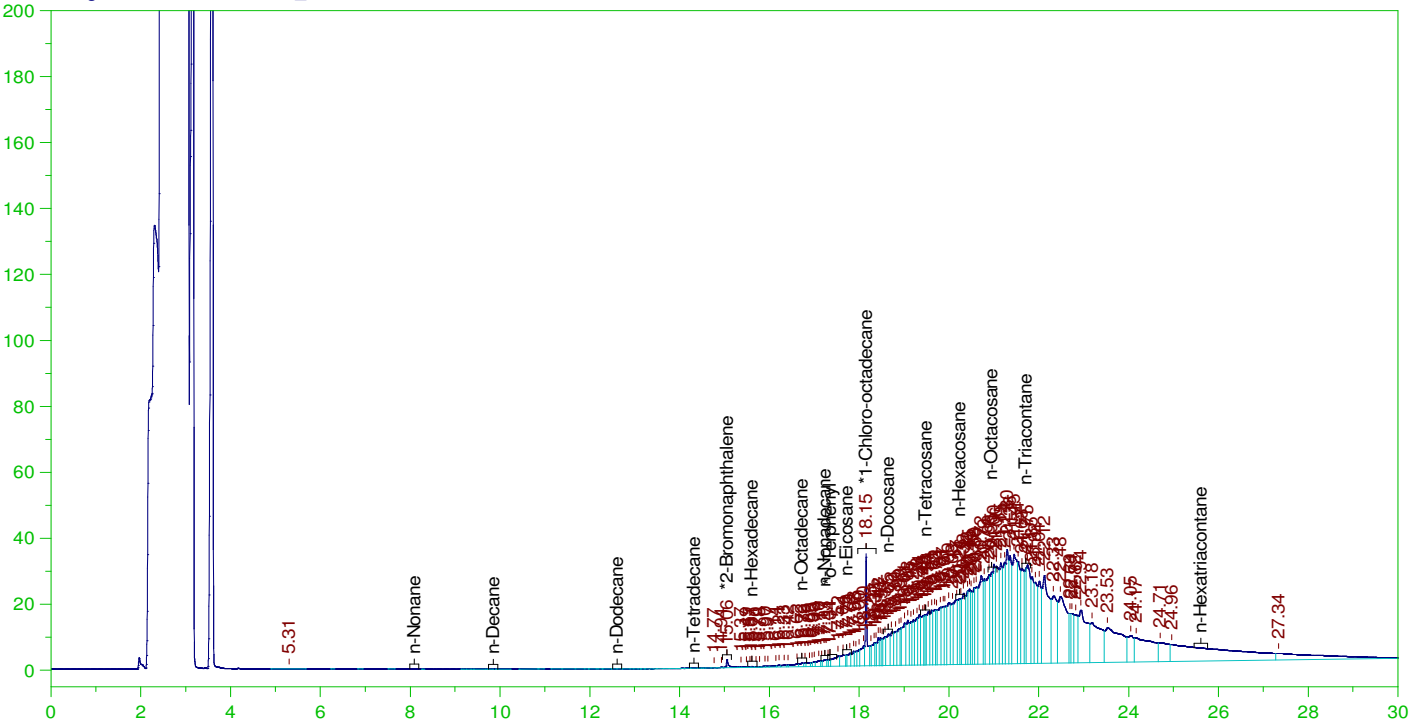
RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

**DIAP-S-EAST (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0029.RAW H16070159-001A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-001A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0029.RAW
Date & Time Acquired: 7/22/2016 7:50:05 AM
Method File: G:\Org\1GC\Methods\07211629.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 20.5 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

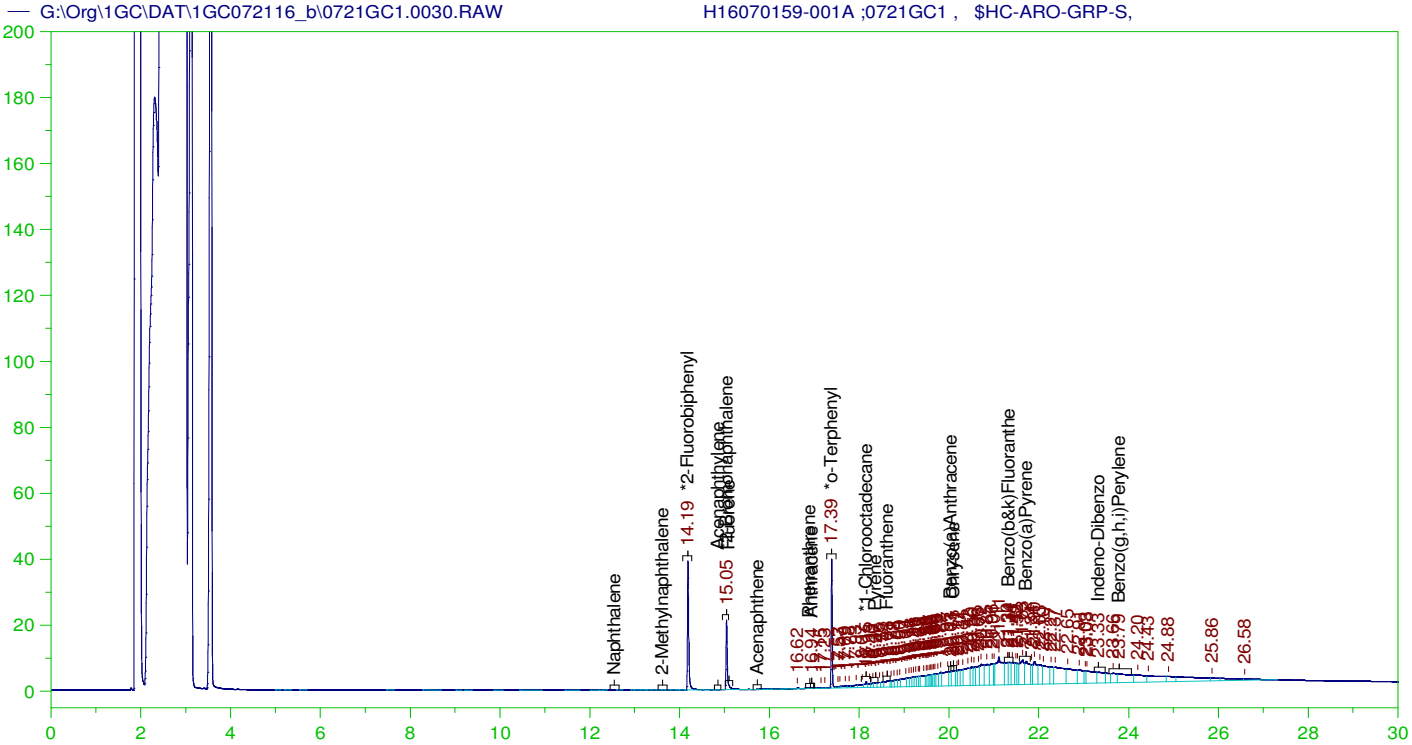
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.155 | 87431 | 9.756 | 11.249 | 115.31 | - |

DRO Area:3180501 DRO Amount: 365.5659
TEH Area:7408383 TEH Amount: 851.5176

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:91049.12 C9-C18 Amount: 10.57648
C19-C36 Area:7163284 C19-C36 Amount: 816.8976

**DIAP-S-EAST (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0030.RAW H16070159-001A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-001A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0030.RAW
Date & Time Acquired: 7/22/2016 8:32:55 AM
Method File: G:\Org\1GC\Methods\07211630.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 20.5 Dilution: 2 S.A.: 1

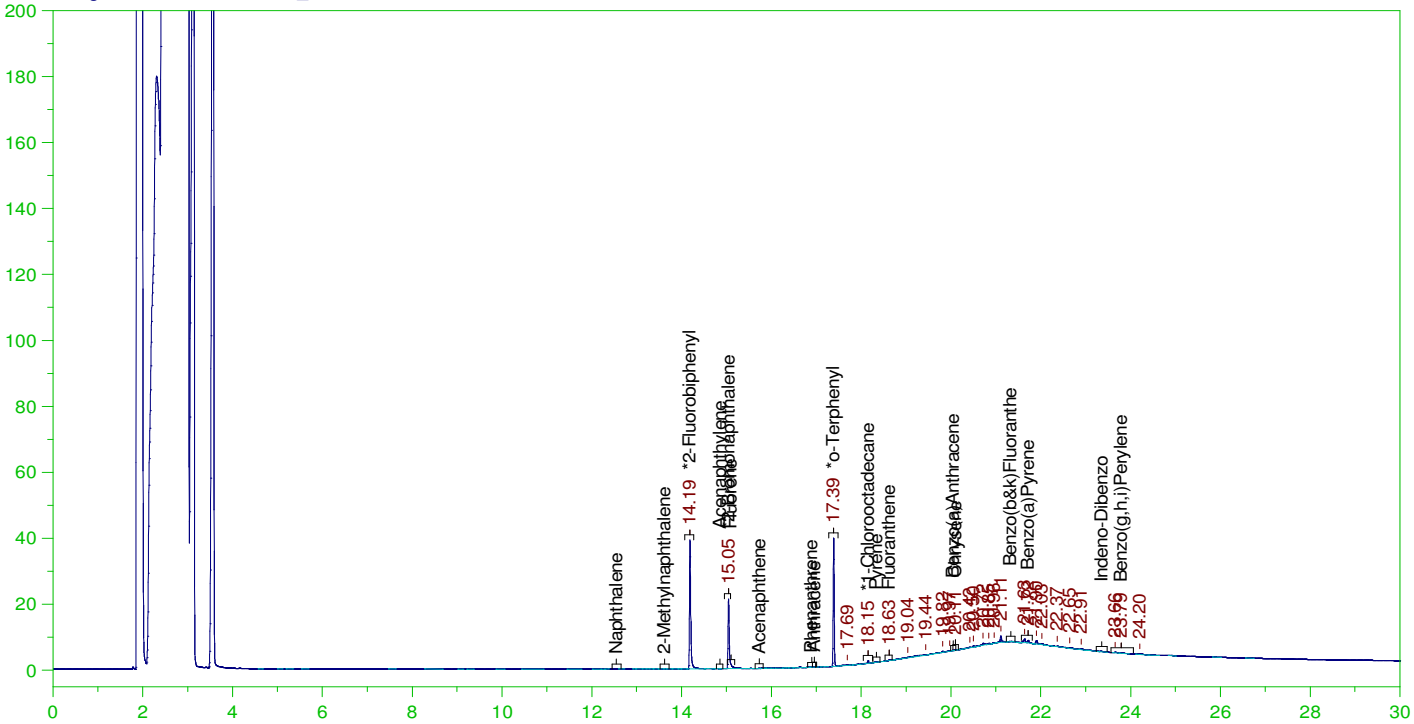
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.19 | 73415 | 9.756 | 7.954 | 81.53 | - |
| *2-Bromonaphthalene | 15.046 | 45079 | 9.756 | 7.415 | 76. | - |
| *o-Terphenyl | 17.386 | 67021 | 9.756 | 6.848 | 70.19 | - |
| *1-Chlorooctadecane | 18.154 | 7010 | 9.756 | .922 | 9.45 | - |

C11-C22 Aromatics Area:1507759 C11-C22 Aromatics Amount: 159.2237
EPH Aromatics total Area:1630164 EPH Aromatics Total Amount: 172.15

**DIAP-S-EAST (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0030.RAW H16070159-001A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

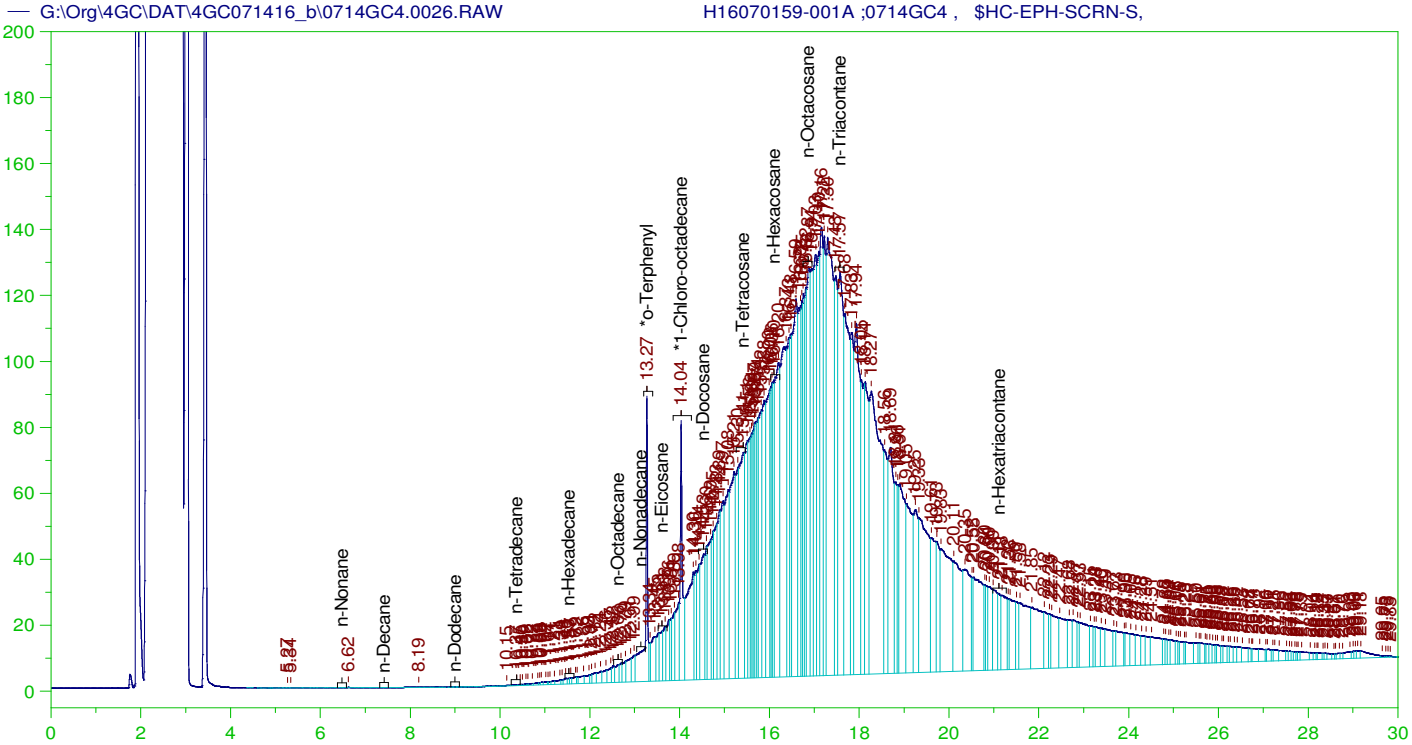
Sample Name: H16070159-001A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0030.RAW
Date & Time Acquired: 7/22/2016 8:32:55 AM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 20.5 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .098 | U |
| 2-Methylnaphthalene | . | . | . | | .098 | U |
| Acenaphthylene | . | . | . | | .098 | U |
| Fluorene | . | . | . | | .098 | U |
| Acenaphthene | . | . | . | | .098 | U |
| Phenanthrene | . | . | . | | .098 | U |
| Anthracene | . | . | . | | .098 | U |
| Pyrene | . | . | . | | .098 | U |
| Fluoranthene | 18.629 | -3.59 | -3.582 | 867 | .09 | J |
| Benzo(a)Anthracene | . | . | . | | .098 | U |
| Chrysene | 20.106 | 20.106 | 20.106 | 576 | .098 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .195 | U |
| Benzo(a)Pyrene | 21.719 | -6.67 | -6.672 | 1854 | .193 | |
| Indeno-Dibenzo | . | . | . | | .195 | U |
| Benzo(g,h,i)Perylene | 23.79 | 23.79 | 23.79 | 553 | .098 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.19 | 73141 | 9.756 | 7.924 | 81.22 | 40-140 |
| *2-Bromonaphthalene | 15.046 | 44920 | 9.756 | 7.389 | 75.74 | 40-140 |
| *o-Terphenyl | 17.386 | 63152 | 9.756 | 6.453 | 66.14 | 40-140 |
| *1-Chlorooctadecane | 18.154 | 1429 | 9.756 | .188 | 1.93 | 40-140 |

**DIAP-S-EAST (0-2)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0026.RAW H16070159-001A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-001A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0026.RAW
Date & Time Acquired: 7/15/2016 7:11:41 AM
Method File: G:\Org\4GC\Methods\07141626.MET
Calibration File: G:\Org\4GC\Cals\SC010816O.CAL
Sample Weight: 20.5 Dilution: 2 S.A.: 1

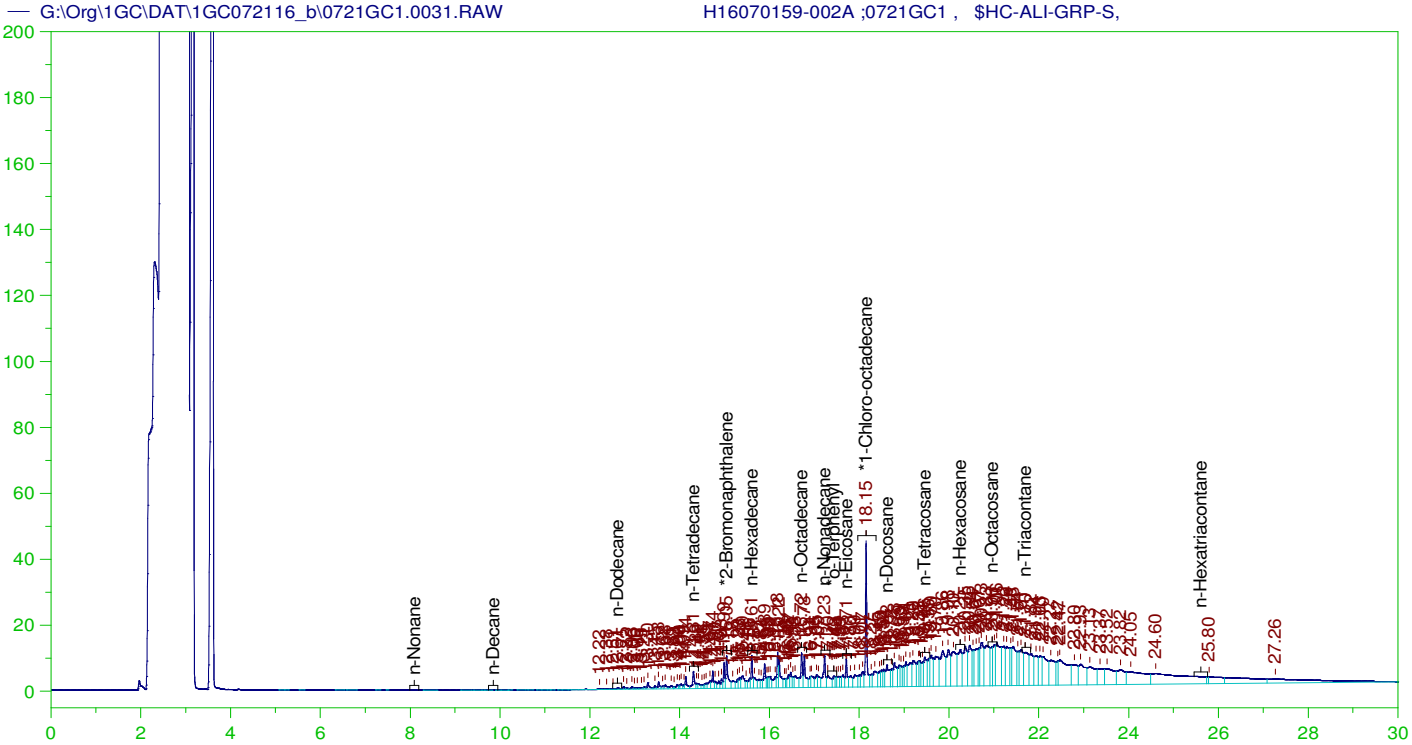
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.272 | 312019 | 9.756 | 15.056 | 154.33 | - |
| *1-Chloro-octadecane | 14.036 | 276698 | 9.756 | 17.106 | 175.34 | - |

DRO Area:1.860602E+07 DRO Amount: 991.9697
TEH Area:3.365818E+07 TEH Amount: 1794.467
C9-C18 Area:402961.1 C9-C18 Amount: 21.70273
C19-C36 Area:2.935587E+07C19-C36 Amount: 1549.45

**DIAP-SS-East (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0031.RAW H16070159-002A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-002A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0031.RAW
Date & Time Acquired: 7/22/2016 9:15:51 AM
Method File: G:\Org\1GC\Methods\07211631.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

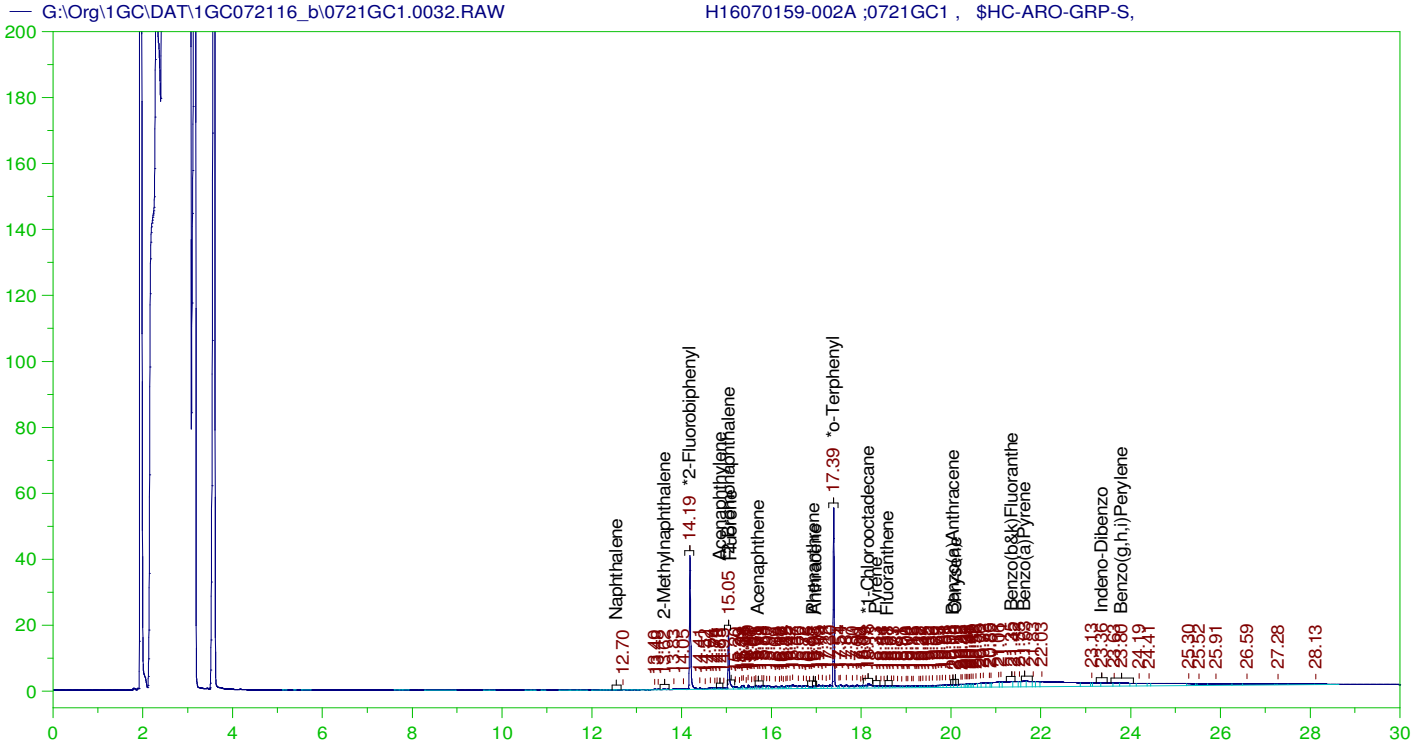
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.154 | 99733 | 7.813 | 10.276 | 131.53 | - |

DRO Area:2302911 DRO Amount: 211.9636
TEH Area:3985630 TEH Amount: 366.8436

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:623123 C9-C18 Amount: 57.96329
C19-C36 Area:3222292 C19-C36 Amount: 294.2621

**DIAP-SS-East (2-20)** Batch ID: 33677

G:\Org\1GC\DAT\1GC072116_b\0721GC1.0032.RAW H16070159-002A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-002A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0032.RAW
Date & Time Acquired: 7/22/2016 9:58:44 AM
Method File: G:\Org\1GC\Methods\07211632.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

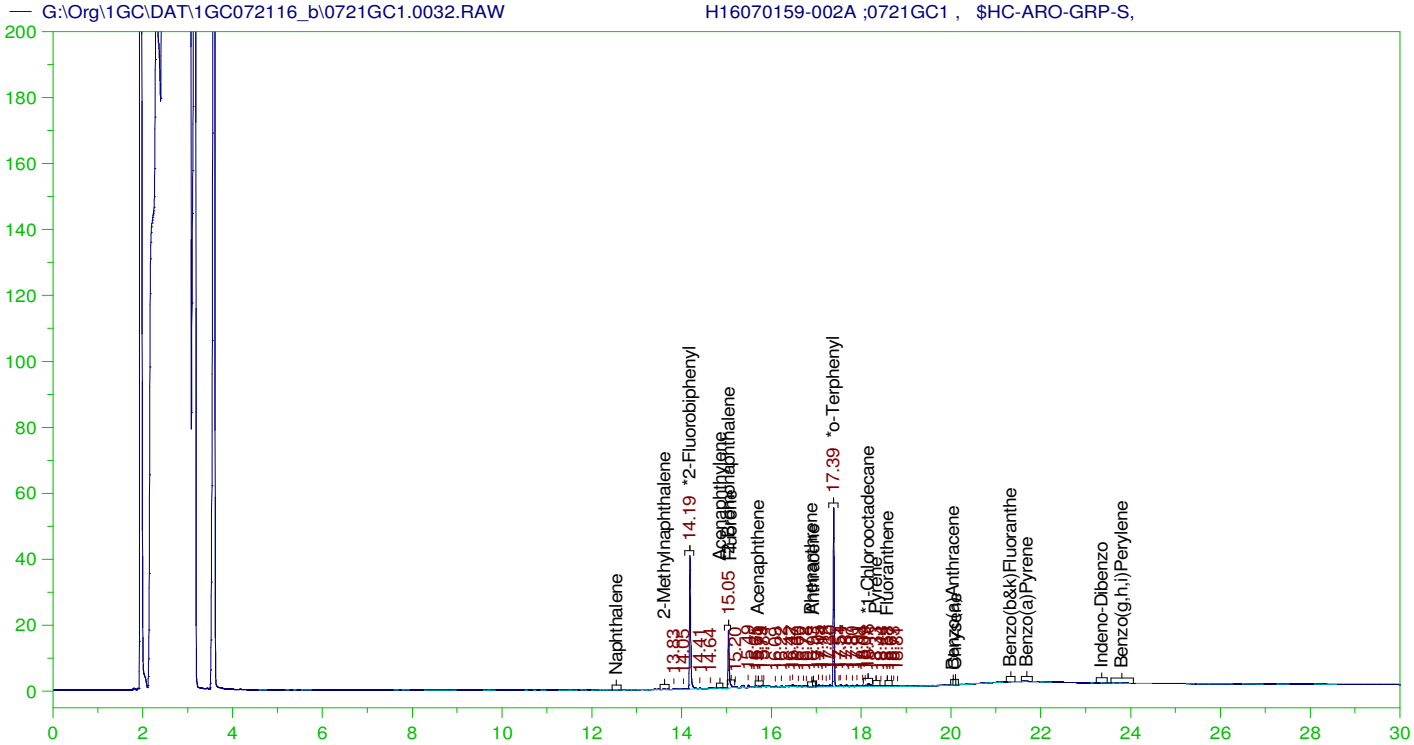
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.189 | 75200 | 7.813 | 6.524 | 83.51 | - |
| *2-Bromonaphthalene | 15.045 | 37690 | 7.813 | 4.965 | 63.55 | - |
| *o-Terphenyl | 17.386 | 92613 | 7.813 | 7.578 | 96.99 | - |
| *1-Chlorooctadecane | 18.158 | 10148 | 7.813 | 1.069 | 13.68 | - |

C11-C22 Aromatics Area:460167.1 C11-C22 Aromatics Amount: 38.91394
EPH Aromatics total Area:523813.2 EPH Aromatics Total Amount: 44.29616

**DIAP-SS-East (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0032.RAW H16070159-002A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

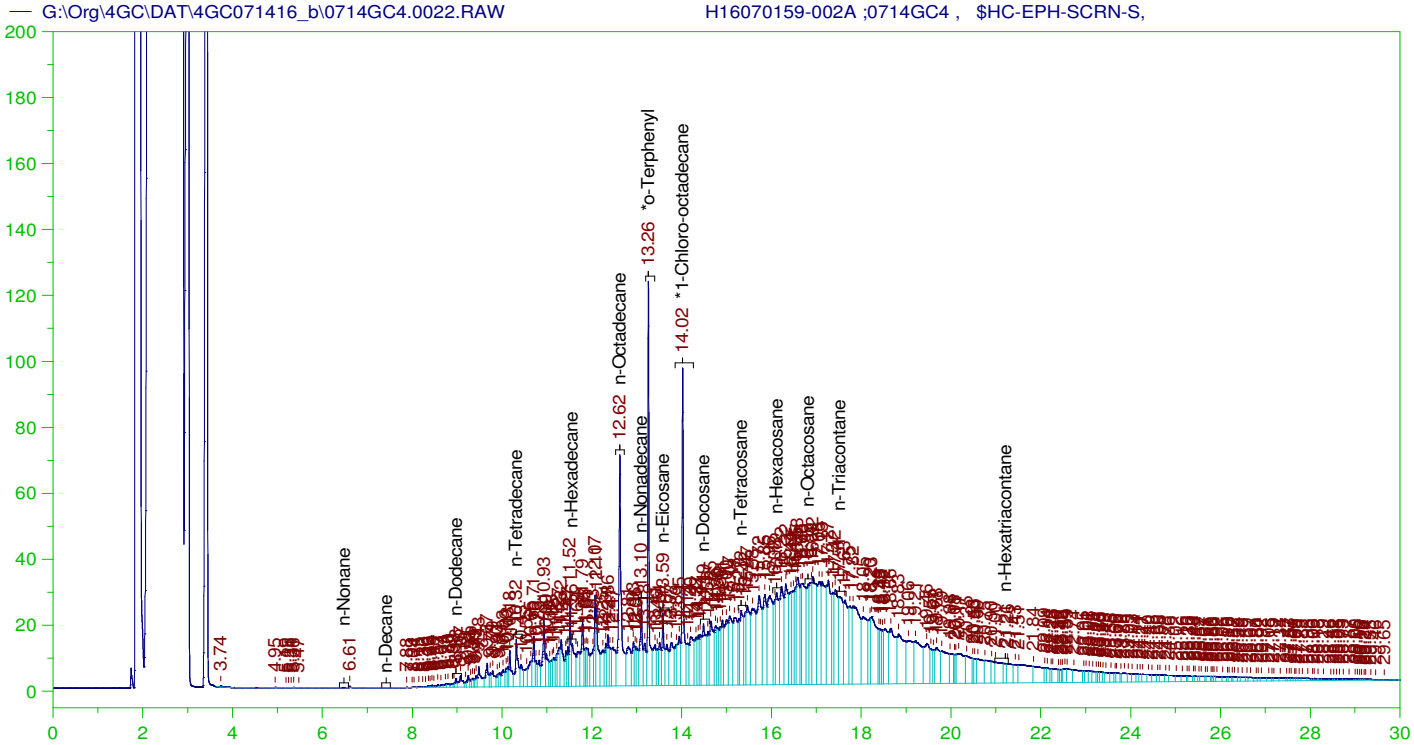
Sample Name: H16070159-002A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0032.RAW
Date & Time Acquired: 7/22/2016 9:58:44 AM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .078 | U |
| 2-Methylnaphthalene | . | . | . | | .078 | U |
| Acenaphthylene | . | . | . | | .078 | U |
| Fluorene | . | . | . | | .078 | U |
| Acenaphthene | 15.709 | 15.709 | 15.709 | 579 | .078 | U |
| Phenanthrene | . | . | . | | .078 | U |
| Anthracene | 16.935 | 16.935 | 16.935 | 511 | .078 | U |
| Pyrene | 18.333 | -3.32 | -3.288 | 875 | .073 | J |
| Fluoranthene | 18.583 | -3.59 | -3.538 | 956 | .079 | |
| Benzo(a)Anthracene | . | . | . | | .078 | U |
| Chrysene | . | . | . | | .078 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .156 | U |
| Benzo(a)Pyrene | . | . | . | | .078 | U |
| Indeno-Dibenzo | . | . | . | | .156 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .078 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.189 | 73159 | 7.813 | 6.347 | 81.24 | 40-140 |
| *2-Bromonaphthalene | 15.045 | 33864 | 7.813 | 4.461 | 57.09 | 40-140 |
| *o-Terphenyl | 17.386 | 88466 | 7.813 | 7.238 | 92.65 | 40-140 |
| *1-Chlorooctadecane | 18.158 | 4859 | 7.813 | .512 | 6.55 | 40-140 |

**DIAP-SS-East (2-20)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0022.RAW H16070159-002A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-002A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0022.RAW
Date & Time Acquired: 7/15/2016 3:56:25 AM
Method File: G:\Org\4GC\Methods\07141622.MET
Calibration File: G:\Org\4GC\Cals\SC010816O.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

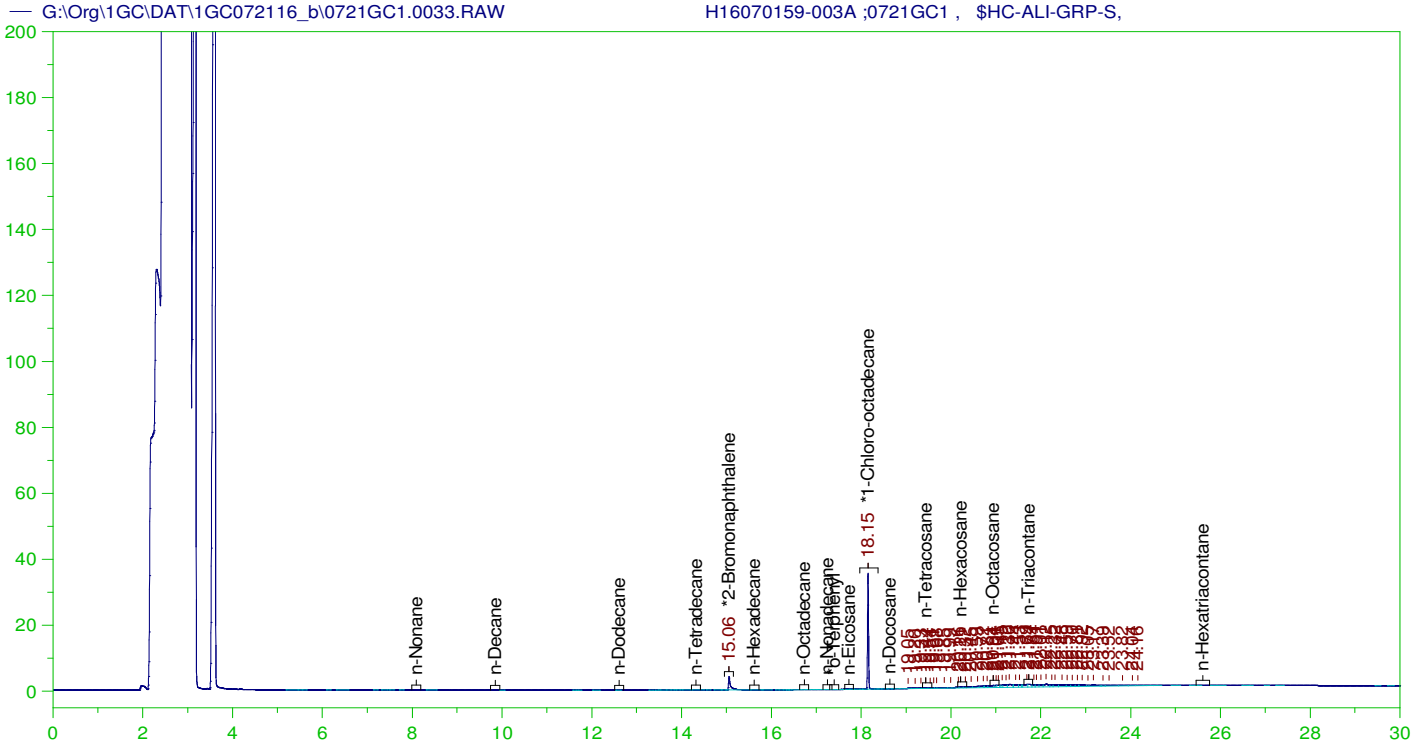
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.26 | 260170 | 7.813 | 10.053 | 128.68 | - |
| *1-Chloro-octadecane | 14.025 | 244707 | 7.813 | 12.114 | 155.07 | - |

DRO Area:7956350 DRO Amount: 339.682
TEH Area:1.157867E+07 TEH Amount: 494.3304
C9-C18 Area:2344768 C9-C18 Amount: 101.1265
C19-C36 Area:8244499 C19-C36 Amount: 348.4664

**DIAP-S-SOUTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0033.RAW H16070159-003A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-003A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0033.RAW
Date & Time Acquired: 7/22/2016 10:41:52 AM
Method File: G:\Org\1GC\Methods\AL102015L.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 24.3 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

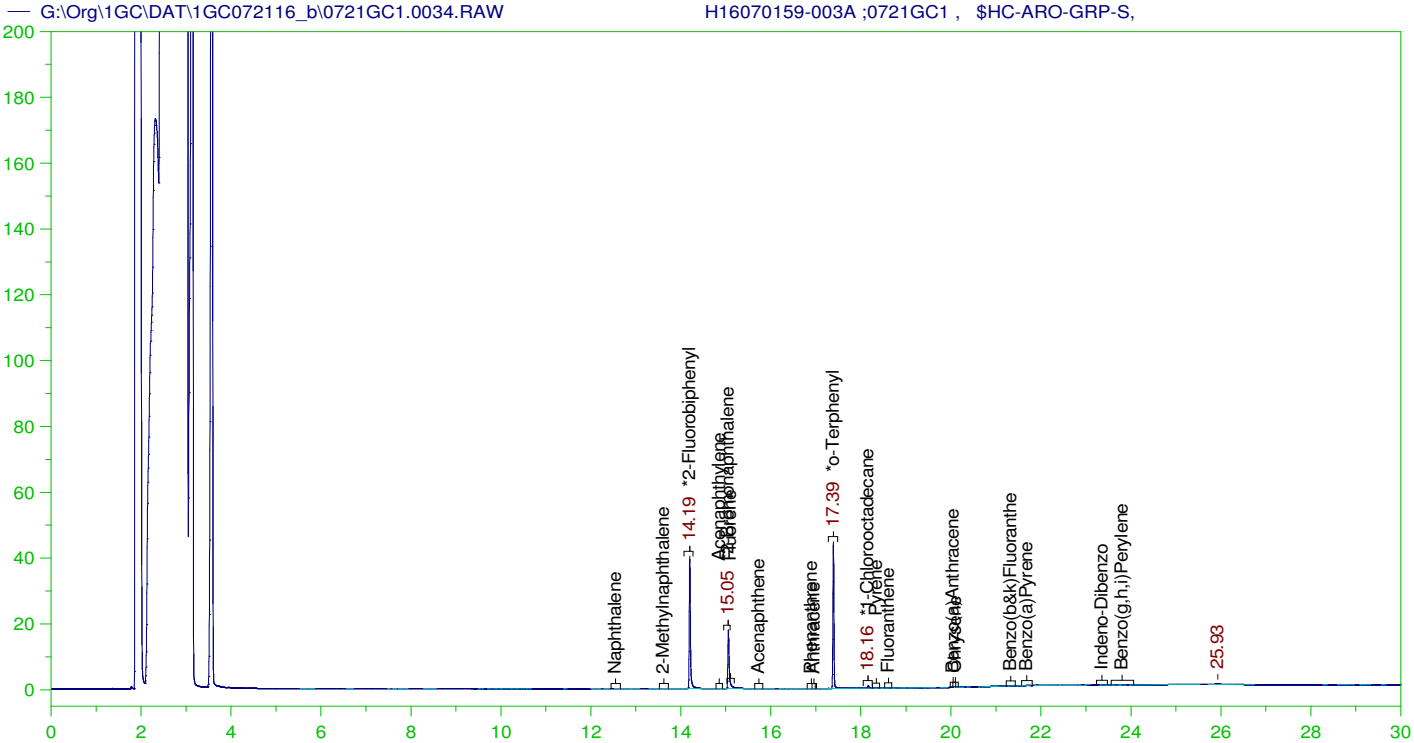
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.153 | 58844 | 8.23 | 6.387 | 77.61 | - |

DRO Area:39125.26 DRO Amount: 3.793805
TEH Area:141505 TEH Amount: 13.72112

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:14421.12 C9-C18 Amount: 1.413227
C19-C36 Area:126696.9 C19-C36 Amount: 12.18903

**DIAP-S-SOUTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0034.RAW H16070159-003A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-003A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0034.RAW
Date & Time Acquired: 7/22/2016 11:24:57 AM
Method File: G:\Org\1GC\Methods\AR102015M.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 24.3 Dilution: 2 S.A.: 1

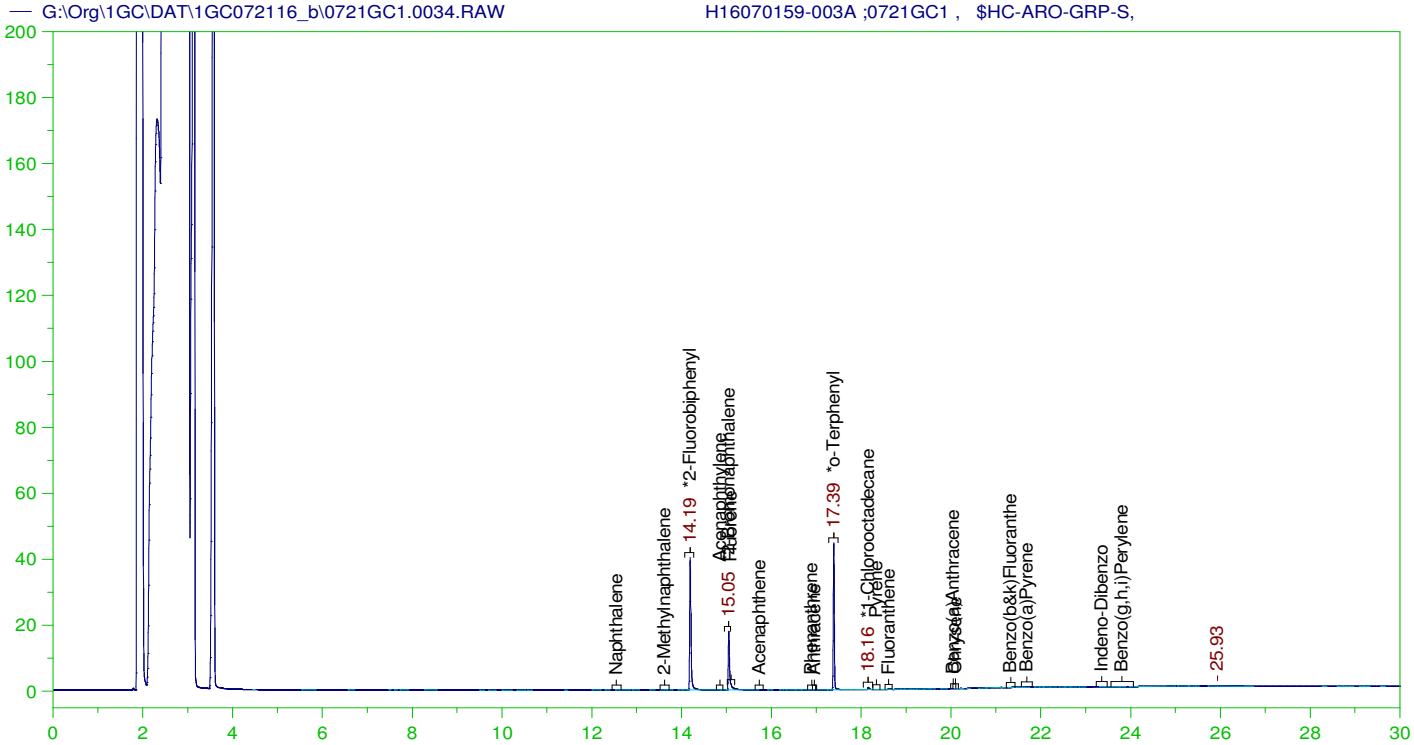
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.194 | 79116 | 8.23 | 7.231 | 87.86 | - |
| *2-Bromonaphthalene | 15.052 | 42092 | 8.23 | 5.841 | 70.97 | - |
| *o-Terphenyl | 17.389 | 75079 | 8.23 | 6.472 | 78.63 | - |
| *1-Chlorooctadecane | 18.158 | 1680 | 8.23 | .186 | 2.26 | - |

C11-C22 Aromatics Area:3892.037 C11-C22 Aromatics Amount: 0.3467371
EPH Aromatics total Area:6003.595 EPH Aromatics Total Amount: 0.5348534

**DIAP-S-SOUTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0034.RAW H16070159-003A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

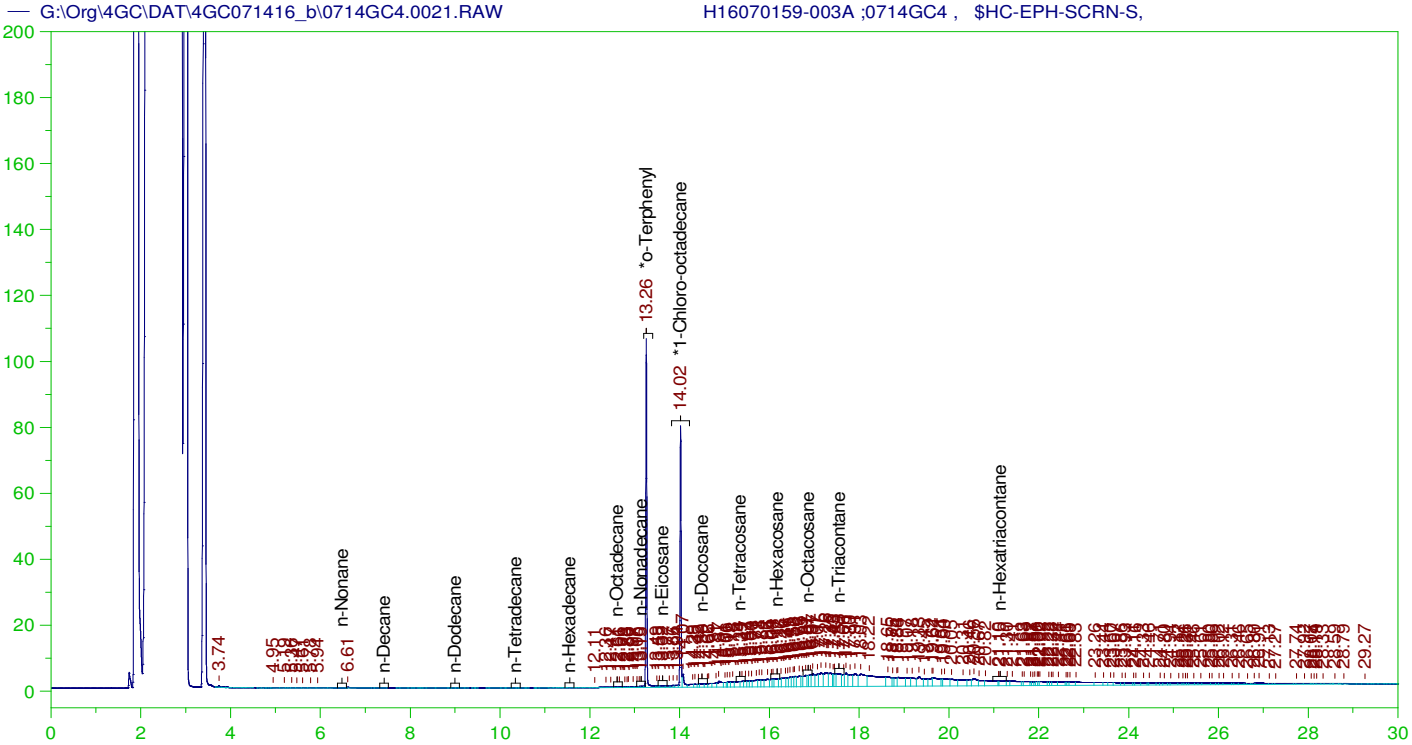
Sample Name: H16070159-003A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0034.RAW
Date & Time Acquired: 7/22/2016 11:24:57 AM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 24.3 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .082 | U |
| 2-Methylnaphthalene | . | . | . | | .082 | U |
| Acenaphthylene | . | . | . | | .082 | U |
| Fluorene | . | . | . | | .082 | U |
| Acenaphthene | . | . | . | | .082 | U |
| Phenanthrene | . | . | . | | .082 | U |
| Anthracene | . | . | . | | .082 | U |
| Pyrene | . | . | . | | .082 | U |
| Fluoranthene | . | . | . | | .082 | U |
| Benzo(a)Anthracene | . | . | . | | .082 | U |
| Chrysene | . | . | . | | .082 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .165 | U |
| Benzo(a)Pyrene | . | . | . | | .082 | U |
| Indeno-Dibenzo | . | . | . | | .165 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .082 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.194 | 78780 | 8.23 | 7.2 | 87.49 | 40-140 |
| *2-Bromonaphthalene | 15.052 | 41639 | 8.23 | 5.778 | 70.2 | 40-140 |
| *o-Terphenyl | 17.389 | 75079 | 8.23 | 6.472 | 78.63 | 40-140 |
| *1-Chlorooctadecane | 18.158 | 1680 | 8.23 | .186 | 2.26 | 40-140 |

**DIAP-S-SOUTH (0-2)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0021.RAW H16070159-003A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-003A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0021.RAW
Date & Time Acquired: 7/15/2016 3:07:43 AM
Method File: G:\Org\4GC\Methods\SR010816O_07141621.MET
Calibration File: G:\Org\4GC\Cals\SC010816O_07141614.CAL
Sample Weight: 24.3 Dilution: 2 S.A.: 1

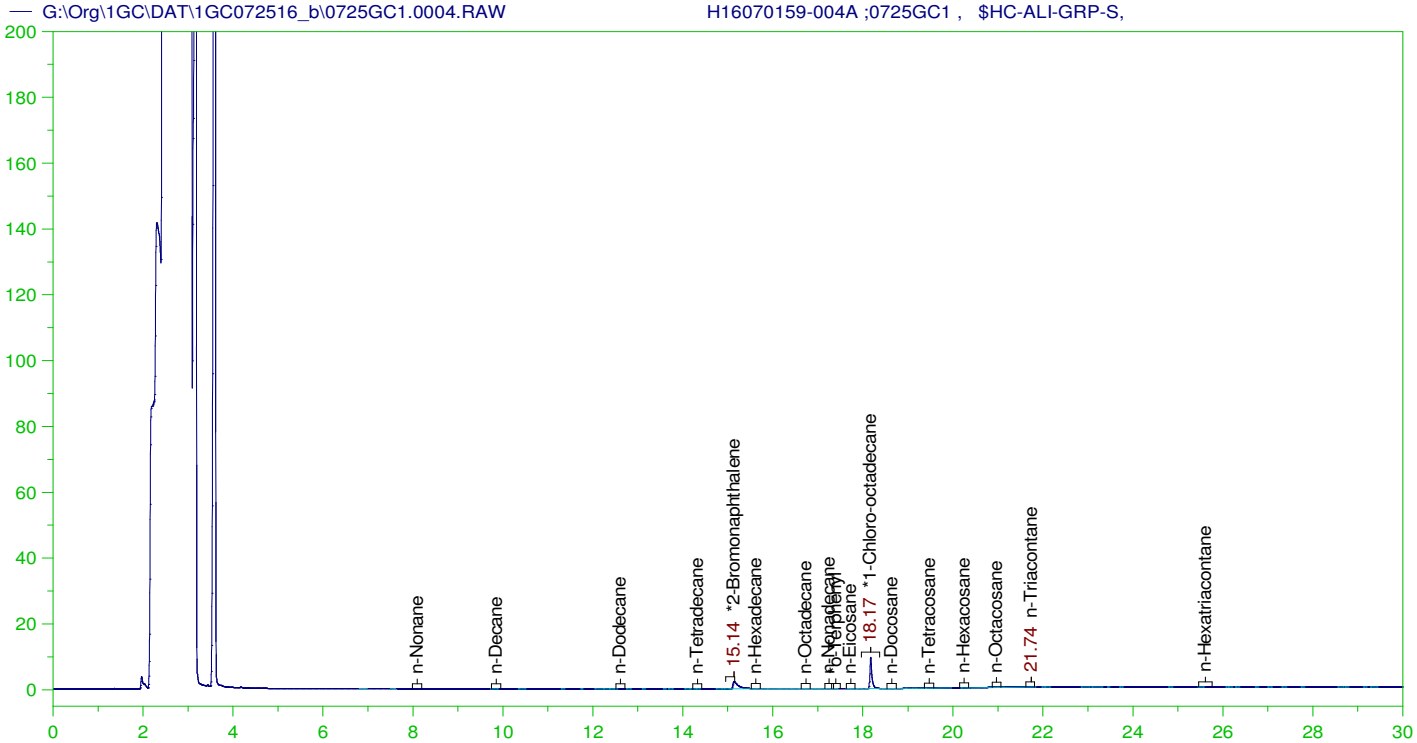
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.258 | 178559 | 8.23 | 7.269 | 88.32 | - |
| *1-Chloro-octadecane | 14.022 | 135905 | 8.23 | 7.088 | 86.12 | - |

DRO Area:536097.7 DRO Amount: 24.11217
TEH Area:1314402 TEH Amount: 59.1181
C9-C18 Area:19442.35 C9-C18 Amount: 0.8833799
C19-C36 Area:1026125 C19-C36 Amount: 45.69098

**DIAP-SS-SOUTH (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072516_b\0725GC1.0004.RAW H16070159-004A ;0725GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-004A ;0725GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072516_b\0725GC1.0004.RAW
Date & Time Acquired: 7/26/2016 12:06:38 PM
Method File: G:\Org\1GC\Methods\AL102015L.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 24.6 Dilution: 4 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

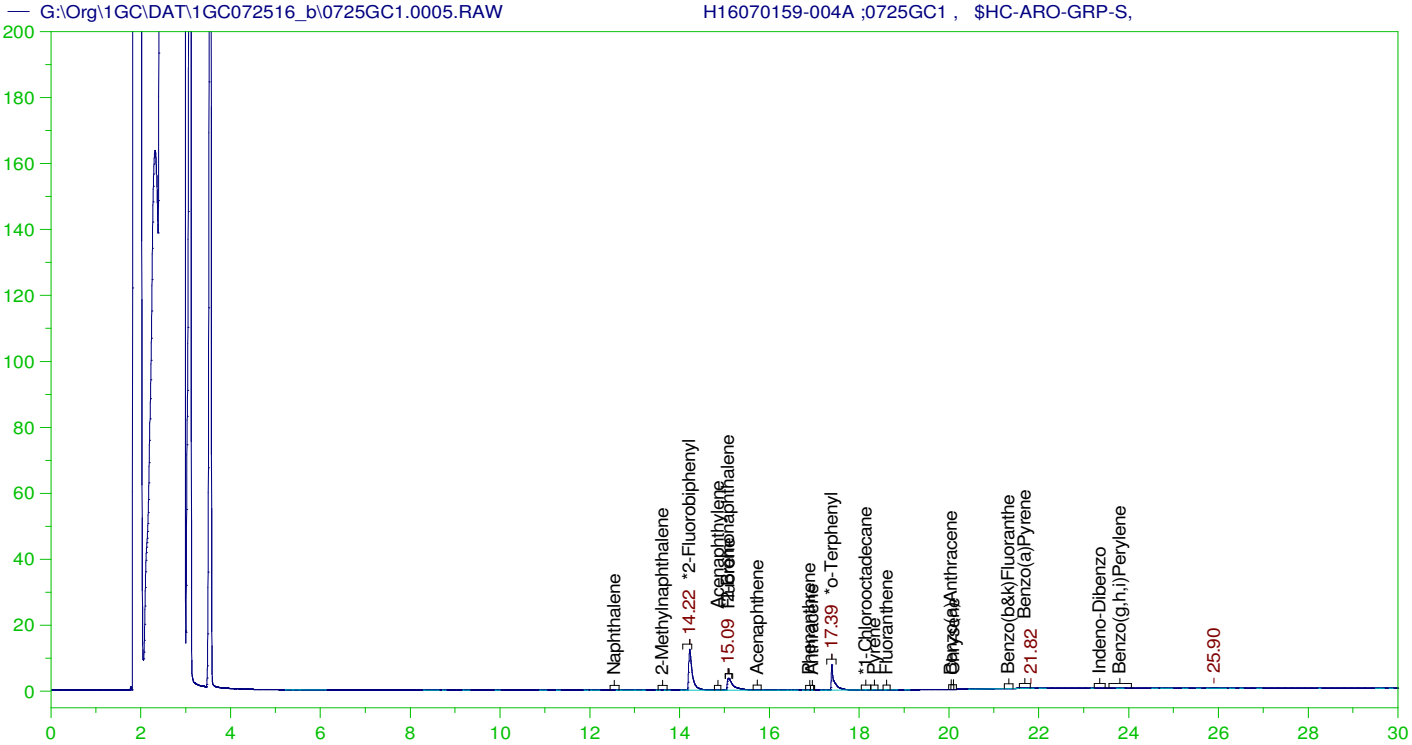
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.17 | 29640 | 8.13 | 6.356 | 78.18 | - |

DRO Area:2027.962 DRO Amount: 0.388489
TEH Area:22771.91 TEH Amount: 4.362328

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:19369.59 C9-C18 Amount: 3.750029
C19-C36 Area:3290.146 C19-C36 Amount: 0.6253445

**DIAP-SS-SOUTH (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072516_b\0725GC1.0005.RAW H16070159-004A ;0725GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-004A ;0725GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072516_b\0725GC1.0005.RAW
Date & Time Acquired: 7/26/2016 12:49:38 PM
Method File: G:\Org\1GC\Methods\AR102015M_07251605.MET
Calibration File: G:\Org\1GC\Cals\AR102015M_07251605.CAL
Sample Weight: 24.6 Dilution: 4 S.A.: 1

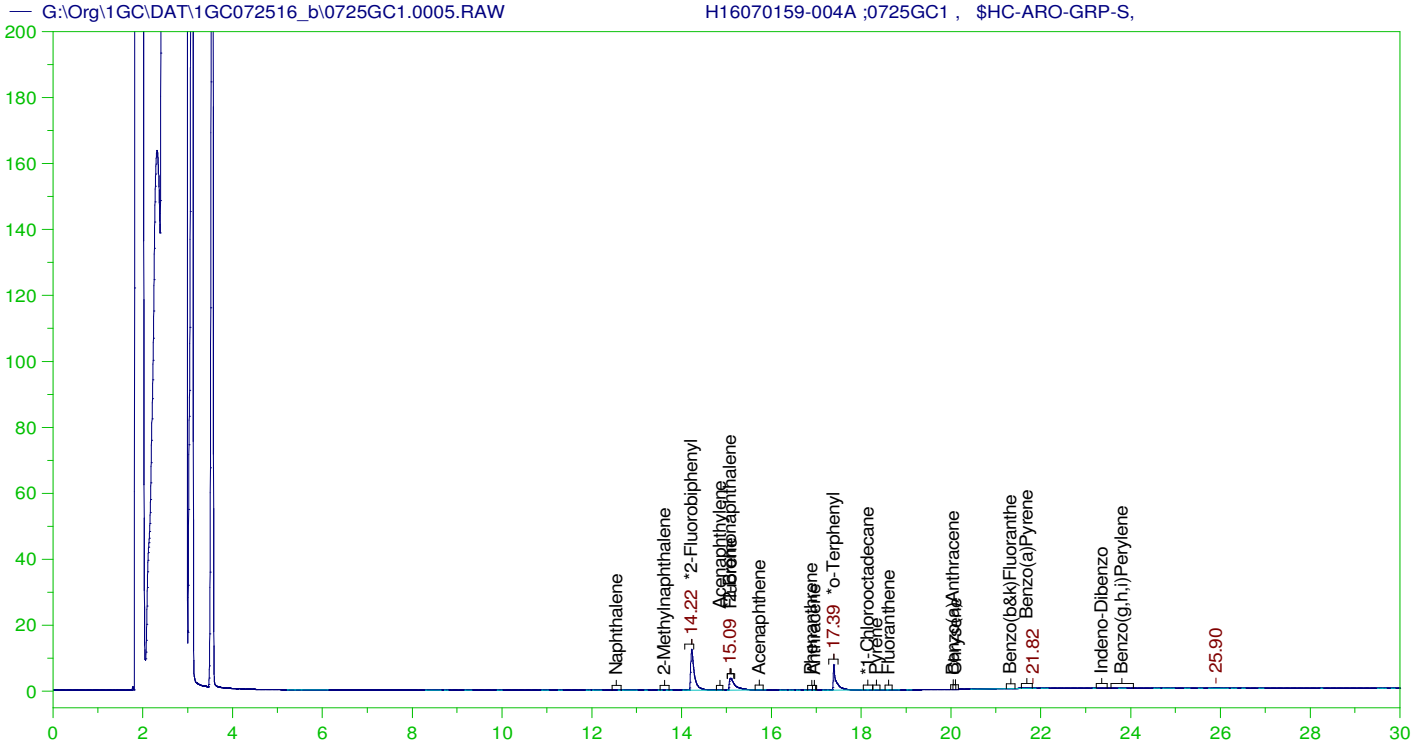
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.224 | 68737 | 8.13 | 12.412 | 152.67 | - |
| *2-Bromonaphthalene | 15.089 | 33344 | 8.13 | 9.141 | 112.44 | - |
| *o-Terphenyl | 17.39 | 35078 | 8.13 | 5.973 | 73.47 | - |
| *1-Chlorooctadecane | 29.837 | 5 | 8.13 | . | . | - |

C11-C22 Aromatics Area:2957.023 C11-C22 Aromatics Amount: 0.5204502
EPH Aromatics total Area:3961.263 EPH Aromatics Total Amount: 0.6972013

**DIAP-SS-SOUTH (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072516_b\0725GC1.0005.RAW H16070159-004A ;0725GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

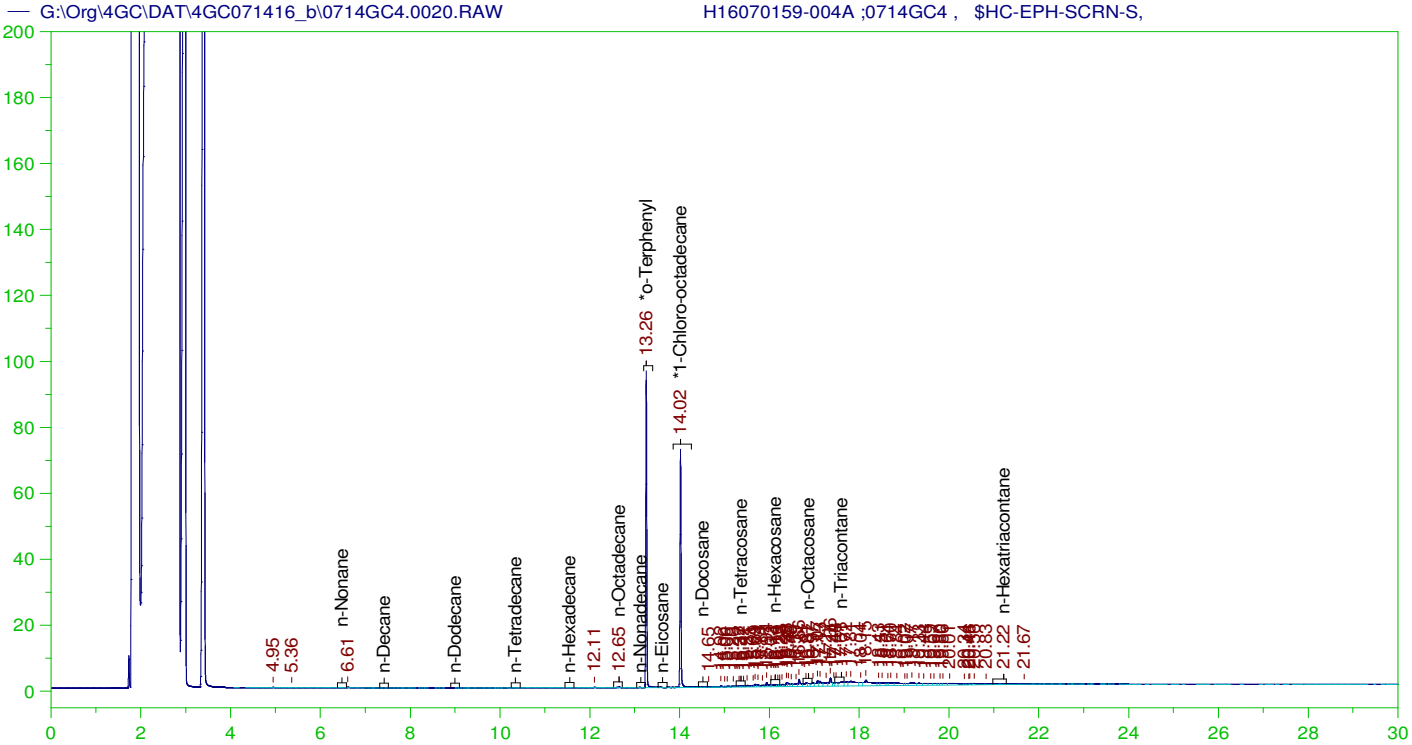
Sample Name: H16070159-004A ;0725GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072516_b\0725GC1.0005.RAW
Date & Time Acquired: 7/26/2016 12:49:38 PM
Method File: G:\Org\1GC\Methods\AROQC102015M_07251605.met
Calibration File: G:\Org\1GC\Cals\AR102015M_07251605.CAL
Sample Weight: 24.6 Dilution: 4 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .163 | U |
| 2-Methylnaphthalene | . | . | . | | .163 | U |
| Acenaphthylene | . | . | . | | .163 | U |
| Fluorene | . | . | . | | .163 | U |
| Acenaphthene | . | . | . | | .163 | U |
| Phenanthrene | . | . | . | | .163 | U |
| Anthracene | . | . | . | | .163 | U |
| Pyrene | . | . | . | | .163 | U |
| Fluoranthene | . | . | . | | .163 | U |
| Benzo(a)Anthracene | . | . | . | | .163 | U |
| Chrysene | . | . | . | | .163 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .325 | U |
| Benzo(a)Pyrene | . | . | . | | .163 | U |
| Indeno-Dibenzo | . | . | . | | .325 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .163 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.224 | 68246 | 8.13 | 12.323 | 151.58 | 40-140 |
| *2-Bromonaphthalene | 15.089 | 32486 | 8.13 | 8.906 | 109.54 | 40-140 |
| *o-Terphenyl | 17.39 | 35078 | 8.13 | 5.973 | 73.47 | 40-140 |
| *1-Chlorooctadecane | . | 5 | 8.13 | . | . | 40-140 |

**DIAP-SS-SOUTH (2-20)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0020.RAW H16070159-004A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-004A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0020.RAW
Date & Time Acquired: 7/15/2016 2:19:26 AM
Method File: G:\Org\4GC\Methods\SR0108160.MET
Calibration File: G:\Org\4GC\Cals\SC0108160.CAL
Sample Weight: 24.6 Dilution: 2 S.A.: 1

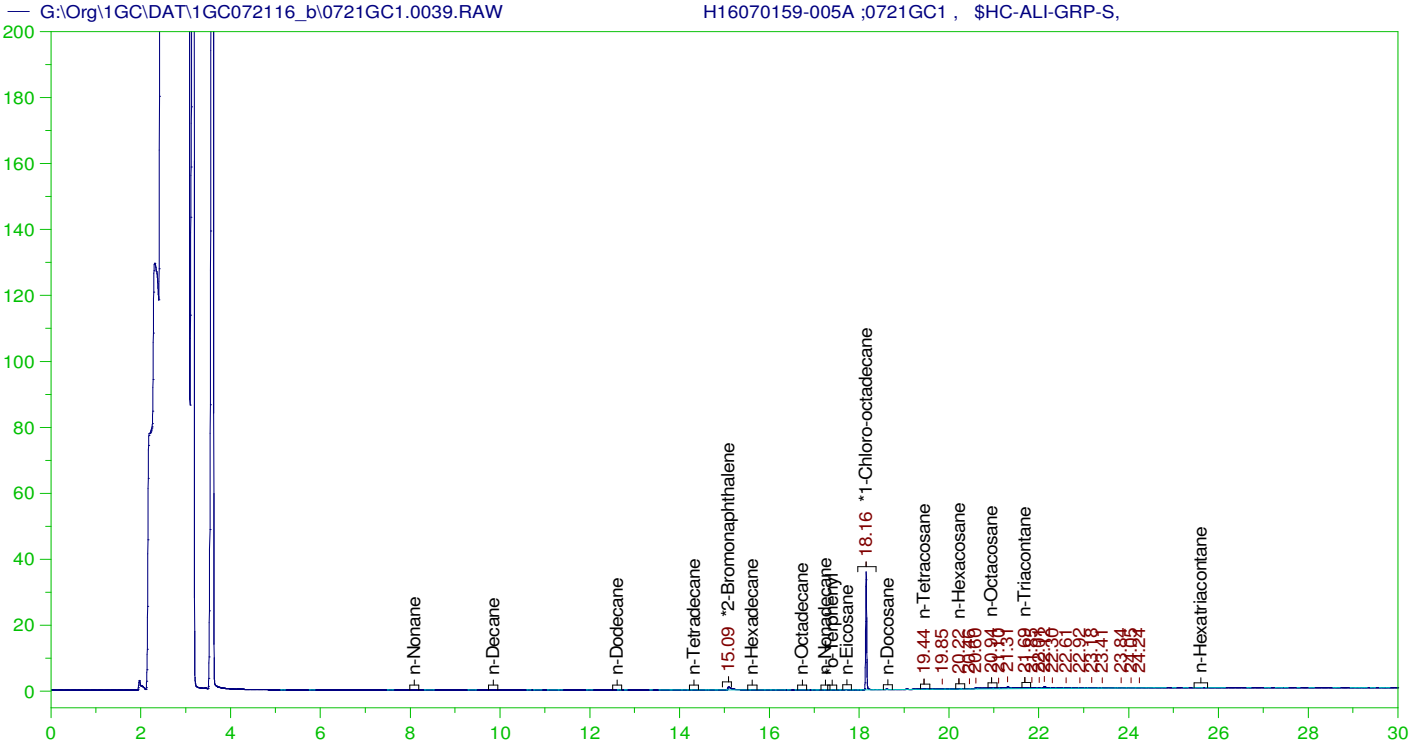
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.258 | 157394 | 8.13 | 6.329 | 77.85 | - |
| *1-Chloro-octadecane | 14.021 | 125303 | 8.13 | 6.455 | 79.4 | - |

DRO Area:114756.6 DRO Amount: 5.098488
TEH Area:247273.2 TEH Amount: 10.98602
C9-C18 Area:6890.382 C9-C18 Amount: 0.3092525
C19-C36 Area:234167.8 C19-C36 Amount: 10.2998

**DIAP-S-WEST (0-2)** Batch ID: 33677

G:\Org\1GC\DAT\1GC072116_b\0721GC1.0039.RAW H16070159-005A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-005A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0039.RAW
Date & Time Acquired: 7/22/2016 3:00:37 PM
Method File: G:\Org\1GC\Methods\07211639.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 27.5 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

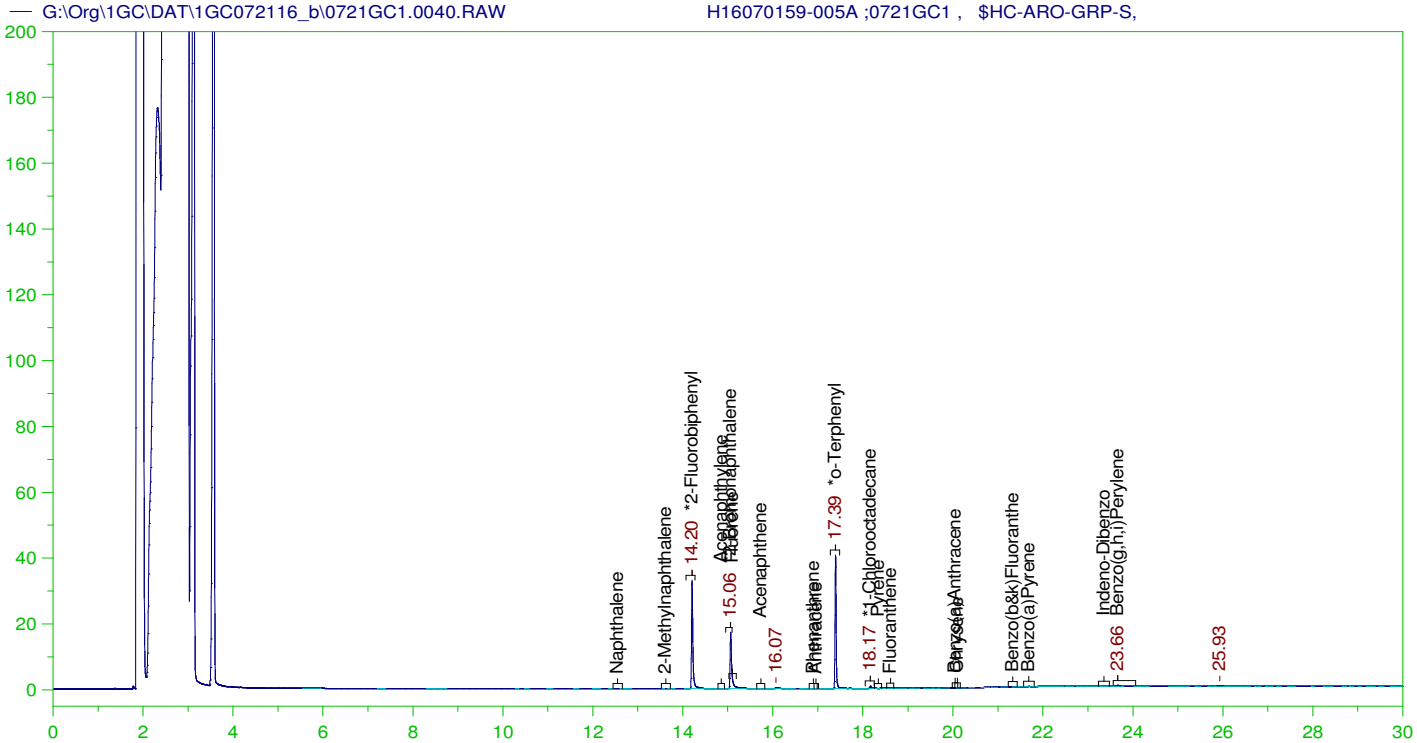
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.156 | 61147 | 7.273 | 5.865 | 80.64 | - |

DRO Area:14348.46 DRO Amount: 1.22941
TEH Area:62314.41 TEH Amount: 5.339245

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:7218.758 C9-C18 Amount: 0.6250993
C19-C36 Area:54720.05 C19-C36 Amount: 4.651822

**DIAP-S-WEST (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0040.RAW H16070159-005A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-005A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0040.RAW
Date & Time Acquired: 7/22/2016 3:43:59 PM
Method File: G:\Org\1GC\Methods\AR102015M.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 27.5 Dilution: 2 S.A.: 1

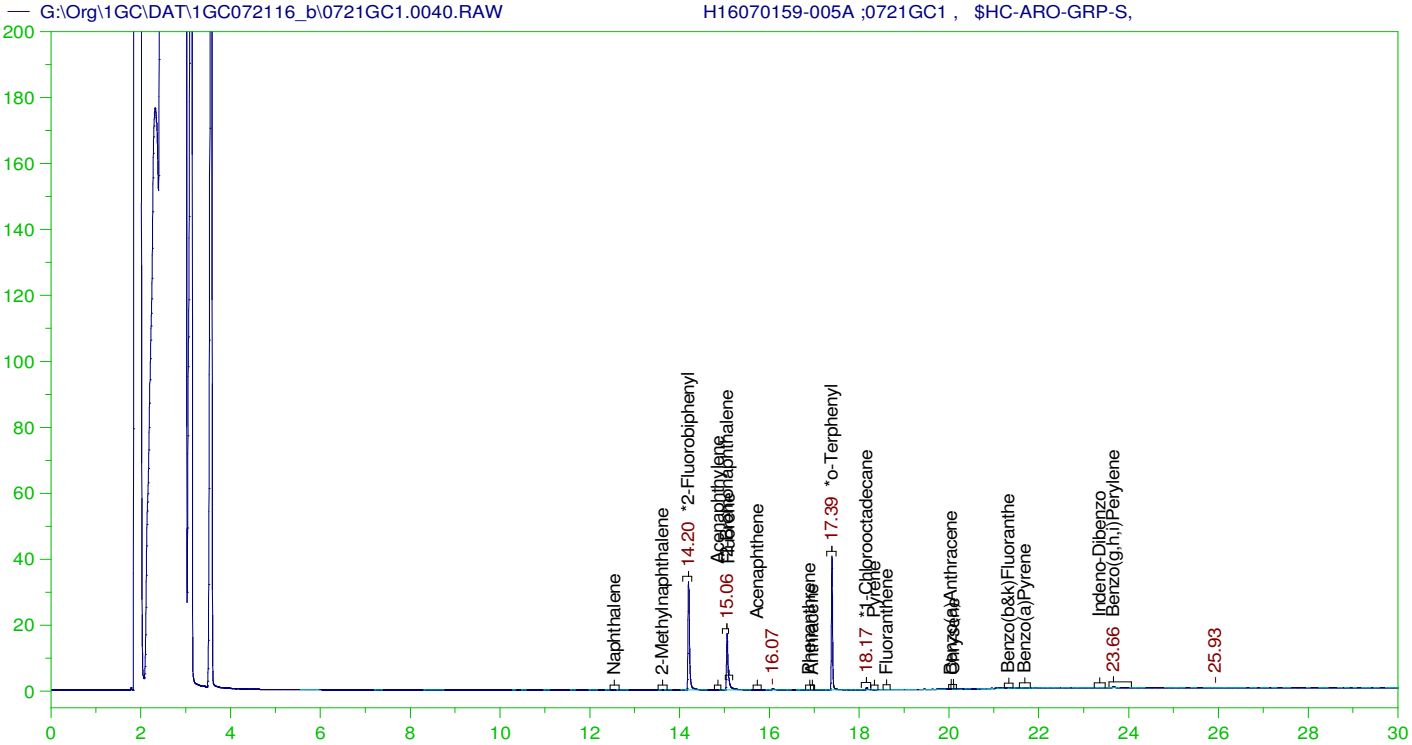
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.201 | 73650 | 7.273 | 5.948 | 81.79 | - |
| *2-Bromonaphthalene | 15.059 | 46907 | 7.273 | 5.752 | 79.09 | - |
| *o-Terphenyl | 17.392 | 75587 | 7.273 | 5.757 | 79.16 | - |
| *1-Chlorooctadecane | 18.166 | 1709 | 7.273 | .168 | 2.3 | - |

C11-C22 Aromatics Area:6161.258 C11-C22 Aromatics Amount: 0.4850275
EPH Aromatics total Area:8710.249 EPH Aromatics Total Amount: 0.6856895

**DIAP-S-WEST (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0040.RAW H16070159-005A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

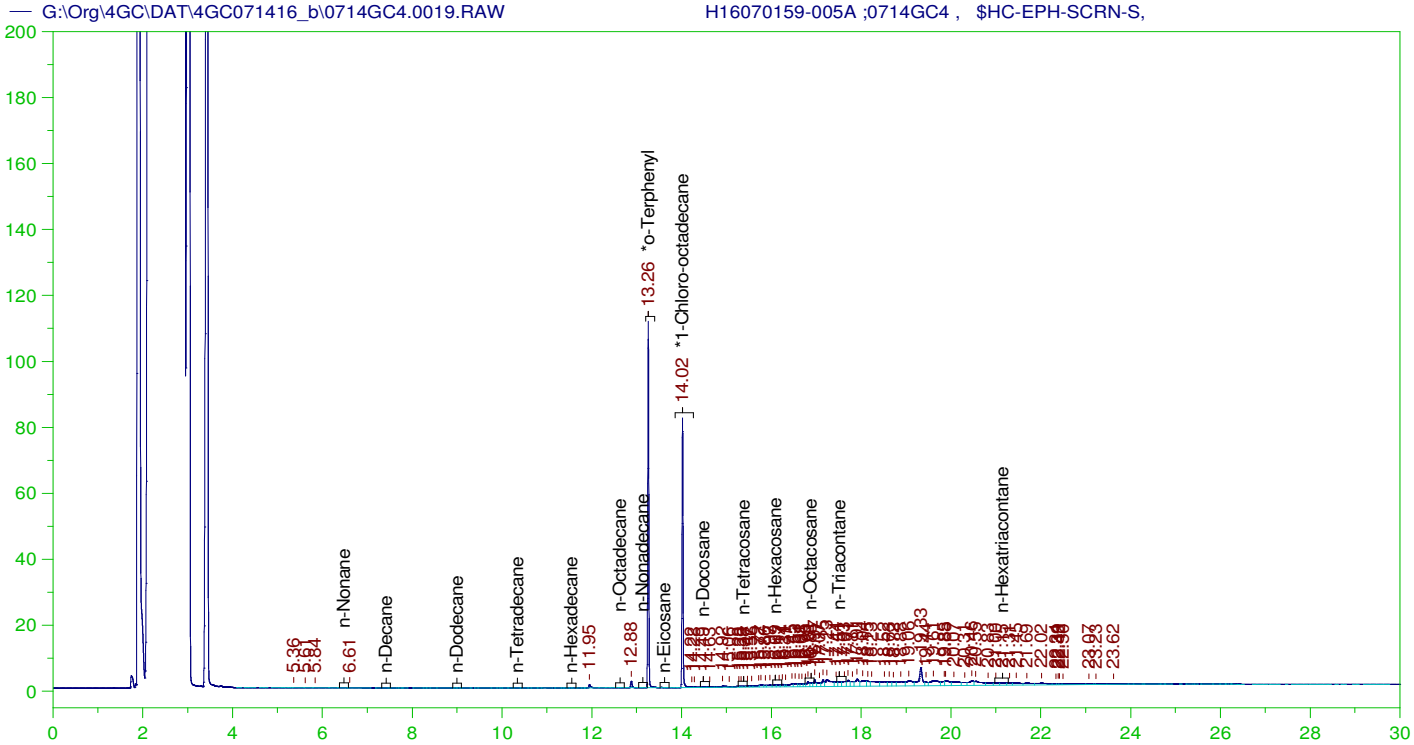
Sample Name: H16070159-005A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0040.RAW
Date & Time Acquired: 7/22/2016 3:43:59 PM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 27.5 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .073 | U |
| 2-Methylnaphthalene | . | . | . | | .073 | U |
| Acenaphthylene | . | . | . | | .073 | U |
| Fluorene | . | . | . | | .073 | U |
| Acenaphthene | . | . | . | | .073 | U |
| Phenanthrene | . | . | . | | .073 | U |
| Anthracene | . | . | . | | .073 | U |
| Pyrene | . | . | . | | .073 | U |
| Fluoranthene | . | . | . | | .073 | U |
| Benzo(a)Anthracene | . | . | . | | .073 | U |
| Chrysene | . | . | . | | .073 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .145 | U |
| Benzo(a)Pyrene | . | . | . | | .073 | U |
| Indeno-Dibenzo | . | . | . | | .145 | U |
| Benzo(g,h,i)Perylene | 23.663 | -8.79 | -8.604 | 1566 | .122 | |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.201 | 73224 | 7.273 | 5.914 | 81.32 | 40-140 |
| *2-Bromonaphthalene | 15.059 | 46322 | 7.273 | 5.68 | 78.1 | 40-140 |
| *o-Terphenyl | 17.392 | 75587 | 7.273 | 5.757 | 79.16 | 40-140 |
| *1-Chlorooctadecane | 18.166 | 1709 | 7.273 | .168 | 2.3 | 40-140 |

**DIAP-S-WEST (0-2)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0019.RAW H16070159-005A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-005A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0019.RAW
Date & Time Acquired: 7/15/2016 1:31:14 AM
Method File: G:\Org\4GC\Methods\SR0108160.MET
Calibration File: G:\Org\4GC\Cals\SC0108160.CAL
Sample Weight: 27.5 Dilution: 2 S.A.: 1

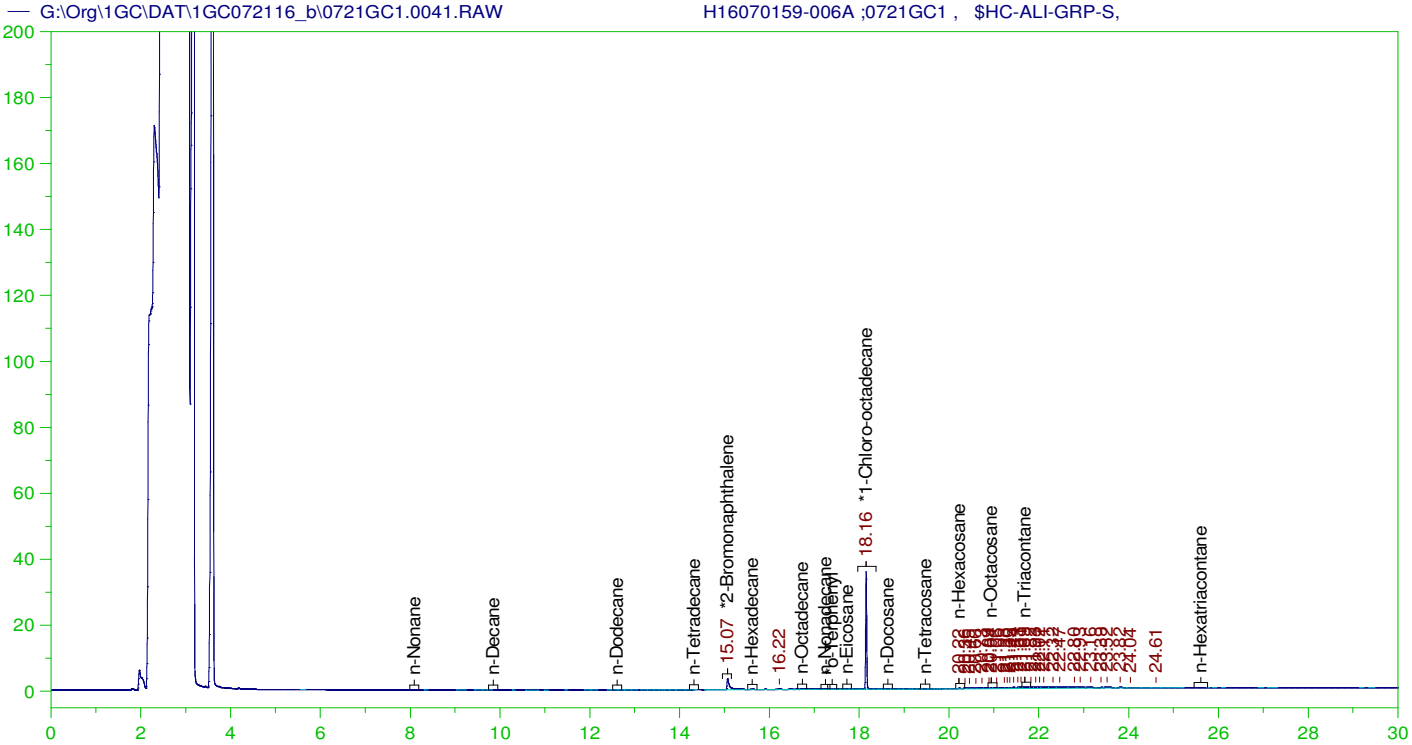
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.258 | 181284 | 7.273 | 6.521 | 89.66 | - |
| *1-Chloro-octadecane | 14.022 | 142235 | 7.273 | 6.555 | 90.13 | - |

DRO Area:142431.5 DRO Amount: 5.660724
TEH Area:455335.5 TEH Amount: 18.09662
C9-C18 Area:12452.53 C9-C18 Amount: 0.4999538
C19-C36 Area:388189.7 C19-C36 Amount: 15.27383

**DIAP-SS-WEST (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0041.RAW H16070159-006A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-006A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0041.RAW
Date & Time Acquired: 7/22/2016 4:27:10 PM
Method File: G:\Org\1GC\Methods\AL102015L.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 25.7 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

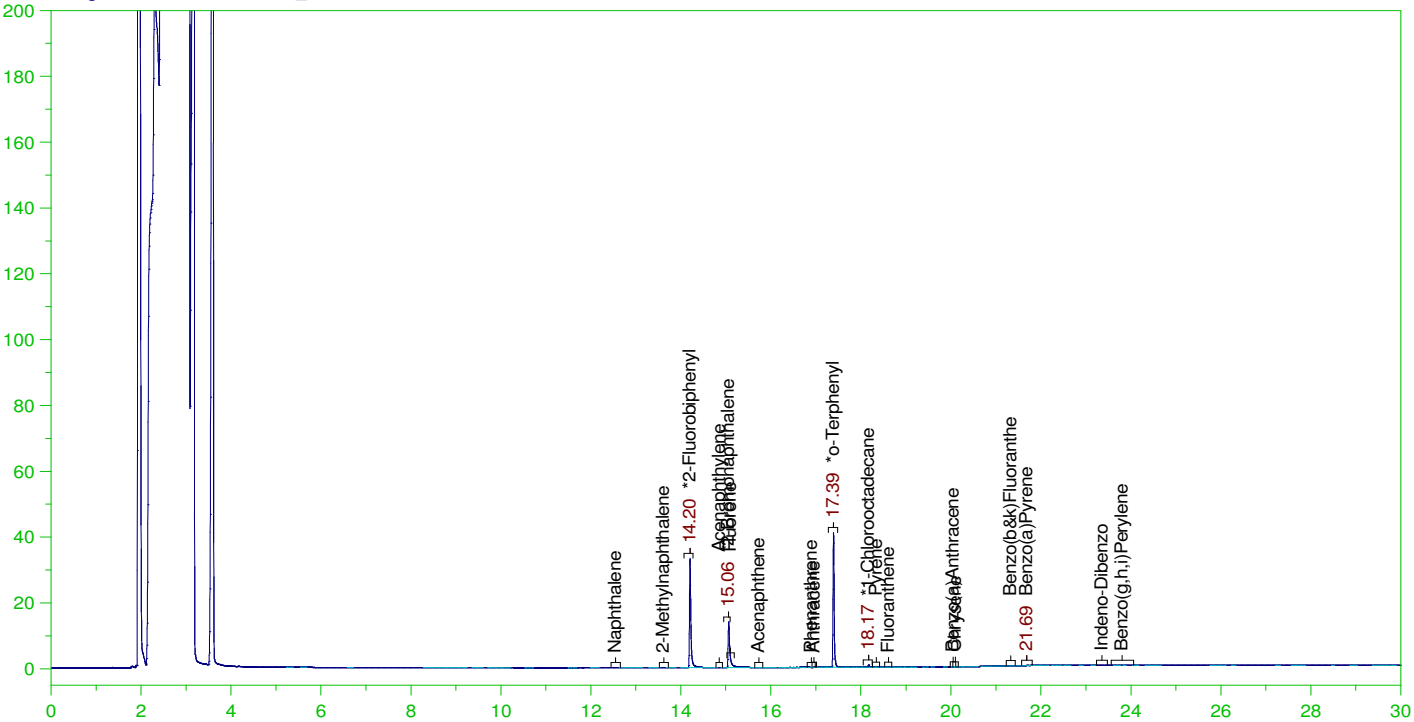
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.156 | 61617 | 7.782 | 6.324 | 81.26 | - |

DRO Area:18764.1 DRO Amount: 1.720357
TEH Area:84340.96 TEH Amount: 7.732669

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:18500.67 C9-C18 Amount: 1.714248
C19-C36 Area:65786.57 C19-C36 Amount: 5.984301

**DIAP-SS-WEST (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0042.RAW H16070159-006A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-006A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0042.RAW
Date & Time Acquired: 7/22/2016 5:10:10 PM
Method File: G:\Org\1GC\Methods\AR102015M.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.7 Dilution: 2 S.A.: 1

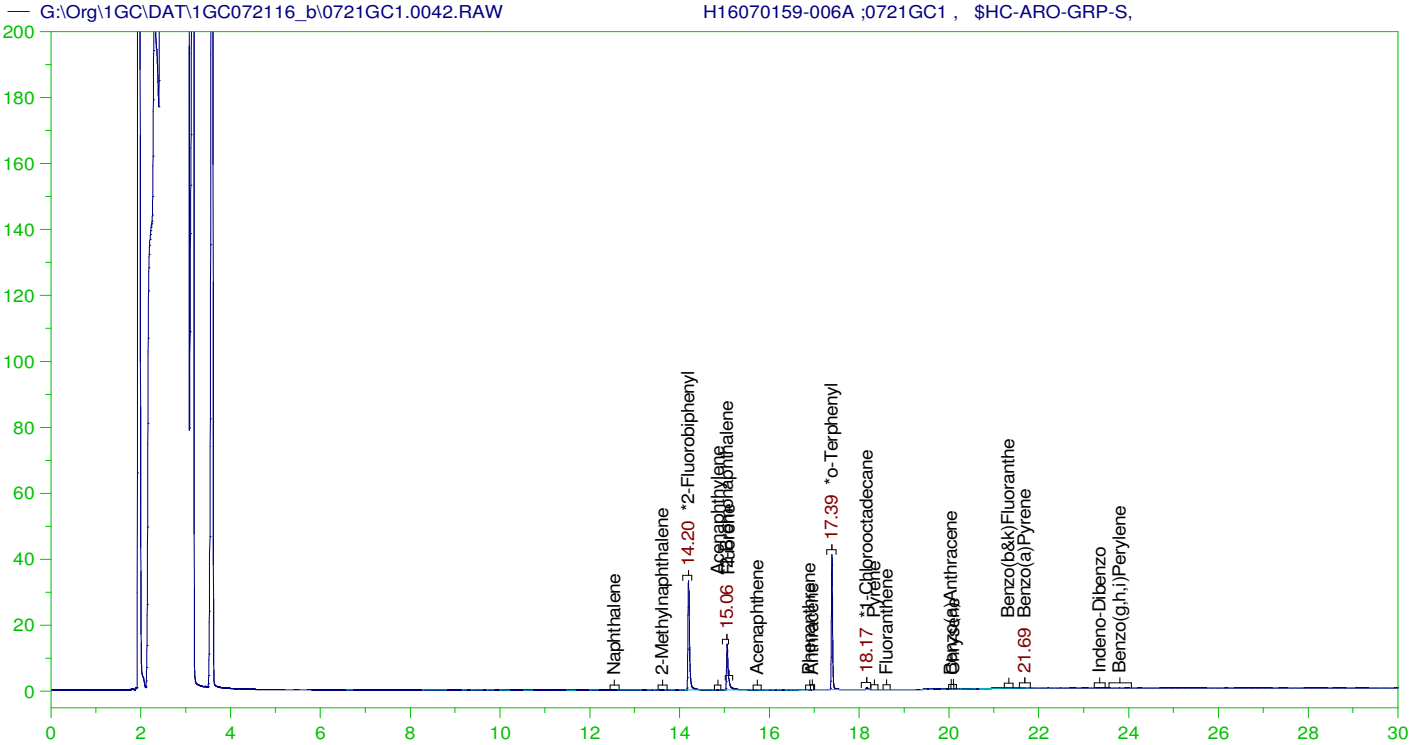
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.2 | 76181 | 7.782 | 6.584 | 84.6 | - |
| *2-Bromonaphthalene | 15.059 | 40154 | 7.782 | 5.268 | 67.7 | - |
| *o-Terphenyl | 17.392 | 78633 | 7.782 | 6.409 | 82.35 | - |
| *1-Chlorooctadecane | 18.17 | 1722 | 7.782 | .181 | 2.32 | - |

C11-C22 Aromatics Area:2968.677 C11-C22 Aromatics Amount: 0.2500688
EPH Aromatics total Area:3992.781 EPH Aromatics Total Amount: 0.336335

**DIAP-SS-WEST (2-20)** Batch ID: 33677

G:\Org\1GC\DAT\1GC072116_b\0721GC1.0042.RAW H16070159-006A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

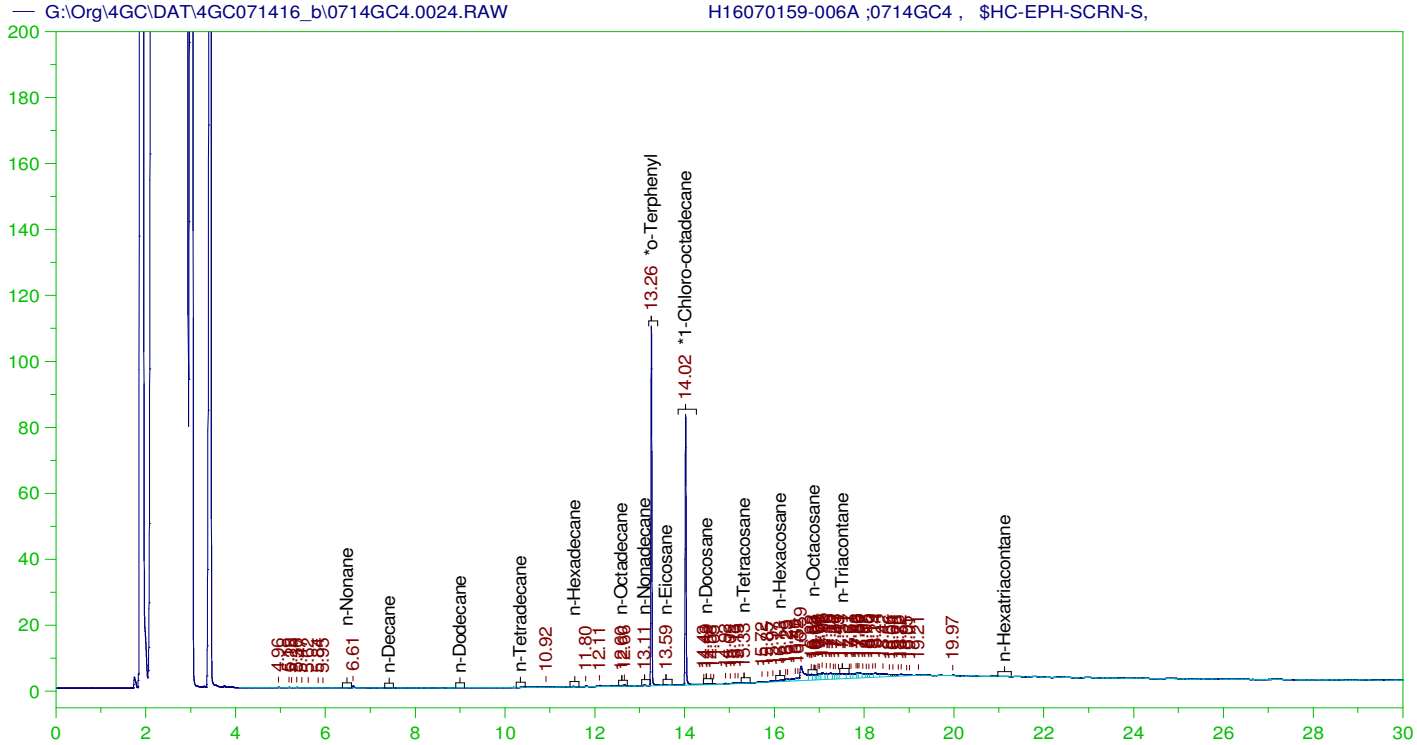
Sample Name: H16070159-006A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0042.RAW
Date & Time Acquired: 7/22/2016 5:10:10 PM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.7 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .078 | U |
| 2-Methylnaphthalene | . | . | . | | .078 | U |
| Acenaphthylene | . | . | . | | .078 | U |
| Fluorene | . | . | . | | .078 | U |
| Acenaphthene | . | . | . | | .078 | U |
| Phenanthrene | . | . | . | | .078 | U |
| Anthracene | . | . | . | | .078 | U |
| Pyrene | . | . | . | | .078 | U |
| Fluoranthene | . | . | . | | .078 | U |
| Benzo(a)Anthracene | . | . | . | | .078 | U |
| Chrysene | . | . | . | | .078 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .156 | U |
| Benzo(a)Pyrene | 21.691 | -6.67 | -6.632 | 1333 | .111 | |
| Indeno-Dibenzo | . | . | . | | .156 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .078 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.2 | 76157 | 7.782 | 6.582 | 84.57 | 40-140 |
| *2-Bromonaphthalene | 15.059 | 39902 | 7.782 | 5.235 | 67.28 | 40-140 |
| *o-Terphenyl | 17.392 | 78633 | 7.782 | 6.409 | 82.35 | 40-140 |
| *1-Chlorooctadecane | 18.17 | 1722 | 7.782 | .181 | 2.32 | 40-140 |

**DIAP-SS-WEST (2-20)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0024.RAW H16070159-006A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-006A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0024.RAW
Date & Time Acquired: 7/15/2016 5:33:49 AM
Method File: G:\Org\4GC\Methods\SR0108160.MET
Calibration File: G:\Org\4GC\Cals\SC0108160.CAL
Sample Weight: 25.7 Dilution: 2 S.A.: 1

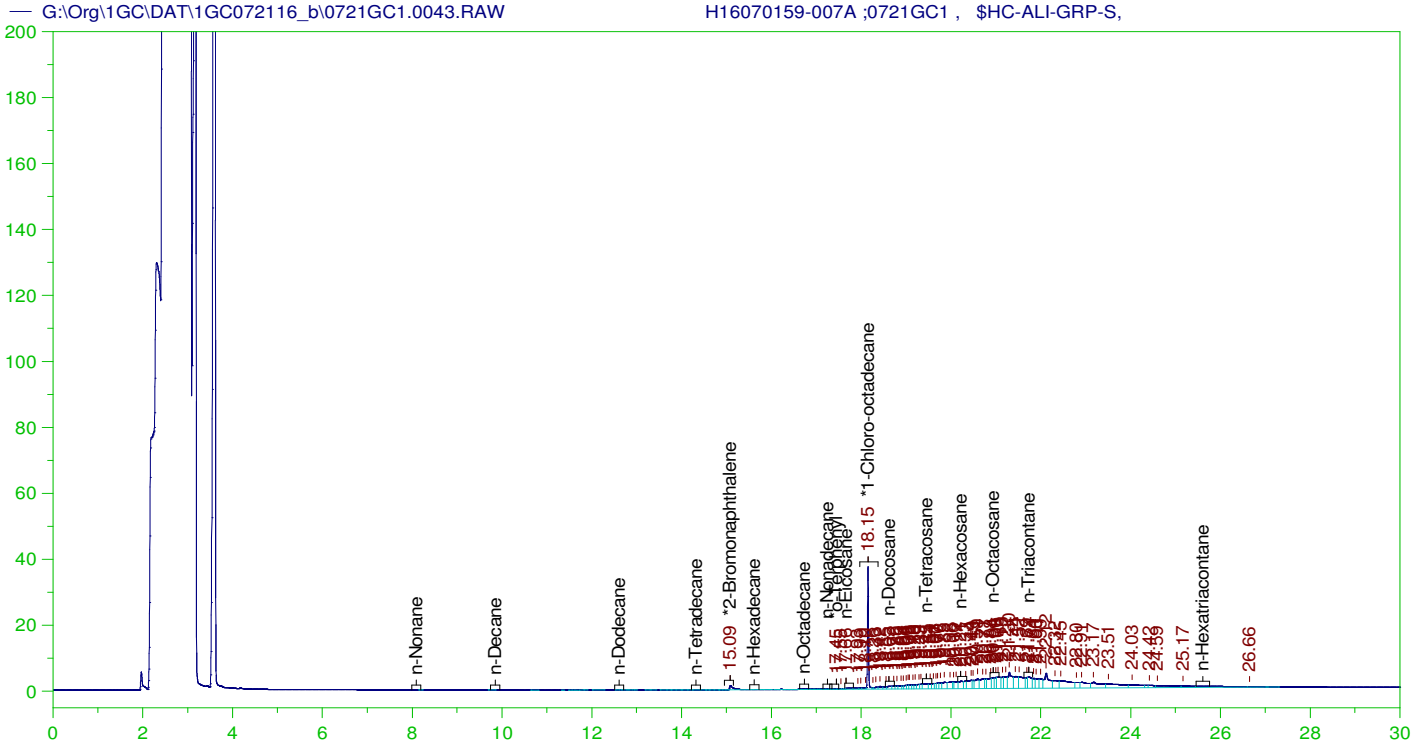
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.26 | 177180 | 7.782 | 6.82 | 87.63 | - |
| *1-Chloro-octadecane | 14.024 | 140781 | 7.782 | 6.942 | 89.21 | - |

DRO Area:158346.6 DRO Amount: 6.734017
TEH Area:255609 TEH Amount: 10.87031
C9-C18 Area:15901.88 C9-C18 Amount: 0.6831568
C19-C36 Area:224664 C19-C36 Amount: 9.458818

**DIAP-S-NORTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0043.RAW H16070159-007A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-007A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0043.RAW
Date & Time Acquired: 7/22/2016 5:53:09 PM
Method File: G:\Org\1GC\Methods\07211643.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 23.7 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

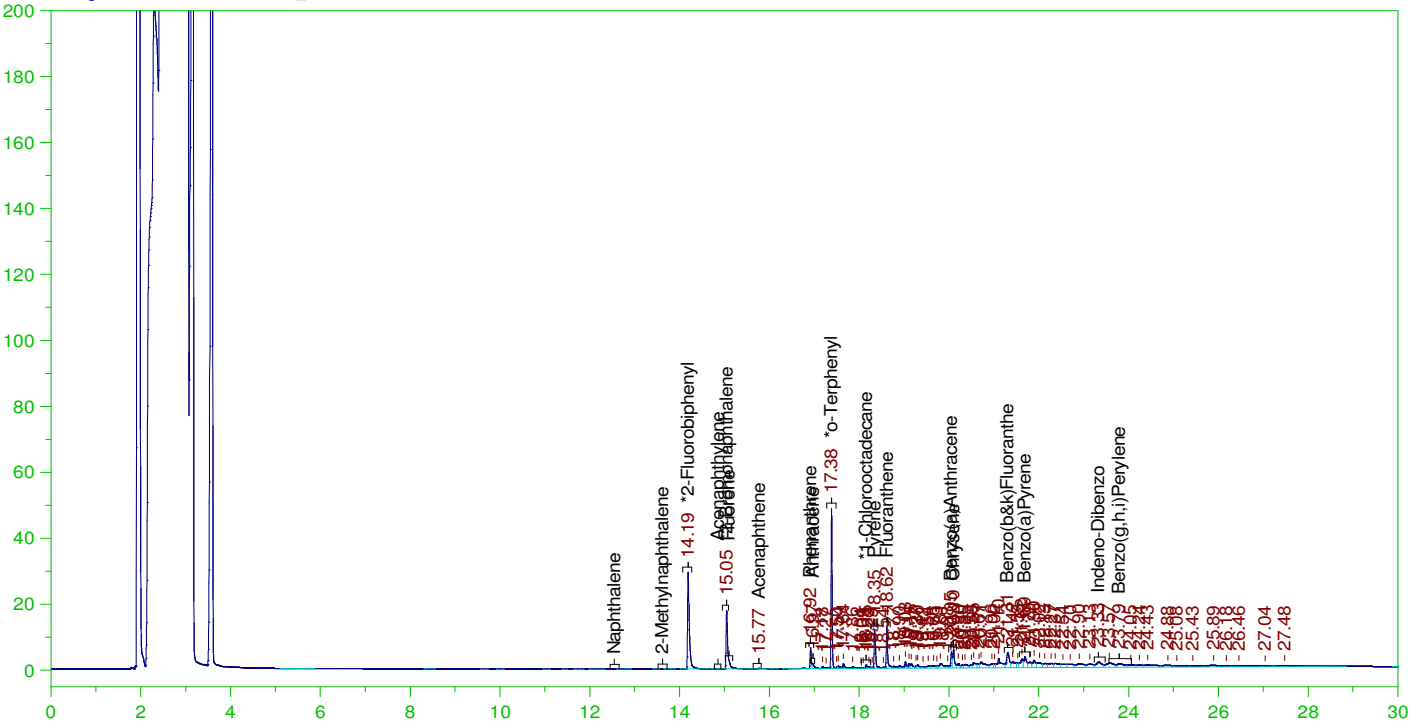
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.152 | 65016 | 8.439 | 7.236 | 85.74 | - |

DRO Area:315205.7 DRO Amount: 31.33789
TEH Area:738580.1 TEH Amount: 73.42995

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:11341.34 C9-C18 Amount: 1.139555
C19-C36 Area:724745.9 C19-C36 Amount: 71.49023

**DIAP-S-NORTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0044.RAW H16070159-007A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-007A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0044.RAW
Date & Time Acquired: 7/22/2016 6:36:00 PM
Method File: G:\Org\1GC\Methods\07211644.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 23.7 Dilution: 2 S.A.: 1

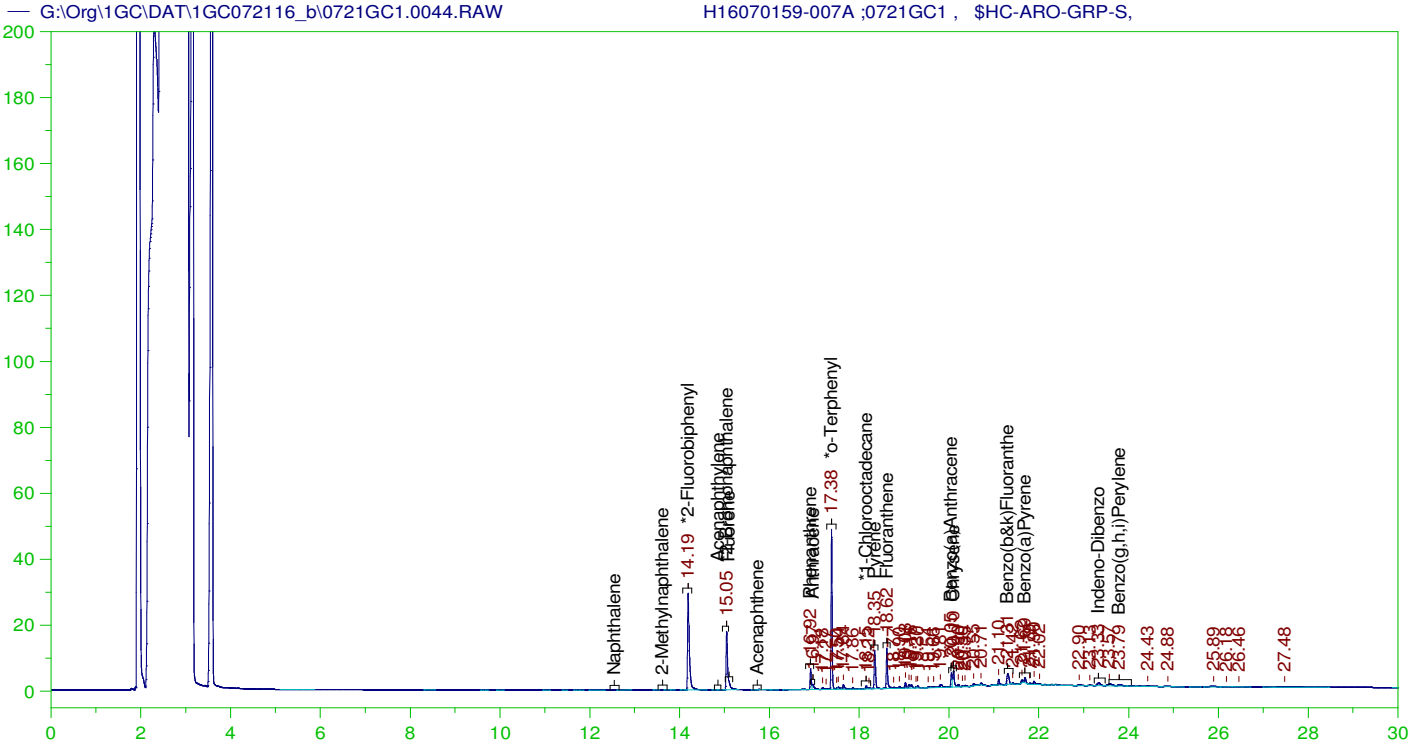
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.192 | 76829 | 8.439 | 7.2 | 85.32 | - |
| *2-Bromonaphthalene | 15.049 | 48355 | 8.439 | 6.88 | 81.53 | - |
| *o-Terphenyl | 17.383 | 83863 | 8.439 | 7.412 | 87.83 | - |
| *1-Chlorooctadecane | 18.152 | 2834 | 8.439 | .322 | 3.82 | - |

C11-C22 Aromatics Area:472491.3 C11-C22 Aromatics Amount: 43.15937
EPH Aromatics total Area:558203.3 EPH Aromatics Total Amount: 50.98867

**DIAP-S-NORTH (0-2)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0044.RAW H16070159-007A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

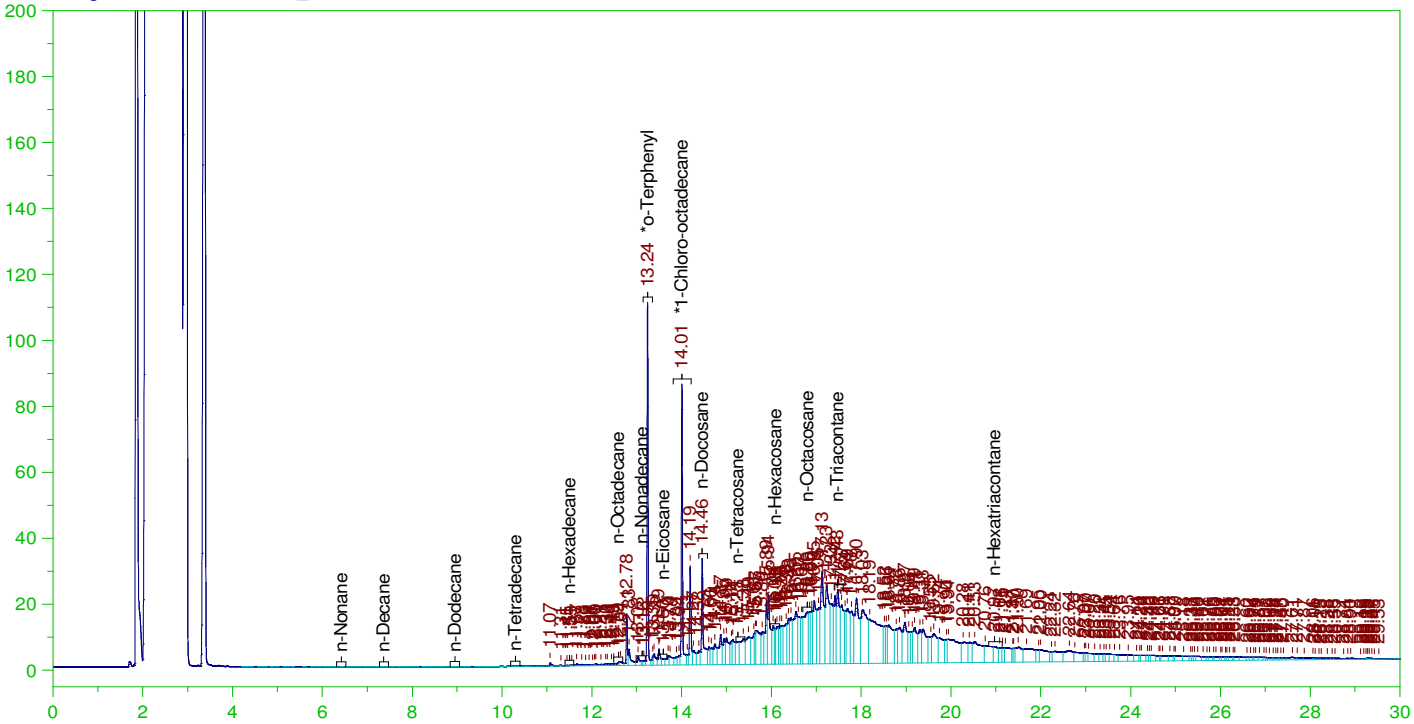
Sample Name: H16070159-007A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0044.RAW
Date & Time Acquired: 7/22/2016 6:36:00 PM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 23.7 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .084 | U |
| 2-Methylnaphthalene | . | . | . | | .084 | U |
| Acenaphthylene | . | . | . | | .084 | U |
| Fluorene | . | . | . | | .084 | U |
| Acenaphthene | . | . | . | | .084 | U |
| Phenanthrene | 16.916 | -1.88 | -1.867 | 12715 | 1.172 | |
| Anthracene | 16.971 | -1.94 | -1.922 | 4953 | .453 | |
| Pyrene | 18.348 | -3.32 | -3.299 | 23333 | 2.112 | |
| Fluoranthene | 18.616 | -3.59 | -3.568 | 26095 | 2.333 | |
| Benzo(a)Anthracene | 20.052 | -5.03 | -5.003 | 8774 | .794 | |
| Chrysene | 20.1 | -5.08 | -5.051 | 11863 | 1.083 | |
| Benzo(b&k)Fluoranthe | 21.31 | -6.31 | -6.261 | 10340 | .945 | |
| Benzo(a)Pyrene | 21.691 | -6.67 | -6.642 | 3953 | .356 | |
| Indeno-Dibenzo | 23.33 | -8.34 | -8.281 | 4321 | .395 | |
| Benzo(g,h,i)Perylene | 23.792 | -8.79 | -8.743 | 2526 | .227 | |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.192 | 76371 | 8.439 | 7.157 | 84.81 | 40-140 |
| *2-Bromonaphthalene | 15.049 | 47346 | 8.439 | 6.736 | 79.83 | 40-140 |
| *o-Terphenyl | 17.383 | 83520 | 8.439 | 7.381 | 87.47 | 40-140 |
| *1-Chlorooctadecane | 18.152 | 2280 | 8.439 | .259 | 3.07 | 40-140 |

**DIAP-S-NORTH (0-2)** Batch ID: 33547

G:\Org\4GC\DAT\4GC071816_b\0718GC4.0016.RAW H16070159-007A ;0718GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-007A ;0718GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071816_b\0718GC4.0016.RAW
Date & Time Acquired: 7/18/2016 9:53:48 PM
Method File: G:\Org\4GC\Methods\07181616.MET
Calibration File: G:\Org\4GC\Cals\SC010816P.CAL
Sample Weight: 23.7 Dilution: 2 S.A.: 1

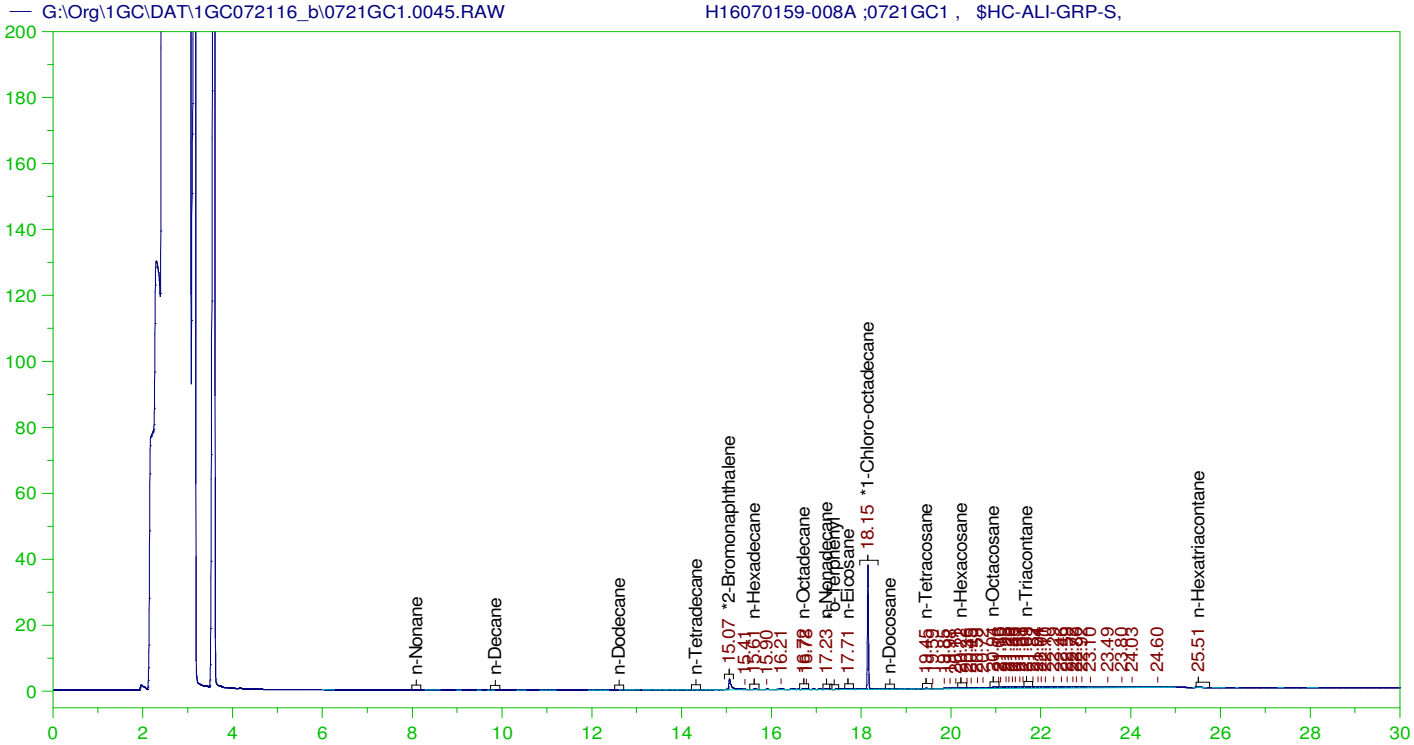
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.27 to 17.6
Rt range for C9 to C18 Hydrocarbons: 6.32 to 13.15
Rt range for C19 to C36 Hydrocarbons: 13.2 to 21.14

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.241 | 184615 | 8.439 | 7.706 | 91.31 | - |
| *1-Chloro-octadecane | 14.008 | 162466 | 8.439 | 8.688 | 102.95 | - |

DRO Area:2616984 DRO Amount: 120.6845
TEH Area:5372712 TEH Amount: 247.7672
C9-C18 Area:105270.6 C9-C18 Amount: 4.904151
C19-C36 Area:4453154 C19-C36 Amount: 203.3087

**DIAP-SS-NORTH (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0045.RAW H16070159-008A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-008A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0045.RAW
Date & Time Acquired: 7/22/2016 7:18:53 PM
Method File: G:\Org\1GC\Methods\07211645.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 25.5 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

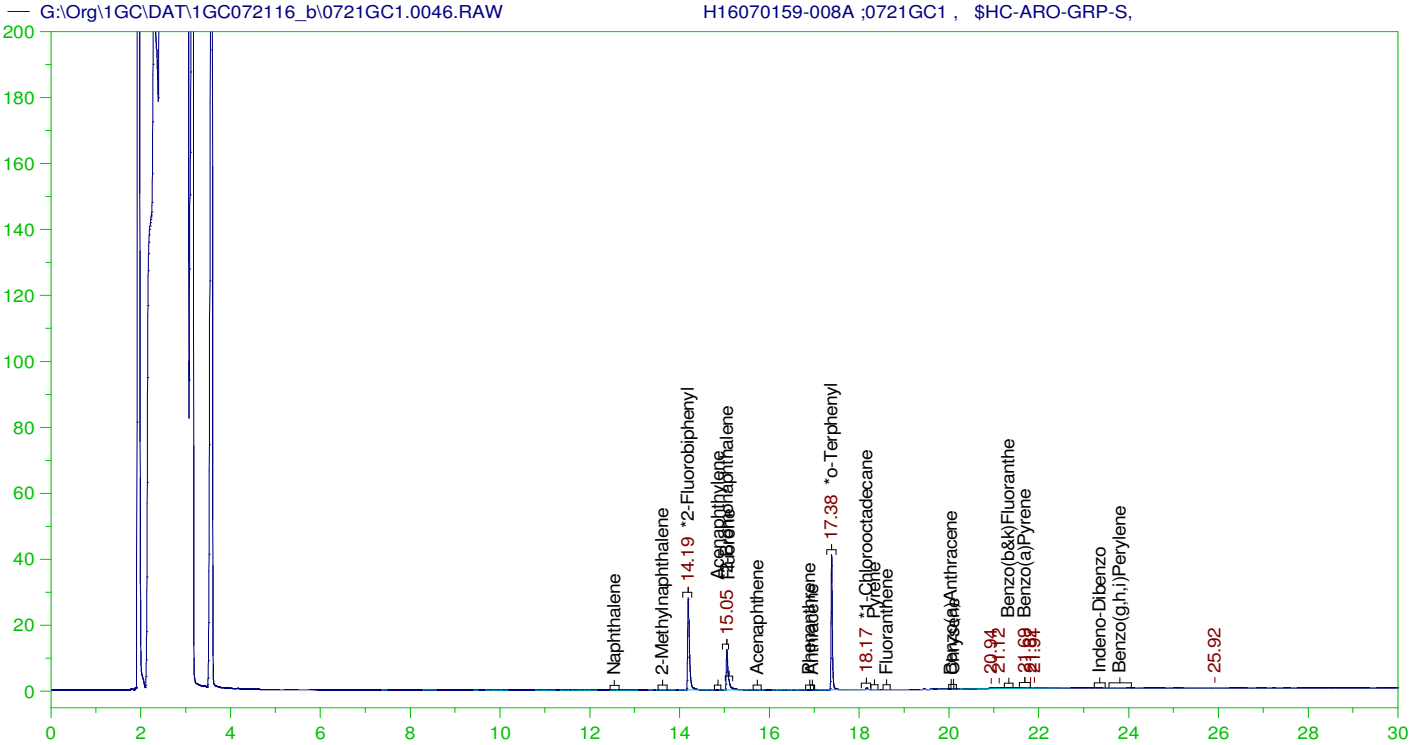
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.151 | 64477 | 7.843 | 6.669 | 85.03 | - |

DRO Area:33072.96 DRO Amount: 3.056025
TEH Area:102977.7 TEH Amount: 9.5154

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:23707.27 C9-C18 Amount: 2.213913
C19-C36 Area:79133.2 C19-C36 Amount: 7.25484

**DIAP-SS-NORTH (2-20)** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0046.RAW H16070159-008A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-008A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0046.RAW
Date & Time Acquired: 7/22/2016 8:01:45 PM
Method File: G:\Org\1GC\Methods\07211646.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.5 Dilution: 2 S.A.: 1

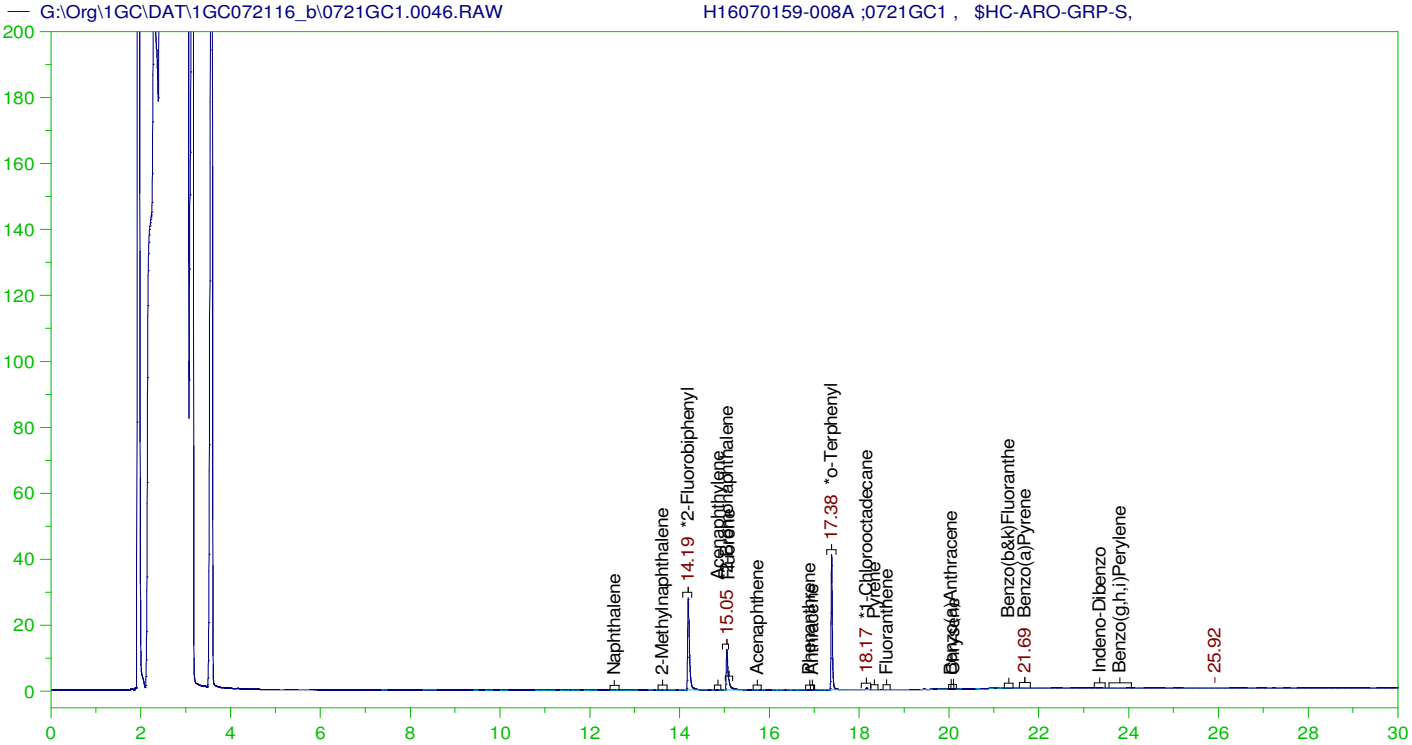
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.194 | 74966 | 7.843 | 6.529 | 83.25 | - |
| *2-Bromonaphthalene | 15.054 | 39420 | 7.843 | 5.213 | 66.46 | - |
| *o-Terphenyl | 17.385 | 83990 | 7.843 | 6.899 | 87.96 | - |
| *1-Chlorooctadecane | 18.167 | 1372 | 7.843 | .145 | 1.85 | - |

C11-C22 Aromatics Area:14988.67 C11-C22 Aromatics Amount: 1.272485
EPH Aromatics total Area:16236.47 EPH Aromatics Total Amount: 1.378418

**DIAP-SS-NORTH (2-20)** Batch ID: 33677

G:\Org\1GC\DAT\1GC072116_b\0721GC1.0046.RAW H16070159-008A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

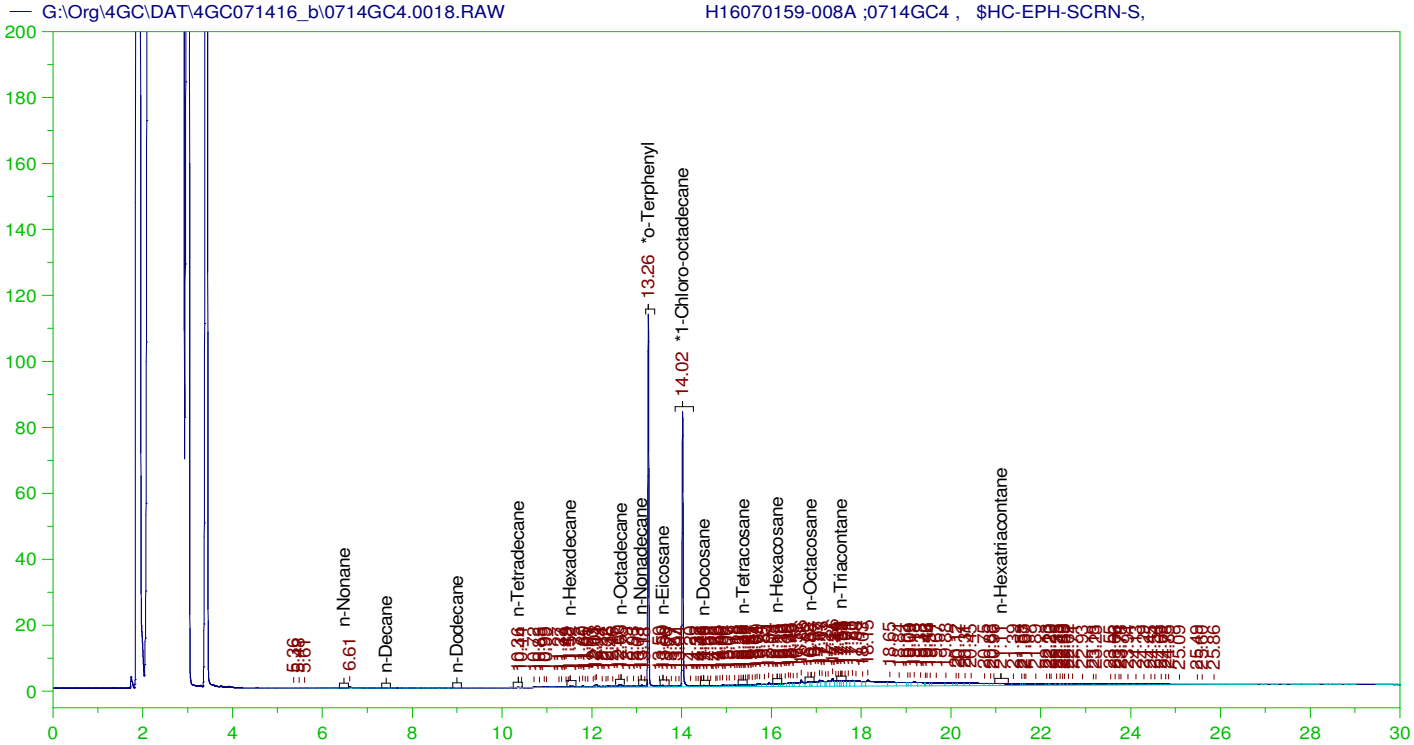
Sample Name: H16070159-008A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0046.RAW
Date & Time Acquired: 7/22/2016 8:01:45 PM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.5 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .078 | U |
| 2-Methylnaphthalene | . | . | . | | .078 | U |
| Acenaphthylene | . | . | . | | .078 | U |
| Fluorene | . | . | . | | .078 | U |
| Acenaphthene | . | . | . | | .078 | U |
| Phenanthrene | . | . | . | | .078 | U |
| Anthracene | . | . | . | | .078 | U |
| Pyrene | . | . | . | | .078 | U |
| Fluoranthene | . | . | . | | .078 | U |
| Benzo(a)Anthracene | . | . | . | | .078 | U |
| Chrysene | . | . | . | | .078 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .157 | U |
| Benzo(a)Pyrene | 21.686 | 21.686 | 21.686 | 540 | .078 | U |
| Indeno-Dibenzo | . | . | . | | .157 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .078 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.194 | 74707 | 7.843 | 6.507 | 82.96 | 40-140 |
| *2-Bromonaphthalene | 15.054 | 39005 | 7.843 | 5.158 | 65.76 | 40-140 |
| *o-Terphenyl | 17.385 | 83990 | 7.843 | 6.899 | 87.96 | 40-140 |
| *1-Chlorooctadecane | 18.167 | 1372 | 7.843 | .145 | 1.85 | 40-140 |

**DIAP-SS-NORTH (2-20)** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0018.RAW H16070159-008A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-008A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0018.RAW
Date & Time Acquired: 7/15/2016 12:42:45 AM
Method File: G:\Org\4GC\Methods\07141618.MET
Calibration File: G:\Org\4GC\Cals\SC010816O.CAL
Sample Weight: 25.5 Dilution: 2 S.A.: 1

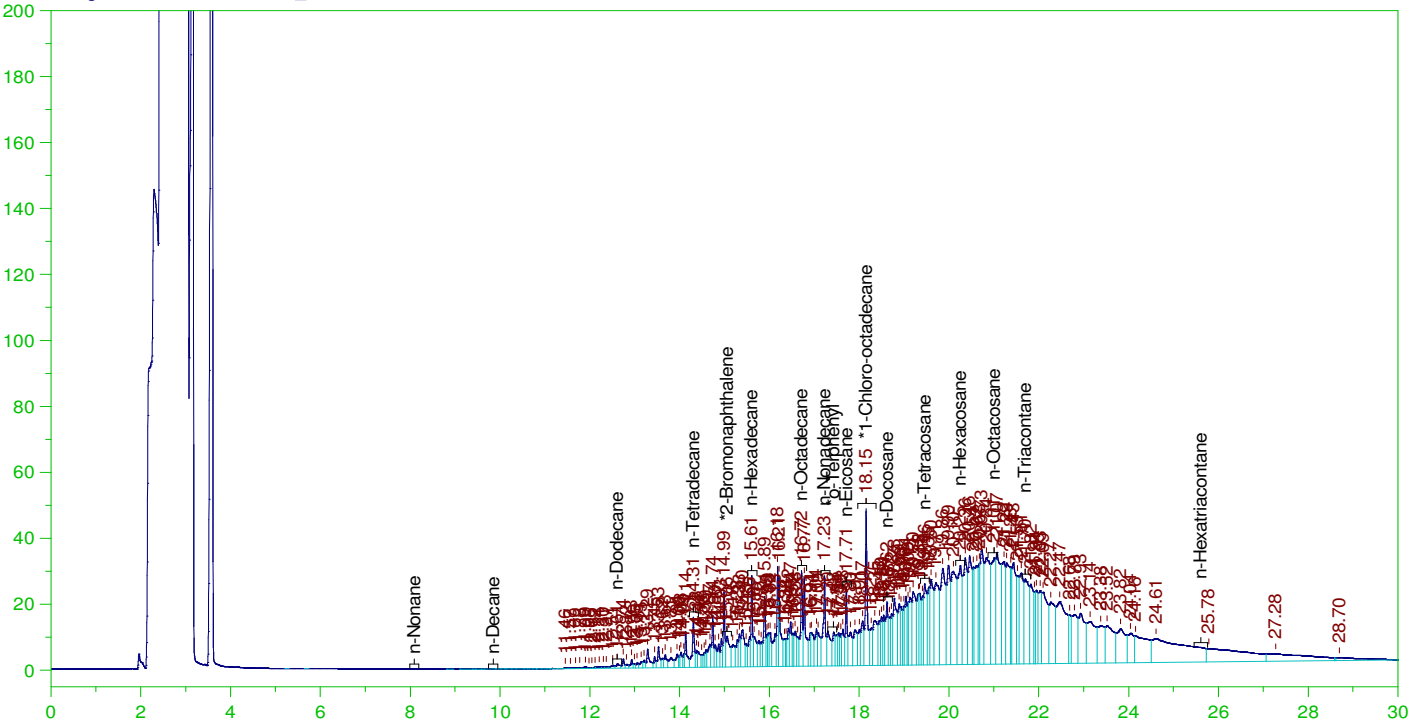
Mean RF for C9 to C18 Hydrocarbons: 1811.444
Mean RF for C19 to C36 Hydrocarbons: 1848.389
Mean RF for Total Extractable Hydrocarbons: 1829.917
Rt range for Diesel Range Organics: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.259 | 188569 | 7.843 | 7.315 | 93.27 | - |
| *1-Chloro-octadecane | 14.023 | 148756 | 7.843 | 7.393 | 94.26 | - |

DRO Area:236009.4 DRO Amount: 10.11551
TEH Area:534553.8 TEH Amount: 22.91131
C9-C18 Area:49884.94 C9-C18 Amount: 2.159903
C19-C36 Area:403066 C19-C36 Amount: 17.10301

**BD-20160711** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0047.RAW H16070159-009A ;0721GC1 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16070159-009A ;0721GC1 , $HC-ALI-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0047.RAW
Date & Time Acquired: 7/22/2016 8:44:40 PM
Method File: G:\Org\1GC\Methods\07211647.MET
Calibration File: G:\Org\1GC\Cals\AL102015L.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 839.8674
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 855.5013
Mean RF for Total Extractable Hydrocarbons: 848.8011
Rt range for Diesel Range Organics: 9.75 to 21.07
Rt range for C9 to C18 Aliphatic Hydrocarbons: 7.99 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.76

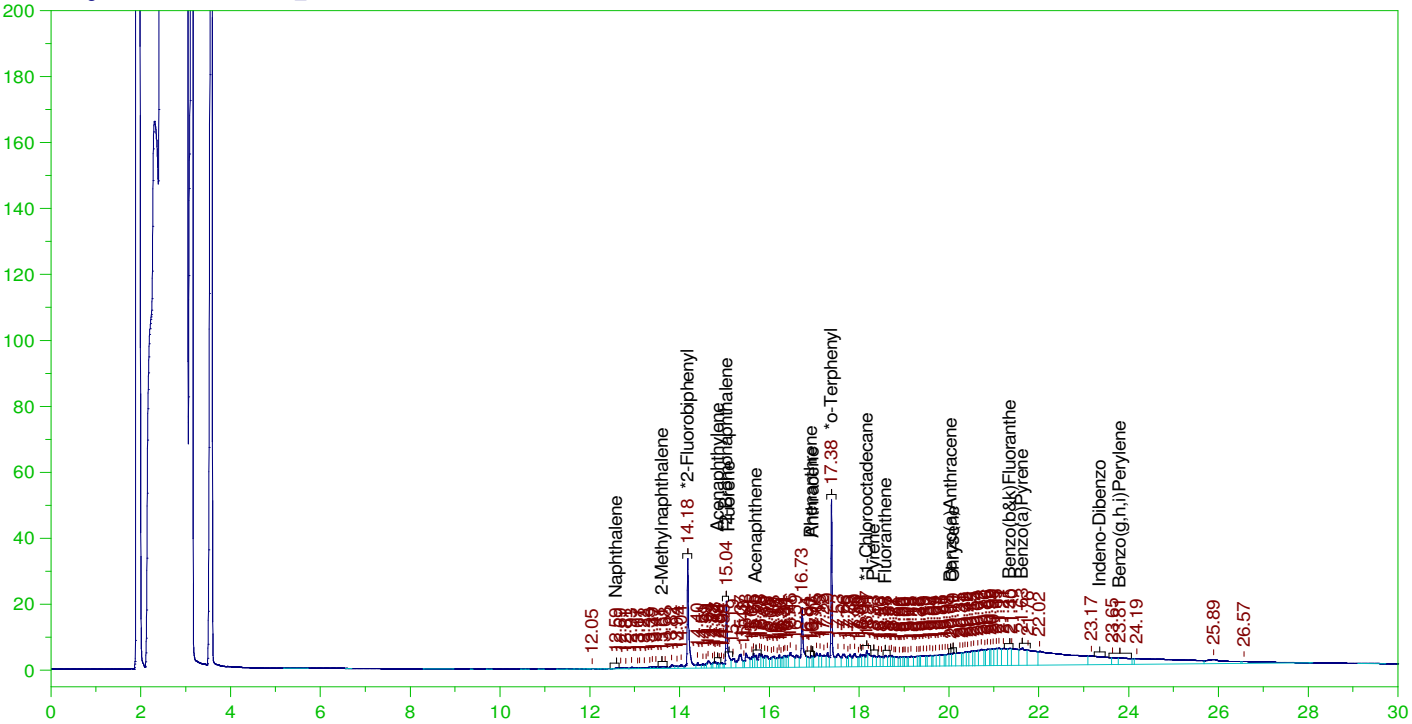
| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.154 | 156435 | 7.813 | 16.118 | 206.31 | - |

DRO Area:6517027 DRO Amount: 599.8375
TEH Area:1.06638E+07 TEH Amount: 981.5128

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:1855936 C9-C18 Amount: 172.6403
C19-C36 Area:8367776 C19-C36 Amount: 764.1513

**BD-20160711** Batch ID: 33677

— G:\Org\1GC\DAT\1GC072116_b\0721GC1.0048.RAW H16070159-009A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16070159-009A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0048.RAW
Date & Time Acquired: 7/22/2016 9:27:37 PM
Method File: G:\Org\1GC\Methods\AR102015M.MET
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

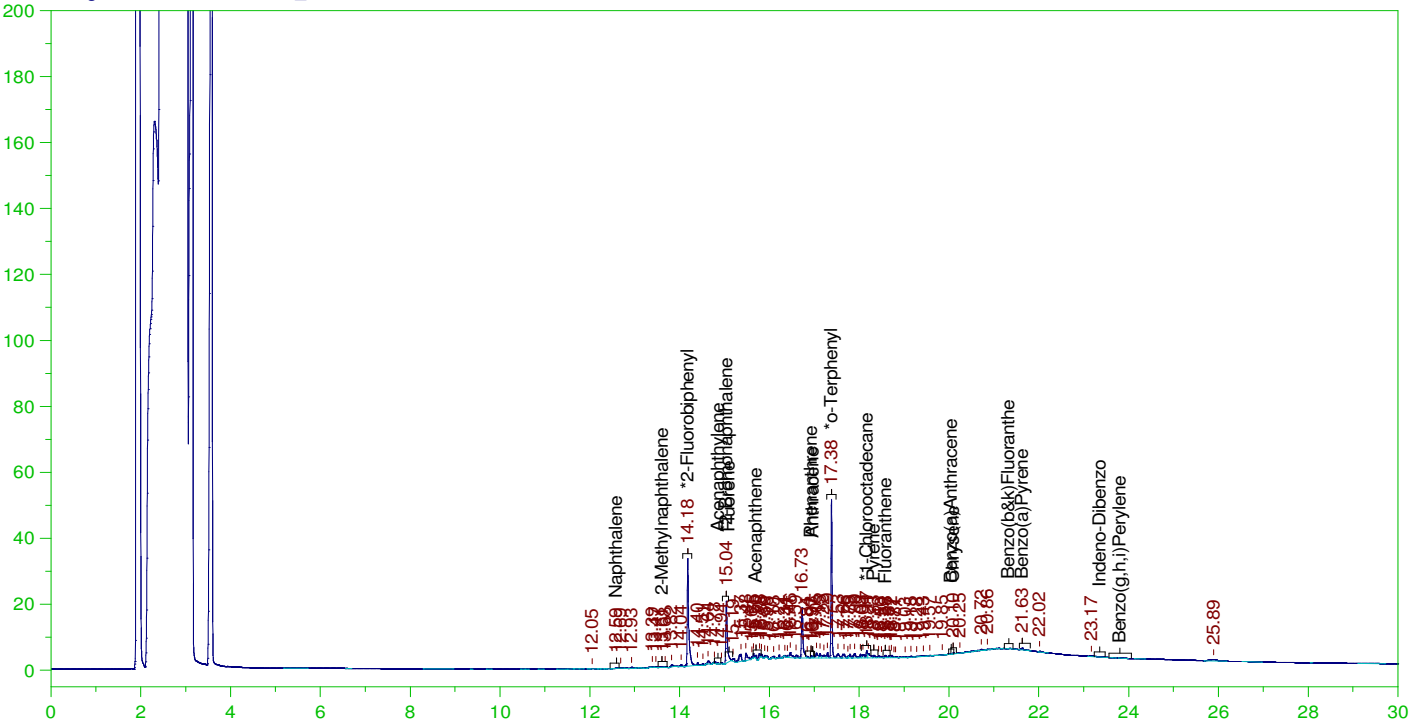
Mean RF EPH Aromatics: 923.8477
Rt range for EPH C11 to C22 Aromatics: 12.45 to 24.06

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.184 | 85956 | 7.813 | 7.457 | 95.45 | - |
| *2-Bromonaphthalene | 15.041 | 58866 | 7.813 | 7.754 | 99.25 | - |
| *o-Terphenyl | 17.381 | 103118 | 7.813 | 8.437 | 107.99 | - |
| *1-Chlorooctadecane | 18.17 | 15059 | 7.813 | 1.586 | 20.3 | - |

C11-C22 Aromatics Area:1882271 C11-C22 Aromatics Amount: 159.1738
EPH Aromatics total Area:2071355 EPH Aromatics Total Amount: 175.1637

**BD-20160711** Batch ID: 33677

G:\Org\1GC\DAT\1GC072116_b\0721GC1.0048.RAW H16070159-009A ;0721GC1 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

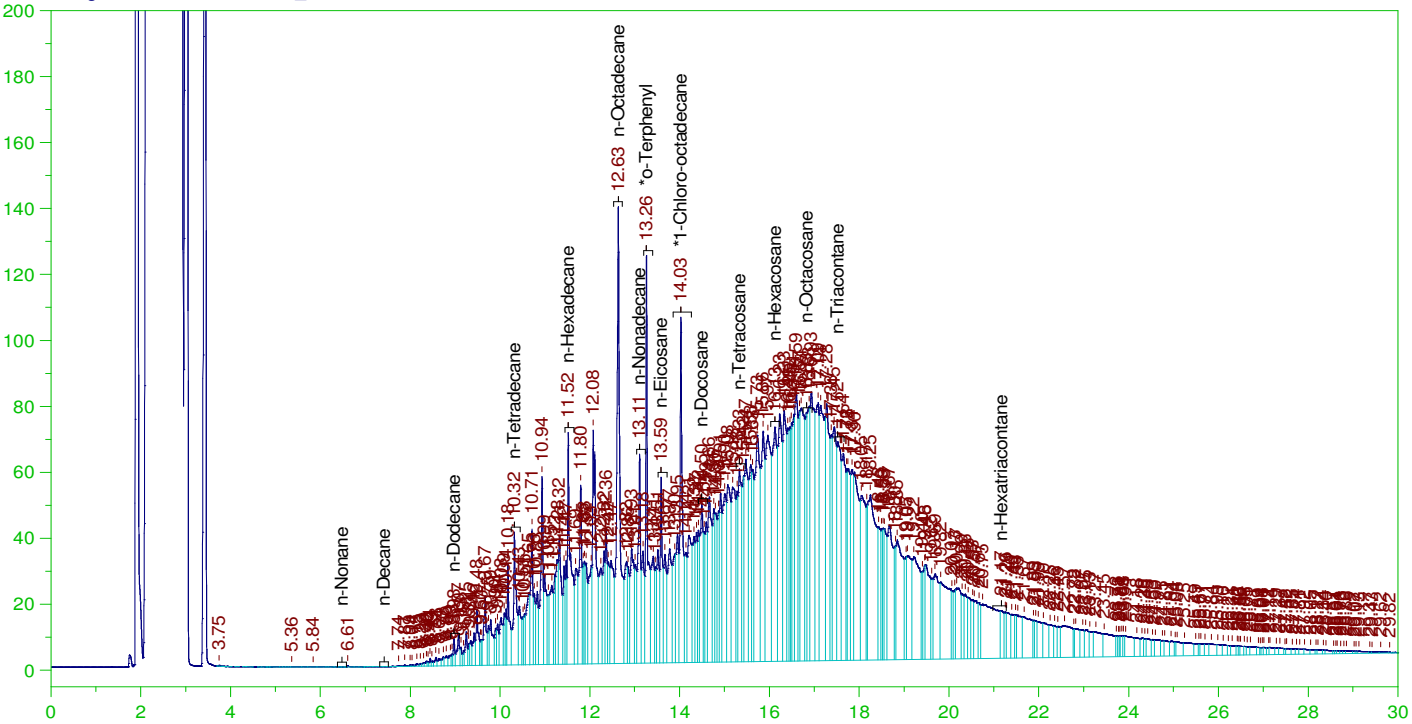
Sample Name: H16070159-009A ;0721GC1 , $HC-ARO-GRP-S,
Raw File: G:\Org\1GC\DAT\1GC072116_b\0721GC1.0048.RAW
Date & Time Acquired: 7/22/2016 9:27:37 PM
Method File: G:\Org\1GC\Methods\AROQC102015M.met
Calibration File: G:\Org\1GC\Cals\AR102015M.CAL
Sample Weight: 25.6 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | 12.59 | 12.59 | 12.59 | 520 | .078 | U |
| 2-Methylnaphthalene | 13.61 | 1.4 | 1.43 | 1413 | .121 | |
| Acenaphthylene | . | . | . | | .078 | U |
| Fluorene | . | . | . | | .078 | U |
| Acenaphthene | 15.7 | -.71 | -.659 | 1621 | .139 | |
| Phenanthrene | 16.927 | -1.88 | -1.886 | 1445 | .123 | |
| Anthracene | 16.968 | -1.94 | -1.927 | 966 | .082 | |
| Pyrene | 18.327 | -3.32 | -3.286 | 2317 | .194 | |
| Fluoranthene | 18.58 | -3.59 | -3.539 | 2507 | .208 | |
| Benzo(a)Anthracene | . | . | . | | .078 | U |
| Chrysene | 20.098 | 20.098 | 20.098 | 714 | .078 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .156 | U |
| Benzo(a)Pyrene | 21.627 | -6.67 | -6.586 | 1908 | .159 | |
| Indeno-Dibenzo | . | . | . | | .156 | U |
| Benzo(g,h,i)Perylene | . | . | . | | .078 | U |

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.184 | 75856 | 7.813 | 6.581 | 84.24 | 40-140 |
| *2-Bromonaphthalene | 15.041 | 44268 | 7.813 | 5.831 | 74.64 | 40-140 |
| *o-Terphenyl | 17.381 | 81854 | 7.813 | 6.697 | 85.73 | 40-140 |
| *1-Chlorooctadecane | 18.17 | 5139 | 7.813 | .541 | 6.93 | 40-140 |

**BD-20160711** Batch ID: 33547

— G:\Org\4GC\DAT\4GC071416_b\0714GC4.0023.RAW H16070159-009A ;0714GC4 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16070159-009A ;0714GC4 , $HC-EPH-SCRN-S,
Raw File: G:\Org\4GC\DAT\4GC071416_b\0714GC4.0023.RAW
Date & Time Acquired: 7/15/2016 4:45:03 AM
Method File: G:\Org\4GC\Methods\07141623.MET
Calibration File: G:\Org\4GC\Cals\SC0108160.CAL
Sample Weight: 25.6 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: 7.32 to 17.66
Rt range for C9 to C18 Hydrocarbons: 6.38 to 13.2
Rt range for C19 to C36 Hydrocarbons: 13.25 to 21.28

| SURROGATE COMPOUND | RT | AREA | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|---|
| *o-Terphenyl | 13.263 | 366670 | 7.813 | 14.169 | 181.36 | - |
| *1-Chloro-octadecane | 14.03 | 395416 | 7.813 | 19.575 | 250.57 | - |

DRO Area:2.041662E+07 DRO Amount: 871.6508
TEH Area:2.911588E+07 TEH Amount: 1243.05
C9-C18 Area:6247383 C9-C18 Amount: 269.4406
C19-C36 Area:2.049755E+07 C19-C36 Amount: 866.3605

**Pace Analytical Services, Inc.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

## Report Prepared for:

Wanda Johnson
Energy Laboratories
PO Box 5688
Helena MT 59604

# REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

**Report Prepared Date:**

July 22, 2016

## Report Information:

**Pace Project #: 10355420**
**Sample Receipt Date: 07/13/2016**
**Client Project #: H16070159**
**Client Sub PO #: N/A**
**State Cert #: 92**

### Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Joanne Richardson, your Pace Project Manager.

### This report has been reviewed by:

Joanne Richardson

July 22, 2016

Joanne Richardson,
(612) 607-6453
(612) 607-6444 (fax)

## Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

**Pace Analytical Services, Inc.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

## DISCUSSION

This report presents the results from the analyses performed on nine samples submitted by a representative of Energy Laboratories, Inc. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were based on signal-to-noise measurements. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations at one-half of the reported concentrations.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The isotopically-labeled PCDD/PCDF internal standards in the sample extracts were recovered at 49-124%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

In some cases, interfering substances impacted the determinations of PCDD or PCDF congeners; the affected values were flagged "I" where incorrect isotope ratios were obtained or "P" where polychlorinated diphenyl ethers were present. Concentrations below the calibration range were flagged "J" and should be regarded as estimates. Concentrations above the calibration range were flagged "E" and should also be regarded as estimates. Values obtained from the analyses of diluted extracts were flagged "D" and "N2".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain trace levels of selected congeners. These levels were below the calibration range of the method. The levels reported for the affected congeners in the field samples were higher than the corresponding blank levels by one or more orders of magnitude. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field samples.

Laboratory and matrix spike samples were also prepared using clean sand or sample matrix that had been fortified with native standard materials. The recoveries of the native compounds generally ranged from 79-128% with relative percent differences (RPDs) of 0.6-38.2%. The background-subtracted recovery values obtained for the hepta and octa-chlorinated congeners in the matrix spike analyses were above the 70-130% target range. Also, the RPD values obtained for OCDD and OCDF were above the 20% target upper limit. These deviations may be due to the levels of the affected congeners in the sample material and/or sample inhomogeneity.



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without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Minnesota Laboratory Certifications

| Authority | Certificate # | Authority | Certificate # |
|---|---|---|---|
| A2LA | 2926.01 | Mississippi | MN00064 |
| Alabama | 40770 | Montana | 92 |
| Alaska | MN00064 | Nebraska | NE-OS-18-06 |
| Arizona | AZ0014 | Nevada | MN_00064_200 |
| Arkansas | 88-0680 | New Jersey (NE | MN002 |
| California | 01155CA | New York (NEL | 11647 |
| Colorado | MN00064 | North Carolina | 27700 |
| Connecticut | PH-0256 | North Dakota | R-036 |
| EPA Region 8 | 8TMS-Q | Ohio | 4150 |
| Florida (NELAP | E87605 | Oklahoma | D9922 |
| Georgia (DNR) | 959 | Oregon (ELAP) | MN200001-005 |
| Guam | 959 | Oregon (OREL | MN300001-001 |
| Hawaii | SLD | Pennsylvania | 68-00563 |
| Idaho | MN00064 | Puerto Rico | MN00064 |
| Illinois | 200012 | Saipan | MP0003 |
| Indiana | C-MN-01 | South Carolina | 74003001 |
| Indiana | C-MN-01 | Tennessee | TN02818 |
| Iowa | 368 | Texas | T104704192-08 |
| Kansas | E-10167 | Utah (NELAP) | MN00064 |
| Kentucky | 90062 | Virginia | 00251 |
| Louisiana | 03086 | Washington | C755 |
| Maine | 2007029 | West Virginia # | 9952C |
| Maryland | 322 | West Virginia D | 382 |
| Michigan | 9909 | Wisconsin | 999407970 |
| Minnesota | 027-053-137 | Wyoming | 8TMS-Q |

## REPORT OF LABORATORY ANALYSIS

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# Appendix A

Sample Management

**Energy Laboratories Inc**
3161 East Lyndale Avenue
Helena, MT 59601
(406) 442-0711

H16070159

# CHAIN-OF-CUSTODY RECORD


11-Jul-16

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

10355420

**Subcontractor:**
Pace Analytical-Minneapolis
1700 Elm St, Ste 200
Minneapolis, MN 55414
TEL: (612) 607-6331 FAX:
Acct #:

**Subcontractor's Client:**

Requested Tests

| Rush | Sample ID | Matrix | Collection Date | Bottle Type | DIOXIN-S-FULL-829 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | H16070159-001B | Soil | 07/11/16 06:00 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 001 |
| ☐ | H16070159-002B | Soil | 07/11/16 06:05 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 002 |
| ☐ | H16070159-003B | Soil | 07/11/16 06:10 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 003 |
| ☐ | H16070159-004B | Soil | 07/11/16 06:15 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 004 |
| ☐ | H16070159-005B | Soil | 07/11/16 06:20 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 005 |
| ☐ | H16070159-006B | Soil | 07/11/16 06:25 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 006 |
| ☐ | H16070159-007B | Soil | 07/11/16 06:30 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 007 |
| ☐ | H16070159-008B | Soil | 07/11/16 06:35 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 008 |
| ☐ | H16070159-009B | Soil | 07/11/16 06:00 A | 2-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 009 |

**Earliest Due Date:** 7/20/2016

**Comments:** Report on a Dry Weight Basis

QC Level:
**STD**

| | Date/Time | | |
|---|---|---|---|
| **Relinquished by:** [signature] | 7-11-16 1635 | **Received by:** [signature] | 7/13/16 950 |
| **Relinquished by:** | | **Received by:** | |

T=0.1

| Pace Analytical | Document Name: **Sample Condition Upon Receipt Form** | Document Revised: 04Apr2016 Page 1 of 1 |
|---|---|---|
| | Document No.: **F-MN-L-213-rev.16** | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Energy Labs

**Project #:** WO#: 10355420

10355420

**Courier:** ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

**Tracking Number:** 12 37E W97 01 5645 3279

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☐ 151401163 ☑ B88A912167504 ☐ 151401164 ☐ B88A0143310098 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 0.1 **Cooler Temp Corrected (°C):** 0.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.0 **Date and Initials of Person Examining Contents:** GS 7/13/16

**USDA Regulated Soil** ( ☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☐ Yes | ☑ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☑ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☑ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☑ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☑ N/A | 11. Note if sediment is visible in the dissolved container |
| Sample Labels Match COC? | ☑ Yes | ☐ No | ☐ N/A | 12. |
| -Includes Date/Time/ID/Analysis Matrix: SL | | | | |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☑ N/A | 13. ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) | ☐ Yes | ☐ No | ☑ N/A | |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC | ☐ Yes | ☐ No | ☑ N/A | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** Joanne Richardson **Date:** 7-14-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

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Fax: 612- 607-6444

# Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion



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# Appendix B

Sample Analysis  Summary

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-001B | | |
| Lab Sample ID | 10355420001 | | |
| Filename | Y160719A_08 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.7 g | Matrix | Soil |
| % Moisture | 36.8 | Dilution | NA |
| Dry Weight Extracted | 6.76 g | Collected | 07/11/2016 06:00 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 17:42 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 5.0 | ---- | 0.36 | | 2,3,7,8-TCDF-13C | 2.00 | 76 | |
| Total TCDF | 250.0 | ---- | 0.36 | | 2,3,7,8-TCDD-13C | 2.00 | 91 | |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 84 | |
| 2,3,7,8-TCDD | 1.2 | ---- | 0.17 | J | 2,3,4,7,8-PeCDF-13C | 2.00 | 84 | |
| Total TCDD | 21.0 | ---- | 0.17 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 100 | |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 67 | |
| 1,2,3,7,8-PeCDF | 18.0 | ---- | 0.74 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 73 | |
| 2,3,4,7,8-PeCDF | 36.0 | ---- | 0.48 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 73 | |
| Total PeCDF | 1700.0 | ---- | 0.61 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 73 | |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 76 | |
| 1,2,3,7,8-PeCDD | 29.0 | ---- | 0.48 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 70 | |
| Total PeCDD | 190.0 | ---- | 0.48 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 74 | DN2 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 88 | DN2 |
| 1,2,3,4,7,8-HxCDF | 140.0 | ---- | 1.70 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 96 | DN2 |
| 1,2,3,6,7,8-HxCDF | ---- | 210 | 1.20 | P | OCDD-13C | 4.00 | 113 | DN2 |
| 2,3,4,6,7,8-HxCDF | 280.0 | ---- | 0.97 | | | | | |
| 1,2,3,7,8,9-HxCDF | 31.0 | ---- | 1.20 | | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 5900.0 | ---- | 1.30 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 91.0 | ---- | 1.30 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 89 | |
| 1,2,3,6,7,8-HxCDD | 410.0 | ---- | 1.50 | | | | | |
| 1,2,3,7,8,9-HxCDD | 240.0 | ---- | 1.40 | | | | | |
| Total HxCDD | 2200.0 | ---- | 1.40 | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 6300.0 | ---- | 2.10 | DN2 | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 430.0 | ---- | 3.20 | DN2 | Equivalence: 440 ng/Kg | | | |
| Total HpCDF | 18000.0 | ---- | 2.60 | DN2 | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 15000.0 | ---- | 4.40 | DN2 | | | | |
| Total HpCDD | 23000.0 | ---- | 4.40 | DN2 | | | | |
| OCDF | 27000.0 | ---- | 4.60 | DN2 | | | | |
| OCDD | 150000.0 | ---- | 3.50 | EDN2 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-002B | | |
| Lab Sample ID | 10355420002 | | |
| Filename | Y160719A_09 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 13.7 g | Matrix | Soil |
| % Moisture | 13.9 | Dilution | NA |
| Dry Weight Extracted | 11.8 g | Collected | 07/11/2016 06:05 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 18:27 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 6.50 | ----- | 0.14 | | 2,3,7,8-TCDF-13C | 2.00 | 65 | |
| Total TCDF | 130.00 | ----- | 0.14 | | 2,3,7,8-TCDD-13C | 2.00 | 79 | |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 74 | |
| 2,3,7,8-TCDD | 0.28 | ----- | 0.23 | J | 2,3,4,7,8-PeCDF-13C | 2.00 | 72 | |
| Total TCDD | 16.00 | ----- | 0.23 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 84 | |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 58 | |
| 1,2,3,7,8-PeCDF | 21.00 | ----- | 0.64 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 60 | |
| 2,3,4,7,8-PeCDF | 58.00 | ----- | 0.36 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 61 | |
| Total PeCDF | 1000.00 | ----- | 0.50 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 61 | |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 64 | |
| 1,2,3,7,8-PeCDD | 11.00 | ----- | 0.27 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 60 | |
| Total PeCDD | 87.00 | ----- | 0.27 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 77 | DN2 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 80 | DN2 |
| 1,2,3,4,7,8-HxCDF | 160.00 | ----- | 1.10 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 89 | DN2 |
| 1,2,3,6,7,8-HxCDF | ----- | 110 | 0.76 | P | OCDD-13C | 4.00 | 102 | DN2 |
| 2,3,4,6,7,8-HxCDF | 210.00 | ----- | 1.00 | | | | | |
| 1,2,3,7,8,9-HxCDF | 75.00 | ----- | 2.20 | | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 7200.00 | ----- | 1.30 | E | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 37.00 | ----- | 0.69 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 74 | |
| 1,2,3,6,7,8-HxCDD | 480.00 | ----- | 0.79 | | | | | |
| 1,2,3,7,8,9-HxCDD | 99.00 | ----- | 0.82 | | | | | |
| Total HxCDD | 1500.00 | ----- | 0.77 | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 8800.00 | ----- | 9.80 | DN2 | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 740.00 | ----- | 17.00 | DN2 | Equivalence: 400 ng/Kg | | | |
| Total HpCDF | 37000.00 | ----- | 13.00 | DN2 | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 11000.00 | ----- | 1.90 | DN2 | | | | |
| Total HpCDD | 17000.00 | ----- | 1.90 | DN2 | | | | |
| OCDF | 68000.00 | ----- | 2.00 | EDN2 | | | | |
| OCDD | 110000.00 | ----- | 2.70 | EDN2 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-003B | | |
| Lab Sample ID | 10355420003 | | |
| Filename | Y160719A_10 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.5 g | Matrix | Soil |
| % Moisture | 21.7 | Dilution | NA |
| Dry Weight Extracted | 8.22 g | Collected | 07/11/2016 06:10 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 19:12 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 6.40 | ----- | 0.29 | | 2,3,7,8-TCDF-13C | 2.00 | 74 | |
| Total TCDF | 170.00 | ----- | 0.29 | | 2,3,7,8-TCDD-13C | 2.00 | 88 | |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 86 | |
| 2,3,7,8-TCDD | 0.60 | ----- | 0.42 | J | 2,3,4,7,8-PeCDF-13C | 2.00 | 81 | |
| Total TCDD | 16.00 | ----- | 0.42 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 97 | |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 66 | |
| 1,2,3,7,8-PeCDF | 23.00 | ----- | 0.46 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 69 | |
| 2,3,4,7,8-PeCDF | 56.00 | ----- | 0.62 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 70 | |
| Total PeCDF | 1400.00 | ----- | 0.54 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 67 | |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 70 | |
| 1,2,3,7,8-PeCDD | 18.00 | ----- | 0.51 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 69 | |
| Total PeCDD | 120.00 | ----- | 0.51 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 91 | DN2 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 94 | DN2 |
| 1,2,3,4,7,8-HxCDF | 160.00 | ----- | 1.10 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 105 | DN2 |
| 1,2,3,6,7,8-HxCDF | ----- | 180 | 1.10 | P | OCDD-13C | 4.00 | 124 | DN2 |
| 2,3,4,6,7,8-HxCDF | 260.00 | ----- | 1.10 | | | | | |
| 1,2,3,7,8,9-HxCDF | 60.00 | ----- | 1.60 | | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 6800.00 | ----- | 1.20 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 56.00 | ----- | 0.82 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 88 | |
| 1,2,3,6,7,8-HxCDD | 410.00 | ----- | 0.67 | | | | | |
| 1,2,3,7,8,9-HxCDD | 140.00 | ----- | 0.66 | | | | | |
| Total HxCDD | 1700.00 | ----- | 0.72 | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 8000.00 | ----- | 11.00 | DN2 | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 510.00 | ----- | 12.00 | DN2 | Equivalence: 360 ng/Kg | | | |
| Total HpCDF | 24000.00 | ----- | 12.00 | DN2 | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 9000.00 | ----- | 1.30 | DN2 | | | | |
| Total HpCDD | 15000.00 | ----- | 1.30 | DN2 | | | | |
| OCDF | 38000.00 | ----- | 2.00 | DN2 | | | | |
| OCDD | 72000.00 | ----- | 1.40 | EDN2 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-004B | | |
| Lab Sample ID | 10355420004 | | |
| Filename | Y160719A_11 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 14.5 g | Matrix | Soil |
| % Moisture | 17.2 | Dilution | NA |
| Dry Weight Extracted | 12.0 g | Collected | 07/11/2016 06:15 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 19:56 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 1.30 | ----- | 0.25 | | 2,3,7,8-TCDF-13C | 2.00 | 72 |
| Total TCDF | 41.00 | ----- | 0.25 | | 2,3,7,8-TCDD-13C | 2.00 | 87 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 81 |
| 2,3,7,8-TCDD | ND | ----- | 0.23 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 79 |
| Total TCDD | 0.96 | ----- | 0.23 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 96 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 64 |
| 1,2,3,7,8-PeCDF | 4.10 | ----- | 0.32 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 70 |
| 2,3,4,7,8-PeCDF | 7.60 | ----- | 0.24 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 68 |
| Total PeCDF | 250.00 | ----- | 0.28 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 66 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 72 |
| 1,2,3,7,8-PeCDD | 3.80 | ----- | 0.23 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 65 |
| Total PeCDD | 29.00 | ----- | 0.23 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 84 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 86 |
| 1,2,3,4,7,8-HxCDF | 25.00 | ----- | 0.51 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 94 |
| 1,2,3,6,7,8-HxCDF | ----- | 37 | 0.65 | P | OCDD-13C | 4.00 | 106 |
| 2,3,4,6,7,8-HxCDF | 49.00 | ----- | 0.63 | | | | |
| 1,2,3,7,8,9-HxCDF | 7.10 | ----- | 0.34 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 980.00 | ----- | 0.53 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 12.00 | ----- | 0.48 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 86 |
| 1,2,3,6,7,8-HxCDD | 60.00 | ----- | 0.52 | | | | |
| 1,2,3,7,8,9-HxCDD | 32.00 | ----- | 0.28 | | | | |
| Total HxCDD | 320.00 | ----- | 0.43 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1100.00 | ----- | 0.73 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 62.00 | ----- | 0.84 | | Equivalence: 61 ng/Kg | | |
| Total HpCDF | 2600.00 | ----- | 0.79 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 1600.00 | ----- | 0.53 | | | | |
| Total HpCDD | 2600.00 | ----- | 0.53 | | | | |
| OCDF | 3400.00 | ----- | 0.33 | E | | | |
| OCDD | 18000.00 | ----- | 0.66 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
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Results reported on a dry weight basis and are valid to no more than 2 significant figures.
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Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-005B | | |
| Lab Sample ID | 10355420005 | | |
| Filename | Y160719A_12 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.3 g | Matrix | Soil |
| % Moisture | 9.0 | Dilution | NA |
| Dry Weight Extracted | 9.37 g | Collected | 07/11/2016 06:20 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 20:41 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.50 | ----- | 0.45 | J | 2,3,7,8-TCDF-13C | 2.00 | 54 |
| Total TCDF | 16.00 | ----- | 0.45 | | 2,3,7,8-TCDD-13C | 2.00 | 65 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 65 |
| 2,3,7,8-TCDD | ND | ----- | 0.43 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 62 |
| Total TCDD | ND | ----- | 0.43 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 74 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 49 |
| 1,2,3,7,8-PeCDF | ----- | 1.3 | 0.73 | IJ | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 54 |
| 2,3,4,7,8-PeCDF | 3.10 | ----- | 0.46 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 54 |
| Total PeCDF | 70.00 | ----- | 0.60 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 52 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 56 |
| 1,2,3,7,8-PeCDD | 1.60 | ----- | 0.29 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 51 |
| Total PeCDD | 13.00 | ----- | 0.29 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 64 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 67 |
| 1,2,3,4,7,8-HxCDF | 7.90 | ----- | 0.62 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 72 |
| 1,2,3,6,7,8-HxCDF | 8.40 | ----- | 0.57 | | OCDD-13C | 4.00 | 75 |
| 2,3,4,6,7,8-HxCDF | 12.00 | ----- | 0.64 | | | | |
| 1,2,3,7,8,9-HxCDF | 3.00 | ----- | 0.81 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 300.00 | ----- | 0.66 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ----- | 3.1 | 0.47 | IJ | 2,3,7,8-TCDD-37Cl4 | 0.20 | 67 |
| 1,2,3,6,7,8-HxCDD | 13.00 | ----- | 0.34 | | | | |
| 1,2,3,7,8,9-HxCDD | 9.60 | ----- | 0.47 | | | | |
| Total HxCDD | 98.00 | ----- | 0.43 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 360.00 | ----- | 0.65 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 19.00 | ----- | 0.86 | | Equivalence: 17 ng/Kg | | |
| Total HpCDF | 1100.00 | ----- | 0.75 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 350.00 | ----- | 0.64 | | | | |
| Total HpCDD | 610.00 | ----- | 0.64 | | | | |
| OCDF | 1800.00 | ----- | 1.00 | | | | |
| OCDD | 3700.00 | ----- | 1.10 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-006B | | |
| Lab Sample ID | 10355420006 | | |
| Filename | Y160719A_13 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 10.4 g | Matrix | Soil |
| % Moisture | 12.8 | Dilution | NA |
| Dry Weight Extracted | 9.07 g | Collected | 07/11/2016 06:25 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 21:26 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 1.2 | ---- | 0.26 | | 2,3,7,8-TCDF-13C | 2.00 | 66 |
| Total TCDF | 36.0 | ---- | 0.26 | | 2,3,7,8-TCDD-13C | 2.00 | 80 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 79 |
| 2,3,7,8-TCDD | ND | ---- | 0.29 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 75 |
| Total TCDD | 5.6 | ---- | 0.29 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 90 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 63 |
| 1,2,3,7,8-PeCDF | 1.7 | ---- | 0.62 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 65 |
| 2,3,4,7,8-PeCDF | 7.5 | ---- | 0.41 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 66 |
| Total PeCDF | 190.0 | ---- | 0.51 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 63 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 68 |
| 1,2,3,7,8-PeCDD | 1.8 | ---- | 0.24 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 64 |
| Total PeCDD | 25.0 | ---- | 0.24 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 83 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 83 |
| 1,2,3,4,7,8-HxCDF | 35.0 | ---- | 0.82 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 93 |
| 1,2,3,6,7,8-HxCDF | ---- | 24 | 0.85 | P | OCDD-13C | 4.00 | 101 |
| 2,3,4,6,7,8-HxCDF | 39.0 | ---- | 0.83 | | | | |
| 1,2,3,7,8,9-HxCDF | 15.0 | ---- | 0.88 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 1900.0 | ---- | 0.85 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 3.3 | ---- | 0.34 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 74 |
| 1,2,3,6,7,8-HxCDD | 34.0 | ---- | 0.28 | | | | |
| 1,2,3,7,8,9-HxCDD | 13.0 | ---- | 0.25 | | | | |
| Total HxCDD | 170.0 | ---- | 0.29 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 3200.0 | ---- | 1.70 | E | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 210.0 | ---- | 2.90 | | Equivalence: 77 ng/Kg | | |
| Total HpCDF | 13000.0 | ---- | 2.30 | E | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 1100.0 | ---- | 0.38 | | | | |
| Total HpCDD | 1700.0 | ---- | 0.38 | | | | |
| OCDF | 26000.0 | ---- | 0.41 | E | | | |
| OCDD | 14000.0 | ---- | 0.49 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | | |
|---|---|---|---|---|
| Client's Sample ID | H16070159-007B | | | |
| Lab Sample ID | 10355420007 | | | |
| Filename | Y160719A_14 | | | |
| Injected By | SMT | | | |
| Total Amount Extracted | 10.3 g | Matrix | Soil | |
| % Moisture | 18.9 | Dilution | NA | |
| Dry Weight Extracted | 8.35 g | Collected | 07/11/2016 | 06:30 |
| ICAL ID | Y160713 | Received | 07/13/2016 | 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 | 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 | 22:11 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 3.0 | ----- | 0.41 | | 2,3,7,8-TCDF-13C | 2.00 | 66 |
| Total TCDF | 180.0 | ----- | 0.41 | | 2,3,7,8-TCDD-13C | 2.00 | 80 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 75 |
| 2,3,7,8-TCDD | 1.1 | ----- | 0.59 | J | 2,3,4,7,8-PeCDF-13C | 2.00 | 73 |
| Total TCDD | 17.0 | ----- | 0.59 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 85 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 61 |
| 1,2,3,7,8-PeCDF | 13.0 | ----- | 0.55 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 63 |
| 2,3,4,7,8-PeCDF | 22.0 | ----- | 0.48 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 64 |
| Total PeCDF | 950.0 | ----- | 0.52 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 66 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 66 |
| 1,2,3,7,8-PeCDD | 16.0 | ----- | 0.15 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 63 |
| Total PeCDD | 170.0 | ----- | 0.15 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 73 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 83 |
| 1,2,3,4,7,8-HxCDF | 80.0 | ----- | 1.20 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 90 |
| 1,2,3,6,7,8-HxCDF | ----- | 120 | 0.69 | P | OCDD-13C | 4.00 | 98 |
| 2,3,4,6,7,8-HxCDF | 150.0 | ----- | 1.00 | | | | |
| 1,2,3,7,8,9-HxCDF | 17.0 | ----- | 1.20 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 3100.0 | ----- | 1.00 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 44.0 | ----- | 0.93 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 79 |
| 1,2,3,6,7,8-HxCDD | 160.0 | ----- | 1.00 | | | | |
| 1,2,3,7,8,9-HxCDD | 100.0 | ----- | 0.77 | | | | |
| Total HxCDD | 1300.0 | ----- | 0.91 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 3300.0 | ----- | 1.20 | E | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 130.0 | ----- | 2.60 | | Equivalence: 170 ng/Kg | | |
| Total HpCDF | 7500.0 | ----- | 1.90 | E | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 4000.0 | ----- | 0.41 | E | | | |
| Total HpCDD | 7100.0 | ----- | 0.41 | E | | | |
| OCDF | 8400.0 | ----- | 0.55 | E | | | |
| OCDD | 27000.0 | ----- | 0.62 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-008B | | |
| Lab Sample ID | 10355420008 | | |
| Filename | Y160719A_15 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 14.2 g | Matrix | Soil |
| % Moisture | 15.4 | Dilution | NA |
| Dry Weight Extracted | 12.0 g | Collected | 07/11/2016 06:35 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 22:56 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 1.2 | ----- | 0.20 | | 2,3,7,8-TCDF-13C | 2.00 | 75 |
| Total TCDF | 34.0 | ----- | 0.20 | | 2,3,7,8-TCDD-13C | 2.00 | 90 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 86 |
| 2,3,7,8-TCDD | ND | ----- | 0.26 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 83 |
| Total TCDD | 4.3 | ----- | 0.26 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 98 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 68 |
| 1,2,3,7,8-PeCDF | 1.7 | ----- | 0.58 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 72 |
| 2,3,4,7,8-PeCDF | 6.0 | ----- | 0.28 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 71 |
| Total PeCDF | 160.0 | ----- | 0.43 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 73 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 74 |
| 1,2,3,7,8-PeCDD | ----- | 1.9 | 0.31 | IJ | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 69 |
| Total PeCDD | 22.0 | ----- | 0.31 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 90 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 92 |
| 1,2,3,4,7,8-HxCDF | 26.0 | ----- | 0.58 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 100 |
| 1,2,3,6,7,8-HxCDF | ----- | 19.0 | 0.61 | P | OCDD-13C | 4.00 | 106 |
| 2,3,4,6,7,8-HxCDF | 32.0 | ----- | 0.58 | | | | |
| 1,2,3,7,8,9-HxCDF | 10.0 | ----- | 0.86 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 1300.0 | ----- | 0.66 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 5.0 | ----- | 0.31 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 53 |
| 1,2,3,6,7,8-HxCDD | 32.0 | ----- | 0.33 | | | | |
| 1,2,3,7,8,9-HxCDD | 14.0 | ----- | 0.43 | | | | |
| Total HxCDD | 180.0 | ----- | 0.35 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 2100.0 | ----- | 0.93 | E | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 130.0 | ----- | 1.90 | | Equivalence: 54 ng/Kg | | |
| Total HpCDF | 8400.0 | ----- | 1.40 | E | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 860.0 | ----- | 1.90 | | | | |
| Total HpCDD | 1400.0 | ----- | 1.90 | | | | |
| OCDF | 17000.0 | ----- | 0.25 | E | | | |
| OCDD | 9100.0 | ----- | 0.31 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range
I = Interference present

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-009B | | |
| Lab Sample ID | 10355420009 | | |
| Filename | Y160719A_16 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 14.9 g | Matrix | Soil |
| % Moisture | 15.4 | Dilution | NA |
| Dry Weight Extracted | 12.6 g | Collected | 07/11/2016 06:00 |
| ICAL ID | Y160713 | Received | 07/13/2016 09:50 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Extracted | 07/15/2016 17:45 |
| Method Blank ID | BLANK-51095 | Analyzed | 07/19/2016 23:40 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 9.30 | ----- | 0.27 | | 2,3,7,8-TCDF-13C | 2.00 | 76 | |
| Total TCDF | 200.00 | ----- | 0.27 | | 2,3,7,8-TCDD-13C | 2.00 | 91 | |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 87 | |
| 2,3,7,8-TCDD | 0.40 | ----- | 0.34 | J | 2,3,4,7,8-PeCDF-13C | 2.00 | 83 | |
| Total TCDD | 24.00 | ----- | 0.34 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 98 | |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 67 | |
| 1,2,3,7,8-PeCDF | 32.00 | ----- | 0.68 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 71 | |
| 2,3,4,7,8-PeCDF | 88.00 | ----- | 0.38 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 71 | |
| Total PeCDF | 1600.00 | ----- | 0.53 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 70 | |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 73 | |
| 1,2,3,7,8-PeCDD | 19.00 | ----- | 0.16 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 69 | |
| Total PeCDD | 140.00 | ----- | 0.16 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 81 | DN2 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 90 | DN2 |
| 1,2,3,4,7,8-HxCDF | 230.00 | ----- | 2.00 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 99 | DN2 |
| 1,2,3,6,7,8-HxCDF | ----- | 170 | 1.90 | P | OCDD-13C | 4.00 | 123 | DN2 |
| 2,3,4,6,7,8-HxCDF | 320.00 | ----- | 2.30 | | | | | |
| 1,2,3,7,8,9-HxCDF | 110.00 | ----- | 2.00 | | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 10000.00 | ----- | 2.10 | E | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 64.00 | ----- | 1.00 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 79 | |
| 1,2,3,6,7,8-HxCDD | 750.00 | ----- | 1.20 | | | | | |
| 1,2,3,7,8,9-HxCDD | 180.00 | ----- | 0.69 | | | | | |
| Total HxCDD | 2400.00 | ----- | 0.98 | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 13000.00 | ----- | 7.90 | DN2 | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 1100.00 | ----- | 18.00 | DN2 | Equivalence: 620 ng/Kg | | | |
| Total HpCDF | 56000.00 | ----- | 13.00 | EDN2 | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 18000.00 | ----- | 3.00 | DN2 | | | | |
| Total HpCDD | 28000.00 | ----- | 3.00 | DN2 | | | | |
| OCDF | 94000.00 | ----- | 2.40 | EDN2 | | | | |
| OCDD | 160000.00 | ----- | 3.10 | EDN2 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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# Method 8290 Blank Analysis Results

| | | | |
|---|---|---|---|
| Lab Sample ID | BLANK-51095 | Matrix | Solid/Wipe |
| Filename | Y160719A_07 | Dilution | NA |
| Total Amount Extracted | 20.2 g | Extracted | 07/15/2016 17:45 |
| ICAL ID | Y160713 | Analyzed | 07/19/2016 16:58 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Injected By | SMT |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.065 | | 2,3,7,8-TCDF-13C | 2.00 | 75 |
| Total TCDF | ND | ----- | 0.065 | | 2,3,7,8-TCDD-13C | 2.00 | 90 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 82 |
| 2,3,7,8-TCDD | ND | ----- | 0.083 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 81 |
| Total TCDD | ND | ----- | 0.083 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 96 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 67 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.059 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 71 |
| 2,3,4,7,8-PeCDF | ND | ----- | 0.043 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 75 |
| Total PeCDF | ND | ----- | 0.051 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 77 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 75 |
| 1,2,3,7,8-PeCDD | ND | ----- | 0.050 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 69 |
| Total PeCDD | ND | ----- | 0.050 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 80 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 95 |
| 1,2,3,4,7,8-HxCDF | ND | ----- | 0.059 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 94 |
| 1,2,3,6,7,8-HxCDF | ND | ----- | 0.051 | | OCDD-13C | 4.00 | 87 |
| 2,3,4,6,7,8-HxCDF | ND | ----- | 0.044 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.068 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | ND | ----- | 0.055 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 0.071 | ----- | 0.041 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 79 |
| 1,2,3,6,7,8-HxCDD | 0.078 | ----- | 0.063 | J | | | |
| 1,2,3,7,8,9-HxCDD | ND | ----- | 0.042 | | | | |
| Total HxCDD | 0.150 | ----- | 0.049 | J | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.330 | ----- | 0.079 | J | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 0.190 | ----- | 0.092 | J | Equivalence: 0.11 ng/Kg | | |
| Total HpCDF | 1.300 | ----- | 0.086 | J | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 0.210 | ----- | 0.071 | J | | | |
| Total HpCDD | 0.370 | ----- | 0.071 | J | | | |
| OCDF | 3.400 | ----- | 0.160 | J | | | |
| OCDD | 2.400 | ----- | 0.120 | J | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Laboratory Control Spike Results

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-51096 | | |
| Filename | Y160719A_03 | Matrix | Solid/Wipe |
| Total Amount Extracted | 20.5 g | Dilution | NA |
| ICAL ID | Y160713 | Extracted | 07/15/2016 17:45 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Analyzed | 07/19/2016 14:01 |
| Method Blank ID | BLANK-51095 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.20 | 100 | 2,3,7,8-TCDF-13C | 2.0 | 84 |
| Total TCDF | | | | 2,3,7,8-TCDD-13C | 2.0 | 102 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.0 | 96 |
| 2,3,7,8-TCDD | 0.20 | 0.16 | 82 | 2,3,4,7,8-PeCDF-13C | 2.0 | 93 |
| Total TCDD | | | | 1,2,3,7,8-PeCDD-13C | 2.0 | 113 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.0 | 76 |
| 1,2,3,7,8-PeCDF | 1.0 | 1.0 | 102 | 1,2,3,6,7,8-HxCDF-13C | 2.0 | 82 |
| 2,3,4,7,8-PeCDF | 1.0 | 1.1 | 111 | 2,3,4,6,7,8-HxCDF-13C | 2.0 | 81 |
| Total PeCDF | | | | 1,2,3,7,8,9-HxCDF-13C | 2.0 | 83 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.0 | 86 |
| 1,2,3,7,8-PeCDD | 1.0 | 0.91 | 91 | 1,2,3,6,7,8-HxCDD-13C | 2.0 | 80 |
| Total PeCDD | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.0 | 91 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.0 | 104 |
| 1,2,3,4,7,8-HxCDF | 1.0 | 1.1 | 111 | 1,2,3,4,6,7,8-HpCDD-13C | 2.0 | 105 |
| 1,2,3,6,7,8-HxCDF | 1.0 | 1.0 | 104 | OCDD-13C | 4.0 | 96 |
| 2,3,4,6,7,8-HxCDF | 1.0 | 1.0 | 103 | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | 0.96 | 96 | 1,2,3,4-TCDD-13C | 2.0 | NA |
| Total HxCDF | | | | 1,2,3,7,8,9-HxCDD-13C | 2.0 | NA |
| 1,2,3,4,7,8-HxCDD | 1.0 | 0.97 | 97 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 96 |
| 1,2,3,6,7,8-HxCDD | 1.0 | 1.2 | 115 | | | |
| 1,2,3,7,8,9-HxCDD | 1.0 | 1.1 | 107 | | | |
| Total HxCDD | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.0 | 1.0 | 104 | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.0 | 0.96 | 96 | | | |
| Total HpCDF | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.0 | 1.00 | 100 | | | |
| Total HpCDD | | | | | | |
| OCDF | 2.0 | 2.3 | 116 | | | |
| OCDD | 2.0 | 2.2 | 109 | | | |

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Spiked Sample Report

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-006B-MS | | |
| Lab Sample ID | 10355420006-MS | | |
| Filename | Y160719A_04 | Matrix | Soil |
| Total Amount Extracted | 10.4 g | Dilution | NA |
| ICAL ID | Y160713 | Extracted | 07/15/2016 17:45 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Analyzed | 07/19/2016 14:44 |
| Method Blank ID | BLANK-51095 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.22 | 108 | 2,3,7,8-TCDF-13C | 2.00 | 76 |
| | | | | 2,3,7,8-TCDD-13C | 2.00 | 92 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 86 |
| 2,3,7,8-TCDD | 0.20 | 0.16 | 79 | 2,3,4,7,8-PeCDF-13C | 2.00 | 84 |
| | | | | 1,2,3,7,8-PeCDD-13C | 2.00 | 101 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | 1.00 | 1.01 | 101 | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 75 |
| 2,3,4,7,8-PeCDF | 1.00 | 1.17 | 117 | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 75 |
| | | | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 75 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 77 |
| 1,2,3,7,8-PeCDD | 1.00 | 0.91 | 91 | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 72 |
| | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 89 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 101 |
| 1,2,3,4,7,8-HxCDF | 1.00 | 1.60 | 160 | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 106 |
| 1,2,3,6,7,8-HxCDF | 1.00 | 1.15 | 115 | OCDD-13C | 4.00 | 108 DN2 |
| 2,3,4,6,7,8-HxCDF | 1.00 | 1.31 | 131 | | | |
| 1,2,3,7,8,9-HxCDF | 1.00 | 1.14 | 114 | 1,2,3,4-TCDD-13C | 2.00 | NA |
| | | | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 1.00 | 1.03 | 103 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 90 |
| 1,2,3,6,7,8-HxCDD | 1.00 | 1.56 | 156 | | | |
| 1,2,3,7,8,9-HxCDD | 1.00 | 1.20 | 120 | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.00 | 38.33 | 3833 E | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.00 | 3.73 | 373 | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.00 | 15.84 | 1584 | | | |
| OCDF | 2.00 | 439.29 | 21964 EDN2 | | | |
| OCDD | 2.00 | 194.53 | 9726 DN2 | | | |

Qs = Quantity Spiked  Qm = Quantity Measured  Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Spiked Sample Report

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16070159-006B-MSD | | |
| Lab Sample ID | 10355420006-MSD | | |
| Filename | Y160719A_05 | Matrix | Soil |
| Total Amount Extracted | 10.4 g | Dilution | NA |
| ICAL ID | Y160713 | Extracted | 07/15/2016 17:45 |
| CCal Filename(s) | Y160719A_02 & Y160719A_18 | Analyzed | 07/19/2016 15:28 |
| Method Blank ID | BLANK-51095 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.22 | 110 | 2,3,7,8-TCDF-13C | 2.00 | 79 |
| | | | | 2,3,7,8-TCDD-13C | 2.00 | 94 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 88 |
| 2,3,7,8-TCDD | 0.20 | 0.16 | 81 | 2,3,4,7,8-PeCDF-13C | 2.00 | 84 |
| | | | | 1,2,3,7,8-PeCDD-13C | 2.00 | 102 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | 1.00 | 0.99 | 99 | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 73 |
| 2,3,4,7,8-PeCDF | 1.00 | 1.18 | 118 | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 74 |
| | | | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 74 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 76 |
| 1,2,3,7,8-PeCDD | 1.00 | 0.93 | 93 | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 71 |
| | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 88 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 101 |
| 1,2,3,4,7,8-HxCDF | 1.00 | 1.49 | 149 | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 100 |
| 1,2,3,6,7,8-HxCDF | 1.00 | 1.18 | 118 | OCDD-13C | 4.00 | 112 DN2 |
| 2,3,4,6,7,8-HxCDF | 1.00 | 1.27 | 127 | | | |
| 1,2,3,7,8,9-HxCDF | 1.00 | 1.10 | 110 | 1,2,3,4-TCDD-13C | 2.00 | NA |
| | | | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 1.00 | 1.08 | 108 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 91 |
| 1,2,3,6,7,8-HxCDD | 1.00 | 1.47 | 147 | | | |
| 1,2,3,7,8,9-HxCDD | 1.00 | 1.21 | 121 | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.00 | 34.18 | 3418 E | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.00 | 3.23 | 323 | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.00 | 13.60 | 1360 | | | |
| OCDF | 2.00 | 298.42 | 14921 DN2 | | | |
| OCDD | 2.00 | 140.55 | 7028 DN2 | | | |

Qs = Quantity Spiked  Qm = Quantity Measured  Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Spike Sample Results

Client - Energy Laboratories

| | | | | | |
|---|---|---|---|---|---|
| Client Sample ID | H16070159-006B | | | Dry Weights | |
| Lab Sample ID | 10355420006 | Sample Filename | Y160719A_13 | Sample Amount | 9.07 g |
| MS ID | 10355420006-MS | MS Filename | Y160719A_04 | MS Amount | 9.1 g |
| MSD ID | 10355420006-MSD | MSD Filename | Y160719A_05 | MSD Amount | 9.1 g |

| Analyte | Sample Conc. ng/Kg | MS/MSD Qs (ng) | MS Qm (ng) | MSD Qm (ng) | RPD | Background Subtracted MS % Rec. | MSD % Rec. | RPD |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 1.205 | 0.20 | 0.22 | 0.22 | 1.5 | 103 | 104 | 1.6 |
| 2,3,7,8-TCDD | 0.000 | 0.20 | 0.16 | 0.16 | 2.6 | 79 | 81 | 2.6 |
| 1,2,3,7,8-PeCDF | 1.732 | 1.00 | 1.01 | 0.99 | 2.4 | 99 | 97 | 2.4 |
| 2,3,4,7,8-PeCDF | 7.478 | 1.00 | 1.17 | 1.18 | 0.6 | 111 | 111 | 0.6 |
| 1,2,3,7,8-PeCDD | 1.828 | 1.00 | 0.91 | 0.93 | 1.5 | 90 | 91 | 1.5 |
| 1,2,3,4,7,8-HxCDF | 35.203 | 1.00 | 1.60 | 1.49 | 6.8 | 128 | 117 | 8.5 |
| 1,2,3,6,7,8-HxCDF | 0.000 | 1.00 | 1.15 | 1.18 | 1.9 | 94 | 96 | 2.3 |
| 2,3,4,6,7,8-HxCDF | 38.878 | 1.00 | 1.31 | 1.27 | 2.6 | 95 | 92 | 3.5 |
| 1,2,3,7,8,9-HxCDF | 15.323 | 1.00 | 1.14 | 1.10 | 2.9 | 100 | 97 | 3.3 |
| 1,2,3,4,7,8-HxCDD | 3.318 | 1.00 | 1.03 | 1.08 | 4.0 | 100 | 105 | 4.1 |
| 1,2,3,6,7,8-HxCDD | 33.868 | 1.00 | 1.56 | 1.47 | 5.8 | 126 | 117 | 7.3 |
| 1,2,3,7,8,9-HxCDD | 12.543 | 1.00 | 1.20 | 1.21 | 1.0 | 109 | 110 | 1.2 |
| 1,2,3,4,6,7,8-HpCDF | 3203.712 | 1.00 | 38.33 | 34.18 | 11.4 | 927 | 513 | 57.5 |
| 1,2,3,4,7,8,9-HpCDF | 212.056 | 1.00 | 3.73 | 3.23 | 14.3 | 181 | 131 | 32.0 |
| 1,2,3,4,6,7,8-HpCDD | 1080.678 | 1.00 | 15.84 | 13.60 | 15.2 | 604 | 380 | 45.5 |
| OCDF | 26052.120 | 2.00 | 439.29 | 298.42 | 38.2 | 10151 | 3108 | 106.2 |
| OCDD | 14232.525 | 2.00 | 194.53 | 140.55 | 32.2 | 3273 | 574 | 140.3 |

**Definitions**

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Qm = Quantity Measured
Qs = Quantity Spiked
% Rec. = Percent Recovery
RPD = Relative Percent Difference
NA = Not Applicable
NC = Not Calculated

CDD = Chlorinated dibenzo-p-dioxin
CDF = Chlorinated dibenzo-p-furan
T = Tetra
Pe = Penta
Hx = Hexa
Hp = Hepta
O = Octa

# Work Order Receipt Checklist

## Trihydro-Laramie

## H16070159

Login completed by: Wanda Johnson
Reviewed by: BL2000\rwilliams
Reviewed Date: 7/18/2016

Date Received: 7/11/2016
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: | 2.1°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

ENERGY LABORATORIES

# Chain of Custody and Analytical Request Record

Page 1 of 1

**PLEASE PRINT (Provide as much information as possible.)**

Company Name: Trihydro Corporation

Project Name, PWS, Permit, Etc.: Diamond P Ranch

Sample Origin State: MT

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required):

Contact Name: Andrew Vann

Phone/Fax: 307 745 7474

Cell:

Sampler: (Please Print) L. Durnell

☐ No Hard Copy Email: avann@trihydro.com

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order: H1141

Invoice Address (Required): ~~390~~ 1252 Commerce Dr, Laramie, WY 82070

☐ No Hard Copy Email: ap@trihydro.com

Special Report/Formats:

☐ DW
☐ POTW/WWTP
☐ State: _____
☐ Other: _____
☒ EDD/EDT (Electronic Data) Format: Trihydro
☐ LEVEL IV
☐ NELAC

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand

Cooler ID(s): 4 167

Receipt Temp: 2.1 °C th

On Ice: (Y) N

Custody Seal: On Bottle Y (N); On Cooler (Y) N

Intact (Y) N

Signature Match (Y) N

#070159

LABORATORY USE ONLY

| SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX | C9-C18 Alipharics (MA-EPH) | C11-C22 Aromatics (MA-EPH) | Dioxins/Furans (8290) | Pentachlorophenol (8151) | PAHs low level (8270) | | | | | | SEE ATTACHED | Standard Turnaround (TAT) | RUSH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 DIAP-S-EAST (0-2) | 07/11/16 | 0600 | S | X | X | X | X | X | | | | | | | | |
| 2 DIAP-SS-EAST (2-20) | | 0605 | S | X | X | X | X | | | | | | | | | |
| 3 DIAP-S-SOUTH (0-2) | | 0610 | S | X | X | X | X | X | | | | | | | | |
| 4 DIAP-SS-SOUTH (2-20) | | 0615 | S | X | X | X | X | | | | | | | | | |
| 5 DIAP-S-WEST (0-2) | | 0620 | S | X | X | X | X | X | | | | | | | | |
| 6 DIAP-SS-WEST (2-20) | | 0625 | S | X | X | X | X | | | | | | | | | |
| 7 DIAP-S-NORTH (0-2) | | 0630 | S | X | X | X | X | X | | | | | | | | |
| 8 DIAP-SS-NORTH (2-20) | | 0635 | S | X | X | X | X | | | | | | | | | |
| 9 BD-20160711 | | — | S | X | X | X | X | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |

**Custody Record MUST be Signed**

Relinquished by (print): L. Durnell — Date/Time: 07/11/16 1300 — Signature:

Relinquished by (print): — Date/Time: — Signature:

Received by (print): — Date/Time: — Signature:

Received by (print): — Date/Time: — Signature:

Received by Laboratory: Rebecca Tooke — Date/Time: 7/11/16 13:08 AM — Signature: Rebecca Tooke

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ENERGY LAB
Trust our People. Trust our Data.
www.energylab.com
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

# BOTTLE ORDER 21206

**SHIPPED TO: Trihydro-Laramie**

**Contact:** Andrew Vann
1252 Commerce Dr
Laramie WY 82070-7000
**Phone:** (303) 910-6187
**Project:** Diamond P Ranch

Order Created by: Wanda Johnson
Shipped From: Helena, MT
Ship Date: 7/5/2016
VIA: Hand Del
Quote Used: 1141

| Bottle Size/Type | Bottles Per Samp | Method | Tests | Critical Hold Time | Preservative | Notes | Num of Samp |
|---|---|---|---|---|---|---|---|
| **Soil Samples ( 9 Sets)** | | | | | | | |
| 4 oz Wide Mouth Amber Glass | 4 | SW8151A | 8151-Herbicides, Chlorinated | | | | 1 |
| | | SW8015M | Hydrocarbons, Extractable Petroleum-Scrn | | | | |
| | | SW3550C | Moisture | | | | |
| | | SW8270C | Semi-Volatile Organic Compounds, PAHs Low Level | | | | |
| | | E6010.20 | Metals by ICP/ICPMS, Total | | | | |
| | | SW7471B | Mercury in Solid By CVAA | | | | |
| | | E8290 | Dioxin | | | | |
| **Supplies** | | | | | | | |
| 4 oz Wide Mouth Amber Glass | 1 | FIELD | Supplies | | | | 12 |

Comments

Samples for Dioxin/furans (8290) subcontracted to Pace Laboratories Minneapolis. Prices reflect a 20-25% discount with the exception of subcontracted analysis.

- [x] HNO3 - Nitric Acid
- [ ] H2SO4 - Sulfuric Acid
- [x] NaOH - Sodium Hydroxide
- [x] ZnAc - Zinc Acetate
- [x] HCl - Hydrochloric Acid
- [ ] H3PO4 - Phosphoric Acid

**We strongly suggest that the samples are shipped the same day as they are collected.**

**Material Safety Data Sheets(MSDS) Available @ EnergyLab.com ->Services -> MSDS Sheets**

**Corrosive Chemicals: Nitric, Sulfuric, Phosphoric, Hydrochloric Acids and Sodium Hydroxide. Zinc Acetate is a skin irritant.**

Subcontracting of sample analyses to an outside laboratory may be required. If so, Energy Laboratories will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

# ANALYTICAL SUMMARY REPORT

August 25, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16080248 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 1 sample for Trihydro-Laramie on 8/10/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16080248-001 | DIAP-BKFL-01 | 08/10/16 12:30 | 08/10/16 | Soil | Metals by ICP/ICPMS, Total<br>Mercury in Solid By CVAA<br>Percent Moisture<br>Digestion, Total Metals<br>Digestion, Mercury by CVAA<br>Soil Preparation |

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:

# LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16080248-001
**Client Sample ID:** DIAP-BKFL-01

**Report Date:** 08/25/16
**Collection Date:** 08/10/16 12:30
**DateReceived:** 08/10/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 5.3 | wt% | | 0.2 | | D2974 | 08/24/16 09:36 / rgk |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 6 | mg/kg-dry | | 5 | | SW6020 | 08/17/16 13:13 / dck |
| Barium | 56 | mg/kg-dry | | 5 | | SW6010B | 08/15/16 16:17 / sld |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 08/17/16 13:13 / dck |
| Chromium | 9 | mg/kg-dry | | 5 | | SW6020 | 08/17/16 13:13 / dck |
| Lead | 7 | mg/kg-dry | | 5 | | SW6020 | 08/17/16 13:13 / dck |
| Selenium | ND | mg/kg-dry | | 1 | | SW6020 | 08/17/16 13:13 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 08/17/16 13:13 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 08/15/16 13:45 / 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

**Client:** Trihydro-Laramie **Report Date:** 08/25/16

**Project:** Diamond P Ranch **Work Order:** H16080248

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **D2974** | | | | | | | | | Batch: R117999 |
| **Lab ID:** | **H16080248-001ADUP** | Sample Duplicate | | | | Run: SOIL DRYING OVEN 2_16082 | | | 08/24/16 09:36 | |
| Moisture | | 5.34 | wt% | 0.20 | | | | 0.1 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 08/25/16

**Project:** Diamond P Ranch **Work Order:** H16080248

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW6010B** | | | | | | | | | Analytical Run: ICP2-HE_160815A | |
| **Lab ID: ICV** | | Initial Calibration Verification Standard | | | | | | | 08/15/16 08:49 | |
| Barium | | 0.771 | mg/L | 0.10 | 96 | 90 | 110 | | | |
| **Lab ID: ICSA** | | Interference Check Sample A | | | | | | | 08/15/16 09:27 | |
| Barium | | -0.00148 | mg/L | 0.10 | | 0 | 0 | | | |
| **Lab ID: ICSAB** | | Interference Check Sample AB | | | | | | | 08/15/16 09:31 | |
| Barium | | 0.495 | mg/L | 0.10 | 99 | 80 | 120 | | | |
| **Method: SW6010B** | | | | | | | | | Batch: 33992 | |
| **Lab ID: MB-33992** | | Method Blank | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:19 | |
| Barium | | ND | mg/kg | 0.02 | | | | | | |
| **Lab ID: LFB-33992** | | Laboratory Fortified Blank | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:30 | |
| Barium | | 50.6 | mg/kg | 1.0 | 101 | 80 | 120 | | | |
| **Lab ID: LCS-33992** | | Laboratory Control Sample | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:33 | |
| Barium | | 201 | mg/kg | 1.0 | 107 | 78.6 | 112.8 | | | |
| **Lab ID: H16080153-008ADIL** | | Serial Dilution | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:52 | |
| Barium | | ND | mg/kg | 1.0 | | 0 | 0 | | 10 | |
| Internal Stds failed - missed sample cup | | | | | | | | | | |
| **Lab ID: H16080153-008APDS** | | Post Digestion/Distillation Spike | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:56 | |
| Barium | | 403 | mg/kg | 1.0 | 89 | 75 | 125 | | | |
| **Lab ID: H16080153-008AMS** | | Sample Matrix Spike | | | | Run: ICP2-HE_160815A | | | 08/15/16 15:59 | |
| Barium | | 174 | mg/kg | 1.0 | -2 | 75 | 125 | | | S |
| - S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference. | | | | | | | | | | |
| **Lab ID: H16080153-008AMSD** | | Sample Matrix Spike Duplicate | | | | Run: ICP2-HE_160815A | | | 08/15/16 16:03 | |
| Barium | | 163 | mg/kg | 1.0 | -25 | 75 | 125 | 6.8 | 20 | S |
| - S= Spike recovery outside of QC advisory limits. The recovery in the Laboratory Control Sample was within QC advisory limits. This suggests that the Matrix Spike recover is due to matrix interference. | | | | | | | | | | |

**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:** Trihydro-Laramie **Report Date:** 08/25/16

**Project:** Diamond P Ranch **Work Order:** H16080248

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | Analytical Run: ICPMS204-B_160817A | | |
| **Lab ID:** | **ICV STD** | 6 | Initial Calibration Verification Standard | | | | | | | 08/17/16 11:22 | |
| Arsenic | | | 0.0604 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Cadmium | | | 0.0306 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Chromium | | | 0.0607 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Lead | | | 0.0600 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| Selenium | | | 0.0603 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Silver | | | 0.0312 | mg/L | 0.0010 | 104 | 90 | 110 | | | |
| **Lab ID:** | **ICV STD** | 6 | Initial Calibration Verification Standard | | | | | | | 08/17/16 16:16 | |
| Arsenic | | | 0.0628 | mg/L | 0.0010 | 105 | 90 | 110 | | | |
| Cadmium | | | 0.0307 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Chromium | | | 0.0614 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Lead | | | 0.0587 | mg/L | 0.0010 | 98 | 90 | 110 | | | |
| Selenium | | | 0.0609 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Silver | | | 0.0302 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | Batch: 33992 | |
| **Lab ID:** | **MB-33992** | 6 | Method Blank | | | | Run: ICPMS204-B_160817A | | | 08/17/16 12:44 | |
| Arsenic | | | ND | mg/kg | 0.2 | | | | | | |
| Cadmium | | | ND | mg/kg | 0.8 | | | | | | |
| Chromium | | | ND | mg/kg | 4 | | | | | | |
| Lead | | | ND | mg/kg | 0.5 | | | | | | |
| Selenium | | | ND | mg/kg | 0.8 | | | | | | |
| Silver | | | 0.3 | mg/kg | 0.3 | | | | | | |
| **Lab ID:** | **LCS-33992** | 6 | Laboratory Control Sample | | | | Run: ICPMS204-B_160817A | | | 08/17/16 12:47 | |
| Arsenic | | | 163 | mg/kg | 1.0 | 83 | 71.4 | 105.1 | | | |
| Cadmium | | | 93.5 | mg/kg | 1.0 | 94 | 73.9 | 106.1 | | | |
| Chromium | | | 108 | mg/kg | 4.2 | 92 | 73.5 | 108.5 | | | |
| Lead | | | 104 | mg/kg | 1.0 | 99 | 74.4 | 108.6 | | | |
| Selenium | | | 191 | mg/kg | 1.0 | 93 | 71.2 | 110.2 | | | |
| Silver | | | 36.6 | mg/kg | 1.0 | 86 | 70.8 | 111.9 | | | |
| **Lab ID:** | **LFB-33992** | 6 | Laboratory Fortified Blank | | | | Run: ICPMS204-B_160817A | | | 08/17/16 12:50 | |
| Arsenic | | | 53.5 | mg/kg | 1.0 | 107 | 80 | 120 | | | |
| Cadmium | | | 27.0 | mg/kg | 1.0 | 108 | 80 | 120 | | | |
| Chromium | | | 51.9 | mg/kg | 4.2 | 104 | 80 | 120 | | | |
| Lead | | | 52.2 | mg/kg | 1.0 | 104 | 80 | 120 | | | |
| Selenium | | | 52.4 | mg/kg | 1.0 | 105 | 80 | 120 | | | |
| Silver | | | 27.6 | mg/kg | 1.0 | 109 | 80 | 120 | | | |
| **Lab ID:** | **H16080153-008ADIL** | 6 | Serial Dilution | | | | Run: ICPMS204-B_160817A | | | 08/17/16 12:57 | |
| Arsenic | | | 1.51 | mg/kg-dry | 1.5 | | 0 | 0 | | 10 | N |
| Cadmium | | | ND | mg/kg-dry | 5.1 | | 0 | 0 | | 10 | |
| Chromium | | | ND | mg/kg-dry | 25 | | 0 | 0 | | 10 | |
| Lead | | | 22.6 | mg/kg-dry | 2.9 | | 0 | 0 | | 10 | N |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 08/25/16

**Project:** Diamond P Ranch **Work Order:** H16080248

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | | Batch: 33992 | |
| **Lab ID:** | **H16080153-008ADIL** | 6 | Serial Dilution | | | | Run: ICPMS204-B_160817A | | | 08/17/16 12:57 | |
| Selenium | | | ND | mg/kg-dry | 4.7 | | 0 | 0 | | 10 | |
| Silver | | | ND | mg/kg-dry | 1.6 | | 0 | 0 | | 10 | |
| **Lab ID:** | **H16080153-008APDS** | 6 | Post Digestion/Distillation Spike | | | | Run: ICPMS204-B_160817A | | | 08/17/16 13:00 | |
| Arsenic | | | 2900 | mg/kg-dry | 1.0 | 96 | 75 | 125 | | | |
| Cadmium | | | 1370 | mg/kg-dry | 1.0 | 91 | 75 | 125 | | | |
| Chromium | | | 2730 | mg/kg-dry | 5.1 | 90 | 75 | 125 | | | |
| Lead | | | 2970 | mg/kg-dry | 1.0 | 97 | 75 | 125 | | | |
| Selenium | | | 2900 | mg/kg-dry | 1.0 | 96 | 75 | 125 | | | |
| Silver | | | 1250 | mg/kg-dry | 1.0 | 82 | 75 | 125 | | | |
| **Lab ID:** | **H16080153-008AMS** | 6 | Sample Matrix Spike | | | | Run: ICPMS204-B_160817A | | | 08/17/16 13:03 | |
| Arsenic | | | 60.6 | mg/kg-dry | 1.0 | 95 | 75 | 125 | | | |
| Cadmium | | | 29.6 | mg/kg-dry | 1.0 | 97 | 75 | 125 | | | |
| Chromium | | | 77.2 | mg/kg-dry | 5.1 | 107 | 75 | 125 | | | |
| Lead | | | 81.2 | mg/kg-dry | 1.0 | 96 | 75 | 125 | | | |
| Selenium | | | 64.4 | mg/kg-dry | 1.0 | 101 | 75 | 125 | | | |
| Silver | | | 37.0 | mg/kg-dry | 1.0 | 119 | 75 | 125 | | | |
| **Lab ID:** | **H16080153-008AMSD** | 6 | Sample Matrix Spike Duplicate | | | | Run: ICPMS204-B_160817A | | | 08/17/16 13:06 | |
| Arsenic | | | 63.3 | mg/kg-dry | 1.0 | 99 | 75 | 125 | 4.2 | 20 | |
| Cadmium | | | 31.2 | mg/kg-dry | 1.0 | 103 | 75 | 125 | 5.3 | 20 | |
| Chromium | | | 81.8 | mg/kg-dry | 5.1 | 115 | 75 | 125 | 5.8 | 20 | |
| Lead | | | 85.5 | mg/kg-dry | 1.0 | 103 | 75 | 125 | 5.1 | 20 | |
| Selenium | | | 68.1 | mg/kg-dry | 1.0 | 107 | 75 | 125 | 5.6 | 20 | |
| Silver | | | 34.0 | mg/kg-dry | 1.0 | 110 | 75 | 125 | 8.3 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 08/25/16

**Project:** Diamond P Ranch **Work Order:** H16080248

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW7471B** | | | | | | | | Analytical Run: HGCV201-H_160815A | | |
| **Lab ID:** | **ICV** | Initial Calibration Verification Standard | | | | | | | | 08/15/16 12:49 | |
| Mercury | | | 0.0010 | mg/kg | 0.50 | 101 | 90 | 110 | | | |
| **Lab ID:** | **CCV** | Continuing Calibration Verification Standard | | | | | | | | 08/15/16 12:51 | |
| Mercury | | | 0.0026 | mg/kg | 0.50 | 105 | 90 | 110 | | | |
| **Method:** | **SW7471B** | | | | | | | | | | Batch: 34013 |
| **Lab ID:** | **MB-34013** | Method Blank | | | | | Run: HGCV201-H_160815A | | | 08/15/16 13:05 | |
| Mercury | | | 0.01 | mg/kg | 0.001 | | | | | | |
| **Lab ID:** | **LCS-34013** | Laboratory Control Sample | | | | | Run: HGCV201-H_160815A | | | 08/15/16 13:07 | |
| Mercury | | | 5.6 | mg/kg | 0.50 | 112 | 71 | 126.4 | | | |
| **Lab ID:** | **LFB-34013** | Laboratory Fortified Blank | | | | | Run: HGCV201-H_160815A | | | 08/15/16 13:13 | |
| Mercury | | | 0.22 | mg/kg | 0.50 | 112 | 80 | 120 | | | |
| **Lab ID:** | **H16080272-002AMS** | Sample Matrix Spike | | | | | Run: HGCV201-H_160815A | | | 08/15/16 13:21 | |
| Mercury | | | 0.22 | mg/kg-dry | 0.50 | 104 | 80 | 120 | | | |
| **Lab ID:** | **H16080272-002AMSD** | Sample Matrix Spike Duplicate | | | | | Run: HGCV201-H_160815A | | | 08/15/16 13:23 | |
| Mercury | | | 0.25 | mg/kg-dry | 0.50 | 120 | 80 | 120 | | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# Work Order Receipt Checklist

## Trihydro-Laramie

## H16080248

Login completed by: Wanda Johnson
Reviewed by: BL2000\rwilliams
Reviewed Date: 8/12/2016

Date Received: 8/10/2016
Received by: wjj
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: | 5.3°C From Field-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

ENERGY LABORATORIES

# Chain of Custody and Analytical Request Record



**PLEASE PRINT** (Provide as much information as possible.)

Company Name: Trihydro Corporation

Project Name, PWS, Permit, Etc.: Diamond P Ranch

Sample Origin State: MT

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required):
Andrew Vann
1252 Commerce Dr
Laramie, WY 82070
☐ No Hard Copy Email: avann@trihydro.com

Contact Name: Andrew Vann
Phone/Fax: 307 745 7474
Cell:

Sampler: (Please Print) L. Durnell

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order:

Invoice Address (Required):
AP
1252 Commerce Dr
Laramie, WY 82070
☐ No Hard Copy Email: ap@trihydro.com

Special Report/Formats:
☐ DW
☐ POTW/WWTP
☐ State: _____
☐ Other: _____
☒ EDD/EDT (Electronic Data) Format: Trihydro
☐ LEVEL IV
☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

| SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX | Metals (RCRA 8) | | | | | | | | | SEE ATTACHED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 DIAP-BKFL-01 | 08/10/16 | 1330 | Soil | X | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand del

Cooler ID(s): 4

Receipt Temp: 5.3 °C

On Ice: Y N

Custody Seal: On Bottle Y N; On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY #16080248

**Custody Record MUST be Signed**

| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
|---|---|---|---|---|---|
| L. Durnell | 8/10/16 1530 | | | | |
| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
| | | | Received by Laboratory: Wanda John | Date/Time: 8-10-16 16:21 | Signature: |

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

# ANALYTICAL SUMMARY REPORT

September 27, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16090282 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 4 samples for Trihydro-Laramie on 9/14/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16090282-001 | MW-1 | 09/13/16 9:35 | 09/14/16 | Aqueous | Metals by ICP/ICPMS, Dissolved<br>Mercury, Dissolved<br>Services Provided by Lab<br>EPH-Sep Funnel Extraction<br>Hydrocarbons, Extractable<br>Petroleum Screen<br>8151-Herbicides, Chlorinated<br>Preparation, Dissolved Filtration<br>Digestion, Mercury by CVAA<br>Separatory Funnel Liquid Liquid Ext.<br>Separatory Funnel Liquid-Liquid Ext.<br>Low Level PAH |
| H16090282-002 | MW-3 | 09/12/16 16:15 | 09/14/16 | Aqueous | Same As Above |
| H16090282-003 | MW-4 | 09/12/16 12:25 | 09/14/16 | Aqueous | Same As Above |
| H16090282-004 | BD-20160912-02 | 09/12/16 12:30 | 09/14/16 | Aqueous | 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Work Order:** H16090282

**Report Date:** 09/27/16

# 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090282-001
**Client Sample ID:** MW-1

**Report Date:** 09/27/16
**Collection Date:** 09/13/16 09:35
**DateReceived:** 09/14/16
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | ND | mg/L | | 0.001 | | SW6020 | 09/19/16 17:39 / dck |
| Barium | 0.05 | mg/L | | 0.05 | | SW6020 | 09/15/16 15:31 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:31 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 09/15/16 15:31 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:31 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 09/19/16 13:21 / rgk |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:31 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:31 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 300 | 1000 | SW8015M | 09/21/16 21:40 / JRS |
| Surr: o-Terphenyl | 85.0 | %REC | | 40-140 | | SW8015M | 09/21/16 21:40 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 17:40 / eli-b |
| Surr: 2-Fluorobiphenyl | 51.0 | %REC | | 25-94 | | SW8270C | 09/19/16 17:40 / eli-b |
| Surr: Nitrobenzene-d5 | 65.0 | %REC | | 19-102 | | SW8270C | 09/19/16 17:40 / eli-b |
| Surr: Terphenyl-d14 | 68.0 | %REC | | 39-106 | | SW8270C | 09/19/16 17:40 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 09/20/16 17:05 / eli-b |
| Surr: DCAA | 75.0 | %REC | | 50-125 | | SW8151A | 09/20/16 17:05 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090282-002
**Client Sample ID:** MW-3

**Report Date:** 09/27/16
**Collection Date:** 09/12/16 16:15
**DateReceived:** 09/14/16
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.002 | mg/L | | 0.001 | | SW6020 | 09/15/16 15:47 / dck |
| Barium | ND | mg/L | | 0.05 | | SW6020 | 09/15/16 15:47 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:47 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 09/15/16 15:47 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:47 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 09/19/16 13:24 / rgk |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:47 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:47 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 322 | 1000 | SW8015M | 09/21/16 22:26 / JRS |
| Surr: o-Terphenyl | 95.0 | %REC | | 40-140 | | SW8015M | 09/21/16 22:26 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 18:43 / eli-b |
| Surr: 2-Fluorobiphenyl | 45.0 | %REC | | 25-94 | | SW8270C | 09/19/16 18:43 / eli-b |
| Surr: Nitrobenzene-d5 | 56.0 | %REC | | 19-102 | | SW8270C | 09/19/16 18:43 / eli-b |
| Surr: Terphenyl-d14 | 70.0 | %REC | | 39-106 | | SW8270C | 09/19/16 18:43 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 09/20/16 17:38 / eli-b |
| Surr: DCAA | 81.0 | %REC | | 50-125 | | SW8151A | 09/20/16 17:38 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090282-003
**Client Sample ID:** MW-4

**Report Date:** 09/27/16
**Collection Date:** 09/12/16 12:25
**DateReceived:** 09/14/16
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.001 | mg/L | | 0.001 | | SW6020 | 09/15/16 15:50 / dck |
| Barium | 0.05 | mg/L | | 0.05 | | SW6020 | 09/15/16 15:50 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:50 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 09/15/16 15:50 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:50 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 09/19/16 13:35 / rgk |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:50 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:50 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 329 | 1000 | SW8015M | 09/21/16 23:12 / JRS |
| Surr: o-Terphenyl | 91.0 | %REC | | 40-140 | | SW8015M | 09/21/16 23:12 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 19:46 / eli-b |
| Surr: 2-Fluorobiphenyl | 48.0 | %REC | | 25-94 | | SW8270C | 09/19/16 19:46 / eli-b |
| Surr: Nitrobenzene-d5 | 64.0 | %REC | | 19-102 | | SW8270C | 09/19/16 19:46 / eli-b |
| Surr: Terphenyl-d14 | 78.0 | %REC | | 39-106 | | SW8270C | 09/19/16 19:46 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 1.2 | ug/L | | 0.10 | | SW8151A | 09/20/16 18:44 / eli-b |
| Surr: DCAA | 53.0 | %REC | | 50-125 | | SW8151A | 09/20/16 18:44 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090282-004
**Client Sample ID:** BD-20160912-02

**Report Date:** 09/27/16
**Collection Date:** 09/12/16 12:30
**DateReceived:** 09/14/16
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.002 | mg/L | | 0.001 | | SW6020 | 09/15/16 15:53 / dck |
| Barium | ND | mg/L | | 0.05 | | SW6020 | 09/15/16 15:53 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:53 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 09/15/16 15:53 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:53 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 09/19/16 13:37 / rgk |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:53 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 09/15/16 15:53 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 303 | 1000 | SW8015M | 09/21/16 23:58 / JRS |
| Surr: o-Terphenyl | 99.0 | %REC | | 40-140 | | SW8015M | 09/21/16 23:58 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 09/19/16 20:18 / eli-b |
| Surr: 2-Fluorobiphenyl | 56.0 | %REC | | 25-94 | | SW8270C | 09/19/16 20:18 / eli-b |
| Surr: Nitrobenzene-d5 | 66.0 | %REC | | 19-102 | | SW8270C | 09/19/16 20:18 / eli-b |
| Surr: Terphenyl-d14 | 73.0 | %REC | | 39-106 | | SW8270C | 09/19/16 20:18 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 09/20/16 18:11 / eli-b |
| Surr: DCAA | 68.0 | %REC | | 50-125 | | SW8151A | 09/20/16 18:11 / 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:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** **E245.1** | | | | | | | | Analytical Run: HGCV202-H_160919A | | |
| **Lab ID:** **ICV** | | Initial Calibration Verification Standard | | | | | | | 09/19/16 12:32 | |
| Mercury | | 0.000198 | mg/L | 0.00010 | 99 | 90 | 110 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | Analytical Run: ICPMS204-B_160915A | | |
| **Lab ID:** | **ICV STD** | 7 | Initial Calibration Verification Standard | | | | | | | 09/15/16 10:15 | |
| Arsenic | | | 0.0607 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Barium | | | 0.0607 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Cadmium | | | 0.0304 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Chromium | | | 0.0596 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| Lead | | | 0.0592 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| Selenium | | | 0.0614 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Silver | | | 0.0304 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | Batch: R118686 | |
| **Lab ID:** | **LRB** | 7 | Method Blank | | | | Run: ICPMS204-B_160915A | | | 09/15/16 13:45 | |
| Arsenic | | | ND | mg/L | 6E-05 | | | | | | |
| Barium | | | ND | mg/L | 0.0001 | | | | | | |
| Cadmium | | | ND | mg/L | 1E-05 | | | | | | |
| Chromium | | | ND | mg/L | 3E-05 | | | | | | |
| Lead | | | ND | mg/L | 5E-06 | | | | | | |
| Selenium | | | ND | mg/L | 0.0003 | | | | | | |
| Silver | | | ND | mg/L | 9E-06 | | | | | | |
| **Lab ID:** | **LFB** | 7 | Laboratory Fortified Blank | | | | Run: ICPMS204-B_160915A | | | 09/15/16 13:48 | |
| Arsenic | | | 0.0485 | mg/L | 0.0010 | 97 | 80 | 120 | | | |
| Barium | | | 0.0470 | mg/L | 0.0010 | 94 | 80 | 120 | | | |
| Cadmium | | | 0.0485 | mg/L | 0.0010 | 97 | 80 | 120 | | | |
| Chromium | | | 0.0477 | mg/L | 0.0010 | 95 | 80 | 120 | | | |
| Lead | | | 0.0469 | mg/L | 0.0010 | 94 | 80 | 120 | | | |
| Selenium | | | 0.0465 | mg/L | 0.0010 | 93 | 80 | 120 | | | |
| Silver | | | 0.0184 | mg/L | 0.0010 | 92 | 80 | 120 | | | |
| **Lab ID:** | **H16090282-001AMS** | 7 | Sample Matrix Spike | | | | Run: ICPMS204-B_160915A | | | 09/15/16 15:37 | |
| Arsenic | | | 0.0519 | mg/L | 0.0010 | 102 | 75 | 125 | | | |
| Barium | | | 0.0980 | mg/L | 0.050 | 93 | 75 | 125 | | | |
| Cadmium | | | 0.0453 | mg/L | 0.0010 | 90 | 75 | 125 | | | |
| Chromium | | | 0.0488 | mg/L | 0.0050 | 95 | 75 | 125 | | | |
| Lead | | | 0.0468 | mg/L | 0.0010 | 94 | 75 | 125 | | | |
| Selenium | | | 0.0533 | mg/L | 0.0010 | 107 | 75 | 125 | | | |
| Silver | | | 0.0177 | mg/L | 0.0010 | 88 | 75 | 125 | | | |
| **Lab ID:** | **H16090282-001AMSD** | 7 | Sample Matrix Spike Duplicate | | | | Run: ICPMS204-B_160915A | | | 09/15/16 15:40 | |
| Arsenic | | | 0.0522 | mg/L | 0.0010 | 102 | 75 | 125 | 0.7 | 20 | |
| Barium | | | 0.0982 | mg/L | 0.050 | 93 | 75 | 125 | 0.2 | 20 | |
| Cadmium | | | 0.0458 | mg/L | 0.0010 | 92 | 75 | 125 | 1.3 | 20 | |
| Chromium | | | 0.0480 | mg/L | 0.0050 | 93 | 75 | 125 | 1.6 | 20 | |
| Lead | | | 0.0466 | mg/L | 0.0010 | 93 | 75 | 125 | 0.4 | 20 | |
| Selenium | | | 0.0537 | mg/L | 0.0010 | 107 | 75 | 125 | 0.8 | 20 | |
| Silver | | | 0.0185 | mg/L | 0.0010 | 92 | 75 | 125 | 4.4 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | Analytical Run: ICPMS204-B_160919A | | | |
| **Lab ID:** | **ICV STD** | | Initial Calibration Verification Standard | | | | | | | 09/19/16 11:48 | |
| Arsenic | | | 0.0602 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| **Lab ID:** | **ICV STD** | | Initial Calibration Verification Standard | | | | | | | 09/19/16 16:39 | |
| Arsenic | | | 0.0593 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | Batch: R118783 | |
| **Lab ID:** | **LRB** | | Method Blank | | | | Run: ICPMS204-B_160919A | | | 09/19/16 17:22 | |
| Arsenic | | | ND | mg/L | 6E-05 | | | | | | |
| **Lab ID:** | **LFB** | | Laboratory Fortified Blank | | | | Run: ICPMS204-B_160919A | | | 09/19/16 17:26 | |
| Arsenic | | | 0.0487 | mg/L | 0.0010 | 97 | 80 | 120 | | | |
| **Lab ID:** | **H16090310-001BMS** | | Sample Matrix Spike | | | | Run: ICPMS204-B_160919A | | | 09/19/16 19:54 | |
| Arsenic | | | 0.116 | mg/L | 0.0010 | 111 | 70 | 130 | | | |
| **Lab ID:** | **H16090310-001BMSD** | | Sample Matrix Spike Duplicate | | | | Run: ICPMS204-B_160919A | | | 09/19/16 19:57 | |
| Arsenic | | | 0.115 | mg/L | 0.0010 | 111 | 70 | 130 | 0.5 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW7470A** | | | | | | | | Analytical Run: HGCV202-H_160919A | | |
| **Lab ID:** | **CCV** | | Continuing Calibration Verification Standard | | | | | | | 09/19/16 13:43 | |
| Mercury | | | 0.000197 | mg/L | 0.00010 | 99 | 90 | 110 | | | |
| **Method:** | **SW7470A** | | | | | | | | | Batch: 34479 | |
| **Lab ID:** | **MB-34479** | | Method Blank | | | | Run: HGCV202-H_160919A | | | 09/19/16 13:14 | |
| Mercury | | | 1E-06 | mg/L | 1E-06 | | | | | | |
| **Lab ID:** | **LCS-34479** | | Laboratory Control Sample | | | | Run: HGCV202-H_160919A | | | 09/19/16 13:16 | |
| Mercury | | | 0.000139 | mg/L | 0.00010 | 92 | 90 | 110 | | | |
| **Lab ID:** | **H16090282-002ADIL** | | Serial Dilution | | | | Run: HGCV202-H_160919A | | | 09/19/16 13:27 | |
| Mercury | | | 1.0E-05 | mg/L | 0.00010 | | 0 | 0 | | 10 | |
| **Lab ID:** | **H16090282-002AMS** | | Sample Matrix Spike | | | | Run: HGCV202-H_160919A | | | 09/19/16 13:29 | |
| Mercury | | | 0.00015 | mg/L | 0.00010 | 102 | 85 | 115 | | | |
| **Lab ID:** | **H16090282-002AMSD** | | Sample Matrix Spike Duplicate | | | | Run: HGCV202-H_160919A | | | 09/19/16 13:32 | |
| Mercury | | | 0.00015 | mg/L | 0.00010 | 100 | 85 | 115 | 1.6 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | | Batch: 34498 |
| **Lab ID: MB-34498** | 2 | Method Blank | | | | Run: HHP_160920A | | | | 09/21/16 20:09 |
| Total Extractable Hydrocarbons | | ND | ug/L | 300 | | | | | | |
| Surr: o-Terphenyl | | | | | 96 | 40 | 140 | | | |
| **Lab ID: LCS-34498** | 2 | Laboratory Control Sample | | | | Run: HHP_160920A | | | | 09/21/16 20:55 |
| Total Extractable Hydrocarbons | | 6730 | ug/L | 300 | 108 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | | 102 | 40 | 140 | | | |
| **Lab ID: H16090300-002AMS** | 2 | Sample Matrix Spike | | | | Run: HHP_160920A | | | | 09/22/16 02:14 |
| Total Extractable Hydrocarbons | | 11500 | ug/L | 600 | 90 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | | 87 | 40 | 140 | | | |
| **Lab ID: H16090300-002AMSD** | 2 | Sample Matrix Spike Duplicate | | | | Run: HHP_160920A | | | | 09/22/16 03:00 |
| Total Extractable Hydrocarbons | | 13500 | ug/L | 600 | 106 | 60 | 140 | 16 | 20 | |
| Surr: o-Terphenyl | | | | | 104 | 40 | 140 | | | |
| **Method: SW8015M** | | | | | | | | | | Analytical Run: R118855 |
| **Lab ID: CCV_0920GC127r-W** | 15 | Continuing Calibration Verification Standard | | | | | | | | 09/21/16 18:38 |
| n-Nonane | | 232 | ug/L | | 116 | 75 | 125 | | | |
| n-Decane | | 232 | ug/L | | 116 | 75 | 125 | | | |
| n-Dodecane | | 220 | ug/L | | 110 | 75 | 125 | | | |
| n-Tetradecane | | 224 | ug/L | | 112 | 75 | 125 | | | |
| n-Hexadecane | | 227 | ug/L | | 113 | 75 | 125 | | | |
| n-Octadecane | | 228 | ug/L | | 114 | 75 | 125 | | | |
| n-Nonadecane | | 229 | ug/L | | 114 | 75 | 125 | | | |
| n-Eicosane | | 229 | ug/L | | 115 | 75 | 125 | | | |
| n-Docosane | | 229 | ug/L | | 115 | 75 | 125 | | | |
| n-Tetracosane | | 231 | ug/L | | 115 | 75 | 125 | | | |
| n-Hexacosane | | 232 | ug/L | | 116 | 75 | 125 | | | |
| n-Octacosane | | 233 | ug/L | | 116 | 75 | 125 | | | |
| n-Triacontane | | 234 | ug/L | | 117 | 75 | 125 | | | |
| n-Hexatriacontane | | 232 | ug/L | | 116 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | | 115 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8151A** | | | | | | | | | Batch: B_102764 | |
| **Lab ID: LCS-102764** | 2 | Laboratory Control Sample | | | | Run: SUB-B267404 | | | 09/20/16 16:00 | |
| Pentachlorophenol | | 3.46 | ug/L | 0.10 | 69 | 61 | 122 | | | |
| Surr: DCAA | | | | 0.10 | 65 | 50 | 125 | | | |
| **Lab ID: MB-102764** | 2 | Method Blank | | | | Run: SUB-B267404 | | | 09/20/16 16:32 | |
| Pentachlorophenol | | ND | ug/L | 0.10 | | | | | | |
| Surr: DCAA | | | | 0.10 | 71 | 50 | 125 | | | |
| **Lab ID: H16090282-003D** | 2 | Sample Matrix Spike | | | | Run: SUB-B267404 | | | 09/21/16 11:43 | |
| Pentachlorophenol | | 4.32 | ug/L | 0.10 | 63 | 61 | 122 | | | |
| Surr: DCAA | | | | 0.10 | 57 | 50 | 125 | | | |
| **Lab ID: H16090282-003D** | 2 | Sample Matrix Spike Duplicate | | | | Run: SUB-B267404 | | | 09/21/16 12:15 | |
| Pentachlorophenol | | 4.12 | ug/L | 0.10 | 59 | 61 | 122 | 4.7 | 40 | S |
| Surr: DCAA | | | | 0.10 | 58 | 50 | 125 | | | |
| **Method: SW8151A** | | | | | | | | | Analytical Run: B_R267404 | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 09/20/16 15:27 | |
| Pentachlorophenol | | 0.421 | ug/L | 0.10 | 89 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.10 | 87 | 85 | 115 | | | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 09/20/16 21:28 | |
| Pentachlorophenol | | 0.427 | ug/L | 0.10 | 90 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.10 | 88 | 85 | 115 | | | |

**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:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_102784 | |
| **Lab ID: LLCS-102784** | 20 | Laboratory Control Sample | | | | Run: SUB-B267305 | | | 09/19/16 16:37 | |
| 2-Methylnaphthalene | | 3.92 | ug/L | 0.10 | 78 | 18 | 117 | 0.0 | 40 | |
| Acenaphthene | | 3.63 | ug/L | 0.10 | 73 | 40 | 92 | 0.0 | 40 | |
| Acenaphthylene | | 3.59 | ug/L | 0.10 | 72 | 37 | 96 | 0.0 | 40 | |
| Anthracene | | 3.82 | ug/L | 0.10 | 76 | 46 | 108 | 0.0 | 40 | |
| Benzo(a)anthracene | | 4.15 | ug/L | 0.10 | 83 | 41 | 105 | 0.0 | 40 | |
| Benzo(a)pyrene | | 3.88 | ug/L | 0.10 | 78 | 42 | 110 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 4.33 | ug/L | 0.10 | 87 | 27 | 121 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 4.20 | ug/L | 0.10 | 84 | 44 | 108 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 3.92 | ug/L | 0.10 | 78 | 44 | 111 | 0.0 | 40 | |
| Chrysene | | 3.71 | ug/L | 0.10 | 74 | 50 | 106 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 3.88 | ug/L | 0.10 | 78 | 47 | 111 | 0.0 | 40 | |
| Fluoranthene | | 3.99 | ug/L | 0.10 | 80 | 44 | 111 | 0.0 | 40 | |
| Fluorene | | 4.21 | ug/L | 0.10 | 84 | 42 | 99 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 4.01 | ug/L | 0.10 | 80 | 33 | 112 | 0.0 | 40 | |
| Naphthalene | | 3.20 | ug/L | 0.10 | 64 | 22 | 108 | 0.0 | 40 | |
| Phenanthrene | | 3.57 | ug/L | 0.10 | 71 | 43 | 106 | 0.0 | 40 | |
| Pyrene | | 4.33 | ug/L | 0.10 | 87 | 41 | 106 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 47 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 70 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 80 | 39 | 106 | | | |
| **Lab ID: LMB-102784** | 20 | Method Blank | | | | Run: SUB-B267305 | | | 09/19/16 17:09 | |
| 2-Methylnaphthalene | | ND | ug/L | 0.10 | | | | | | |
| Acenaphthene | | ND | ug/L | 0.10 | | | | | | |
| Acenaphthylene | | ND | ug/L | 0.10 | | | | | | |
| Anthracene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(a)anthracene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(a)pyrene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(b)fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(g,h,i)perylene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(k)fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Chrysene | | ND | ug/L | 0.10 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | ug/L | 0.10 | | | | | | |
| Fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Fluorene | | ND | ug/L | 0.10 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | ug/L | 0.10 | | | | | | |
| Naphthalene | | ND | ug/L | 0.10 | | | | | | |
| Phenanthrene | | ND | ug/L | 0.10 | | | | | | |
| Pyrene | | ND | ug/L | 0.10 | | | | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 59 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 64 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 74 | 39 | 106 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | | Batch: B_102784 |
| **Lab ID: H16090282-001C** | 20 | Sample Matrix Spike | | | | Run: SUB-B267305 | | | | 09/19/16 18:12 |
| 2-Methylnaphthalene | | 7.78 | ug/L | 0.20 | 78 | 17 | 118 | | | |
| Acenaphthene | | 7.40 | ug/L | 0.20 | 74 | 40 | 92 | | | |
| Acenaphthylene | | 7.48 | ug/L | 0.20 | 75 | 37 | 96 | | | |
| Anthracene | | 7.78 | ug/L | 0.20 | 78 | 46 | 108 | | | |
| Benzo(a)anthracene | | 7.98 | ug/L | 0.20 | 80 | 41 | 105 | | | |
| Benzo(a)pyrene | | 7.92 | ug/L | 0.20 | 79 | 42 | 110 | | | |
| Benzo(b)fluoranthene | | 7.94 | ug/L | 0.20 | 79 | 27 | 121 | | | |
| Benzo(g,h,i)perylene | | 8.26 | ug/L | 0.20 | 83 | 44 | 108 | | | |
| Benzo(k)fluoranthene | | 8.96 | ug/L | 0.20 | 90 | 44 | 111 | | | |
| Chrysene | | 7.54 | ug/L | 0.20 | 75 | 50 | 106 | | | |
| Dibenzo(a,h)anthracene | | 7.60 | ug/L | 0.20 | 76 | 47 | 111 | | | |
| Fluoranthene | | 8.36 | ug/L | 0.20 | 84 | 44 | 111 | | | |
| Fluorene | | 8.60 | ug/L | 0.20 | 86 | 42 | 99 | | | |
| Indeno(1,2,3-cd)pyrene | | 7.88 | ug/L | 0.20 | 79 | 33 | 112 | | | |
| Naphthalene | | 6.52 | ug/L | 0.20 | 65 | 22 | 108 | | | |
| Phenanthrene | | 7.30 | ug/L | 0.20 | 73 | 43 | 106 | | | |
| Pyrene | | 8.82 | ug/L | 0.20 | 88 | 41 | 106 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.20 | 48 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.20 | 69 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.20 | 75 | 39 | 106 | | | |
| **Lab ID: H16090282-002C** | 20 | Sample Matrix Spike | | | | Run: SUB-B267305 | | | | 09/19/16 19:15 |
| 2-Methylnaphthalene | | 8.58 | ug/L | 0.20 | 86 | 17 | 118 | | | |
| Acenaphthene | | 8.12 | ug/L | 0.20 | 81 | 40 | 92 | | | |
| Acenaphthylene | | 8.00 | ug/L | 0.20 | 80 | 37 | 96 | | | |
| Anthracene | | 8.10 | ug/L | 0.20 | 81 | 46 | 108 | | | |
| Benzo(a)anthracene | | 8.64 | ug/L | 0.20 | 86 | 41 | 105 | | | |
| Benzo(a)pyrene | | 8.20 | ug/L | 0.20 | 82 | 42 | 110 | | | |
| Benzo(b)fluoranthene | | 8.74 | ug/L | 0.20 | 87 | 27 | 121 | | | |
| Benzo(g,h,i)perylene | | 9.46 | ug/L | 0.20 | 95 | 44 | 108 | | | |
| Benzo(k)fluoranthene | | 9.62 | ug/L | 0.20 | 96 | 44 | 111 | | | |
| Chrysene | | 8.04 | ug/L | 0.20 | 80 | 50 | 106 | | | |
| Dibenzo(a,h)anthracene | | 7.94 | ug/L | 0.20 | 79 | 47 | 111 | | | |
| Fluoranthene | | 8.86 | ug/L | 0.20 | 89 | 44 | 111 | | | |
| Fluorene | | 9.10 | ug/L | 0.20 | 91 | 42 | 99 | | | |
| Indeno(1,2,3-cd)pyrene | | 8.12 | ug/L | 0.20 | 81 | 33 | 112 | | | |
| Naphthalene | | 7.02 | ug/L | 0.20 | 70 | 22 | 108 | | | |
| Phenanthrene | | 7.78 | ug/L | 0.20 | 78 | 43 | 106 | | | |
| Pyrene | | 9.52 | ug/L | 0.20 | 95 | 41 | 106 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.20 | 48 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.20 | 70 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.20 | 82 | 39 | 106 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 09/27/16

**Project:** Diamond P Ranch **Work Order:** H16090282

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R267305 | |
| **Lab ID: 19-Sep-16_CCV_3** | 20 | Continuing Calibration Verification Standard | | | | | | | 09/19/16 16:06 | |
| 2-Methylnaphthalene | | 1.95 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Acenaphthene | | 2.12 | ug/L | 0.10 | 106 | 80 | 120 | | | |
| Acenaphthylene | | 2.17 | ug/L | 0.10 | 108 | 80 | 120 | | | |
| Anthracene | | 2.08 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Benzo(a)anthracene | | 2.22 | ug/L | 0.10 | 111 | 80 | 120 | | | |
| Benzo(a)pyrene | | 2.34 | ug/L | 0.10 | 117 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 2.27 | ug/L | 0.10 | 114 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 2.07 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.27 | ug/L | 0.10 | 114 | 80 | 120 | | | |
| Chrysene | | 1.98 | ug/L | 0.10 | 99 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 2.09 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Fluoranthene | | 2.11 | ug/L | 0.10 | 105 | 80 | 120 | | | |
| Fluorene | | 2.32 | ug/L | 0.10 | 116 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.31 | ug/L | 0.10 | 116 | 80 | 120 | | | |
| Naphthalene | | 2.06 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Phenanthrene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Pyrene | | 2.20 | ug/L | 0.10 | 110 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 105 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 114 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 118 | 80 | 120 | | | |

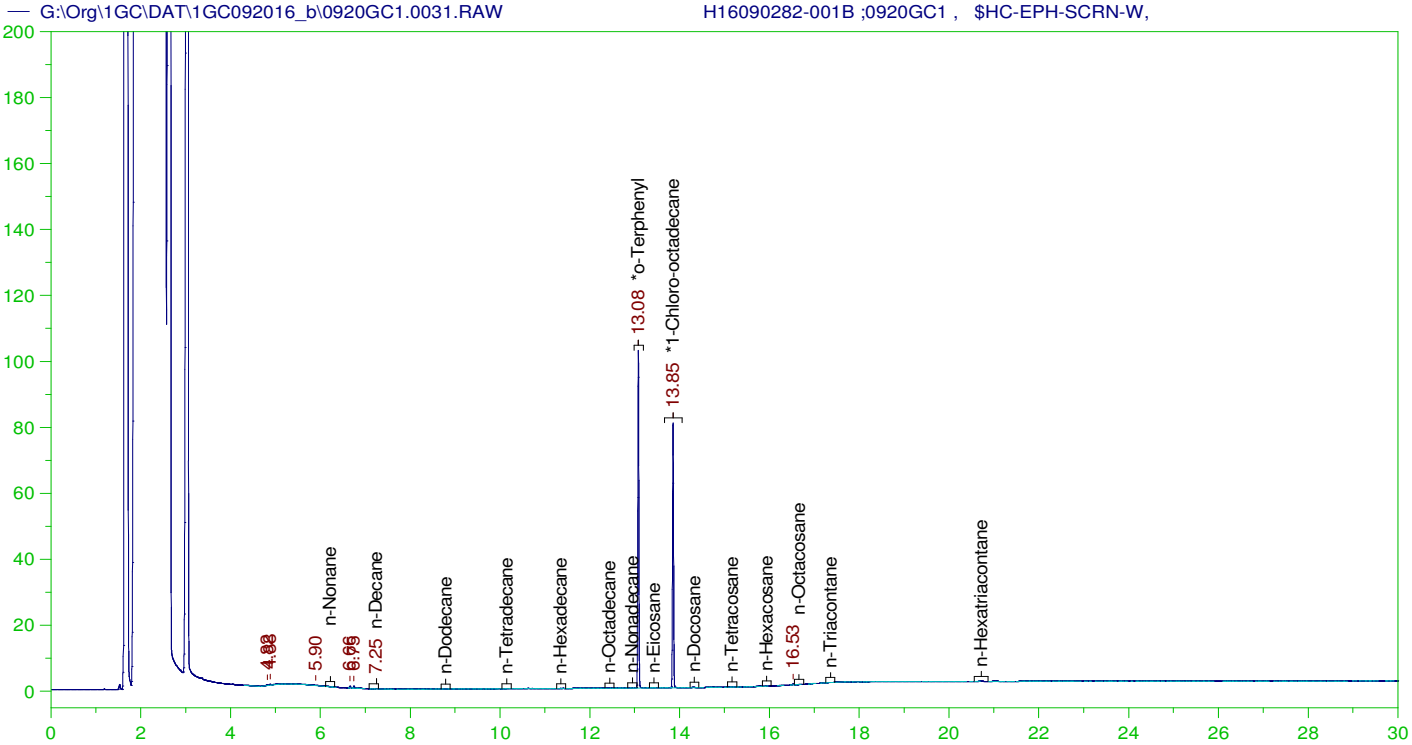
**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

**MW-1** Batch ID: 34498

G:\Org\1GC\DAT\1GC092016_b\0920GC1.0031.RAW H16090282-001B ;0920GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090282-001B ;0920GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC092016_b\0920GC1.0031.RAW
Date & Time Acquired: 9/21/2016 9:40:58 PM
Method File: G:\Org\1GC\Methods\09201631.MET
Calibration File: G:\Org\1GC\Cals\SR082516D.CAL
Sample Weight: 1.0486 Dilution: 2 S.A.: 1

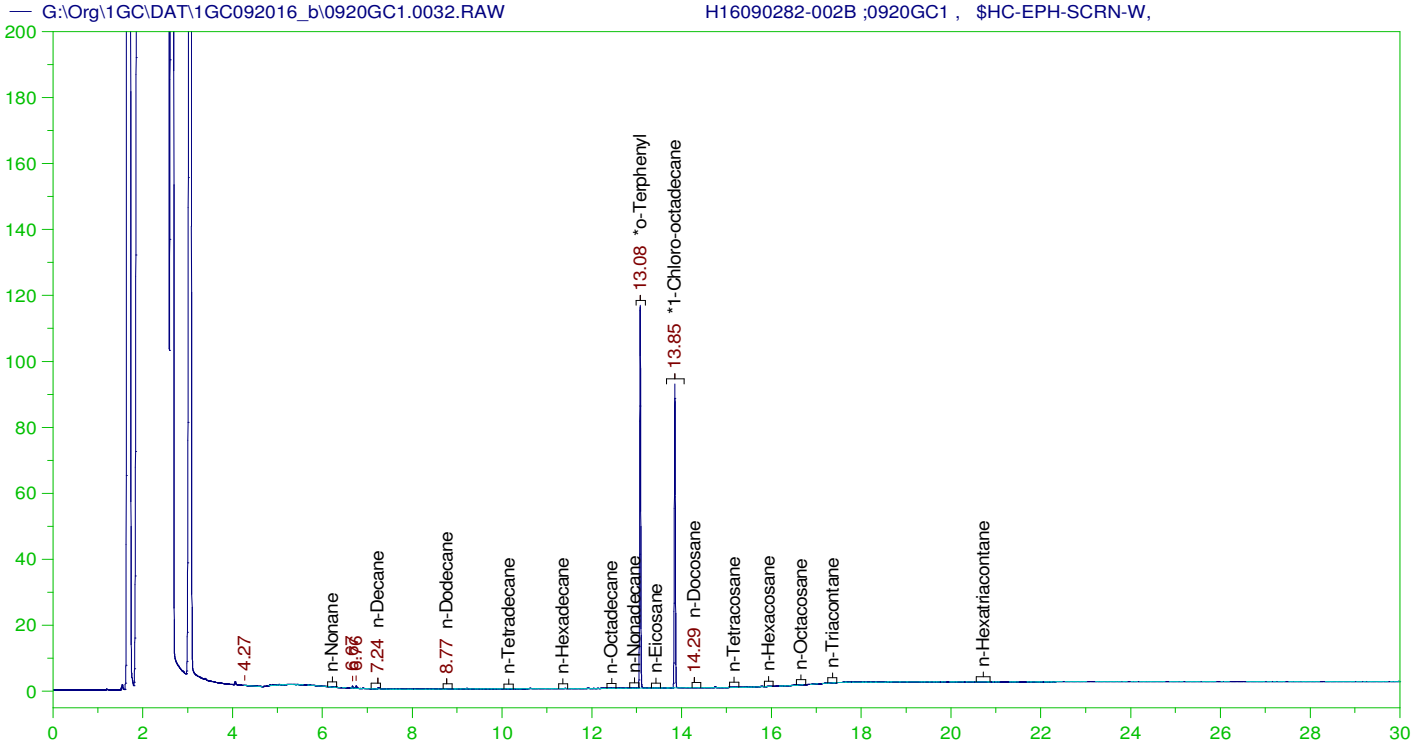
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 7.09 to 17.46
Rt range for C9 to C18 Hydrocarbons: 6.12 to 12.99
Rt range for C19 to C36 Hydrocarbons: 13.04 to 20.87

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.08 | 190.731 | 161.884 | 84.88 | - |
| *1-Chloro-octadecane | 13.855 | 190.731 | 167.5 | 87.82 | - |

DRO Area:11784.03 DRO Amount: 12.44253
TEH Area:21105.84 TEH Amount: 22.28526
C9-C18 Area:9263.767 C9-C18 Amount: 10.05803
C19-C36 Area:6318.688 C19-C36 Amount: 6.493217

**MW-3** Batch ID: 34498

G:\Org\1GC\DAT\1GC092016_b\0920GC1.0032.RAW H16090282-002B ;0920GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090282-002B ;0920GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC092016_b\0920GC1.0032.RAW
Date & Time Acquired: 9/21/2016 10:26:52 PM
Method File: G:\Org\1GC\Methods\09201632.MET
Calibration File: G:\Org\1GC\Cals\SR082516D.CAL
Sample Weight: 0.9312 Dilution: 2 S.A.: 1

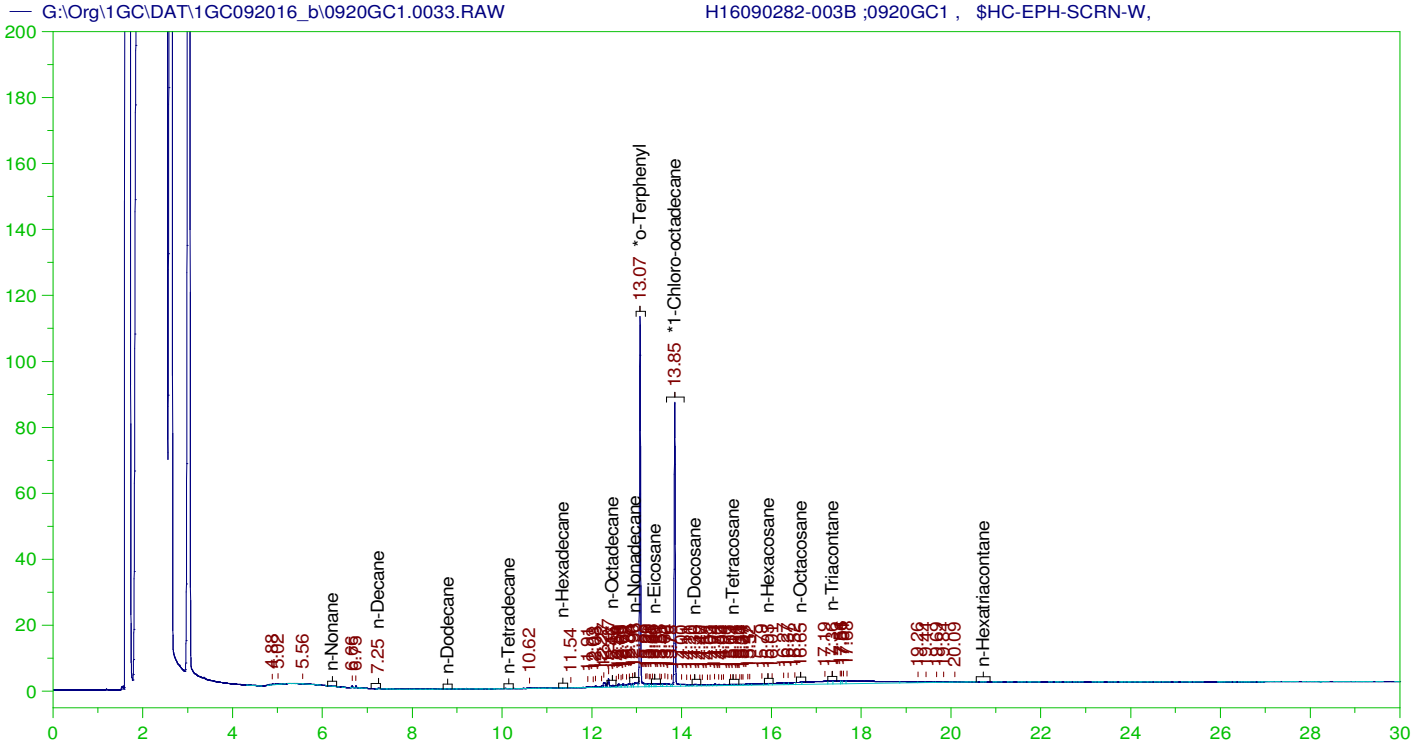
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 7.09 to 17.46
Rt range for C9 to C18 Hydrocarbons: 6.12 to 12.99
Rt range for C19 to C36 Hydrocarbons: 13.04 to 20.87

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.076 | 214.777 | 204.528 | 95.23 | - |
| *1-Chloro-octadecane | 13.85 | 214.777 | 214.093 | 99.68 | - |

DRO Area:13698.39 DRO Amount: 16.28738
TEH Area:22137.89 TEH Amount: 26.32195
C9-C18 Area:12006.96 C9-C18 Amount: 14.67997
C19-C36 Area:6101.609 C19-C36 Amount: 7.060644

**MW-4** Batch ID: 34498

— G:\Org\1GC\DAT\1GC092016_b\0920GC1.0033.RAW H16090282-003B ;0920GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090282-003B ;0920GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC092016_b\0920GC1.0033.RAW
Date & Time Acquired: 9/21/2016 11:12:33 PM
Method File: G:\Org\1GC\Methods\SR082516D.MET
Calibration File: G:\Org\1GC\Cals\SR082516D.CAL
Sample Weight: 0.9129 Dilution: 2 S.A.: 1

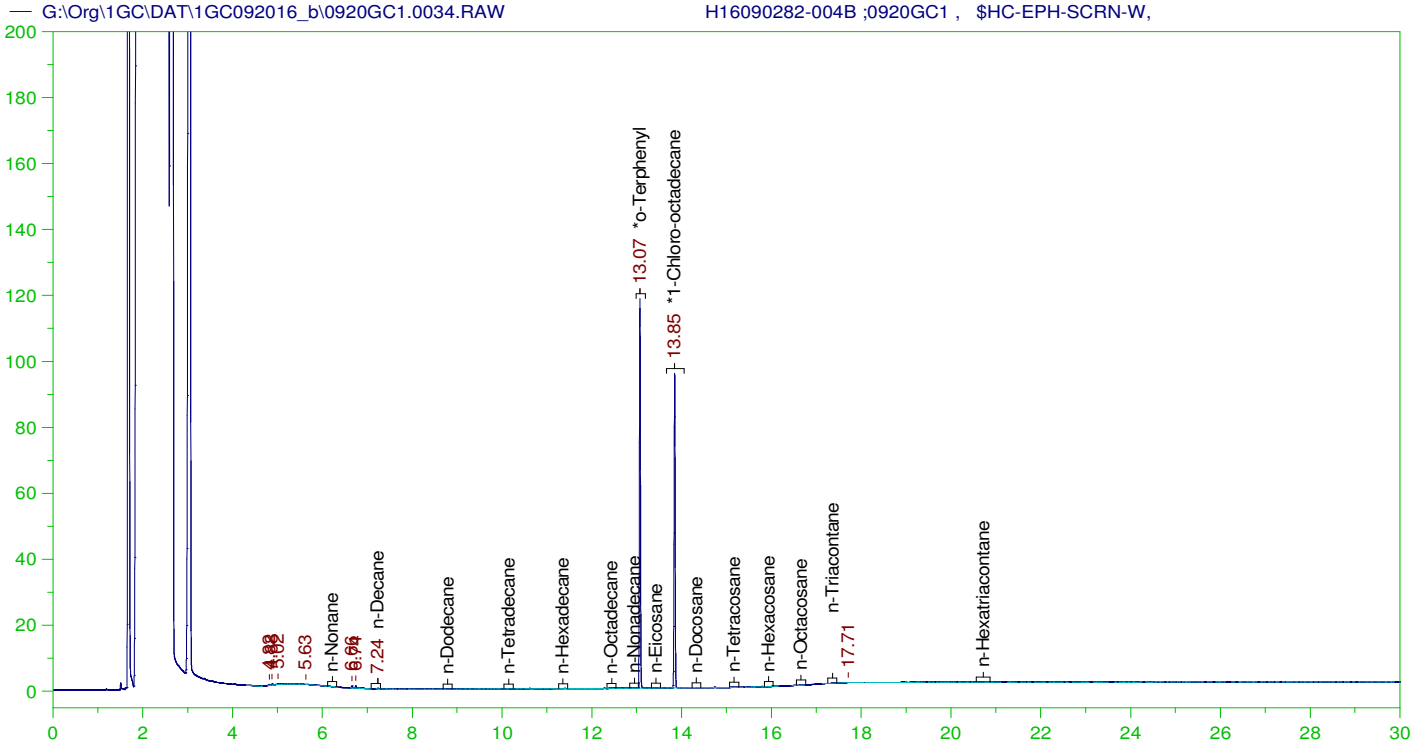
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 7.09 to 17.46
Rt range for C9 to C18 Hydrocarbons: 6.12 to 12.99
Rt range for C19 to C36 Hydrocarbons: 13.04 to 20.87

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.073 | 219.082 | 209.041 | 95.42 | - |
| *1-Chloro-octadecane | 13.847 | 219.082 | 215.332 | 98.29 | - |

DRO Area:190126.2 DRO Amount: 230.5916
TEH Area:268221.4 TEH Amount: 325.3081
C9-C18 Area:57827.29 C9-C18 Amount: 72.11818
C19-C36 Area:205107.1 C19-C36 Amount: 242.1031

**BD-20160912-02** Batch ID: 34498

G:\Org\1GC\DAT\1GC092016_b\0920GC1.0034.RAW H16090282-004B ;0920GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090282-004B ;0920GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC092016_b\0920GC1.0034.RAW
Date & Time Acquired: 9/21/2016 11:58:24 PM
Method File: G:\Org\1GC\Methods\09201634.MET
Calibration File: G:\Org\1GC\Cals\SR082516D.CAL
Sample Weight: 0.9916 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: 7.09 to 17.46
Rt range for C9 to C18 Hydrocarbons: 6.12 to 12.99
Rt range for C19 to C36 Hydrocarbons: 13.04 to 20.87

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.07 | 201.694 | 199.391 | 98.86 | - |
| *1-Chloro-octadecane | 13.845 | 201.694 | 207.924 | 103.09 | - |

DRO Area:12662.92 DRO Amount: 14.13911
TEH Area:22949.7 TEH Amount: 25.62508
C9-C18 Area:11639.79 C9-C18 Amount: 13.36423
C19-C36 Area:5417.453 C19-C36 Amount: 5.887102

# Work Order Receipt Checklist

## Trihydro-Laramie

## H16090282

Login completed by: Tracy L. Lorash
Reviewed by: BL2000\rwilliams
Reviewed Date: 9/16/2016

Date Received: 9/14/2016
Received by: bjs
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: | °C See comments | | |
| 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:

No sample ID or collection date or time on one MW-3 unpreserved amber glass bottle. Logged in with ID, date and time from COC.
No collection time on COC or bottles for BD-20160912-02. Estimated collection time in the laboratory.
Cooler 1 was received at 2.4°C, Cooler 2 at 1.0°C, Cooler 3 at 1.6°C, Cooler 4 at 0.7°C. Samples were received on wet ice.
Samples for Dissolved Metals/Hardness were subsampled, filtered, and preserved to pH <2 with 2 mL of Nitric acid per 250 mL in the laboratory. According to 40CFR136, samples for Dissolved Metals should be filtered and preserved within 15 minutes of collection. tl 9/14/16

# Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

Page 1 of 1

**PLEASE PRINT (Provide as much information as possible.)**

Company Name: Trihydro

Project Name, PWS, Permit, Etc.: Dormont P Ranch

Sample Origin State: MT

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required): 1252 Commerce Dr, Laramie, WY 82070

Contact Name: Andrew Vom Phone/Fax: 307 745 7474 Cell:

Sampler: (Please Print) L. Dowell

☐ No Hard Copy Email: avom@trihydro.com

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order:

Invoice Address (Required):

☐ No Hard Copy Email: ap@trihydro.com

Special Report/Formats:

☐ DW ☐ POTW/WWTP ☐ State: ☐ Other: ☑ EDD/EDT (Electronic Data) Format: Trihydro ☐ LEVEL IV ☐ NELAC

ANALYSIS REQUESTED

Number of Containers; Sample Type: A W S V B O DW; Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

| | SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX | Dissolved metals lab filtered no preserved | EPH 8015 m | PCP 8270A | PAH 8270C | | | | | | | SEE ATTACHED | Standard Turnaround (TAT) | RUSH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1 MW-1 | 9/13/16 | 0935 | W | x | x | x | x | | | | | | | | | |
| | ~~2 MW-2~~ | | | ~~W~~ | | | | | | | | | | | | | |
| 2 | 3 MW-3 | 9/12/16 | 1615 | W | x | x | x | x | | | | | | | | | |
| 4 | 4 MW-4 | 9/12/16 | 1225 | W | x | x | x | x | | | | | | | | | |
| 1 | 5 BD-20160912-02 | 9/12/16 | — | W | x | x | x | x | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | |

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments: Filter for dissolved metals in lab. Not preserved

1 = 2.4 tb
2 = 1.0 tb
3 = 1.6 tb
4 = 0.7 tb

LABORATORY USE ONLY

Shipped by: hand del / left in entry

Cooler ID(s): Y

Receipt Temp: See comm.

On Ice: (Y) N

Custody Seal: On Bottle (Y) N; On Cooler (Y) N; Intact (Y) N; Signature Match (Y) N

H16090282

**Custody Record MUST be Signed**

| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
|---|---|---|---|---|---|
| L. Dowell | 9/13/16 1930 | [signature] | | | |
| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
| | | | Received by Laboratory: B. Seher | Date/Time: 9/14/16 9:30 | Signature: Brandy Seher |

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.

# ANALYTICAL SUMMARY REPORT

October 07, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16090301 Quote ID: H1141
Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 6 samples for Trihydro-Laramie on 9/14/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16090301-001 | DIAP-SS-N-F (3.0) | 09/12/16 9:00 | 09/14/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Sonication Extraction |
| H16090301-002 | DIAP-S-North-01 (0-2) | 09/12/16 9:05 | 09/14/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16090301-003 | DIAP-S-South-01 (0-2) | 09/12/16 9:30 | 09/14/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16090301-004 | DIAP-SS-S-F (2.0) | 09/12/16 9:35 | 09/14/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Sonication Extraction |
| H16090301-005 | BD-20160912-01 | 09/12/16 9:40 | 09/14/16 | Soil | Same As Above |

# ANALYTICAL SUMMARY REPORT

| | | | | | |
|---|---|---|---|---|---|
| H16090301-006 | DIAP-SRC-E (6) | 09/12/16 10:30 | 09/14/16 | Soil | Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>EPH-Fractionation<br>Hydrocarbons, Aliphatic Extractable Petroleum<br>Hydrocarbons, Aromatic Extractable Petroleum<br>Hydrocarbons, Extractable Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |

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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Work Order:** H16090301

**Report Date:** 10/07/16

# 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-001
**Client Sample ID:** DIAP-SS-N-F (3.0)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:00
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 8.0 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 132 | mg/kg-dry | | 11 | 200 | SW8015M | 09/16/16 23:03 / JRS |
| Surr: o-Terphenyl | 110 | %REC | | 40-140 | | SW8015M | 09/16/16 23:03 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.061 | mg/kg-dry | | 0.0022 | | SW8151A | 09/27/16 05:23 / eli-b |
| Surr: DCAA | 67.0 | %REC | | 45-117 | | SW8151A | 09/27/16 05:23 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-002
**Client Sample ID:** DIAP-S-North-01 (0-2)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:05
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 6.8 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 392 | mg/kg-dry | * | 11 | 200 | SW8015M | 09/17/16 07:22 / JRS |
| Surr: o-Terphenyl | 101 | %REC | | 40-140 | | SW8015M | 09/17/16 07:22 / 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 | 30 | mg/kg-dry | | 11 | 200 | MA-EPH | 09/24/16 05:00 / JRS |
| C19 to C36 Aliphatics | 121 | mg/kg-dry | | 11 | 20000 | MA-EPH | 09/24/16 05:00 / JRS |
| Surr: 1-Chloro-octadecane | 91.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 05:00 / JRS |
| C11 to C22 Aromatics | 28 | mg/kg-dry | | 11 | 400 | MA-EPH | 09/24/16 05:45 / JRS |
| Total Extractable Hydrocarbons | 188 | mg/kg-dry | | 11 | | MA-EPH | 09/24/16 05:45 / JRS |
| Surr: 2-Bromonaphthalene | 73.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 05:45 / JRS |
| Surr: 2-Fluorobiphenyl | 78.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 05:45 / JRS |
| Surr: o-Terphenyl | 89.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 05:45 / JRS |
| - A significant portion of the hydrocarbons measured in the EPH Screening analysis were not recovered from the silica gel fractionation cartridge. Silica gel can act as a cleanup media for non-petroleum hydrocarbons. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Acenaphthylene | 0.024 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Anthracene | 0.044 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Benzo(a)anthracene | 0.27 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Benzo(a)pyrene | 0.29 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Benzo(b)fluoranthene | 0.52 | mg/kg-dry | | 0.33 | | SW8270C | 09/23/16 00:00 / eli-b |
| Benzo(g,h,i)perylene | 0.22 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Benzo(k)fluoranthene | 0.17 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Chrysene | 0.34 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Dibenzo(a,h)anthracene | 0.072 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Fluoranthene | 0.72 | mg/kg-dry | | 0.33 | | SW8270C | 09/23/16 00:00 / eli-b |
| Fluorene | 0.0072 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.21 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Phenanthrene | 0.15 | mg/kg-dry | | 0.0036 | | SW8270C | 09/23/16 00:00 / eli-b |
| Pyrene | 0.58 | mg/kg-dry | | 0.33 | | SW8270C | 09/23/16 00:00 / eli-b |
| Surr: 2-Fluorobiphenyl | 68.0 | %REC | | 47-110 | | SW8270C | 09/23/16 00:00 / eli-b |
| Surr: Nitrobenzene-d5 | 60.0 | %REC | | 43-105 | | SW8270C | 09/23/16 00:00 / eli-b |
| Surr: Terphenyl-d14 | 81.0 | %REC | | 51-117 | | SW8270C | 09/23/16 00:00 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.052 | mg/kg-dry | | 0.0022 | | SW8151A | 09/27/16 05:56 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-002
**Client Sample ID:** DIAP-S-North-01 (0-2)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:05
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Surr: DCAA | 70.0 | %REC | | 45-117 | | SW8151A | 09/27/16 05:56 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-003
**Client Sample ID:** DIAP-S-South-01 (0-2)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:30
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 5.3 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 32 | mg/kg-dry | | 11 | 200 | SW8015M | 09/16/16 23:48 / JRS |
| Surr: o-Terphenyl | 102 | %REC | | 40-140 | | SW8015M | 09/16/16 23:48 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Benzo(a)anthracene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Benzo(a)pyrene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Benzo(b)fluoranthene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Benzo(g,h,i)perylene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Benzo(k)fluoranthene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Chrysene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Dibenzo(a,h)anthracene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Fluoranthene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Pyrene | ND | mg/kg-dry | | 0.0035 | | SW8270C | 09/22/16 20:53 / eli-b |
| Surr: 2-Fluorobiphenyl | 69.0 | %REC | | 47-110 | | SW8270C | 09/22/16 20:53 / eli-b |
| Surr: Nitrobenzene-d5 | 61.0 | %REC | | 43-105 | | SW8270C | 09/22/16 20:53 / eli-b |
| Surr: Terphenyl-d14 | 91.0 | %REC | | 51-117 | | SW8270C | 09/22/16 20:53 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.041 | mg/kg-dry | | 0.0021 | | SW8151A | 09/27/16 06:28 / eli-b |
| Surr: DCAA | 67.0 | %REC | | 45-117 | | SW8151A | 09/27/16 06:28 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-004
**Client Sample ID:** DIAP-SS-S-F (2.0)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:35
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 5.7 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 18 | mg/kg-dry | | 11 | 200 | SW8015M | 09/17/16 00:33 / JRS |
| Surr: o-Terphenyl | 104 | %REC | | 40-140 | | SW8015M | 09/17/16 00:33 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.011 | mg/kg-dry | | 0.0021 | | SW8151A | 09/27/16 07:01 / eli-b |
| Surr: DCAA | 64.0 | %REC | | 45-117 | | SW8151A | 09/27/16 07:01 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-005
**Client Sample ID:** BD-20160912-01

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 09:40
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 6.2 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 17 | mg/kg-dry | | 11 | 200 | SW8015M | 09/17/16 06:37 / JRS |
| Surr: o-Terphenyl | 102 | %REC | | 40-140 | | SW8015M | 09/17/16 06:37 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.0074 | mg/kg-dry | | 0.0022 | | SW8151A | 09/27/16 03:13 / eli-b |
| Surr: DCAA | 70.0 | %REC | | 45-117 | | SW8151A | 09/27/16 03:13 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16090301-006
**Client Sample ID:** DIAP-SRC-E (6)

**Report Date:** 10/07/16
**Collection Date:** 09/12/16 10:30
**DateReceived:** 09/14/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 11.7 | wt% | | 0.2 | | SW3550C | 09/16/16 14:40 / kjw |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 7740 | mg/kg-dry | * | 23 | 200 | SW8015M | 09/20/16 16:49 / JRS |
| Surr: o-Terphenyl | 101 | %REC | | 40-140 | | SW8015M | 09/20/16 16:49 / 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 | 1210 | mg/kg-dry | * | 57 | 200 | MA-EPH | 09/24/16 08:02 / JRS |
| C19 to C36 Aliphatics | 2860 | mg/kg-dry | | 57 | 20000 | MA-EPH | 09/24/16 08:02 / JRS |
| Surr: 1-Chloro-octadecane | 257 | %REC | S | 40-140 | | MA-EPH | 09/24/16 08:02 / JRS |
| C11 to C22 Aromatics | 732 | mg/kg-dry | * | 57 | 400 | MA-EPH | 09/24/16 08:47 / JRS |
| Total Extractable Hydrocarbons | 5020 | mg/kg-dry | | 57 | | MA-EPH | 09/24/16 08:47 / JRS |
| Surr: 2-Bromonaphthalene | 80.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 08:47 / JRS |
| Surr: 2-Fluorobiphenyl | 67.0 | %REC | | 40-140 | | MA-EPH | 09/24/16 08:47 / JRS |
| Surr: o-Terphenyl | 101 | %REC | | 40-140 | | MA-EPH | 09/24/16 08:47 / 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 | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Benzo(a)anthracene | 0.049 | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Benzo(a)pyrene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Benzo(b)fluoranthene | 0.041 | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Benzo(g,h,i)perylene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Benzo(k)fluoranthene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Chrysene | 0.045 | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Dibenzo(a,h)anthracene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Fluoranthene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Pyrene | 0.27 | mg/kg-dry | | 0.038 | | SW8270C | 10/05/16 22:41 / eli-b |
| Surr: 2-Fluorobiphenyl | 73.0 | %REC | | 47-110 | | SW8270C | 10/05/16 22:10 / eli-b |
| Surr: o-Terphenyl | 95.0 | %REC | | 40-140 | | SW8270C | 10/05/16 22:10 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 205 | mg/kg-dry | | 11 | | SW8151A | 09/27/16 09:47 / eli-b |
| Surr: DCAA | 66.0 | %REC | | 45-117 | | SW8151A | 09/23/16 09:10 / 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.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 34538 |
| **Lab ID: MB-34538-34440** | 3 | Method Blank | | | | Run: HHP2_160923A | | | 09/23/16 18:23 | |
| C9 to C18 Aliphatics | | ND | mg/kg-dry | 10 | | | | | | |
| C19 to C36 Aliphatics | | ND | mg/kg-dry | 10 | | | | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 74 | 40 | 140 | | | |
| **Lab ID: LCS-34538-34440** | 17 | Laboratory Control Sample | | | | Run: HHP2_160923A | | | 09/23/16 19:54 | |
| C9 to C18 Aliphatics | | 28.7 | mg/kg-dry | 10 | 72 | 40 | 140 | | | |
| C19 to C36 Aliphatics | | 45.1 | mg/kg-dry | 10 | 85 | 40 | 140 | | | |
| n-Nonane | | 3.05 | mg/kg-dry | 0.17 | 46 | 30 | 140 | | | |
| n-Decane | | 4.22 | mg/kg-dry | 0.17 | 63 | 40 | 140 | | | |
| n-Dodecane | | 4.67 | mg/kg-dry | 0.17 | 70 | 40 | 140 | | | |
| n-Tetradecane | | 4.71 | mg/kg-dry | 0.17 | 71 | 40 | 140 | | | |
| n-Hexadecane | | 5.03 | mg/kg-dry | 0.17 | 76 | 40 | 140 | | | |
| n-Octadecane | | 5.37 | mg/kg-dry | 0.17 | 81 | 40 | 140 | | | |
| n-Nonadecane | | 5.47 | mg/kg-dry | 0.17 | 82 | 40 | 140 | | | |
| n-Eicosane | | 5.59 | mg/kg-dry | 0.17 | 84 | 40 | 140 | | | |
| n-Docosane | | 5.69 | mg/kg-dry | 0.17 | 85 | 40 | 140 | | | |
| n-Tetracosane | | 5.74 | mg/kg-dry | 0.17 | 86 | 40 | 140 | | | |
| n-Hexacosane | | 5.73 | mg/kg-dry | 0.17 | 86 | 40 | 140 | | | |
| n-Octacosane | | 5.43 | mg/kg-dry | 0.17 | 81 | 40 | 140 | | | |
| n-Triacontane | | 5.59 | mg/kg-dry | 0.17 | 84 | 40 | 140 | | | |
| n-Hexatriacontane | | 5.57 | mg/kg-dry | 0.17 | 84 | 40 | 140 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 78 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMS** | 17 | Sample Matrix Spike | | | | Run: HHP2_160923A | | | 09/23/16 22:56 | |
| C9 to C18 Aliphatics | | 672 | mg/kg-dry | 16 | -514 | 40 | 140 | | | S |
| C19 to C36 Aliphatics | | 341 | mg/kg-dry | 16 | -79 | 40 | 140 | | | S |
| n-Nonane | | 1.75 | mg/kg-dry | 0.26 | 25 | 30 | 140 | | | S |
| n-Decane | | 3.10 | mg/kg-dry | 0.26 | 45 | 40 | 140 | | | |
| n-Dodecane | | 7.34 | mg/kg-dry | 0.26 | 106 | 40 | 140 | | | |
| n-Tetradecane | | 14.4 | mg/kg-dry | 0.26 | 209 | 40 | 140 | | | S |
| n-Hexadecane | | 15.4 | mg/kg-dry | 0.26 | 224 | 40 | 140 | | | S |
| n-Octadecane | | 14.9 | mg/kg-dry | 0.26 | 216 | 40 | 140 | | | S |
| n-Nonadecane | | 15.5 | mg/kg-dry | 0.26 | 225 | 40 | 140 | | | S |
| n-Eicosane | | 12.7 | mg/kg-dry | 0.26 | 185 | 40 | 140 | | | S |
| n-Docosane | | 9.87 | mg/kg-dry | 0.26 | 143 | 40 | 140 | | | S |
| n-Tetracosane | | 7.86 | mg/kg-dry | 0.26 | 114 | 40 | 140 | | | |
| n-Hexacosane | | 6.69 | mg/kg-dry | 0.26 | 97 | 40 | 140 | | | |
| n-Octacosane | | 5.85 | mg/kg-dry | 0.26 | 85 | 40 | 140 | | | |
| n-Triacontane | | 5.85 | mg/kg-dry | 0.26 | 85 | 40 | 140 | | | |
| n-Hexatriacontane | | 5.80 | mg/kg-dry | 0.26 | 84 | 40 | 140 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.26 | 154 | 40 | 140 | | | S |
| **Lab ID: H16090299-005AMSD** | 17 | Sample Matrix Spike Duplicate | | | | Run: HHP2_160923A | | | 09/24/16 00:27 | |
| C9 to C18 Aliphatics | | 659 | mg/kg-dry | 16 | -545 | 40 | 140 | 2.0 | 20 | S |
| C19 to C36 Aliphatics | | 306 | mg/kg-dry | 16 | -142 | 40 | 140 | 11 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 34538 |
| **Lab ID: H16090299-005AMSD** | 17 | Sample Matrix Spike Duplicate | | | | Run: HHP2_160923A | | | 09/24/16 00:27 | |
| n-Nonane | | 2.05 | mg/kg-dry | 0.26 | 30 | 30 | 140 | 16 | 30 | |
| n-Decane | | 3.85 | mg/kg-dry | 0.26 | 56 | 40 | 140 | 22 | 20 | R |
| n-Dodecane | | 7.93 | mg/kg-dry | 0.26 | 115 | 40 | 140 | 7.7 | 20 | |
| n-Tetradecane | | 14.4 | mg/kg-dry | 0.26 | 209 | 40 | 140 | 0.0 | 20 | S |
| n-Hexadecane | | 14.9 | mg/kg-dry | 0.26 | 216 | 40 | 140 | 3.5 | 20 | S |
| n-Octadecane | | 14.2 | mg/kg-dry | 0.26 | 206 | 40 | 140 | 5.2 | 20 | S |
| n-Nonadecane | | 14.5 | mg/kg-dry | 0.26 | 210 | 40 | 140 | 6.6 | 20 | S |
| n-Eicosane | | 12.2 | mg/kg-dry | 0.26 | 178 | 40 | 140 | 4.0 | 20 | S |
| n-Docosane | | 9.49 | mg/kg-dry | 0.26 | 138 | 40 | 140 | 3.9 | 20 | |
| n-Tetracosane | | 7.40 | mg/kg-dry | 0.26 | 107 | 40 | 140 | 6.0 | 20 | |
| n-Hexacosane | | 6.48 | mg/kg-dry | 0.26 | 94 | 40 | 140 | 3.2 | 20 | |
| n-Octacosane | | 5.72 | mg/kg-dry | 0.26 | 83 | 40 | 140 | 2.1 | 20 | |
| n-Triacontane | | 5.75 | mg/kg-dry | 0.26 | 83 | 40 | 140 | 1.7 | 20 | |
| n-Hexatriacontane | | 5.60 | mg/kg-dry | 0.26 | 81 | 40 | 140 | 3.7 | 20 | |
| Surr: 1-Chloro-octadecane | | | | 0.26 | 142 | 40 | 140 | | | S |
| **Lab ID: MB-34538-34440** | 20 | Method Blank | | | | Run: HHP2_160923A | | | 09/23/16 19:09 | |
| 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 | 83 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 82 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 86 | 40 | 140 | | | |
| **Lab ID: LCS-34538-34440** | 19 | Laboratory Control Sample | | | | Run: HHP2_160923A | | | 09/23/16 20:40 | |
| C11 to C22 Aromatics | | 97.4 | mg/kg-dry | 10 | 86 | 40 | 140 | | | |
| Naphthalene | | 4.70 | mg/kg-dry | 0.17 | 70 | 40 | 140 | | | |
| 2-MethylNaphthalene | | 4.48 | mg/kg-dry | 0.17 | 67 | 40 | 140 | | | |
| Acenaphthylene | | 4.94 | mg/kg-dry | 0.17 | 74 | 40 | 140 | | | |
| Acenaphthene | | 5.06 | mg/kg-dry | 0.17 | 76 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 34538 |
| **Lab ID: LCS-34538-34440** | 19 | Laboratory Control Sample | | | | Run: HHP2_160923A | | | | 09/23/16 20:40 |
| Fluorene | | 4.43 | mg/kg-dry | 0.17 | 66 | 40 | 140 | | | |
| Phenanthrene | | 4.74 | mg/kg-dry | 0.17 | 71 | 40 | 140 | | | |
| Anthracene | | 4.26 | mg/kg-dry | 0.17 | 64 | 40 | 140 | | | |
| Fluoranthene | | 5.85 | mg/kg-dry | 0.17 | 88 | 40 | 140 | | | |
| Pyrene | | 5.82 | mg/kg-dry | 0.17 | 87 | 40 | 140 | | | |
| Benzo(a)Anthracene | | 4.70 | mg/kg-dry | 0.17 | 70 | 40 | 140 | | | |
| Chrysene | | 4.64 | mg/kg-dry | 0.17 | 70 | 40 | 140 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 12.2 | mg/kg-dry | 0.17 | 92 | 40 | 140 | | | |
| Benzo(a)Pyrene | | 6.00 | mg/kg-dry | 0.17 | 88 | 40 | 140 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 11.8 | mg/kg-dry | 0.17 | 89 | 40 | 140 | | | |
| Benzo(g,h,I)perylene | | 5.69 | mg/kg-dry | 0.17 | 85 | 40 | 140 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 48 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 82 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 88 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMS** | 19 | Sample Matrix Spike | | | | Run: HHP2_160923A | | | | 09/23/16 23:41 |
| C11 to C22 Aromatics | | 326 | mg/kg-dry | 16 | 32 | 40 | 140 | | | S |
| Naphthalene | | 4.95 | mg/kg-dry | 0.26 | 62 | 40 | 140 | | | |
| 2-MethylNaphthalene | | 5.42 | mg/kg-dry | 0.26 | 70 | 40 | 140 | | | |
| Acenaphthylene | | 4.21 | mg/kg-dry | 0.26 | 51 | 40 | 140 | | | |
| Acenaphthene | | 5.24 | mg/kg-dry | 0.26 | 63 | 40 | 140 | | | |
| Fluorene | | 4.41 | mg/kg-dry | 0.26 | 60 | 40 | 140 | | | |
| Phenanthrene | | 5.17 | mg/kg-dry | 0.26 | 70 | 40 | 140 | | | |
| Anthracene | | 4.57 | mg/kg-dry | 0.26 | 66 | 40 | 140 | | | |
| Fluoranthene | | 5.96 | mg/kg-dry | 0.26 | 86 | 40 | 140 | | | |
| Pyrene | | 5.73 | mg/kg-dry | 0.26 | 82 | 40 | 140 | | | |
| Benzo(a)Anthracene | | 4.45 | mg/kg-dry | 0.26 | 65 | 40 | 140 | | | |
| Chrysene | | 4.39 | mg/kg-dry | 0.26 | 64 | 40 | 140 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 11.9 | mg/kg-dry | 0.26 | 87 | 40 | 140 | | | |
| Benzo(a)Pyrene | | 5.85 | mg/kg-dry | 0.26 | 85 | 40 | 140 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 11.5 | mg/kg-dry | 0.26 | 84 | 40 | 140 | | | |
| Benzo(g,h,I)perylene | | 5.47 | mg/kg-dry | 0.26 | 79 | 40 | 140 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.26 | 64 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.26 | 66 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.26 | 89 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMSD** | 19 | Sample Matrix Spike Duplicate | | | | Run: HHP2_160923A | | | | 09/24/16 01:12 |
| C11 to C22 Aromatics | | 301 | mg/kg-dry | 16 | 10 | 40 | 140 | 7.9 | 20 | S |
| Naphthalene | | 3.63 | mg/kg-dry | 0.26 | 43 | 40 | 140 | 31 | 40 | |
| 2-MethylNaphthalene | | 5.80 | mg/kg-dry | 0.26 | 76 | 40 | 140 | 6.7 | 20 | |
| Acenaphthylene | | 4.37 | mg/kg-dry | 0.26 | 53 | 40 | 140 | 3.8 | 20 | |
| Acenaphthene | | 5.18 | mg/kg-dry | 0.26 | 62 | 40 | 140 | 1.1 | 20 | |
| Fluorene | | 4.93 | mg/kg-dry | 0.26 | 68 | 40 | 140 | 11 | 20 | |
| Phenanthrene | | 4.97 | mg/kg-dry | 0.26 | 67 | 40 | 140 | 4.0 | 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

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | | Batch: 34538 |
| **Lab ID: H16090299-005AMSD** | 19 | Sample Matrix Spike Duplicate | | | | Run: HHP2_160923A | | | 09/24/16 01:12 | |
| Anthracene | | 4.38 | mg/kg-dry | 0.26 | 64 | 40 | 140 | 4.3 | 20 | |
| Fluoranthene | | 5.71 | mg/kg-dry | 0.26 | 83 | 40 | 140 | 4.3 | 20 | |
| Pyrene | | 5.49 | mg/kg-dry | 0.26 | 78 | 40 | 140 | 4.2 | 20 | |
| Benzo(a)Anthracene | | 4.27 | mg/kg-dry | 0.26 | 62 | 40 | 140 | 4.0 | 20 | |
| Chrysene | | 4.23 | mg/kg-dry | 0.26 | 61 | 40 | 140 | 3.8 | 20 | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 11.5 | mg/kg-dry | 0.26 | 84 | 40 | 140 | 3.7 | 20 | |
| Benzo(a)Pyrene | | 5.62 | mg/kg-dry | 0.26 | 82 | 40 | 140 | 4.0 | 20 | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 11.1 | mg/kg-dry | 0.26 | 81 | 40 | 140 | 3.4 | 20 | |
| Benzo(g,h,I)perylene | | 5.30 | mg/kg-dry | 0.26 | 77 | 40 | 140 | 3.1 | 20 | |
| Surr: 2-Bromonaphthalene | | | | 0.26 | 58 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.26 | 65 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.26 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R118953 | |
| **Lab ID: CCV_0923GC402r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 09/23/16 16:52 | |
| n-Nonane | | 8.07 | mg/kg-dry | 0.17 | 121 | 75 | 125 | | | |
| n-Decane | | 8.28 | mg/kg-dry | 0.17 | 124 | 75 | 125 | | | |
| n-Dodecane | | 7.79 | mg/kg-dry | 0.17 | 117 | 75 | 125 | | | |
| n-Tetradecane | | 7.65 | mg/kg-dry | 0.17 | 115 | 75 | 125 | | | |
| n-Hexadecane | | 7.74 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Octadecane | | 7.71 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Nonadecane | | 7.71 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Eicosane | | 7.72 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Docosane | | 7.72 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Tetracosane | | 7.70 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| n-Hexacosane | | 7.69 | mg/kg-dry | 0.17 | 115 | 75 | 125 | | | |
| n-Octacosane | | 7.49 | mg/kg-dry | 0.17 | 112 | 75 | 125 | | | |
| n-Triacontane | | 7.43 | mg/kg-dry | 0.17 | 111 | 75 | 125 | | | |
| n-Hexatriacontane | | 7.73 | mg/kg-dry | 0.17 | 116 | 75 | 125 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 106 | 75 | 125 | | | |
| **Lab ID: CCV_0923GC420r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 09/24/16 06:31 | |
| n-Nonane | | 7.56 | mg/kg-dry | 0.17 | 113 | 75 | 125 | | | |
| n-Decane | | 7.82 | mg/kg-dry | 0.17 | 117 | 75 | 125 | | | |
| n-Dodecane | | 7.30 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Tetradecane | | 7.19 | mg/kg-dry | 0.17 | 108 | 75 | 125 | | | |
| n-Hexadecane | | 7.25 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Octadecane | | 7.24 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Nonadecane | | 7.23 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Eicosane | | 7.25 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Docosane | | 7.28 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Tetracosane | | 7.24 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| n-Hexacosane | | 7.22 | mg/kg-dry | 0.17 | 108 | 75 | 125 | | | |
| n-Octacosane | | 7.03 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Triacontane | | 6.97 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| n-Hexatriacontane | | 7.26 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| Surr: 1-Chloro-octadecane | | | | 0.17 | 99 | 75 | 125 | | | |
| **Lab ID: CCV_0923GC403r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 09/23/16 17:38 | |
| Naphthalene | | 6.98 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 6.83 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Acenaphthylene | | 6.76 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Acenaphthene | | 6.71 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Fluorene | | 6.75 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Phenanthrene | | 6.73 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Anthracene | | 6.74 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Fluoranthene | | 6.80 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Pyrene | | 6.74 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 6.53 | mg/kg-dry | 0.17 | 98 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: MA-EPH** | | | | | | | | | Analytical Run: R118953 | |
| **Lab ID: CCV_0923GC403r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 09/23/16 17:38 | |
| Chrysene | | 6.87 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 13.6 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 6.79 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 13.7 | mg/kg-dry | 0.17 | 102 | 75 | 125 | | | |
| Benzo(g,h,I)perylene | | 6.71 | mg/kg-dry | 0.17 | 101 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 95 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 101 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 101 | 40 | 140 | | | |
| **Lab ID: CCV_0923GC421r-S** | 18 | Continuing Calibration Verification Standard | | | | | | | 09/24/16 07:16 | |
| Naphthalene | | 7.27 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| 2-MethylNaphthalene | | 7.13 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| Acenaphthylene | | 7.06 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Acenaphthene | | 7.00 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| Fluorene | | 7.04 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Phenanthrene | | 7.02 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| Anthracene | | 7.04 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Fluoranthene | | 7.10 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| Pyrene | | 7.04 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Benzo(a)Anthracene | | 6.84 | mg/kg-dry | 0.17 | 103 | 75 | 125 | | | |
| Chrysene | | 7.25 | mg/kg-dry | 0.17 | 109 | 75 | 125 | | | |
| Benzo(b)Fluoranthene/Benzo(k)Fluorant | | 14.1 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Benzo(a)Pyrene | | 7.05 | mg/kg-dry | 0.17 | 106 | 75 | 125 | | | |
| Dibenz(a,h)anthracene/Indeno(1,2,3-cd) | | 14.3 | mg/kg-dry | 0.17 | 107 | 75 | 125 | | | |
| Benzo(g,h,I)perylene | | 7.00 | mg/kg-dry | 0.17 | 105 | 75 | 125 | | | |
| Surr: 2-Bromonaphthalene | | | | 0.17 | 99 | 40 | 140 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.17 | 105 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | | Batch: 34440 |
| **Lab ID: MB-34440** | 2 | Method Blank | | | | Run: HHP_160916A | | | | 09/16/16 20:01 |
| Total Extractable Hydrocarbons | | ND | mg/kg-dry | 10 | | | | | | |
| Surr: o-Terphenyl | | | | 0.17 | 105 | 40 | 140 | | | |
| **Lab ID: LCS-34440** | 2 | Laboratory Control Sample | | | | Run: HHP_160916A | | | | 09/16/16 20:47 |
| Total Extractable Hydrocarbons | | 223.4 | mg/kg-dry | 10 | 109 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 107 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMS** | 2 | Sample Matrix Spike | | | | Run: HHP_160916A | | | | 09/17/16 08:08 |
| Total Extractable Hydrocarbons | | 1907 | mg/kg-dry | 10 | -65 | 60 | 140 | | | S |
| Surr: o-Terphenyl | | | | 0.17 | 108 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMSD** | 2 | Sample Matrix Spike Duplicate | | | | Run: HHP_160916A | | | | 09/17/16 08:53 |
| Total Extractable Hydrocarbons | | 1745 | mg/kg-dry | 10 | -141 | 60 | 140 | 8.8 | 20 | S |
| Surr: o-Terphenyl | | | | 0.17 | 104 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | Analytical Run: R118779 | |
| **Lab ID: CCV_0916GC102r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 09/16/16 19:16 | |
| n-Nonane | | 7.715 | mg/kg-dry | | 116 | 75 | 125 | | | |
| n-Decane | | 7.815 | mg/kg-dry | | 117 | 75 | 125 | | | |
| n-Dodecane | | 7.348 | mg/kg-dry | | 110 | 75 | 125 | | | |
| n-Tetradecane | | 7.461 | mg/kg-dry | | 112 | 75 | 125 | | | |
| n-Hexadecane | | 7.516 | mg/kg-dry | | 113 | 75 | 125 | | | |
| n-Octadecane | | 7.565 | mg/kg-dry | | 113 | 75 | 125 | | | |
| n-Nonadecane | | 7.570 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Eicosane | | 7.583 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Docosane | | 7.582 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Tetracosane | | 7.630 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Hexacosane | | 7.665 | mg/kg-dry | | 115 | 75 | 125 | | | |
| n-Octacosane | | 7.690 | mg/kg-dry | | 115 | 75 | 125 | | | |
| n-Triacontane | | 7.730 | mg/kg-dry | | 116 | 75 | 125 | | | |
| n-Hexatriacontane | | 7.710 | mg/kg-dry | | 116 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 114 | 75 | 125 | | | |
| **Lab ID: CCV_0916GC115r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | 09/17/16 05:06 | |
| n-Nonane | | 7.807 | mg/kg-dry | | 117 | 75 | 125 | | | |
| n-Decane | | 7.840 | mg/kg-dry | | 118 | 75 | 125 | | | |
| n-Dodecane | | 7.367 | mg/kg-dry | | 111 | 75 | 125 | | | |
| n-Tetradecane | | 7.469 | mg/kg-dry | | 112 | 75 | 125 | | | |
| n-Hexadecane | | 7.515 | mg/kg-dry | | 113 | 75 | 125 | | | |
| n-Octadecane | | 7.559 | mg/kg-dry | | 113 | 75 | 125 | | | |
| n-Nonadecane | | 7.567 | mg/kg-dry | | 113 | 75 | 125 | | | |
| n-Eicosane | | 7.581 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Docosane | | 7.581 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Tetracosane | | 7.629 | mg/kg-dry | | 114 | 75 | 125 | | | |
| n-Hexacosane | | 7.665 | mg/kg-dry | | 115 | 75 | 125 | | | |
| n-Octacosane | | 7.691 | mg/kg-dry | | 115 | 75 | 125 | | | |
| n-Triacontane | | 7.727 | mg/kg-dry | | 116 | 75 | 125 | | | |
| n-Hexatriacontane | | 7.700 | mg/kg-dry | | 115 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 114 | 75 | 125 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie
**Report Date:** 10/07/16
**Project:** Diamond P Ranch
**Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8151A** | | | | | | | | | Batch: B_102845 | |
| **Lab ID: LCS-102845** | | Laboratory Control Sample | | | | Run: SUB-B267712 | | | 09/27/16 01:02 | |
| Pentachlorophenol | | 0.0730 | mg/kg | 0.0020 | 73 | 51 | 103 | | | |
| **Lab ID: MB-102845** | | Method Blank | | | | Run: SUB-B267712 | | | 09/27/16 01:35 | |
| Pentachlorophenol | | ND | mg/kg | 0.0020 | | | | | | |
| **Lab ID: H16090301-005A** | 2 | Sample Matrix Spike | | | | Run: SUB-B267712 | | | 09/27/16 03:45 | |
| Pentachlorophenol | | 0.0495 | mg/kg-dry | 0.0022 | 39 | 51 | 103 | | | S |
| Surr: DCAA | | | | 0.0022 | 69 | 45 | 117 | | | |
| **Lab ID: H16090301-005A** | 2 | Sample Matrix Spike Duplicate | | | | Run: SUB-B267712 | | | 09/27/16 04:18 | |
| Pentachlorophenol | | 0.0486 | mg/kg-dry | 0.0021 | 38 | 51 | 103 | 1.8 | 40 | S |
| Surr: DCAA | | | | 0.0021 | 66 | 45 | 117 | | | |
| **Method: SW8151A** | | | | | | | | | Analytical Run: B_R267712 | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 09/27/16 00:29 | |
| Pentachlorophenol | | 0.465 | mg/kg | 0.0020 | 98 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.0020 | 98 | 85 | 115 | | | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 09/27/16 09:11 | |
| Pentachlorophenol | | 0.495 | mg/kg | 0.0020 | 104 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.0020 | 106 | 85 | 115 | | | |
| **Lab ID: CK6** | | Continuing Calibration Verification Standard | | | | | | | 09/27/16 14:08 | |
| Pentachlorophenol | | 0.492 | mg/kg | 0.0020 | 104 | 85 | 115 | | | |

**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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_102906 | |
| **Lab ID: LLCS-102906** | 20 | Laboratory Control Sample | | | | Run: SUB-B267531 | | | 09/22/16 19:19 | |
| 2-Methylnaphthalene | | 0.152 | mg/kg | 0.0033 | 91 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.117 | mg/kg | 0.0033 | 70 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.117 | mg/kg | 0.0033 | 70 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.133 | mg/kg | 0.0033 | 80 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.140 | mg/kg | 0.0033 | 84 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.136 | mg/kg | 0.0033 | 81 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.142 | mg/kg | 0.0033 | 85 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.154 | mg/kg | 0.0033 | 92 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.146 | mg/kg | 0.0033 | 87 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.140 | mg/kg | 0.0033 | 84 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.146 | mg/kg | 0.0033 | 87 | 63 | 113 | 0.0 | 40 | |
| Fluoranthene | | 0.145 | mg/kg | 0.0033 | 87 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.140 | mg/kg | 0.0033 | 84 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.128 | mg/kg | 0.0033 | 77 | 57 | 119 | 0.0 | 40 | |
| Naphthalene | | 0.122 | mg/kg | 0.0033 | 73 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.122 | mg/kg | 0.0033 | 73 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.138 | mg/kg | 0.0033 | 83 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 71 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 71 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 76 | 51 | 117 | | | |
| **Lab ID: LMB-102906** | 20 | Method Blank | | | | Run: SUB-B267531 | | | 09/22/16 19:51 | |
| 2-Methylnaphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthylene | | ND | mg/kg | 0.0033 | | | | | | |
| Anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(b)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(g,h,i)perylene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(k)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Chrysene | | ND | mg/kg | 0.0033 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluorene | | ND | mg/kg | 0.0033 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Naphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Phenanthrene | | ND | mg/kg | 0.0033 | | | | | | |
| Pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 64 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 63 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 75 | 51 | 117 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_102906 | |
| **Lab ID: B16091610-001ALMS** | 20 | Sample Matrix Spike | | | | Run: SUB-B267531 | | | 09/22/16 21:55 | |
| 2-Methylnaphthalene | | 0.158 | mg/kg | 0.0033 | 95 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.121 | mg/kg | 0.0033 | 72 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.131 | mg/kg | 0.0033 | 78 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.133 | mg/kg | 0.0033 | 80 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.157 | mg/kg | 0.0033 | 94 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.162 | mg/kg | 0.0033 | 97 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.157 | mg/kg | 0.0033 | 94 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.166 | mg/kg | 0.0033 | 100 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.155 | mg/kg | 0.0033 | 93 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.145 | mg/kg | 0.0033 | 87 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.175 | mg/kg | 0.0033 | 105 | 63 | 113 | 0.0 | 40 | |
| Fluoranthene | | 0.159 | mg/kg | 0.0033 | 95 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.153 | mg/kg | 0.0033 | 92 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.160 | mg/kg | 0.0033 | 96 | 57 | 119 | 0.0 | 40 | |
| Naphthalene | | 0.120 | mg/kg | 0.0033 | 72 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.127 | mg/kg | 0.0033 | 76 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.150 | mg/kg | 0.0033 | 90 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 73 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 73 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 96 | 51 | 117 | | | |
| **Lab ID: B16091610-001ALMS** | 20 | Sample Matrix Spike Duplicate | | | | Run: SUB-B267531 | | | 09/22/16 22:27 | |
| 2-Methylnaphthalene | | 0.157 | mg/kg | 0.0033 | 94 | 54 | 113 | 0.6 | 40 | |
| Acenaphthene | | 0.122 | mg/kg | 0.0033 | 73 | 54 | 111 | 1.1 | 40 | |
| Acenaphthylene | | 0.129 | mg/kg | 0.0033 | 77 | 53 | 113 | 1.3 | 40 | |
| Anthracene | | 0.139 | mg/kg | 0.0033 | 83 | 66 | 109 | 4.2 | 40 | |
| Benzo(a)anthracene | | 0.152 | mg/kg | 0.0033 | 91 | 51 | 121 | 2.8 | 40 | |
| Benzo(a)pyrene | | 0.159 | mg/kg | 0.0033 | 95 | 62 | 114 | 1.6 | 40 | |
| Benzo(b)fluoranthene | | 0.160 | mg/kg | 0.0033 | 95 | 50 | 128 | 1.7 | 40 | |
| Benzo(g,h,i)perylene | | 0.167 | mg/kg | 0.0033 | 100 | 62 | 116 | 0.4 | 40 | |
| Benzo(k)fluoranthene | | 0.149 | mg/kg | 0.0033 | 89 | 47 | 127 | 3.7 | 40 | |
| Chrysene | | 0.143 | mg/kg | 0.0033 | 85 | 56 | 119 | 1.8 | 40 | |
| Dibenzo(a,h)anthracene | | 0.175 | mg/kg | 0.0033 | 104 | 63 | 113 | 0.3 | 40 | |
| Fluoranthene | | 0.159 | mg/kg | 0.0033 | 95 | 70 | 115 | 0.2 | 40 | |
| Fluorene | | 0.153 | mg/kg | 0.0033 | 91 | 53 | 118 | 0.4 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.162 | mg/kg | 0.0033 | 97 | 57 | 119 | 1.5 | 40 | |
| Naphthalene | | 0.120 | mg/kg | 0.0033 | 71 | 50 | 109 | 0.3 | 40 | |
| Phenanthrene | | 0.129 | mg/kg | 0.0033 | 77 | 63 | 116 | 1.8 | 40 | |
| Pyrene | | 0.148 | mg/kg | 0.0033 | 88 | 62 | 113 | 1.3 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 76 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 73 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 89 | 51 | 117 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | | Batch: B_102906 |
| **Lab ID: LMB-102906** | 3 | Method Blank | | | | Run: SUB-B267532 | | | | 09/22/16 19:51 |
| Benzo(b)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Pyrene | | ND | mg/kg | 0.0033 | | | | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | | Batch: B_103331 |
| **Lab ID: MB-103331-34538-344** | 17 | Method Blank | | | | Run: SUB-B268194 | | | | 10/05/16 21:38 |
| 2-Methylnaphthalene | | ND | mg/kg | 0.0067 | | | | | | |
| Acenaphthene | | ND | mg/kg | 0.0067 | | | | | | |
| Acenaphthylene | | ND | mg/kg | 0.0067 | | | | | | |
| Anthracene | | ND | mg/kg | 0.0067 | | | | | | |
| Benzo(a)anthracene | | ND | mg/kg | 0.0067 | | | | | | |
| Benzo(a)pyrene | | ND | mg/kg | 0.0067 | | | | | | |
| Benzo(b)fluoranthene | | ND | mg/kg | 0.0067 | | | | | | |
| Benzo(g,h,i)perylene | | ND | mg/kg | 0.0067 | | | | | | |
| Benzo(k)fluoranthene | | ND | mg/kg | 0.0067 | | | | | | |
| Chrysene | | ND | mg/kg | 0.0067 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | mg/kg | 0.0067 | | | | | | |
| Fluoranthene | | ND | mg/kg | 0.0067 | | | | | | |
| Fluorene | | ND | mg/kg | 0.0067 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | mg/kg | 0.0067 | | | | | | |
| Naphthalene | | 0.00867 | mg/kg | 0.0067 | | | | | | |
| Phenanthrene | | ND | mg/kg | 0.0067 | | | | | | |
| Pyrene | | ND | mg/kg | 0.0067 | | | | | | |
| **Lab ID: H16090299-005AMS** | 19 | Sample Matrix Spike | | | | Run: SUB-B268194 | | | | 10/05/16 23:43 |
| 2-Methylnaphthalene | | 4.36 | mg/kg-dry | 0.21 | 63 | 40 | 140 | 0.0 | 40 | |
| Acenaphthene | | 5.34 | mg/kg-dry | 0.21 | 77 | 40 | 140 | 0.0 | 40 | |
| Acenaphthylene | | 4.61 | mg/kg-dry | 0.21 | 67 | 40 | 140 | 0.0 | 40 | |
| Anthracene | | 5.29 | mg/kg-dry | 0.21 | 77 | 40 | 140 | 0.0 | 40 | |
| Benzo(a)anthracene | | 5.96 | mg/kg-dry | 0.21 | 86 | 40 | 140 | 0.0 | 40 | |
| Benzo(a)pyrene | | 5.71 | mg/kg-dry | 0.21 | 83 | 40 | 140 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 5.62 | mg/kg-dry | 0.21 | 82 | 40 | 140 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 5.46 | mg/kg-dry | 0.21 | 79 | 40 | 140 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 6.18 | mg/kg-dry | 0.21 | 90 | 40 | 140 | 0.0 | 40 | |
| Chrysene | | 5.29 | mg/kg-dry | 0.21 | 77 | 40 | 140 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 5.71 | mg/kg-dry | 0.21 | 83 | 40 | 140 | 0.0 | 40 | |
| Fluoranthene | | 6.16 | mg/kg-dry | 0.21 | 89 | 40 | 140 | 0.0 | 40 | |
| Fluorene | | 5.71 | mg/kg-dry | 0.21 | 83 | 40 | 140 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 5.71 | mg/kg-dry | 0.21 | 83 | 40 | 140 | 0.0 | 40 | |
| Naphthalene | | 3.78 | mg/kg-dry | 0.21 | 55 | 40 | 140 | 0.0 | 40 | |
| Phenanthrene | | 4.94 | mg/kg-dry | 0.21 | 72 | 40 | 140 | 0.0 | 40 | |
| Pyrene | | 6.62 | mg/kg-dry | 0.21 | 96 | 40 | 140 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.21 | 116 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.21 | 83 | 40 | 140 | | | |
| **Lab ID: H16090299-005AMSD** | 19 | Sample Matrix Spike | | | | Run: SUB-B268194 | | | | 10/06/16 00:14 |
| 2-Methylnaphthalene | | 5.48 | mg/kg-dry | 0.21 | 79 | 40 | 140 | 23 | 40 | |
| Acenaphthene | | 5.65 | mg/kg-dry | 0.21 | 82 | 40 | 140 | 5.6 | 40 | |
| Acenaphthylene | | 4.98 | mg/kg-dry | 0.21 | 72 | 40 | 140 | 7.8 | 40 | |
| Anthracene | | 5.42 | mg/kg-dry | 0.21 | 79 | 40 | 140 | 2.3 | 40 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_103331 | |
| **Lab ID: H16090299-005AMSD** | 19 | Sample Matrix Spike | | | | Run: SUB-B268194 | | | 10/06/16 00:14 | |
| Benzo(a)anthracene | | 6.08 | mg/kg-dry | 0.21 | 88 | 40 | 140 | 2.1 | 40 | |
| Benzo(a)pyrene | | 5.85 | mg/kg-dry | 0.21 | 85 | 40 | 140 | 2.5 | 40 | |
| Benzo(b)fluoranthene | | 5.77 | mg/kg-dry | 0.21 | 84 | 40 | 140 | 2.5 | 40 | |
| Benzo(g,h,i)perylene | | 5.00 | mg/kg-dry | 0.21 | 73 | 40 | 140 | 8.7 | 40 | |
| Benzo(k)fluoranthene | | 6.14 | mg/kg-dry | 0.21 | 89 | 40 | 140 | 0.7 | 40 | |
| Chrysene | | 4.55 | mg/kg-dry | 0.21 | 66 | 40 | 140 | 15 | 40 | |
| Dibenzo(a,h)anthracene | | 5.69 | mg/kg-dry | 0.21 | 82 | 40 | 140 | 0.4 | 40 | |
| Fluoranthene | | 6.39 | mg/kg-dry | 0.21 | 93 | 40 | 140 | 3.6 | 40 | |
| Fluorene | | 6.12 | mg/kg-dry | 0.21 | 89 | 40 | 140 | 7.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 5.79 | mg/kg-dry | 0.21 | 84 | 40 | 140 | 1.4 | 40 | |
| Naphthalene | | 4.49 | mg/kg-dry | 0.21 | 65 | 40 | 140 | 17 | 40 | |
| Phenanthrene | | 4.86 | mg/kg-dry | 0.21 | 70 | 40 | 140 | 1.7 | 40 | |
| Pyrene | | 6.47 | mg/kg-dry | 0.21 | 94 | 40 | 140 | 2.2 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.21 | 121 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.21 | 80 | 40 | 140 | | | |
| **Lab ID: LCS-103331** | 19 | Laboratory Control Sample | | | | Run: SUB-B268194 | | | 10/06/16 00:45 | |
| 2-Methylnaphthalene | | 5.64 | mg/kg | 0.13 | 85 | 40 | 140 | 0.0 | 40 | |
| Acenaphthene | | 5.52 | mg/kg | 0.13 | 83 | 40 | 140 | 0.0 | 40 | |
| Acenaphthylene | | 4.77 | mg/kg | 0.13 | 72 | 40 | 140 | 0.0 | 40 | |
| Anthracene | | 5.55 | mg/kg | 0.13 | 83 | 40 | 140 | 0.0 | 40 | |
| Benzo(a)anthracene | | 6.04 | mg/kg | 0.13 | 91 | 40 | 140 | 0.0 | 40 | |
| Benzo(a)pyrene | | 6.03 | mg/kg | 0.13 | 90 | 40 | 140 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 5.96 | mg/kg | 0.13 | 89 | 40 | 140 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 6.39 | mg/kg | 0.13 | 96 | 40 | 140 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 6.51 | mg/kg | 0.13 | 98 | 40 | 140 | 0.0 | 40 | |
| Chrysene | | 5.69 | mg/kg | 0.13 | 85 | 40 | 140 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 5.88 | mg/kg | 0.13 | 88 | 40 | 140 | 0.0 | 40 | |
| Fluoranthene | | 6.43 | mg/kg | 0.13 | 96 | 40 | 140 | 0.0 | 40 | |
| Fluorene | | 4.83 | mg/kg | 0.13 | 72 | 40 | 140 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 5.81 | mg/kg | 0.13 | 87 | 40 | 140 | 0.0 | 40 | |
| Naphthalene | | 4.45 | mg/kg | 0.13 | 67 | 40 | 140 | 0.0 | 40 | |
| Phenanthrene | | 4.99 | mg/kg | 0.13 | 75 | 40 | 140 | 0.0 | 40 | |
| Pyrene | | 6.43 | mg/kg | 0.13 | 96 | 40 | 140 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.13 | 77 | 40 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.13 | 86 | 40 | 140 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R267531 | |
| **Lab ID: 22-Sep-16_CCV_12** | 20 | Continuing Calibration Verification Standard | | | | | | | 09/22/16 18:48 | |
| 2-Methylnaphthalene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Acenaphthene | | 1.82 | ug/L | 0.10 | 91 | 80 | 120 | | | |
| Acenaphthylene | | 1.93 | ug/L | 0.10 | 97 | 80 | 120 | | | |
| Anthracene | | 1.93 | ug/L | 0.10 | 97 | 80 | 120 | | | |
| Benzo(a)anthracene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Benzo(a)pyrene | | 1.95 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 1.92 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Chrysene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 1.94 | ug/L | 0.10 | 97 | 80 | 120 | | | |
| Fluoranthene | | 1.95 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Fluorene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 1.85 | ug/L | 0.10 | 93 | 80 | 120 | | | |
| Naphthalene | | 1.94 | ug/L | 0.10 | 97 | 80 | 120 | | | |
| Phenanthrene | | 1.88 | ug/L | 0.10 | 94 | 80 | 120 | | | |
| Pyrene | | 1.93 | ug/L | 0.10 | 97 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 99 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 103 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 100 | 80 | 120 | | | |
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R267532 | |
| **Lab ID: 22-Sep-16_CCV_11** | 9 | Continuing Calibration Verification Standard | | | | | | | 09/22/16 18:16 | |
| Benzo(b)fluoranthene | | 77.2 | ug/L | 10 | 103 | 70 | 130 | 0.0 | 40 | |
| Fluoranthene | | 75.0 | ug/L | 10 | 100 | 80 | 120 | 0.0 | 40 | |
| Pyrene | | 72.5 | ug/L | 10 | 97 | 70 | 130 | 0.0 | 40 | |
| Surr: 2,4,6-Tribromophenol | | | | 10 | 103 | 70 | 130 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 10 | 102 | 70 | 130 | 0.0 | 40 | |
| Surr: 2-Fluorophenol | | | | 10 | 100 | 70 | 130 | 0.0 | 40 | |
| Surr: Nitrobenzene-d5 | | | | 10 | 105 | 70 | 130 | 0.0 | 40 | |
| Surr: Phenol-d5 | | | | 10 | 100 | 70 | 130 | 0.0 | 40 | |
| Surr: Terphenyl-d14 | | | | 10 | 100 | 70 | 130 | 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:** Trihydro-Laramie **Report Date:** 10/07/16

**Project:** Diamond P Ranch **Work Order:** H16090301

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R268194 | |
| **Lab ID: 05-Oct-16_CCV_60** | 21 | Continuing Calibration Verification Standard | | | | | | | 10/05/16 20:36 | |
| 2-Methylnaphthalene | | 2.04 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Acenaphthene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Acenaphthylene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Anthracene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Benzo(a)anthracene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Benzo(a)pyrene | | 1.90 | ug/L | 0.10 | 95 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 2.15 | ug/L | 0.10 | 107 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 1.78 | ug/L | 0.10 | 89 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.10 | ug/L | 0.10 | 105 | 80 | 120 | | | |
| Chrysene | | 1.92 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 2.02 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Fluoranthene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Fluorene | | 2.02 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.09 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Naphthalene | | 1.86 | ug/L | 0.10 | 93 | 80 | 120 | | | |
| o-Terphenyl | | 1.98 | ug/L | 0.10 | 99 | 80 | 120 | | | |
| Phenanthrene | | 1.90 | ug/L | 0.10 | 95 | 80 | 120 | | | |
| Pyrene | | 2.14 | ug/L | 0.10 | 107 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 100 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 92 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 100 | 80 | 120 | | | |

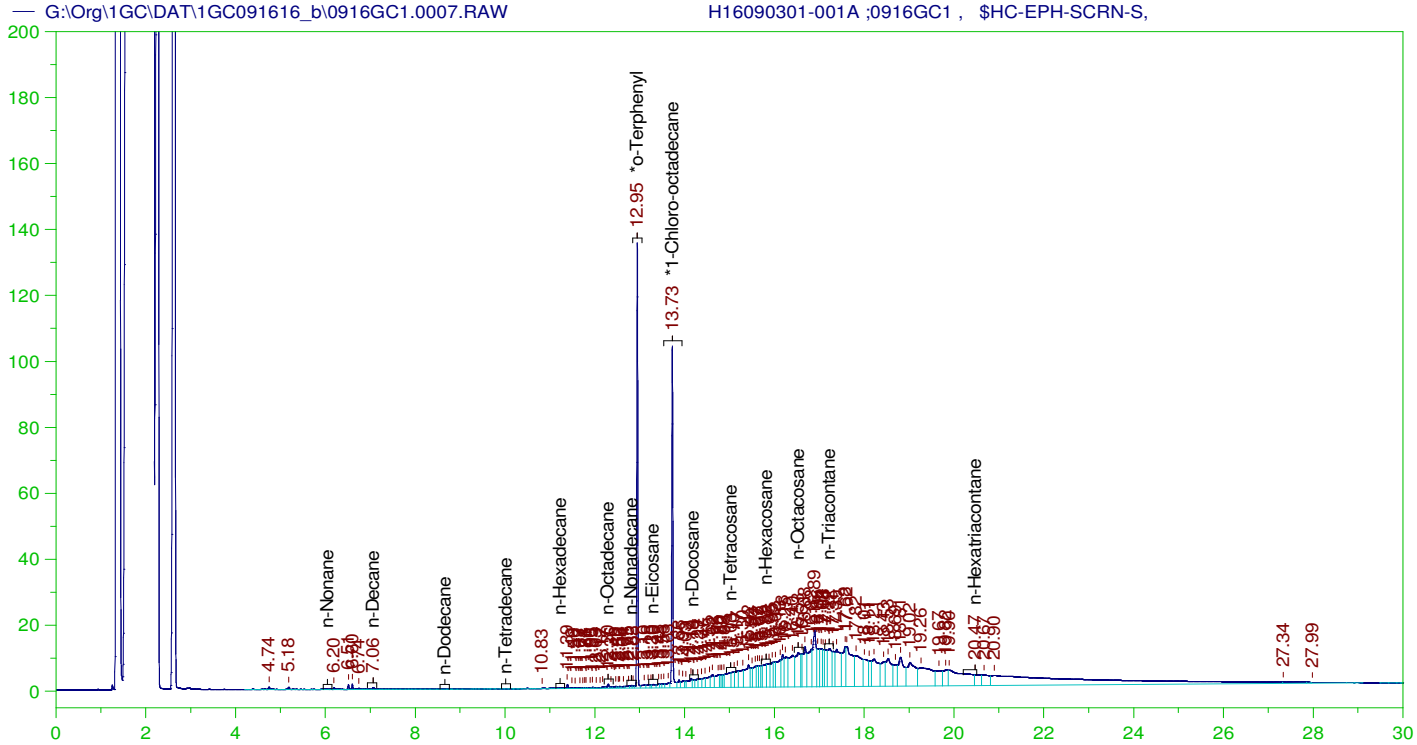
**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

**DIAP-SS-N-F (3.0)** Batch ID: 34440

— G:\Org\1GC\DAT\1GC091616_b\0916GC1.0007.RAW H16090301-001A ;0916GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-001A ;0916GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC091616_b\0916GC1.0007.RAW
Date & Time Acquired: 9/16/2016 11:03:12 PM
Method File: G:\Org\1GC\Methods\09161607.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 27.6 Dilution: 2 S.A.: 1

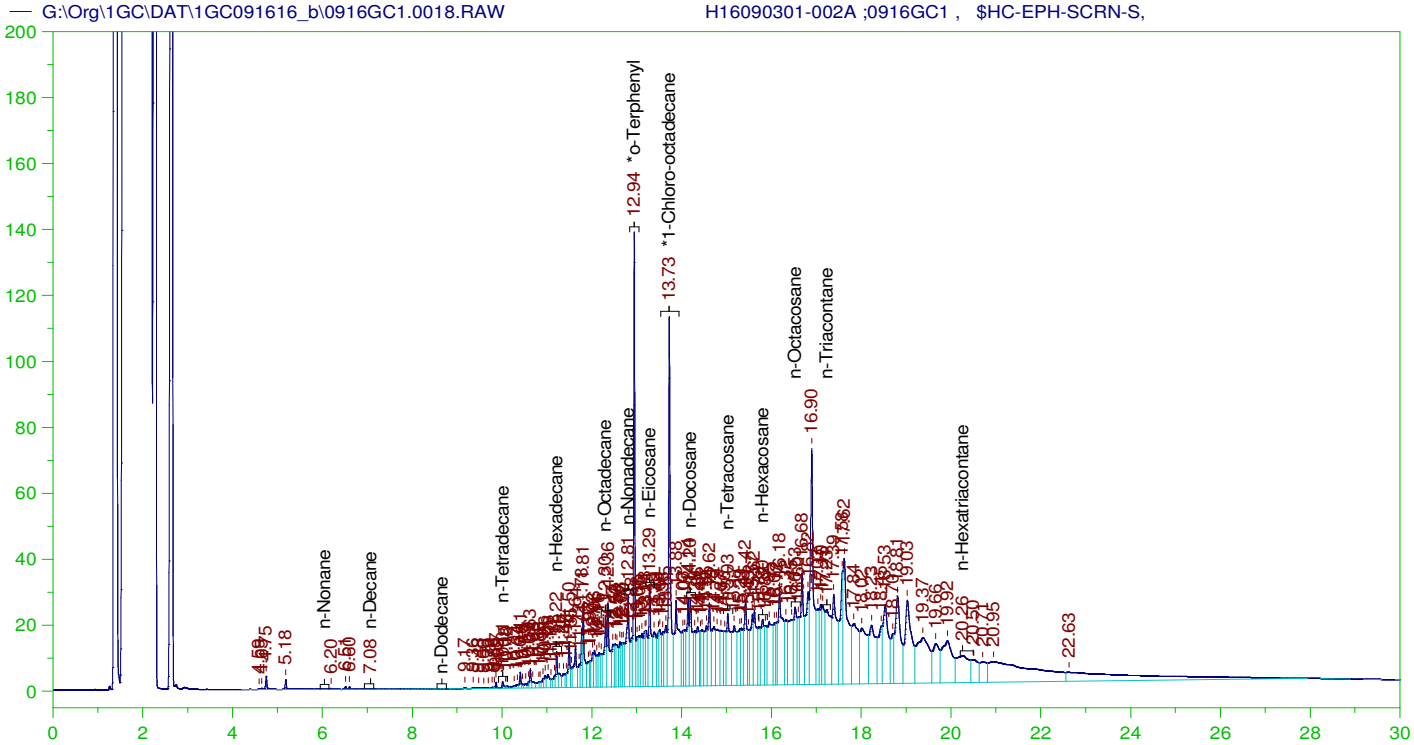
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.946 | 7.246 | 8.205 | 113.23 | - |
| *1-Chloro-octadecane | 13.728 | 7.246 | 8.84 | 121.99 | - |

DRO Area:1475656 DRO Amount: 59.19712
TEH Area:3291083 TEH Amount: 132.0245
C9-C18 Area:51580.86 C9-C18 Amount: 2.127721
C19-C36 Area:2681270 C19-C36 Amount: 104.6826

**DIAP-S-North-01 (0-2)** Batch ID: 34440

— G:\Org\1GC\DAT\1GC091616_b\0916GC1.0018.RAW H16090301-002A ;0916GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-002A ;0916GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC091616_b\0916GC1.0018.RAW
Date & Time Acquired: 9/17/2016 7:22:35 AM
Method File: G:\Org\1GC\Methods\09161618.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 28 Dilution: 2 S.A.: 1

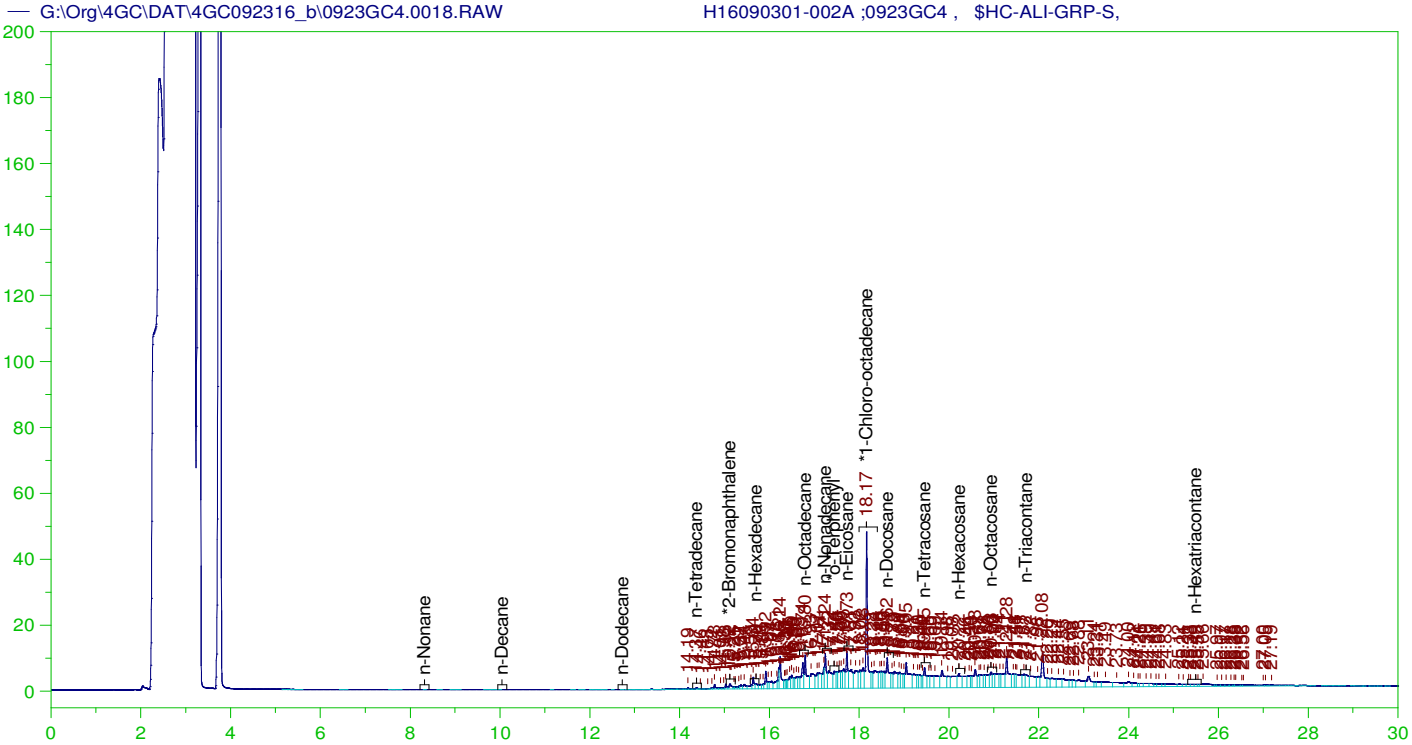
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.945 | 7.143 | 9.691 | 135.67 | - |
| *1-Chloro-octadecane | 13.727 | 7.143 | 14.286 | 200.01 | - |

DRO Area:6145344 DRO Amount: 243.0037
TEH Area:9919434 TEH Amount: 392.2415
C9-C18 Area:1193684 C9-C18 Amount: 48.53629
C19-C36 Area:7787040 C19-C36 Amount: 299.6797

**DIAP-S-North-01 (0-2)** Batch ID: 34538

G:\Org\4GC\DAT\4GC092316_b\0923GC4.0018.RAW H16090301-002A ;0923GC4 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16090301-002A ;0923GC4 , $HC-ALI-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0018.RAW
Date & Time Acquired: 9/24/2016 5:00:07 AM
Method File: G:\Org\4GC\Methods\09231618.MET
Calibration File: G:\Org\4GC\Cals\AL050416H.CAL
Sample Weight: 28 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 874.522
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 910.2241
Mean RF for Total Extractable Hydrocarbons: 894.9232
Rt range for Diesel Range Organics: 9.95 to 21.06
Rt range for C9 to C18 Aliphatic Hydrocarbons: 8.219999 to 17.18
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.23 to 25.62

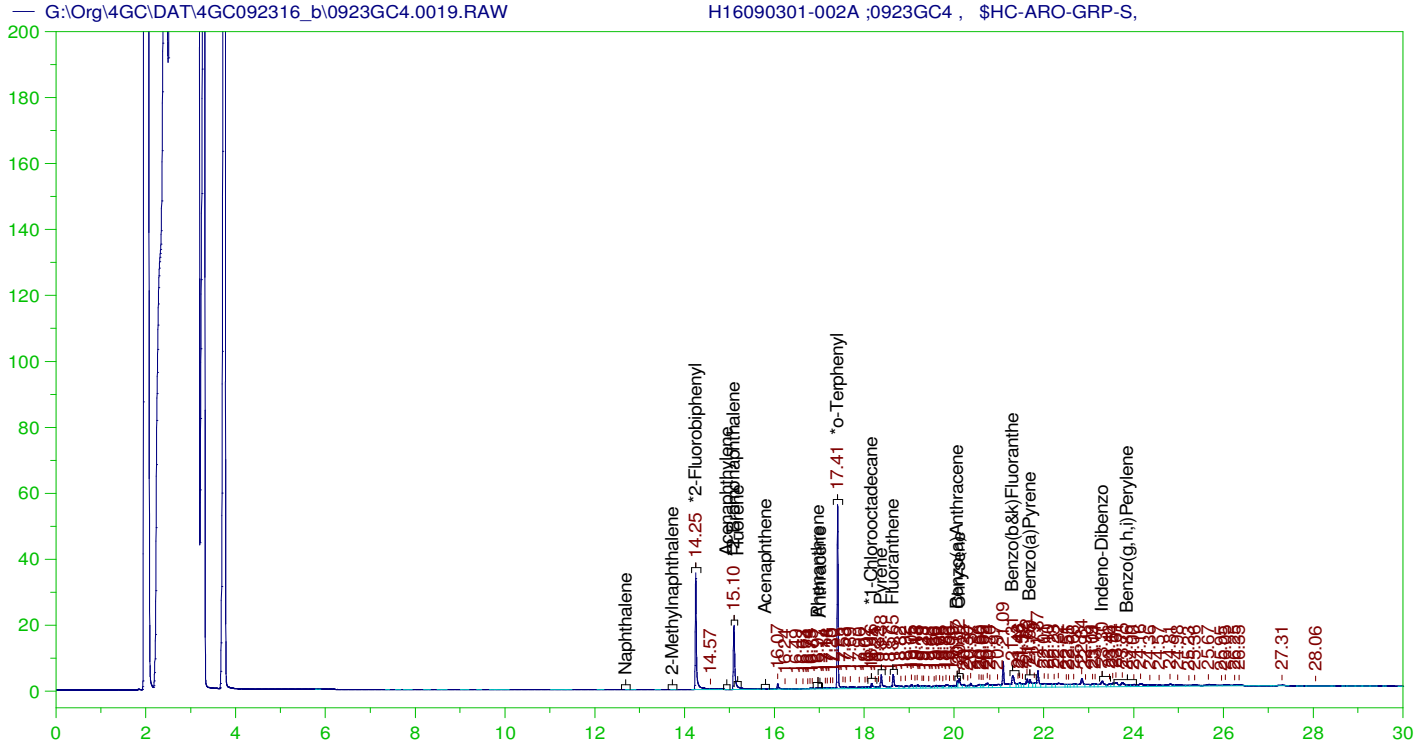
| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.167 | 7.143 | 10.123 | 141.72 | - |

DRO Area:1363380 DRO Amount: 108.8186
TEH Area:1960772 TEH Amount: 156.4996

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:366921.7 C9-C18 Amount: 29.96916
C19-C36 Area:1538207 C19-C36 Amount: 120.7086

**DIAP-S-North-01 (0-2)** Batch ID: 34538

— G:\Org\4GC\DAT\4GC092316_b\0923GC4.0019.RAW H16090301-002A ;0923GC4 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16090301-002A ;0923GC4 , $HC-ARO-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0019.RAW
Date & Time Acquired: 9/24/2016 5:45:37 AM
Method File: G:\Org\4GC\Methods\09231619.MET
Calibration File: G:\Org\4GC\Cals\AR050416H_09231603.CAL
Sample Weight: 28 Dilution: 2 S.A.: 1

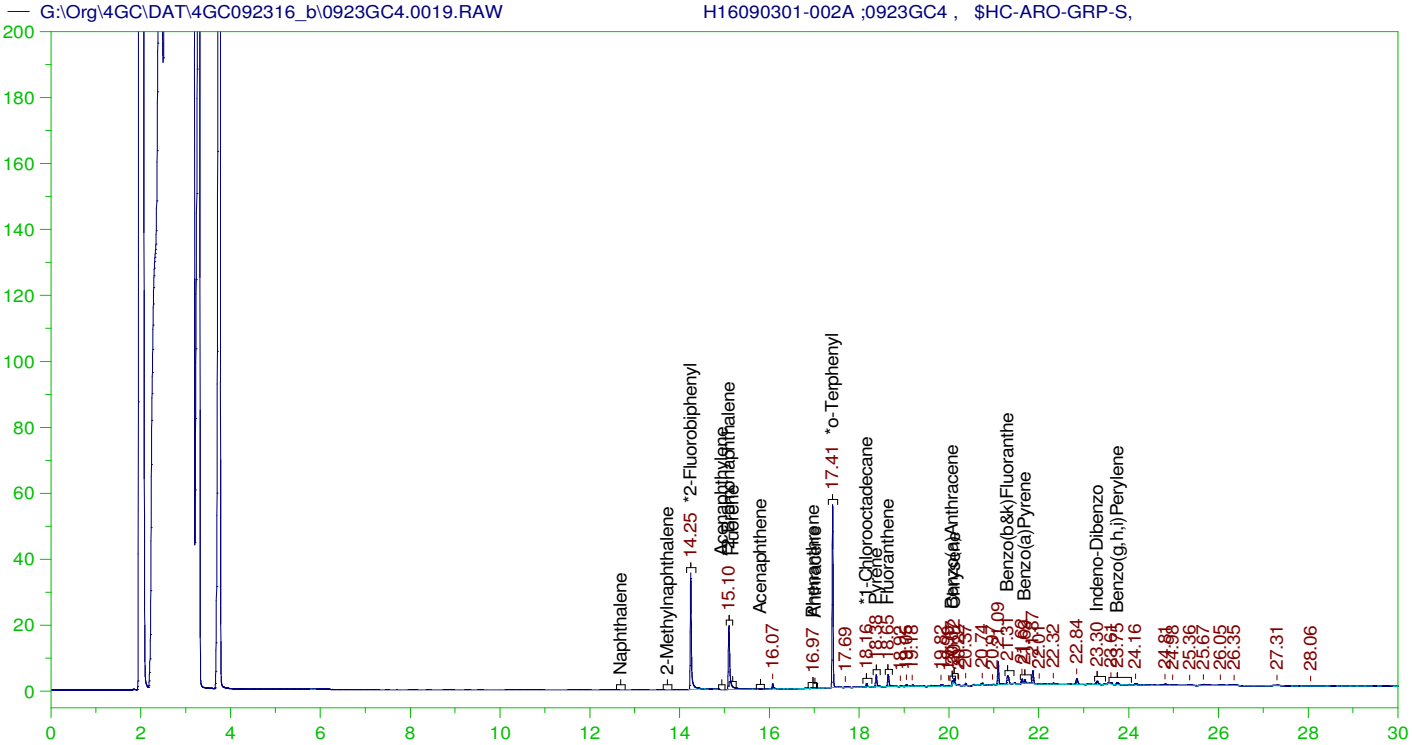
Mean RF EPH Aromatics: 977.5857
Rt range for EPH C11 to C22 Aromatics: 12.59 to 24.06

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.247 | 7.143 | 5.693 | 79.71 | - |
| *2-Bromonaphthalene | 15.098 | 7.143 | 5.244 | 73.42 | - |
| *o-Terphenyl | 17.408 | 7.143 | 6.617 | 92.63 | - |
| *1-Chlorooctadecane | 18.164 | 7.143 | .544 | 7.61 | - |

C11-C22 Aromatics Area:381615.3 C11-C22 Aromatics Amount: 27.88322
EPH Aromatics total Area:430013.2 EPH Aromatics Total Amount: 31.41948

**DIAP-S-North-01 (0-2)** Batch ID: 34538

— G:\Org\4GC\DAT\4GC092316_b\0923GC4.0019.RAW H16090301-002A ;0923GC4 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

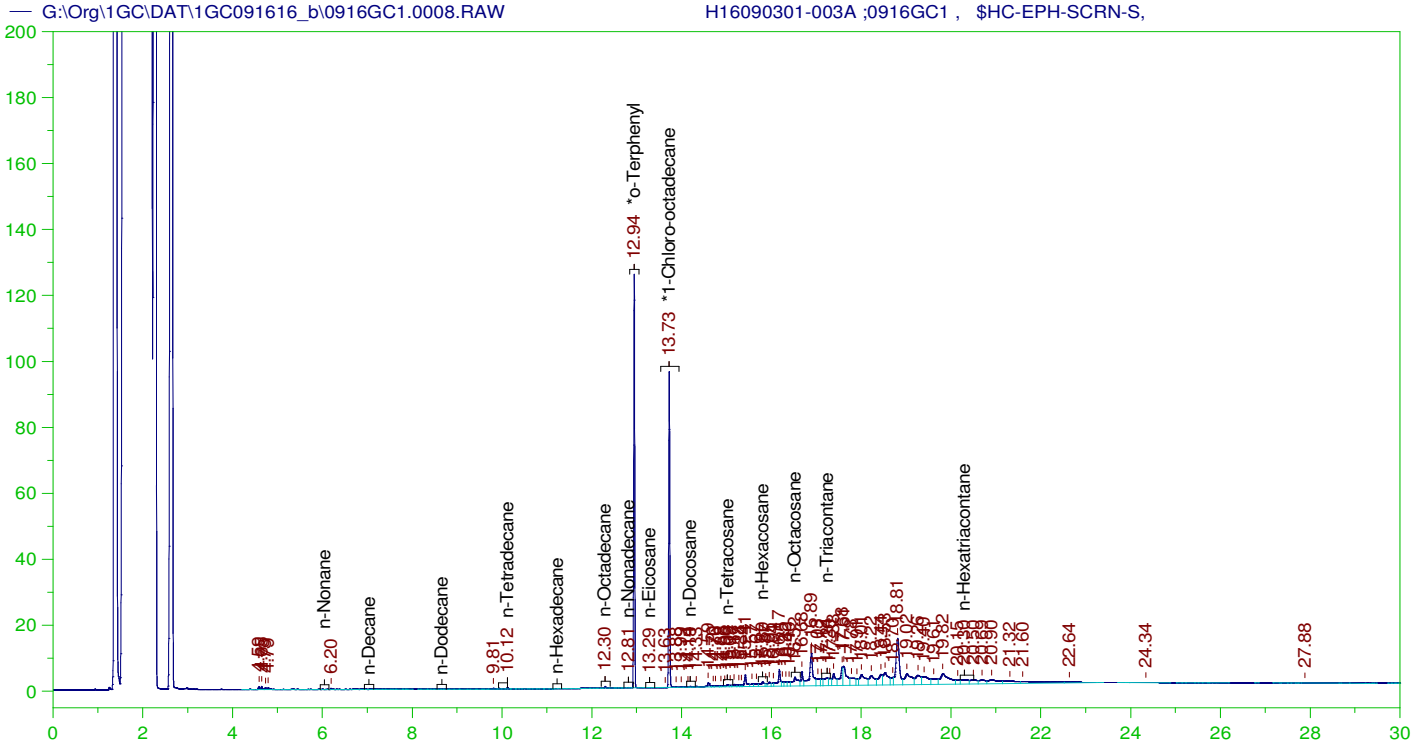
Sample Name: H16090301-002A ;0923GC4 , $HC-ARO-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0019.RAW
Date & Time Acquired: 9/24/2016 5:45:37 AM
Method File: G:\Org\4GC\Methods\AROQC050416H_09231603.met
Calibration File: G:\Org\4GC\Cals\AR050416H_09231603.CAL
Sample Weight: 28 Dilution: 2 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | . | . | . | | .071 | U |
| 2-Methylnaphthalene | . | . | . | | .071 | U |
| Acenaphthylene | . | . | . | | .071 | U |
| Fluorene | . | . | . | | .071 | U |
| Acenaphthene | . | . | . | | .071 | U |
| Phenanthrene | 16.97 | -1.85 | -1.871 | 1066 | .08 | |
| Anthracene | . | . | . | | .071 | U |
| Pyrene | 18.377 | -3.28 | -3.278 | 7540 | .545 | |
| Fluoranthene | 18.645 | -3.55 | -3.547 | 7328 | .523 | |
| Benzo(a)Anthracene | 20.071 | -4.97 | -4.972 | 1328 | .095 | |
| Chrysene | 20.116 | -5.03 | -5.017 | 2564 | .185 | |
| Benzo(b&k)Fluoranthe | 21.308 | -6.24 | -6.21 | 7274 | .529 | |
| Benzo(a)Pyrene | 21.69 | -6.6 | -6.591 | 2249 | .163 | |
| Indeno-Dibenzo | 23.296 | -8.26 | -8.198 | 3730 | .275 | |
| Benzo(g,h,i)Perylene | 23.745 | -8.7 | -8.647 | 2407 | .173 | |

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.247 | 7.143 | 5.584 | 78.17 | 40-140 |
| *2-Bromonaphthalene | 15.098 | 7.143 | 5.199 | 72.78 | 40-140 |
| *o-Terphenyl | 17.408 | 7.143 | 6.348 | 88.87 | 40-140 |
| *1-Chlorooctadecane | 18.164 | 7.143 | .174 | 2.43 | 40-140 |

**DIAP-S-South-01 (0-2)** Batch ID: 34440

— G:\Org\1GC\DAT\1GC091616_b\0916GC1.0008.RAW H16090301-003A ;0916GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-003A ;0916GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC091616_b\0916GC1.0008.RAW
Date & Time Acquired: 9/16/2016 11:48:34 PM
Method File: G:\Org\1GC\Methods\09161608.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 28.5 Dilution: 2 S.A.: 1

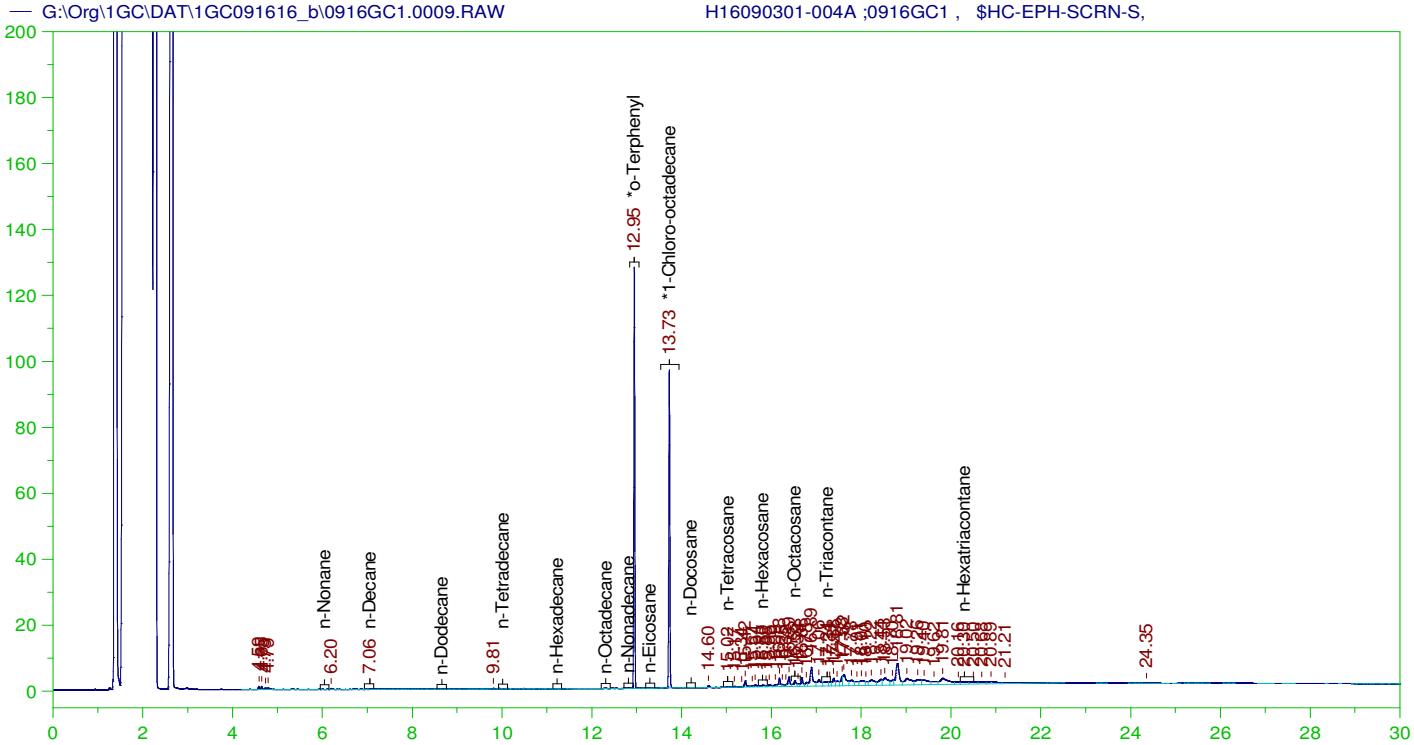
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.944 | 7.018 | 7.204 | 102.65 | - |
| *1-Chloro-octadecane | 13.727 | 7.018 | 7.459 | 106.28 | - |

DRO Area:255879.3 DRO Amount: 9.940656
TEH Area:821671.6 TEH Amount: 31.92112
C9-C18 Area:11108.45 C9-C18 Amount: 0.4437555
C19-C36 Area:722392.2 C19-C36 Amount: 27.3131

**DIAP-SS-S-F (2.0)** Batch ID: 34440

— G:\Org\1GC\DAT\1GC091616_b\0916GC1.0009.RAW H16090301-004A ;0916GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-004A ;0916GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC091616_b\0916GC1.0009.RAW
Date & Time Acquired: 9/17/2016 12:33:52 AM
Method File: G:\Org\1GC\Methods\09161609.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 28.4 Dilution: 2 S.A.: 1

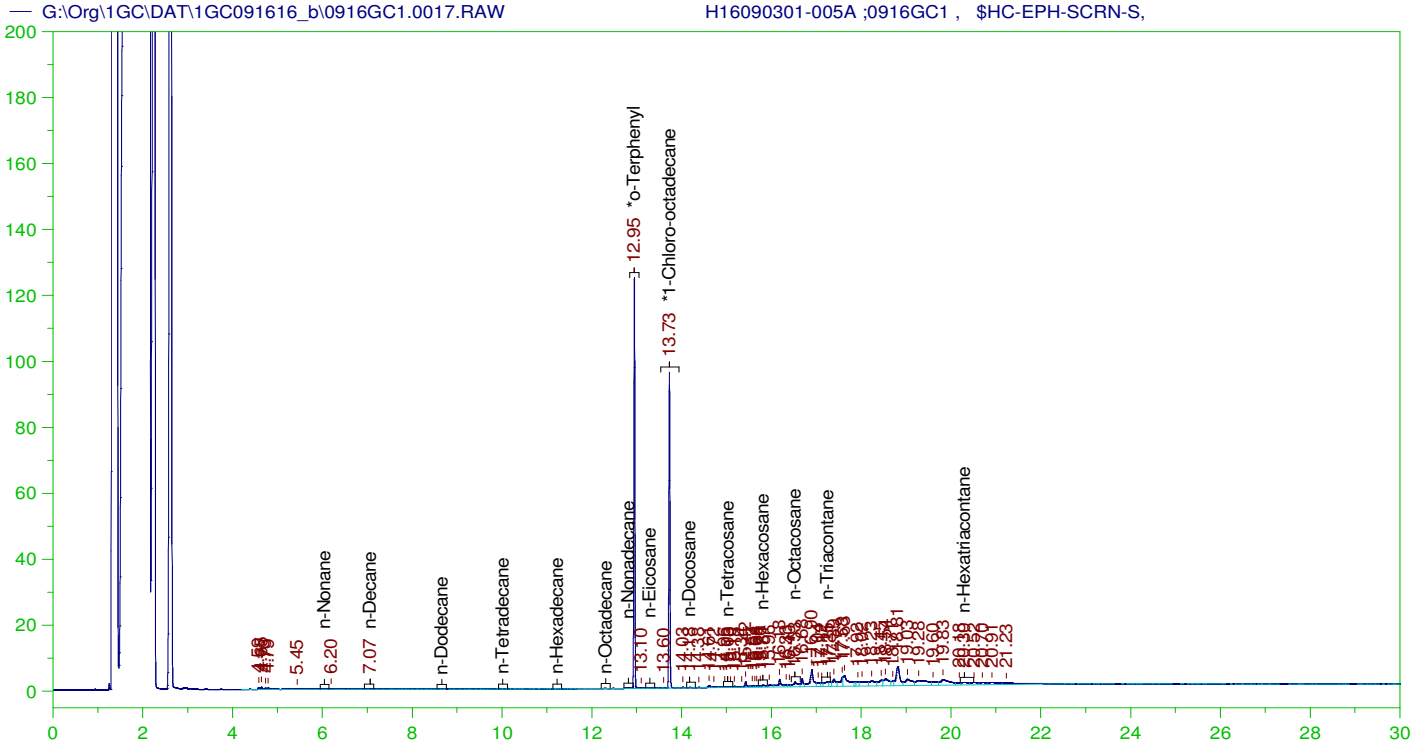
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.946 | 7.042 | 7.298 | 103.63 | - |
| *1-Chloro-octadecane | 13.728 | 7.042 | 7.5 | 106.49 | - |

DRO Area:137547.7 DRO Amount: 5.362407
TEH Area:450839.4 TEH Amount: 17.57633
C9-C18 Area:10594.33 C9-C18 Amount: 0.424708
C19-C36 Area:398050.1 C19-C36 Amount: 15.10297

**BD-20160912-01** Batch ID: 34440

— G:\Org\1GC\DAT\1GC091616_b\0916GC1.0017.RAW H16090301-005A ;0916GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-005A ;0916GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC091616_b\0916GC1.0017.RAW
Date & Time Acquired: 9/17/2016 6:37:08 AM
Method File: G:\Org\1GC\Methods\09161617.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 28.2 Dilution: 2 S.A.: 1

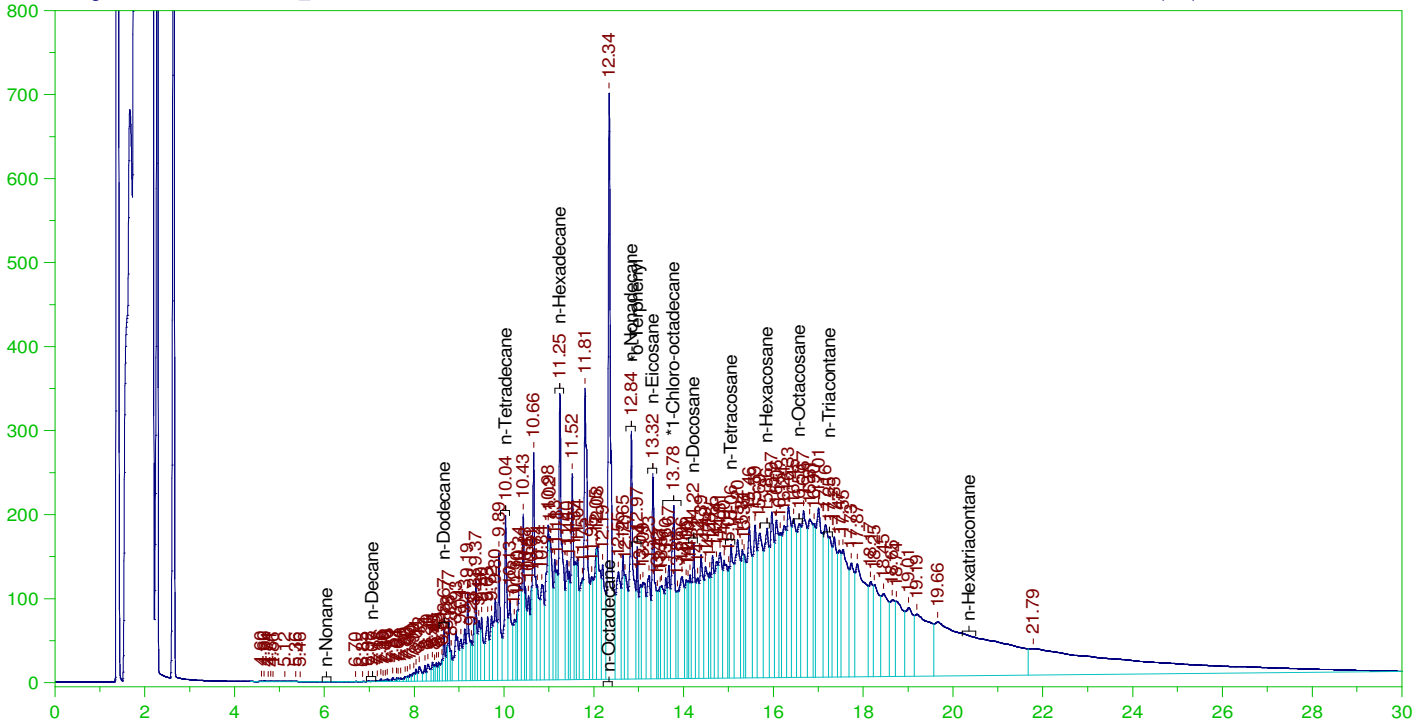
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.948 | 7.092 | 7.245 | 102.15 | - |
| *1-Chloro-octadecane | 13.73 | 7.092 | 7.502 | 105.77 | - |

DRO Area:134769.1 DRO Amount: 5.291343
TEH Area:434171.2 TEH Amount: 17.04655
C9-C18 Area:9483.281 C9-C18 Amount: 0.3828641
C19-C36 Area:374014.1 C19-C36 Amount: 14.29163

**DIAP-SRC-E (6)** Batch ID: 34440

— G:\Org\1GC\DAT\1GC092016_b\0920GC1.0008.RAW H16090301-006A ;0920GC1 , $HC-EPH-SCRN-S, ,(2,2)




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16090301-006A ;0920GC1 , $HC-EPH-SCRN-S, ,(2,2)
Raw File: G:\Org\1GC\DAT\1GC092016_b\0920GC1.0008.RAW
Date & Time Acquired: 9/20/2016 4:49:52 PM
Method File: G:\Org\1GC\Methods\09201608.MET
Calibration File: G:\Org\1GC\Cals\SR082516B.CAL
Sample Weight: 26.5 Dilution: 4 S.A.: 1

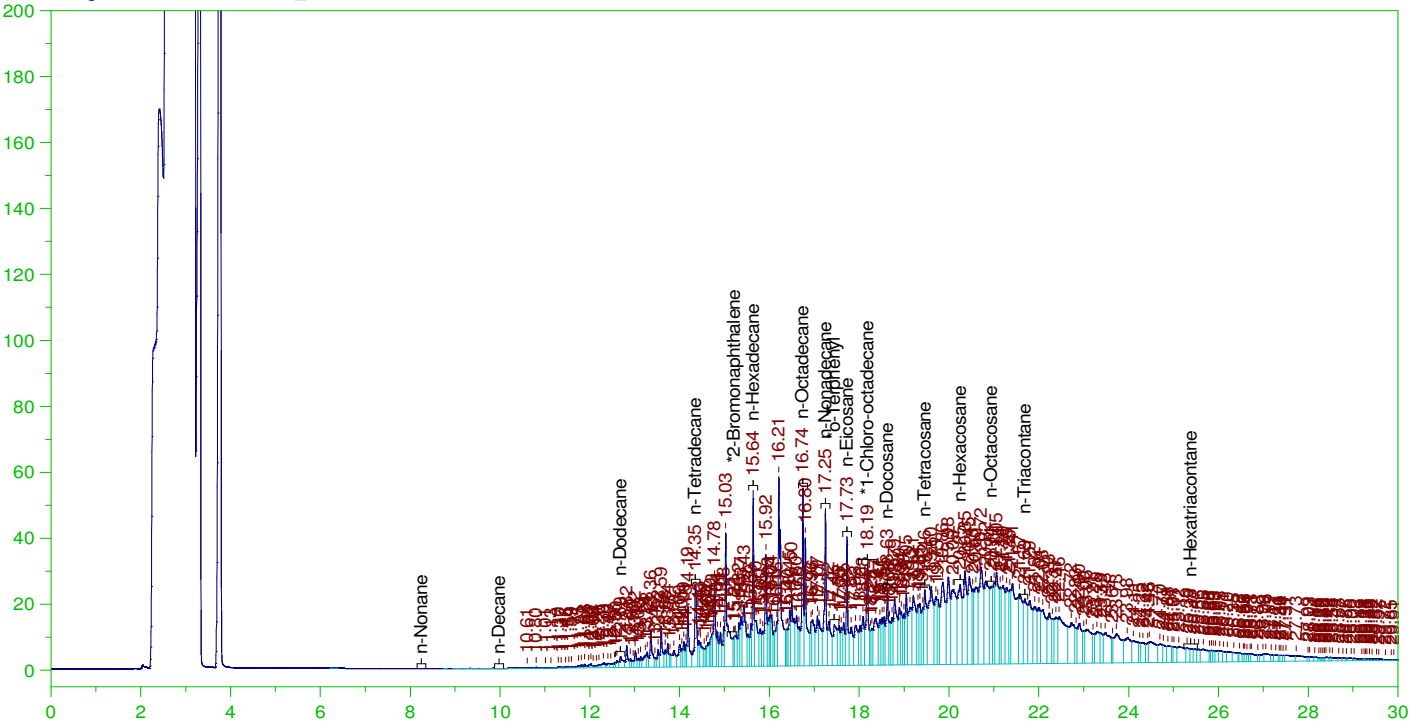
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.94 to 17.32
Rt range for C9 to C18 Hydrocarbons: 5.95 to 12.85
Rt range for C19 to C36 Hydrocarbons: 12.9 to 20.51

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.967 | 7.547 | 37.675 | 499.2 | - |
| *1-Chloro-octadecane | 13.778 | 7.547 | 99.57 | 1319.3 | - |

DRO Area:6.745095E+07 DRO Amount: 5636.337
TEH Area:9.257514E+07 TEH Amount: 7735.765
C9-C18 Area:3.025684E+07 C9-C18 Amount: 2599.817
C19-C36 Area:5.672701E+07C19-C36 Amount: 4613.355

**DIAP-SRC-E (6)** Batch ID: 34538

— G:\Org\4GC\DAT\4GC092316_b\0923GC4.0022.RAW H16090301-006A ;0923GC4 , $HC-ALI-GRP-S,




**EPH ALIPHATICS (FID) ANALYSIS REPORT**

Sample Name: H16090301-006A ;0923GC4 , $HC-ALI-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0022.RAW
Date & Time Acquired: 9/24/2016 8:02:00 AM
Method File: G:\Org\4GC\Methods\09231622.MET
Calibration File: G:\Org\4GC\Cals\AL050416H_09231610.CAL
Sample Weight: 26.5 Dilution: 10 S.A.: 1

Mean RF for C9 to C18 Aliphatic Hydrocarbons: 874.522
Mean RF for C19 to C36 Aliphatic Hydrocarbons: 910.2241
Mean RF for Total Extractable Hydrocarbons: 894.9232
Rt range for Diesel Range Organics: 9.879999 to 21.04
Rt range for C9 to C18 Aliphatic Hydrocarbons: 8.15 to 17.15
Rt range for C19 to C36 Aliphatic Hydrocarbons: 17.2 to 25.53

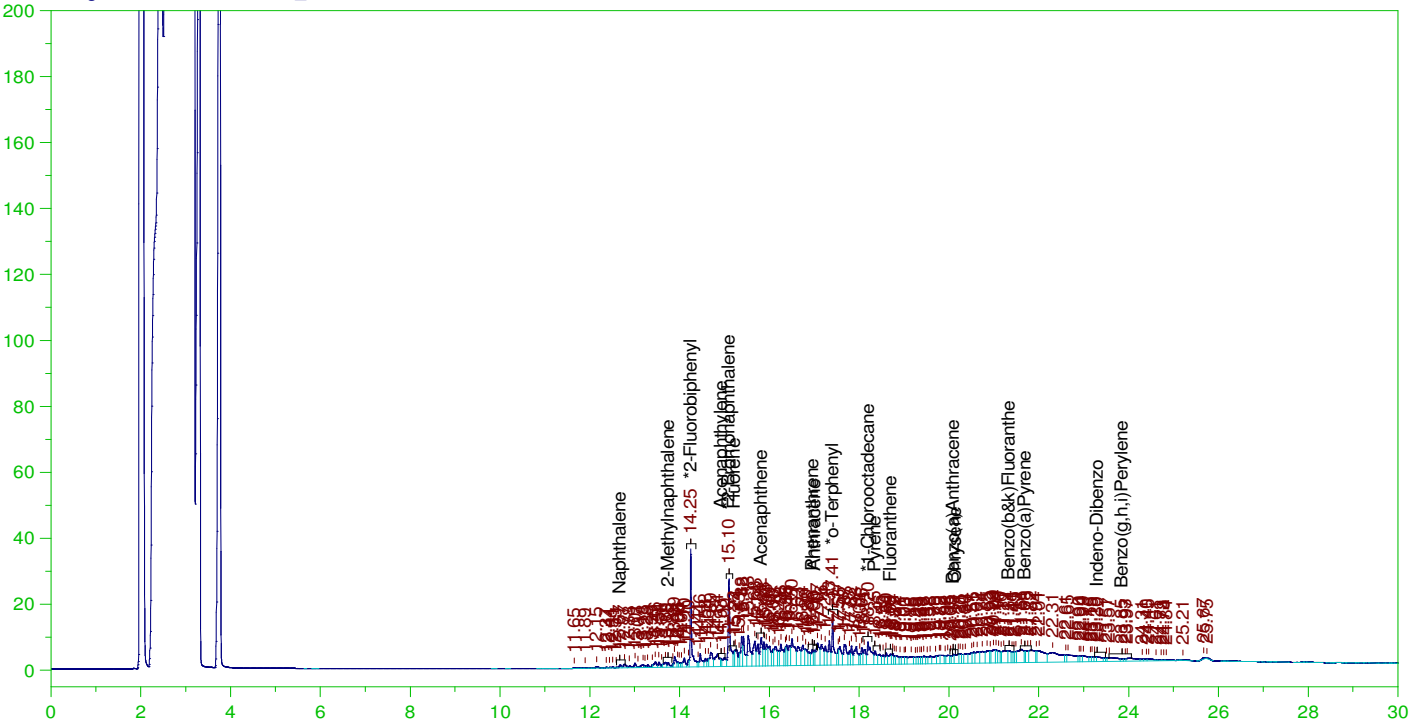
| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *1-Chloro-octadecane | 18.187 | 7.547 | 50.616 | 670.66 | - |

DRO Area:6661591 DRO Amount: 2808.965
TEH Area:1.015372E+07 TEH Amount: 4281.476

Aliphatic Hydrocarbon Areas and Amounts:
C9-C18 Area:2808927 C9-C18 Amount: 1212.059
C19-C36 Area:6899585 C19-C36 Amount: 2860.413

**DIAP-SRC-E (6)** Batch ID: 34538

— G:\Org\4GC\DAT\4GC092316_b\0923GC4.0023.RAW H16090301-006A ;0923GC4 , $HC-ARO-GRP-S,




**EPH AROMATICS RANGE VALUES (FID) ANALYSIS REPORT**

Sample Name: H16090301-006A ;0923GC4 , $HC-ARO-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0023.RAW
Date & Time Acquired: 9/24/2016 8:47:25 AM
Method File: G:\Org\4GC\Methods\09231623.MET
Calibration File: G:\Org\4GC\Cals\AR050416H_09231603.CAL
Sample Weight: 26.5 Dilution: 10 S.A.: 1

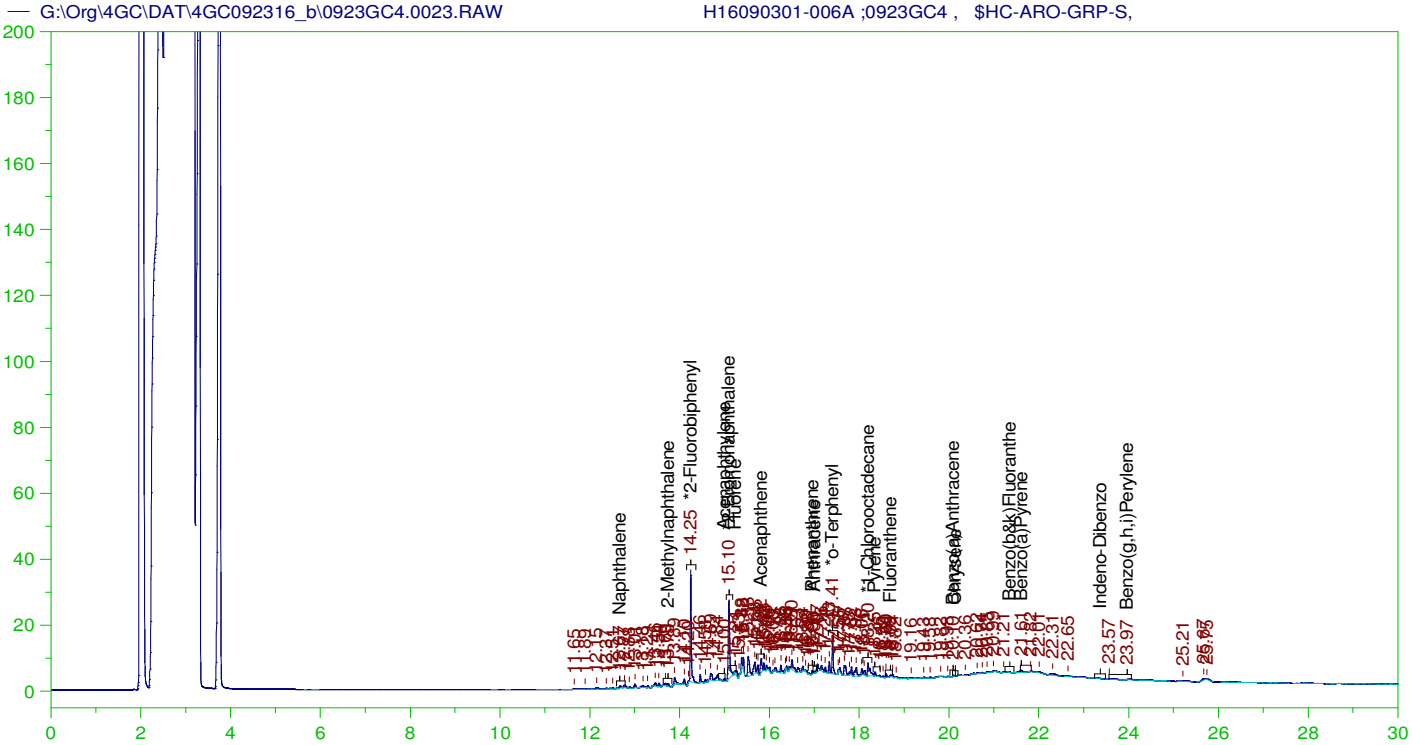
Mean RF EPH Aromatics: 977.5857
Rt range for EPH C11 to C22 Aromatics: 12.59 to 24.06

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.247 | 7.547 | 32.77 | 434.2 | - |
| *2-Bromonaphthalene | 15.098 | 7.547 | 45.719 | 605.78 | - |
| *o-Terphenyl | 17.407 | 7.547 | 18.147 | 240.45 | - |
| *1-Chlorooctadecane | 18.198 | 7.547 | 20.249 | 268.3 | - |

C11-C22 Aromatics Area:1895685 C11-C22 Aromatics Amount: 731.7546
EPH Aromatics total Area:1925332 EPH Aromatics Total Amount: 743.1987

**DIAP-SRC-E (6)** Batch ID: 34538

— G:\Org\4GC\DAT\4GC092316_b\0923GC4.0023.RAW H16090301-006A ;0923GC4 , $HC-ARO-GRP-S,




**EPH AROMATICS TARGET VALUES (FID) ANALYSIS REPORT**

Sample Name: H16090301-006A ;0923GC4 , $HC-ARO-GRP-S,
Raw File: G:\Org\4GC\DAT\4GC092316_b\0923GC4.0023.RAW
Date & Time Acquired: 9/24/2016 8:47:25 AM
Method File: G:\Org\4GC\Methods\AROQC050416H_09231603.met
Calibration File: G:\Org\4GC\Cals\AR050416H_09231603.CAL
Sample Weight: 26.5 Dilution: 10 S.A.: 1

| TARGET ANALYTES | RT | CAL RRT | RRT | AREA | AMOUNT | FLAG |
|---|---|---|---|---|---|---|
| Naphthalene | 12.671 | 2.42 | 2.427 | 2111 | .869 | |
| 2-Methylnaphthalene | 13.748 | 1.38 | 1.351 | 1927 | .78 | |
| Acenaphthylene | 14.995 | .17 | .103 | 1987 | .797 | |
| Fluorene | 15.243 | -.07 | -.144 | 3482 | 1.246 | |
| Acenaphthene | 15.819 | -.69 | -.72 | 10013 | 3.896 | |
| Phenanthrene | 16.955 | -1.85 | -1.857 | 1867 | .741 | |
| Anthracene | 17.003 | 17.003 | 17.003 | 806 | .377 | U |
| Pyrene | 18.354 | -3.28 | -3.255 | 2091 | .799 | |
| Fluoranthene | 18.695 | -3.55 | -3.596 | 1405 | .53 | |
| Benzo(a)Anthracene | 20.097 | 20.097 | 20.097 | 588 | .377 | U |
| Chrysene | . | . | . | | .377 | U |
| Benzo(b&k)Fluoranthe | . | . | . | | .755 | U |
| Benzo(a)Pyrene | 21.614 | -6.6 | -6.515 | 2657 | 1.02 | |
| Indeno-Dibenzo | . | . | . | | .755 | U |
| Benzo(g,h,i)Perylene | 23.971 | -8.7 | -8.873 | 1364 | .517 | |

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | QC LIMITS |
|---|---|---|---|---|---|
| *2-Fluorobiphenyl | 14.247 | 7.547 | 25.164 | 333.42 | 40-140 |
| *2-Bromonaphthalene | 15.098 | 7.547 | 30.082 | 398.59 | 40-140 |
| *o-Terphenyl | 17.407 | 7.547 | 7.608 | 100.81 | 40-140 |
| *1-Chlorooctadecane | 18.198 | 7.547 | 6.249 | 82.8 | 40-140 |

**Pace Analytical Services, Inc.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

## Report Prepared for:

Wanda Johnson
Energy Laboratories
PO Box 5688
Helena MT 59604

# REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

## Report Information:

**Pace Project #: 10362722**
**Sample Receipt Date: 09/16/2016**
**Client Project #: H16090301**
**Client Sub PO #: H13238**
**State Cert #: 92**

### Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Joanne Richardson, your Pace Project Manager.

### This report has been reviewed by:

Joanne Richardson

September 23, 2016

Joanne Richardson,
(612) 607-6453
(612) 607-6444 (fax)

**Report Prepared Date:**
September 23, 2016

## Report of Laboratory Analysis

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The results relate only to the samples included in this report.

**Pace Analytical Services, Inc.**
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## DISCUSSION

This report presents the results from the analyses performed on six samples submitted by a representative of Energy Laboratories, Inc. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were based on signal-to-noise measurements. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations at one-half of the reported concentrations.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The isotopically-labeled PCDD/PCDF internal standards in the sample extracts were recovered at 49-88%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates. Concentrations above the calibration range were flagged "E" and should also be regarded as estimates. Values obtained from analyses of diluted extracts were flagged "D".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain a trace level of OCDD. This level was below the calibration range of the method. The OCDD levels reported for the field samples were higher than the corresponding blank level by one or more orders of magnitude. These results indicate that the sample processing steps did not contribute signficantly to the levels reported for the field samples.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard materials. The recoveries of the native compounds ranged from 92-115%. These results were within the 70-130% target range for the method. Matrix spikes were prepared with the extraction batch using sample material from a separate project; results from these analyses will be provided upon request.



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# Minnesota Laboratory Certifications

| Authority | Certificate # | Authority | Certificate # |
|---|---|---|---|
| A2LA | 2926.01 | Mississippi | MN00064 |
| Alabama | 40770 | Montana | 92 |
| Alaska | MN00064 | Nebraska | NE-OS-18-06 |
| Arizona | AZ0014 | Nevada | MN_00064_200 |
| Arkansas | 88-0680 | New Jersey (NE | MN002 |
| California | 01155CA | New York (NEL | 11647 |
| Colorado | MN00064 | North Carolina | 27700 |
| Connecticut | PH-0256 | North Dakota | R-036 |
| EPA Region 8 | 8TMS-Q | Ohio | 4150 |
| Florida (NELAP | E87605 | Oklahoma | D9922 |
| Georgia (DNR) | 959 | Oregon (ELAP) | MN200001-005 |
| Guam | 959 | Oregon (OREL | MN300001-001 |
| Hawaii | SLD | Pennsylvania | 68-00563 |
| Idaho | MN00064 | Puerto Rico | MN00064 |
| Illinois | 200012 | Saipan | MP0003 |
| Indiana | C-MN-01 | South Carolina | 74003001 |
| Indiana | C-MN-01 | Tennessee | TN02818 |
| Iowa | 368 | Texas | T104704192-08 |
| Kansas | E-10167 | Utah (NELAP) | MN00064 |
| Kentucky | 90062 | Virginia | 00251 |
| Louisiana | 03086 | Washington | C755 |
| Maine | 2007029 | West Virginia # | 9952C |
| Maryland | 322 | West Virginia D | 382 |
| Michigan | 9909 | Wisconsin | 999407970 |
| Minnesota | 027-053-137 | Wyoming | 8TMS-Q |

## REPORT OF LABORATORY ANALYSIS

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# Appendix A

Sample Management

**Energy Laboratories Inc**
3161 East Lyndale Avenue
Helena, MT 59601
(406) 442-0711

H16090301

# CHAIN-OF-CUSTODY RECORD


15-Sep-16

10362722

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

**Subcontractor:**
Pace Analytical-Minneapolis
1700 Elm St, Ste 200
Minneapolis, MN 55414
TEL: (612) 607-6331 FAX:
Acct #:

**Subcontractor's Client:**

Requested Tests

| Rush | Sample ID | Matrix | Collection Date | Bottle Type | DIOXIN-S-FULL-829 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | H16090301-001B | Soil | 09/12/16 09:00 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 001 |
| ☐ | H16090301-002B | Soil | 09/12/16 09:05 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 002 |
| ☐ | H16090301-003B | Soil | 09/12/16 09:30 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 003 |
| ☐ | H16090301-004B | Soil | 09/12/16 09:35 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 004 |
| ☐ | H16090301-005B | Soil | 09/12/16 09:40 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 005 |
| ☐ | H16090301-006B | Soil | 09/12/16 10:30 A | 1-4OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 006 |

**Earliest Due Date:** 9/23/2016

**Comments:** PO# H13238. Please send results to wjohnson@energylab.com

QC Level:
**STD**

| | Date/Time | | |
|---|---|---|---|
| **Relinquished by:** | | **Received by:** | PACE 9-16-16 09:30 |
| **Relinquished by:** | 9/15/16 9:42 | **Received by:** | T=4.4 |

| Pace Analytical | Document Name: **Sample Condition Upon Receipt Form** | Document Revised: 02Aug2016 Page 1 of 2 |
|---|---|---|
| | Document No.: **F-MN-L-213-rev.17** | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Energy Lab

**Project #:** WO#: 10362722

10362722

**Courier:** ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

**Tracking Number:** 1Z 376 W9 70 1559 9 4035

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☐ 151401163 ☐ B88A912167504 ☐ ~~151401164~~ ☐ B88A0143310098 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 4.5 **Cooler Temp Corrected (°C):** 4.4 **Biological Tissue Frozen?** ☐ Yes ☑ No ☐ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.1 **Date and Initials of Person Examining Contents:** 9-19-16

**USDA Regulated Soil** ( ☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☐ Yes | ☑ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☑ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☑ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☐ Yes | ☑ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☑ N/A | 11. Note if sediment is visible in the dissolved container |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL | ☐ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☑ N/A | 13. ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) | ☐ Yes | ☐ No | ☑ N/A | |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC | ☐ Yes | ☐ No | ☑ N/A | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** Nathan Boberg **Date:** 9/19/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers).

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# Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion



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# Appendix B

Sample Analysis  Summary

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-001B | | |
| Lab Sample ID | 10362722001 | | |
| Filename | Y160922A_11 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.1 g | Matrix | Soil |
| % Moisture | 11.8 | Dilution | NA |
| Dry Weight Extracted | 9.79 g | Collected | 09/12/2016 09:00 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 17:00 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.98 | ----- | 0.27 | J | 2,3,7,8-TCDF-13C | 2.00 | 69 |
| Total TCDF | 58.00 | ----- | 0.27 | | 2,3,7,8-TCDD-13C | 2.00 | 82 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 63 |
| 2,3,7,8-TCDD | ----- | 0.30 | 0.25 | IJ | 2,3,4,7,8-PeCDF-13C | 2.00 | 58 |
| Total TCDD | 7.30 | ----- | 0.25 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 67 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 71 |
| 1,2,3,7,8-PeCDF | 4.50 | ----- | 0.17 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 67 |
| 2,3,4,7,8-PeCDF | 5.60 | ----- | 0.13 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 68 |
| Total PeCDF | 300.00 | ----- | 0.15 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 70 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 |
| 1,2,3,7,8-PeCDD | 5.50 | ----- | 0.16 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 63 |
| Total PeCDD | 77.00 | ----- | 0.16 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 61 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 64 |
| 1,2,3,4,7,8-HxCDF | 29.00 | ----- | 0.35 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 71 |
| 1,2,3,6,7,8-HxCDF | 47.00 | ----- | 0.38 | | OCDD-13C | 4.00 | 59 |
| 2,3,4,6,7,8-HxCDF | 49.00 | ----- | 0.44 | | | | |
| 1,2,3,7,8,9-HxCDF | 4.10 | ----- | 0.31 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 1100.00 | ----- | 0.37 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 20.00 | ----- | 0.60 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 80 |
| 1,2,3,6,7,8-HxCDD | 61.00 | ----- | 0.53 | | | | |
| 1,2,3,7,8,9-HxCDD | 41.00 | ----- | 0.47 | | | | |
| Total HxCDD | 560.00 | ----- | 0.54 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1100.00 | ----- | 0.69 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 45.00 | ----- | 0.70 | | Equivalence: 65 ng/Kg | | |
| Total HpCDF | 2600.00 | ----- | 0.70 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 1700.00 | ----- | 0.25 | | | | |
| Total HpCDD | 2900.00 | ----- | 0.25 | | | | |
| OCDF | 2600.00 | ----- | 0.33 | | | | |
| OCDD | 12000.00 | ----- | 0.27 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
E = Exceeds calibration range
I = Interference present

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Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-002B | | |
| Lab Sample ID | 10362722002 | | |
| Filename | Y160922A_13 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 6.9 | Dilution | 10 |
| Dry Weight Extracted | 10.5 g | Collected | 09/12/2016 09:05 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 18:26 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 4.5 | ----- | 2.30 | JD | 2,3,7,8-TCDF-13C | 2.00 | 64 | D |
| Total TCDF | 270.0 | ----- | 2.30 | D | 2,3,7,8-TCDD-13C | 2.00 | 74 | D |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 55 | D |
| 2,3,7,8-TCDD | ND | ----- | 2.10 | D | 2,3,4,7,8-PeCDF-13C | 2.00 | 53 | D |
| Total TCDD | 18.0 | ----- | 2.10 | D | 1,2,3,7,8-PeCDD-13C | 2.00 | 60 | D |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 64 | D |
| 1,2,3,7,8-PeCDF | 22.0 | ----- | 1.30 | JD | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 66 | D |
| 2,3,4,7,8-PeCDF | 28.0 | ----- | 0.89 | JD | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 63 | D |
| Total PeCDF | 1600.0 | ----- | 1.10 | D | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 69 | D |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 | D |
| 1,2,3,7,8-PeCDD | 26.0 | ----- | 1.20 | JD | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 57 | D |
| Total PeCDD | 390.0 | ----- | 1.20 | D | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 63 | D |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 | D |
| 1,2,3,4,7,8-HxCDF | 160.0 | ----- | 2.80 | D | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 76 | D |
| 1,2,3,6,7,8-HxCDF | 230.0 | ----- | 2.30 | D | OCDD-13C | 4.00 | 67 | D |
| 2,3,4,6,7,8-HxCDF | 240.0 | ----- | 3.20 | D | | | | |
| 1,2,3,7,8,9-HxCDF | 22.0 | ----- | 3.60 | JD | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 5500.0 | ----- | 3.00 | D | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 83.0 | ----- | 4.20 | D | 2,3,7,8-TCDD-37Cl4 | 0.20 | 71 | D |
| 1,2,3,6,7,8-HxCDD | 350.0 | ----- | 4.60 | D | | | | |
| 1,2,3,7,8,9-HxCDD | 200.0 | ----- | 3.70 | D | | | | |
| Total HxCDD | 2900.0 | ----- | 4.10 | D | | | | |
| 1,2,3,4,6,7,8-HpCDF | 5700.0 | ----- | 2.60 | D | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 210.0 | ----- | 4.80 | D | Equivalence: 330 ng/Kg | | | |
| Total HpCDF | 13000.0 | ----- | 3.70 | D | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 8500.0 | ----- | 1.70 | D | | | | |
| Total HpCDD | 15000.0 | ----- | 1.70 | D | | | | |
| OCDF | 12000.0 | ----- | 2.50 | D | | | | |
| OCDD | 53000.0 | ----- | 3.50 | D | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
D = Result obtained from analysis of diluted sample

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-003B | | |
| Lab Sample ID | 10362722003 | | |
| Filename | Y160922A_09 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 5.4 | Dilution | NA |
| Dry Weight Extracted | 10.7 g | Collected | 09/12/2016 09:30 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 15:35 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.45 | ----- | 0.290 | J | 2,3,7,8-TCDF-13C | 2.00 | 69 |
| Total TCDF | 13.00 | ----- | 0.290 | | 2,3,7,8-TCDD-13C | 2.00 | 83 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 67 |
| 2,3,7,8-TCDD | ND | ----- | 0.220 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 63 |
| Total TCDD | 0.80 | ----- | 0.220 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 73 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | 1.90 | ----- | 0.110 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 66 |
| 2,3,4,7,8-PeCDF | 4.10 | ----- | 0.120 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 68 |
| Total PeCDF | 75.00 | ----- | 0.110 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 71 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 70 |
| 1,2,3,7,8-PeCDD | 1.10 | ----- | 0.150 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 62 |
| Total PeCDD | 6.90 | ----- | 0.150 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 64 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 |
| 1,2,3,4,7,8-HxCDF | 9.50 | ----- | 0.210 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 76 |
| 1,2,3,6,7,8-HxCDF | 9.30 | ----- | 0.280 | | OCDD-13C | 4.00 | 66 |
| 2,3,4,6,7,8-HxCDF | 14.00 | ----- | 0.240 | | | | |
| 1,2,3,7,8,9-HxCDF | 4.30 | ----- | 0.190 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 360.00 | ----- | 0.230 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 4.00 | ----- | 0.420 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 75 |
| 1,2,3,6,7,8-HxCDD | 29.00 | ----- | 0.470 | | | | |
| 1,2,3,7,8,9-HxCDD | 7.20 | ----- | 0.180 | | | | |
| Total HxCDD | 120.00 | ----- | 0.350 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 400.00 | ----- | 0.740 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 23.00 | ----- | 1.000 | | Equivalence: 23 ng/Kg | | |
| Total HpCDF | 1300.00 | ----- | 0.870 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 610.00 | ----- | 0.092 | | | | |
| Total HpCDD | 1000.00 | ----- | 0.092 | | | | |
| OCDF | 1900.00 | ----- | 0.570 | | | | |
| OCDD | 4800.00 | ----- | 0.430 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-004B | | |
| Lab Sample ID | 10362722004 | | |
| Filename | Y160922A_10 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 6.0 | Dilution | NA |
| Dry Weight Extracted | 10.6 g | Collected | 09/12/2016 09:35 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 16:18 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.200 | | 2,3,7,8-TCDF-13C | 2.00 | 73 |
| Total TCDF | 8.30 | ----- | 0.200 | | 2,3,7,8-TCDD-13C | 2.00 | 88 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 69 |
| 2,3,7,8-TCDD | ND | ----- | 0.320 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 67 |
| Total TCDD | 0.35 | ----- | 0.320 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 76 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 72 |
| 1,2,3,7,8-PeCDF | 0.83 | ----- | 0.170 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 70 |
| 2,3,4,7,8-PeCDF | 1.80 | ----- | 0.099 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 71 |
| Total PeCDF | 47.00 | ----- | 0.140 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 75 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDD | 0.90 | ----- | 0.120 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 69 |
| Total PeCDD | 4.50 | ----- | 0.120 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 67 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 72 |
| 1,2,3,4,7,8-HxCDF | 5.70 | ----- | 0.190 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 76 |
| 1,2,3,6,7,8-HxCDF | 6.50 | ----- | 0.190 | | OCDD-13C | 4.00 | 63 |
| 2,3,4,6,7,8-HxCDF | 8.90 | ----- | 0.240 | | | | |
| 1,2,3,7,8,9-HxCDF | 2.20 | ----- | 0.280 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 220.00 | ----- | 0.220 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 2.70 | ----- | 0.110 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 83 |
| 1,2,3,6,7,8-HxCDD | 12.00 | ----- | 0.140 | | | | |
| 1,2,3,7,8,9-HxCDD | 5.90 | ----- | 0.200 | | | | |
| Total HxCDD | 63.00 | ----- | 0.150 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 250.00 | ----- | 0.860 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 16.00 | ----- | 0.790 | | Equivalence: 13 ng/Kg | | |
| Total HpCDF | 800.00 | ----- | 0.820 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 310.00 | ----- | 0.180 | | | | |
| Total HpCDD | 510.00 | ----- | 0.180 | | | | |
| OCDF | 1200.00 | ----- | 0.470 | | | | |
| OCDD | 2400.00 | ----- | 0.400 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16090301-005B | | |
| Lab Sample ID | 10362722005 | | |
| Filename | Y160922A_12 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 11.3 g | Matrix | Soil |
| % Moisture | 5.7 | Dilution | NA |
| Dry Weight Extracted | 10.7 g | Collected | 09/12/2016 09:40 |
| ICAL ID | Y160816A | Received | 09/16/2016 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 17:43 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 2.7 | ----- | 0.30 | | 2,3,7,8-TCDF-13C | 2.00 | 73 |
| Total TCDF | 48.0 | ----- | 0.30 | | 2,3,7,8-TCDD-13C | 2.00 | 86 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 70 |
| 2,3,7,8-TCDD | ND | ----- | 0.30 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 66 |
| Total TCDD | 3.8 | ----- | 0.30 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 75 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 76 |
| 1,2,3,7,8-PeCDF | 8.1 | ----- | 0.26 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 73 |
| 2,3,4,7,8-PeCDF | 20.0 | ----- | 0.31 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 73 |
| Total PeCDF | 370.0 | ----- | 0.28 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 76 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 72 |
| 1,2,3,7,8-PeCDD | 5.8 | ----- | 0.19 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 70 |
| Total PeCDD | 38.0 | ----- | 0.19 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 72 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 77 |
| 1,2,3,4,7,8-HxCDF | 56.0 | ----- | 0.51 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 85 |
| 1,2,3,6,7,8-HxCDF | 48.0 | ----- | 0.56 | | OCDD-13C | 4.00 | 82 |
| 2,3,4,6,7,8-HxCDF | 76.0 | ----- | 0.73 | | | | |
| 1,2,3,7,8,9-HxCDF | 25.0 | ----- | 1.40 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 2300.0 | ----- | 0.81 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 17.0 | ----- | 0.45 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 81 |
| 1,2,3,6,7,8-HxCDD | 150.0 | ----- | 0.60 | | | | |
| 1,2,3,7,8,9-HxCDD | 44.0 | ----- | 0.46 | | | | |
| Total HxCDD | 540.0 | ----- | 0.50 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 2800.0 | ----- | 0.22 | E | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 160.0 | ----- | 0.25 | | Equivalence: 130 ng/Kg | | |
| Total HpCDF | 10000.0 | ----- | 0.23 | E | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | 3300.0 | ----- | 0.21 | E | | | |
| Total HpCDD | 5100.0 | ----- | 0.21 | E | | | |
| OCDF | 16000.0 | ----- | 0.28 | E | | | |
| OCDD | 25000.0 | ----- | 0.30 | E | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
E = Exceeds calibration range

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# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | | |
|---|---|---|---|---|
| Client's Sample ID | H16090301-006B | | | |
| Lab Sample ID | 10362722006 | | | |
| Filename | Y160922A_14 | | | |
| Injected By | SMT | | | |
| Total Amount Extracted | 12.2 g | Matrix | Soil | |
| % Moisture | 11.8 | Dilution | 50 | |
| Dry Weight Extracted | 10.8 g | Collected | 09/12/2016 | 10:30 |
| ICAL ID | Y160816A | Received | 09/16/2016 | 09:30 |
| CCal Filename(s) | Y160922A_01 & Y160922A_18 | Extracted | 09/19/2016 | 17:10 |
| Method Blank ID | BLANK-52027 | Analyzed | 09/22/2016 | 19:09 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery | |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 69 | ----- | 7.9 | D | 2,3,7,8-TCDF-13C | 2.00 | 67 | D |
| Total TCDF | 630 | ----- | 7.9 | D | 2,3,7,8-TCDD-13C | 2.00 | 80 | D |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 53 | D |
| 2,3,7,8-TCDD | ND | ----- | 10.0 | D | 2,3,4,7,8-PeCDF-13C | 2.00 | 49 | D |
| Total TCDD | 78 | ----- | 10.0 | D | 1,2,3,7,8-PeCDD-13C | 2.00 | 58 | D |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 76 | D |
| 1,2,3,7,8-PeCDF | 220 | ----- | 16.0 | JD | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 85 | D |
| 2,3,4,7,8-PeCDF | 590 | ----- | 8.7 | D | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 73 | D |
| Total PeCDF | 5300 | ----- | 12.0 | D | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 68 | D |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 67 | D |
| 1,2,3,7,8-PeCDD | 39 | ----- | 6.7 | JD | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 68 | D |
| Total PeCDD | 410 | ----- | 6.7 | D | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 72 | D |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 | D |
| 1,2,3,4,7,8-HxCDF | 1100 | ----- | 19.0 | D | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 85 | D |
| 1,2,3,6,7,8-HxCDF | 330 | ----- | 14.0 | D | OCDD-13C | 4.00 | 85 | D |
| 2,3,4,6,7,8-HxCDF | 990 | ----- | 18.0 | D | | | | |
| 1,2,3,7,8,9-HxCDF | 700 | ----- | 36.0 | D | 1,2,3,4-TCDD-13C | 2.00 | NA | |
| Total HxCDF | 44000 | ----- | 22.0 | D | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA | |
| 1,2,3,4,7,8-HxCDD | 140 | ----- | 22.0 | JD | 2,3,7,8-TCDD-37Cl4 | 0.20 | 89 | D |
| 1,2,3,6,7,8-HxCDD | 4400 | ----- | 18.0 | D | | | | |
| 1,2,3,7,8,9-HxCDD | 470 | ----- | 18.0 | D | | | | |
| Total HxCDD | 12000 | ----- | 19.0 | D | | | | |
| 1,2,3,4,6,7,8-HpCDF | 41000 | ----- | 6.0 | D | Total 2,3,7,8-TCDD | | | |
| 1,2,3,4,7,8,9-HpCDF | 3300 | ----- | 11.0 | D | Equivalence: 2700 ng/Kg | | | |
| Total HpCDF | 260000 | ----- | 8.4 | ED | (Using 2005 WHO Factors - Using PRL/2 where ND) | | | |
| 1,2,3,4,6,7,8-HpCDD | 86000 | ----- | 7.0 | D | | | | |
| Total HpCDD | 130000 | ----- | 7.0 | D | | | | |
| OCDF | 370000 | ----- | 12.0 | ED | | | | |
| OCDD | 680000 | ----- | 15.0 | ED | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample

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# Method 8290 Blank Analysis Results

| | | | |
|---|---|---|---|
| Lab Sample ID | BLANK-52027 | Matrix | Solid |
| Filename | Y160921B_07 | Dilution | NA |
| Total Amount Extracted | 11.3 g | Extracted | 09/19/2016 17:10 |
| ICAL ID | Y160816A | Analyzed | 09/22/2016 01:40 |
| CCal Filename(s) | Y160921A_17 & Y160921B_17 | Injected By | SMT |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.073 | | 2,3,7,8-TCDF-13C | 2.00 | 70 |
| Total TCDF | ND | ----- | 0.073 | | 2,3,7,8-TCDD-13C | 2.00 | 86 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 62 |
| 2,3,7,8-TCDD | ND | ----- | 0.064 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 56 |
| Total TCDD | ND | ----- | 0.064 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 69 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 69 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.056 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 69 |
| 2,3,4,7,8-PeCDF | ND | ----- | 0.038 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 70 |
| Total PeCDF | ND | ----- | 0.047 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 70 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 70 |
| 1,2,3,7,8-PeCDD | ND | ----- | 0.160 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 71 |
| Total PeCDD | ND | ----- | 0.160 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 66 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 67 |
| 1,2,3,4,7,8-HxCDF | ND | ----- | 0.035 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 73 |
| 1,2,3,6,7,8-HxCDF | ND | ----- | 0.042 | | OCDD-13C | 4.00 | 53 |
| 2,3,4,6,7,8-HxCDF | ND | ----- | 0.038 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.054 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | ND | ----- | 0.042 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ND | ----- | 0.110 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 79 |
| 1,2,3,6,7,8-HxCDD | ND | ----- | 0.130 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | ----- | 0.097 | | | | |
| Total HxCDD | ND | ----- | 0.110 | | | | |
| 1,2,3,4,6,7,8-HpCDF | ND | ----- | 0.065 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | ND | ----- | 0.100 | | Equivalence: 0.15 ng/Kg | | |
| Total HpCDF | ND | ----- | 0.085 | | (Using 2005 WHO Factors - Using PRL/2 where ND) | | |
| 1,2,3,4,6,7,8-HpCDD | ND | ----- | 0.190 | | | | |
| Total HpCDD | ND | ----- | 0.190 | | | | |
| OCDF | ND | ----- | 0.170 | | | | |
| OCDD | 0.40 | ----- | 0.280 | J | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value

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# Method 8290 Laboratory Control Spike Results

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-52028 | | |
| Filename | Y160921B_03 | Matrix | Solid |
| Total Amount Extracted | 10.6 g | Dilution | NA |
| ICAL ID | Y160816A | Extracted | 09/19/2016 17:10 |
| CCal Filename(s) | Y160921A_17 & Y160921B_17 | Analyzed | 09/21/2016 22:49 |
| Method Blank ID | BLANK-52027 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.21 | 106 | 2,3,7,8-TCDF-13C | 2.0 | 69 |
| Total TCDF | | | | 2,3,7,8-TCDD-13C | 2.0 | 86 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.0 | 63 |
| 2,3,7,8-TCDD | 0.20 | 0.18 | 92 | 2,3,4,7,8-PeCDF-13C | 2.0 | 58 |
| Total TCDD | | | | 1,2,3,7,8-PeCDD-13C | 2.0 | 69 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.0 | 71 |
| 1,2,3,7,8-PeCDF | 1.0 | 1.0 | 103 | 1,2,3,6,7,8-HxCDF-13C | 2.0 | 71 |
| 2,3,4,7,8-PeCDF | 1.0 | 1.1 | 109 | 2,3,4,6,7,8-HxCDF-13C | 2.0 | 70 |
| Total PeCDF | | | | 1,2,3,7,8,9-HxCDF-13C | 2.0 | 72 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.0 | 70 |
| 1,2,3,7,8-PeCDD | 1.0 | 0.96 | 96 | 1,2,3,6,7,8-HxCDD-13C | 2.0 | 69 |
| Total PeCDD | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.0 | 66 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.0 | 64 |
| 1,2,3,4,7,8-HxCDF | 1.0 | 1.1 | 107 | 1,2,3,4,6,7,8-HpCDD-13C | 2.0 | 72 |
| 1,2,3,6,7,8-HxCDF | 1.0 | 1.0 | 101 | OCDD-13C | 4.0 | 51 |
| 2,3,4,6,7,8-HxCDF | 1.0 | 0.99 | 99 | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | 0.95 | 95 | 1,2,3,4-TCDD-13C | 2.0 | NA |
| Total HxCDF | | | | 1,2,3,7,8,9-HxCDD-13C | 2.0 | NA |
| 1,2,3,4,7,8-HxCDD | 1.0 | 1.1 | 115 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 81 |
| 1,2,3,6,7,8-HxCDD | 1.0 | 1.2 | 115 | | | |
| 1,2,3,7,8,9-HxCDD | 1.0 | 1.1 | 114 | | | |
| Total HxCDD | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.0 | 1.0 | 103 | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.0 | 1.1 | 106 | | | |
| Total HpCDF | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.0 | 1.0 | 103 | | | |
| Total HpCDD | | | | | | |
| OCDF | 2.0 | 2.2 | 108 | | | |
| OCDD | 2.0 | 2.2 | 111 | | | |

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

# Work Order Receipt Checklist

## Trihydro-Laramie

## H16090301

Login completed by: Tracy L. Lorash
Reviewed by: BL2000\rwilliams
Reviewed Date: 9/18/2016

Date Received: 9/14/2016
Received by: bjs
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: | °C See comments | | |
| 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:

We are not analyzing for metals on any of the samples and we are only analyzing PAH on the samples with (0-2) in the depth per Andrew.
No collection time on COC or sample jars for BD-20160912-01. Estimated collection time in the laboratory.
Cooler 1 was received at 2.4°C, Cooler 2 at 1.0°C, Cooler 3 at 1.6°C, Cooler 4 at 0.7°C. Samples were received on wet ice. tl 9/15/16 Fractionate samples over the MCL with pah's, sample DIAP-S-North-01 (0-2) is without pah's, DIAP-SRC-E (6) fractionate with 8270 LL PAHs per A. Vann. wj 9/22/16

ENERGY LABORATORIES

# Chain of Custody and Analytical Request Record



**PLEASE PRINT (Provide as much information as possible.)**

| Company Name: | Project Name, PWS, Permit, Etc. | Sample Origin | EPA/State Compliance: |
|---|---|---|---|
| Trihydro | Diamond P Ranch | State: MT | Yes ☐ No ☐ |

Report Mail Address (Required): 1252 Commerce Dr, Laramie, WY 82070

Contact Name: Andrew Vonna Phone/Fax: 307 745 7474 Cell:

Sampler: (Please Print) L. Darrell

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order:

☐ No Hard Copy Email: avonna@trihydro.com

Invoice Address (Required):

☐ No Hard Copy Email: apa@trihydro.com

Special Report/Formats:

☐ DW ☐ POTW/WWTP ☐ State: _____ ☐ Other: _____

☒ EDD/EDT (Electronic Data) Format: Trihydro

☐ LEVEL IV ☐ NELAC

ANALYSIS REQUESTED

SEE ATTACHED

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand del / FedEx

Cooler ID(s): Y

Receipt Temp: See comm.

On Ice: Y N

Custody Seal: On Bottle Y N; On Cooler Y N

Intact Y N

Signature Match Y N

| | SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX (Number of Containers; Sample Type: A W S V B O DW; Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water) | PCP 8151 | EPH | PAH 8270C | Metals (RCRA 8) 6020 | Dissolved Metals 8240 | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIAP-SS-N-F (3.0) | 9/12/16 | 0900 | Soil | X | X | X | X | X | | | | | | 1 = 2.4 +b |
| 2 | DIAP-S-NORTH-01 (0-2) | 9/12/16 | 0905 | | X | X | X | X | X | | | | | | 2 = 1.0 +b |
| 3 | DIAP-S-SOUTH-01 (0-2) | 9/12/16 | 0930 | | X | X | X | X | X | | | | | | 3 = 1.6 +b |
| 4 | DIAP-SS-S-F (2.0) | 9/12/16 | 0935 | | X | X | X | X | X | | | | | | 4 = 0.7 +b |
| 5 | BD-20160912-01 | 9/12/16 | — | | X | X | X | X | X | | | | | | |
| 6 | DIAP-SRC-E (6) | 9/12/16 | 1030 | | X | X | X | X | X | | | | | | |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |

LABORATORY USE ONLY H16090301

**Custody Record MUST be Signed**

| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
|---|---|---|---|---|---|
| L. Darrell | 9/13/16 1930 | | | | |
| Relinquished by (print): | Date/Time: | Signature: | Received by (print): | Date/Time: | Signature: |
| | | | Received by Laboratory: B. Seher | Date/Time: 9/14/16 9:30 | Signature: Brandy Seher |

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.

# ANALYTICAL SUMMARY REPORT

December 12, 2016

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H16110260 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 5 samples for Trihydro-Laramie on 11/15/2016 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H16110260-001 | DIAP-3-S-East (0-2) | 11/12/16 9:20 | 11/15/16 | Soil | Metals by ICP/ICPMS, Total<br>Mercury in Solid By CVAA<br>Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>Hydrocarbons, Extractable<br>Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Digestion, Total Metals<br>Digestion, Mercury by CVAA<br>Sonication Extraction<br>Soil Preparation<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16110260-002 | DIAP-3-S-North (0-2) | 11/12/16 9:25 | 11/15/16 | Soil | Metals by ICP/ICPMS, Total<br>Mercury in Solid By CVAA<br>Dioxin<br>EPH-Ultrasonic Extraction<br>Methanol Extraction for Volatiles<br>Hydrocarbons, Extractable<br>Petroleum-Scrn<br>8151-Herbicides, Chlorinated<br>Moisture<br>Digestion, Total Metals<br>Digestion, Mercury by CVAA<br>Sonication Extraction<br>Soil Sonication Extraction<br>Semi-Volatile Organic Compounds, PAHs Low Level |
| H16110260-003 | DIAP-3-S-West (0-2) | 11/12/16 9:30 | 11/15/16 | Soil | Same As Above |
| H16110260-004 | DIAP-3-SS-F (2.0) | 11/12/16 9:35 | 11/15/16 | Soil | Same As Above |
| H16110260-005 | BD-20161112-01 | 11/12/16 9:40 | 11/15/16 | 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Work Order:** H16110260

**Report Date:** 12/12/16

# 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16110260-001
**Client Sample ID:** DIAP-3-S-East (0-2)

**Report Date:** 12/12/16
**Collection Date:** 11/12/16 09:20
**DateReceived:** 11/15/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 17.6 | wt% | | 0.2 | | SW3550C | 11/16/16 16:00 / tjb |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 5 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:21 / dck |
| Barium | 125 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:21 / dck |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:21 / dck |
| Chromium | 21 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:21 / dck |
| Lead | 12 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:21 / dck |
| Selenium | 1 | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:21 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:21 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 11/23/16 16:50 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 17 | mg/kg-dry | | 12 | 200 | SW8015M | 11/18/16 18:52 / JRS |
| Surr: o-Terphenyl | 79.0 | %REC | | 40-140 | | SW8015M | 11/18/16 18:52 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Anthracene | 0.019 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Benzo(a)anthracene | 0.030 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Benzo(a)pyrene | 0.086 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Benzo(b)fluoranthene | 0.20 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Benzo(g,h,i)perylene | 0.073 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Benzo(k)fluoranthene | 0.10 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Chrysene | 0.10 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Dibenzo(a,h)anthracene | 0.023 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Fluoranthene | 0.058 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.090 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Phenanthrene | 0.013 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Pyrene | 0.053 | mg/kg-dry | | 0.0041 | | SW8270C | 11/29/16 01:29 / eli-b |
| Surr: 2-Fluorobiphenyl | 68.0 | %REC | | 47-110 | | SW8270C | 11/29/16 01:29 / eli-b |
| Surr: Nitrobenzene-d5 | 58.0 | %REC | | 43-105 | | SW8270C | 11/29/16 01:29 / eli-b |
| Surr: Terphenyl-d14 | 91.0 | %REC | | 51-117 | | SW8270C | 11/29/16 01:29 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.016 | mg/kg-dry | | 0.0024 | | SW8151A | 11/22/16 23:54 / eli-b12 |
| Surr: DCAA | 65.0 | %REC | | 45-117 | | SW8151A | 11/22/16 23:54 / eli-b12 |

**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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16110260-002
**Client Sample ID:** DIAP-3-S-North (0-2)

**Report Date:** 12/12/16
**Collection Date:** 11/12/16 09:25
**DateReceived:** 11/15/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 15.8 | wt% | | 0.2 | | SW3550C | 11/16/16 16:00 / tjb |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 6 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:24 / dck |
| Barium | 117 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:24 / dck |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:24 / dck |
| Chromium | 21 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:24 / dck |
| Lead | 11 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:24 / dck |
| Selenium | 1 | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:24 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:24 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 11/23/16 16:57 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 200 | SW8015M | 11/18/16 19:36 / JRS |
| Surr: o-Terphenyl | 76.0 | %REC | | 40-140 | | SW8015M | 11/18/16 19:36 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Benzo(a)anthracene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Benzo(a)pyrene | 0.015 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Benzo(b)fluoranthene | 0.020 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Benzo(g,h,i)perylene | 0.0071 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Benzo(k)fluoranthene | 0.0086 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Chrysene | 0.0043 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Dibenzo(a,h)anthracene | 0.0098 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Fluoranthene | 0.0047 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.015 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Pyrene | 0.0047 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 03:00 / eli-b |
| Surr: 2-Fluorobiphenyl | 80.0 | %REC | | 47-110 | | SW8270C | 11/29/16 03:00 / eli-b |
| Surr: Nitrobenzene-d5 | 73.0 | %REC | | 43-105 | | SW8270C | 11/29/16 03:00 / eli-b |
| Surr: Terphenyl-d14 | 113 | %REC | | 51-117 | | SW8270C | 11/29/16 03:00 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.0030 | mg/kg-dry | | 0.0024 | | SW8151A | 11/22/16 21:43 / eli-b12 |
| Surr: DCAA | 66.0 | %REC | | 45-117 | | SW8151A | 11/22/16 21:43 / eli-b12 |

**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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16110260-003
**Client Sample ID:** DIAP-3-S-West (0-2)

**Report Date:** 12/12/16
**Collection Date:** 11/12/16 09:30
**DateReceived:** 11/15/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 16.4 | wt% | | 0.2 | | SW3550C | 11/16/16 16:00 / tjb |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 5 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:27 / dck |
| Barium | 123 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:27 / dck |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:27 / dck |
| Chromium | 24 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:27 / dck |
| Lead | 12 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:27 / dck |
| Selenium | 1 | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:27 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:27 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 11/23/16 16:59 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 18 | mg/kg-dry | | 12 | 200 | SW8015M | 11/18/16 20:21 / JRS |
| Surr: o-Terphenyl | 76.0 | %REC | | 40-140 | | SW8015M | 11/18/16 20:21 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Benzo(a)anthracene | 0.0076 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Benzo(a)pyrene | 0.020 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Benzo(b)fluoranthene | 0.027 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Benzo(g,h,i)perylene | 0.010 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Benzo(k)fluoranthene | 0.011 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Chrysene | 0.010 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Dibenzo(a,h)anthracene | 0.010 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Fluoranthene | 0.017 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.022 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Pyrene | 0.016 | mg/kg-dry | | 0.0040 | | SW8270C | 11/29/16 03:31 / eli-b |
| Surr: 2-Fluorobiphenyl | 74.0 | %REC | | 47-110 | | SW8270C | 11/29/16 03:31 / eli-b |
| Surr: Nitrobenzene-d5 | 77.0 | %REC | | 43-105 | | SW8270C | 11/29/16 03:31 / eli-b |
| Surr: Terphenyl-d14 | 109 | %REC | | 51-117 | | SW8270C | 11/29/16 03:31 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.0039 | mg/kg-dry | | 0.0023 | | SW8151A | 11/22/16 22:16 / eli-b12 |
| Surr: DCAA | 69.0 | %REC | | 45-117 | | SW8151A | 11/22/16 22:16 / eli-b12 |

**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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16110260-004
**Client Sample ID:** DIAP-3-SS-F (2.0)

**Report Date:** 12/12/16
**Collection Date:** 11/12/16 09:35
**DateReceived:** 11/15/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 14.7 | wt% | | 0.2 | | SW3550C | 11/16/16 16:00 / tjb |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 5 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:30 / dck |
| Barium | 106 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:30 / dck |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:30 / dck |
| Chromium | 25 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:30 / dck |
| Lead | 10 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:30 / dck |
| Selenium | 1 | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:30 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:30 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 11/23/16 17:01 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | mg/kg-dry | | 12 | 200 | SW8015M | 11/18/16 21:06 / JRS |
| Surr: o-Terphenyl | 77.0 | %REC | | 40-140 | | SW8015M | 11/18/16 21:06 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Benzo(a)anthracene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Benzo(a)pyrene | 0.016 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Benzo(b)fluoranthene | 0.022 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Benzo(g,h,i)perylene | 0.0089 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Benzo(k)fluoranthene | 0.0089 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Chrysene | 0.0062 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Dibenzo(a,h)anthracene | 0.0097 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Fluoranthene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.022 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Pyrene | 0.0054 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 04:01 / eli-b |
| Surr: 2-Fluorobiphenyl | 89.0 | %REC | | 47-110 | | SW8270C | 11/29/16 04:01 / eli-b |
| Surr: Nitrobenzene-d5 | 77.0 | %REC | | 43-105 | | SW8270C | 11/29/16 04:01 / eli-b |
| Surr: Terphenyl-d14 | 110 | %REC | | 51-117 | | SW8270C | 11/29/16 04:01 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.0088 | mg/kg-dry | | 0.0023 | | SW8151A | 11/22/16 22:48 / eli-b12 |
| Surr: DCAA | 64.0 | %REC | | 45-117 | | SW8151A | 11/22/16 22:48 / eli-b12 |

**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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H16110260-005
**Client Sample ID:** BD-20161112-01

**Report Date:** 12/12/16
**Collection Date:** 11/12/16 09:40
**DateReceived:** 11/15/16
**Matrix:** Soil

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **PHYSICAL CHARACTERISTICS** | | | | | | | |
| Moisture | 16.0 | wt% | | 0.2 | | SW3550C | 11/16/16 16:00 / tjb |
| **3050 EXTRACTABLE METALS** | | | | | | | |
| Arsenic | 5 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:34 / dck |
| Barium | 115 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:34 / dck |
| Cadmium | ND | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:34 / dck |
| Chromium | 23 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:34 / dck |
| Lead | 10 | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:34 / dck |
| Selenium | 1 | mg/kg-dry | | 1 | | SW6020 | 11/17/16 20:34 / dck |
| Silver | ND | mg/kg-dry | | 5 | | SW6020 | 11/17/16 20:34 / dck |
| **METALS, TOTAL** | | | | | | | |
| Mercury | ND | mg/kg-dry | | 0.50 | | SW7471B | 11/23/16 17:03 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 19 | mg/kg-dry | | 12 | 200 | SW8015M | 11/18/16 21:50 / JRS |
| Surr: o-Terphenyl | 81.0 | %REC | | 40-140 | | SW8015M | 11/18/16 21:50 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS** | | | | | | | |
| 2-Methylnaphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Acenaphthene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Acenaphthylene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Anthracene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Benzo(a)anthracene | 0.0063 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Benzo(a)pyrene | 0.015 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Benzo(b)fluoranthene | 0.019 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Benzo(g,h,i)perylene | 0.0087 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Benzo(k)fluoranthene | 0.0075 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Chrysene | 0.0051 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Dibenzo(a,h)anthracene | 0.0095 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Fluoranthene | 0.011 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Fluorene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Indeno(1,2,3-cd)pyrene | 0.015 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Naphthalene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Phenanthrene | ND | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Pyrene | 0.011 | mg/kg-dry | | 0.0039 | | SW8270C | 11/29/16 05:53 / eli-b |
| Surr: 2-Fluorobiphenyl | 75.0 | %REC | | 47-110 | | SW8270C | 11/29/16 05:53 / eli-b |
| Surr: Nitrobenzene-d5 | 79.0 | %REC | | 43-105 | | SW8270C | 11/29/16 05:53 / eli-b |
| Surr: Terphenyl-d14 | 108 | %REC | | 51-117 | | SW8270C | 11/29/16 05:53 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 0.0026 | mg/kg-dry | | 0.0024 | | SW8151A | 11/22/16 23:21 / eli-b12 |
| Surr: DCAA | 63.0 | %REC | | 45-117 | | SW8151A | 11/22/16 23:21 / eli-b12 |

**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:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | Analytical Run: ICPMS204-B_161117B | | |
| **Lab ID:** | **ICV STD** | 7 | Initial Calibration Verification Standard | | | | | | | | 11/17/16 13:48 |
| Arsenic | | | 0.0606 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Barium | | | 0.0592 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| Cadmium | | | 0.0304 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| Chromium | | | 0.0590 | mg/L | 0.0010 | 98 | 90 | 110 | | | |
| Lead | | | 0.0576 | mg/L | 0.0010 | 96 | 90 | 110 | | | |
| Selenium | | | 0.0587 | mg/L | 0.0010 | 98 | 90 | 110 | | | |
| Silver | | | 0.0298 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | | Batch: 35244 |
| **Lab ID:** | **MB-35244** | 7 | Method Blank | | | | Run: ICPMS204-B_161117B | | | | 11/17/16 19:33 |
| Arsenic | | | 0.08 | 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 | | | 0.07 | mg/kg | 0.05 | | | | | | |
| **Lab ID:** | **LCS-35244** | 7 | Laboratory Control Sample | | | | Run: ICPMS204-B_161117B | | | | 11/17/16 19:36 |
| Arsenic | | | 167 | mg/kg | 1.0 | 87 | 71.4 | 105.1 | | | |
| Barium | | | 171 | mg/kg | 1.0 | 93 | 78.6 | 112.8 | | | |
| Cadmium | | | 96.8 | mg/kg | 1.0 | 100 | 73.9 | 106.1 | | | |
| Chromium | | | 110 | mg/kg | 1.0 | 96 | 73.5 | 108.5 | | | |
| Lead | | | 97.6 | mg/kg | 1.0 | 95 | 74.4 | 108.6 | | | |
| Selenium | | | 189 | mg/kg | 1.0 | 94 | 71.2 | 110.2 | | | |
| Silver | | | 42.4 | mg/kg | 1.0 | 103 | 70.8 | 111.9 | | | |
| **Lab ID:** | **LFB-35244** | 7 | Laboratory Fortified Blank | | | | Run: ICPMS204-B_161117B | | | | 11/17/16 19:39 |
| Arsenic | | | 48.8 | mg/kg | 1.0 | 99 | 80 | 120 | | | |
| Barium | | | 48.5 | mg/kg | 1.0 | 99 | 80 | 120 | | | |
| Cadmium | | | 24.9 | mg/kg | 1.0 | 101 | 80 | 120 | | | |
| Chromium | | | 49.7 | mg/kg | 1.0 | 102 | 80 | 120 | | | |
| Lead | | | 49.0 | mg/kg | 1.0 | 100 | 80 | 120 | | | |
| Selenium | | | 46.8 | mg/kg | 1.0 | 96 | 80 | 120 | | | |
| Silver | | | 26.3 | mg/kg | 1.0 | 107 | 80 | 120 | | | |
| **Lab ID:** | **H16110281-004APDS** | 7 | Post Digestion/Distillation Spike | | | | Run: ICPMS204-B_161117B | | | | 11/17/16 19:59 |
| Arsenic | | | 582 | mg/kg-dry | 1.0 | 97 | 75 | 125 | | | |
| Barium | | | 855 | mg/kg-dry | 1.0 | 98 | 75 | 125 | | | |
| Cadmium | | | 279 | mg/kg-dry | 1.0 | 94 | 75 | 125 | | | |
| Chromium | | | 668 | mg/kg-dry | 1.0 | 108 | 75 | 125 | | | |
| Lead | | | 653 | mg/kg-dry | 1.0 | 107 | 75 | 125 | | | |
| Selenium | | | 526 | mg/kg-dry | 1.0 | 88 | 75 | 125 | | | |
| Silver | | | 45.4 | mg/kg-dry | 1.0 | 15 | 75 | 125 | | | 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:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | | | Batch: 35244 |
| **Lab ID:** | **H16110281-004AMS** | 7 | Sample Matrix Spike | | | | Run: ICPMS204-B_161117B | | | 11/17/16 20:02 | |
| Arsenic | | | 66.8 | mg/kg-dry | 1.0 | 102 | 75 | 125 | | | |
| Barium | | | 382 | mg/kg-dry | 1.0 | | 75 | 125 | | | A |
| Cadmium | | | 29.4 | mg/kg-dry | 1.0 | 99 | 75 | 125 | | | |
| Chromium | | | 88.0 | mg/kg-dry | 1.0 | 110 | 75 | 125 | | | |
| Lead | | | 74.1 | mg/kg-dry | 1.0 | 102 | 75 | 125 | | | |
| Selenium | | | 57.5 | mg/kg-dry | 1.0 | 95 | 75 | 125 | | | |
| Silver | | | 30.7 | mg/kg-dry | 1.0 | 103 | 75 | 125 | | | |
| **Lab ID:** | **H16110281-004AMSD** | 7 | Sample Matrix Spike Duplicate | | | | Run: ICPMS204-B_161117B | | | 11/17/16 20:05 | |
| Arsenic | | | 64.4 | mg/kg-dry | 1.0 | 99 | 75 | 125 | 3.6 | 20 | |
| Barium | | | 372 | mg/kg-dry | 1.0 | | 75 | 125 | 2.8 | 20 | A |
| Cadmium | | | 29.7 | mg/kg-dry | 1.0 | 100 | 75 | 125 | 1.0 | 20 | |
| Chromium | | | 87.5 | mg/kg-dry | 1.0 | 110 | 75 | 125 | 0.6 | 20 | |
| Lead | | | 72.1 | mg/kg-dry | 1.0 | 100 | 75 | 125 | 2.7 | 20 | |
| Selenium | | | 57.3 | mg/kg-dry | 1.0 | 95 | 75 | 125 | 0.4 | 20 | |
| Silver | | | 30.4 | mg/kg-dry | 1.0 | 103 | 75 | 125 | 1.0 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW7471B** | | | | | | | | Analytical Run: HGCV201-H_161123A | | |
| **Lab ID:** | **ICV** | | Initial Calibration Verification Standard | | | | | | | 11/23/16 15:23 | |
| Mercury | | | 0.00100 | mg/L | 0.00010 | 100 | 90 | 110 | | | |
| **Lab ID:** | **CCV** | | Continuing Calibration Verification Standard | | | | | | | 11/23/16 16:40 | |
| Mercury | | | 0.0025 | mg/kg | 0.50 | 100 | 90 | 110 | | | |
| **Method:** | **SW7471B** | | | | | | | | | Batch: 35363 | |
| **Lab ID:** | **MB-35363** | | Method Blank | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:12 | |
| Mercury | | | 0.002 | mg/kg | 0.001 | | | | | | |
| **Lab ID:** | **LCS-35363** | | Laboratory Control Sample | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:13 | |
| Mercury | | | 5.2 | mg/kg | 0.50 | 107 | 71 | 126.4 | | | |
| **Lab ID:** | **LFB-35363** | | Laboratory Fortified Blank | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:15 | |
| Mercury | | | 0.20 | mg/kg | 0.50 | 102 | 80 | 120 | | | |
| **Lab ID:** | **H16110260-001ADIL** | | Serial Dilution | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:52 | |
| Mercury | | | 0.021 | mg/kg-dry | 0.50 | | 0 | 0 | | 10 | |
| **Lab ID:** | **H16110260-001AMS** | | Sample Matrix Spike | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:54 | |
| Mercury | | | 0.23 | mg/kg-dry | 0.50 | 97 | 80 | 120 | | | |
| **Lab ID:** | **H16110260-001AMSD** | | Sample Matrix Spike Duplicate | | | | Run: HGCV201-H_161123A | | | 11/23/16 16:55 | |
| Mercury | | | 0.23 | mg/kg-dry | 0.50 | 95 | 80 | 120 | | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | | Batch: 35295 |
| **Lab ID: MB-35295** | 2 | Method Blank | | | | Run: HHP_161118A | | | | 11/18/16 17:23 |
| Total Extractable Hydrocarbons | | ND | mg/kg-dry | 10 | | | | | | |
| Surr: o-Terphenyl | | | | 0.17 | 96 | 40 | 140 | | | |
| **Lab ID: LCS-35295** | 2 | Laboratory Control Sample | | | | Run: HHP_161118A | | | | 11/18/16 18:08 |
| Total Extractable Hydrocarbons | | 168.5 | mg/kg-dry | 10 | 82 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 81 | 40 | 140 | | | |
| **Lab ID: H16110332-001AMS** | 2 | Sample Matrix Spike | | | | Run: HHP_161123A | | | | 11/23/16 19:39 |
| Total Extractable Hydrocarbons | | 1818 | mg/kg-dry | 21 | -394 | 60 | 140 | | | S |
| Surr: o-Terphenyl | | | | 0.35 | 59 | 40 | 140 | | | |
| **Lab ID: H16110332-001AMSD** | 2 | Sample Matrix Spike Duplicate | | | | Run: HHP_161123A | | | | 11/23/16 20:24 |
| Total Extractable Hydrocarbons | | 1999 | mg/kg-dry | 21 | -310 | 60 | 140 | 9.5 | 20 | S |
| Surr: o-Terphenyl | | | | 0.35 | 53 | 40 | 140 | | | |
| **Method: SW8015M** | | | | | | | | | | Analytical Run: R120740 |
| **Lab ID: CCV_1118GC102r-S** | 15 | Continuing Calibration Verification Standard | | | | | | | | 11/18/16 16:38 |
| n-Nonane | | 6.861 | mg/kg-dry | | 103 | 75 | 125 | | | |
| n-Decane | | 6.843 | mg/kg-dry | | 103 | 75 | 125 | | | |
| n-Dodecane | | 6.399 | mg/kg-dry | | 96 | 75 | 125 | | | |
| n-Tetradecane | | 6.485 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Hexadecane | | 6.482 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Octadecane | | 6.489 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Nonadecane | | 6.484 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Eicosane | | 6.493 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Docosane | | 6.481 | mg/kg-dry | | 97 | 75 | 125 | | | |
| n-Tetracosane | | 6.517 | mg/kg-dry | | 98 | 75 | 125 | | | |
| n-Hexacosane | | 6.547 | mg/kg-dry | | 98 | 75 | 125 | | | |
| n-Octacosane | | 6.565 | mg/kg-dry | | 98 | 75 | 125 | | | |
| n-Triacontane | | 6.566 | mg/kg-dry | | 98 | 75 | 125 | | | |
| n-Hexatriacontane | | 6.398 | mg/kg-dry | | 96 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | 0.17 | 100 | 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:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8151A** | | | | | | | | | Batch: B_104603 | |
| **Lab ID: LCS-104603** | 2 | Laboratory Control Sample | | | | Run: SUB-B270932 | | | 11/22/16 20:38 | |
| Pentachlorophenol | | 0.0687 | mg/kg | 0.0020 | 69 | 51 | 103 | | | |
| Surr: DCAA | | | | 0.0020 | 68 | 45 | 117 | | | |
| **Lab ID: MB-104603** | 2 | Method Blank | | | | Run: SUB-B270932 | | | 11/22/16 21:11 | |
| Pentachlorophenol | | ND | mg/kg | 0.0020 | | | | | | |
| Surr: DCAA | | | | 0.0020 | 68 | 45 | 117 | | | |
| **Lab ID: H16110260-001A** | 2 | Sample Matrix Spike | | | | Run: SUB-B270932 | | | 11/23/16 00:26 | |
| Pentachlorophenol | | 0.0476 | mg/kg-dry | 0.0024 | 26 | 51 | 103 | | | S |
| Surr: DCAA | | | | 0.0024 | 65 | 45 | 117 | | | |
| **Lab ID: H16110260-001A** | 2 | Sample Matrix Spike Duplicate | | | | Run: SUB-B270932 | | | 11/23/16 00:59 | |
| Pentachlorophenol | | 0.0708 | mg/kg-dry | 0.0024 | 46 | 51 | 103 | 39 | 40 | S |
| Surr: DCAA | | | | 0.0024 | 72 | 45 | 117 | | | |
| **Method: SW8151A** | | | | | | | | | Analytical Run: B_R270932 | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 11/22/16 20:06 | |
| Pentachlorophenol | | 0.432 | mg/kg | 0.0020 | 91 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.0020 | 106 | 85 | 115 | | | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | 11/23/16 02:36 | |
| Pentachlorophenol | | 0.428 | mg/kg | 0.0020 | 90 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.0020 | 104 | 85 | 115 | | | |

**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:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_104683 | |
| **Lab ID: LMB-104683** | 20 | Method Blank | | | | Run: SUB-B271029 | | | 11/28/16 22:27 | |
| 2-Methylnaphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthene | | ND | mg/kg | 0.0033 | | | | | | |
| Acenaphthylene | | ND | mg/kg | 0.0033 | | | | | | |
| Anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(a)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(b)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(g,h,i)perylene | | ND | mg/kg | 0.0033 | | | | | | |
| Benzo(k)fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Chrysene | | ND | mg/kg | 0.0033 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluoranthene | | ND | mg/kg | 0.0033 | | | | | | |
| Fluorene | | ND | mg/kg | 0.0033 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Naphthalene | | ND | mg/kg | 0.0033 | | | | | | |
| Phenanthrene | | ND | mg/kg | 0.0033 | | | | | | |
| Pyrene | | ND | mg/kg | 0.0033 | | | | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 76 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 67 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 98 | 51 | 117 | | | |
| **Lab ID: LLCS-104683** | 20 | Sample Matrix Spike | | | | Run: SUB-B271029 | | | 11/28/16 22:58 | |
| 2-Methylnaphthalene | | 0.170 | mg/kg | 0.0033 | 102 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.158 | mg/kg | 0.0033 | 95 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.138 | mg/kg | 0.0033 | 82 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.156 | mg/kg | 0.0033 | 93 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.154 | mg/kg | 0.0033 | 92 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.135 | mg/kg | 0.0033 | 81 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.116 | mg/kg | 0.0033 | 70 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.172 | mg/kg | 0.0033 | 103 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.175 | mg/kg | 0.0033 | 105 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.176 | mg/kg | 0.0033 | 105 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.160 | mg/kg | 0.0033 | 96 | 63 | 113 | 0.0 | 40 | |
| Fluoranthene | | 0.187 | mg/kg | 0.0033 | 112 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.159 | mg/kg | 0.0033 | 95 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.129 | mg/kg | 0.0033 | 77 | 57 | 119 | 0.0 | 40 | |
| Naphthalene | | 0.149 | mg/kg | 0.0033 | 89 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.158 | mg/kg | 0.0033 | 94 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.181 | mg/kg | 0.0033 | 108 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0033 | 82 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0033 | 71 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0033 | 109 | 51 | 117 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_104683 | |
| **Lab ID: H16110260-001A** | 20 | Sample Matrix Spike | | | | Run: SUB-B271029 | | | 11/29/16 02:00 | |
| 2-Methylnaphthalene | | 0.178 | mg/kg-dry | 0.0040 | 88 | 54 | 113 | 0.0 | 40 | |
| Acenaphthene | | 0.182 | mg/kg-dry | 0.0040 | 90 | 54 | 111 | 0.0 | 40 | |
| Acenaphthylene | | 0.168 | mg/kg-dry | 0.0040 | 83 | 53 | 113 | 0.0 | 40 | |
| Anthracene | | 0.197 | mg/kg-dry | 0.0040 | 88 | 66 | 109 | 0.0 | 40 | |
| Benzo(a)anthracene | | 0.241 | mg/kg-dry | 0.0040 | 105 | 51 | 121 | 0.0 | 40 | |
| Benzo(a)pyrene | | 0.280 | mg/kg-dry | 0.0040 | 96 | 62 | 114 | 0.0 | 40 | |
| Benzo(b)fluoranthene | | 0.370 | mg/kg-dry | 0.0040 | 85 | 50 | 128 | 0.0 | 40 | |
| Benzo(g,h,i)perylene | | 0.246 | mg/kg-dry | 0.0040 | 85 | 62 | 116 | 0.0 | 40 | |
| Benzo(k)fluoranthene | | 0.252 | mg/kg-dry | 0.0040 | 74 | 47 | 127 | 0.0 | 40 | |
| Chrysene | | 0.314 | mg/kg-dry | 0.0040 | 105 | 56 | 119 | 0.0 | 40 | |
| Dibenzo(a,h)anthracene | | 0.185 | mg/kg-dry | 0.0040 | 80 | 63 | 113 | 0.0 | 40 | |
| Fluoranthene | | 0.257 | mg/kg-dry | 0.0040 | 98 | 70 | 115 | 0.0 | 40 | |
| Fluorene | | 0.184 | mg/kg-dry | 0.0040 | 91 | 53 | 118 | 0.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.286 | mg/kg-dry | 0.0040 | 97 | 57 | 119 | 0.0 | 40 | |
| Naphthalene | | 0.171 | mg/kg-dry | 0.0040 | 85 | 50 | 109 | 0.0 | 40 | |
| Phenanthrene | | 0.188 | mg/kg-dry | 0.0040 | 86 | 63 | 116 | 0.0 | 40 | |
| Pyrene | | 0.266 | mg/kg-dry | 0.0040 | 105 | 62 | 113 | 0.0 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0040 | 74 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0040 | 69 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0040 | 110 | 51 | 117 | | | |
| **Lab ID: H16110260-001A** | 20 | Sample Matrix Spike Duplicate | | | | Run: SUB-B271029 | | | 11/29/16 02:30 | |
| 2-Methylnaphthalene | | 0.192 | mg/kg-dry | 0.0040 | 95 | 54 | 113 | 7.6 | 40 | |
| Acenaphthene | | 0.198 | mg/kg-dry | 0.0040 | 98 | 54 | 111 | 8.2 | 40 | |
| Acenaphthylene | | 0.176 | mg/kg-dry | 0.0040 | 87 | 53 | 113 | 4.6 | 40 | |
| Anthracene | | 0.218 | mg/kg-dry | 0.0040 | 98 | 66 | 109 | 10 | 40 | |
| Benzo(a)anthracene | | 0.256 | mg/kg-dry | 0.0040 | 112 | 51 | 121 | 5.8 | 40 | |
| Benzo(a)pyrene | | 0.301 | mg/kg-dry | 0.0040 | 106 | 62 | 114 | 7.2 | 40 | |
| Benzo(b)fluoranthene | | 0.478 | mg/kg-dry | 0.0040 | 138 | 50 | 128 | 26 | 40 | SE |
| Benzo(g,h,i)perylene | | 0.283 | mg/kg-dry | 0.0040 | 103 | 62 | 116 | 14 | 40 | |
| Benzo(k)fluoranthene | | 0.291 | mg/kg-dry | 0.0040 | 93 | 47 | 127 | 14 | 40 | |
| Chrysene | | 0.316 | mg/kg-dry | 0.0040 | 106 | 56 | 119 | 0.7 | 40 | |
| Dibenzo(a,h)anthracene | | 0.184 | mg/kg-dry | 0.0040 | 79 | 63 | 113 | 0.7 | 40 | |
| Fluoranthene | | 0.275 | mg/kg-dry | 0.0040 | 108 | 70 | 115 | 7.0 | 40 | |
| Fluorene | | 0.199 | mg/kg-dry | 0.0040 | 98 | 53 | 118 | 8.0 | 40 | |
| Indeno(1,2,3-cd)pyrene | | 0.306 | mg/kg-dry | 0.0040 | 106 | 57 | 119 | 6.8 | 40 | |
| Naphthalene | | 0.181 | mg/kg-dry | 0.0040 | 89 | 50 | 109 | 5.7 | 40 | |
| Phenanthrene | | 0.203 | mg/kg-dry | 0.0040 | 94 | 63 | 116 | 7.6 | 40 | |
| Pyrene | | 0.265 | mg/kg-dry | 0.0040 | 105 | 62 | 113 | 0.3 | 40 | |
| Surr: 2-Fluorobiphenyl | | | | 0.0040 | 76 | 47 | 110 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.0040 | 78 | 43 | 105 | | | |
| Surr: Terphenyl-d14 | | | | 0.0040 | 89 | 51 | 117 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

E - Estimated value. Result exceeds the instrument upper quantitation 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:** Trihydro-Laramie **Report Date:** 12/12/16

**Project:** Diamond P Ranch **Work Order:** H16110260

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_R271029 | |
| **Lab ID: 28-Nov-16_CAL_5** | 20 | Initial Calibration Standard | | | | Run: SUB-B271029 | | | 11/28/16 17:54 | |
| 2-Methylnaphthalene | | 2.01 | ug/L | 0.10 | 100 | 50 | 150 | | | |
| Acenaphthene | | 1.99 | ug/L | 0.10 | 100 | 50 | 150 | | | |
| Acenaphthylene | | 1.76 | ug/L | 0.10 | 88 | 50 | 150 | | | |
| Anthracene | | 1.99 | ug/L | 0.10 | 100 | 50 | 150 | | | |
| Benzo(a)anthracene | | 1.95 | ug/L | 0.10 | 98 | 50 | 150 | | | |
| Benzo(a)pyrene | | 1.92 | ug/L | 0.10 | 96 | 50 | 150 | | | |
| Benzo(b)fluoranthene | | 2.08 | ug/L | 0.10 | 104 | 50 | 150 | | | |
| Benzo(g,h,i)perylene | | 2.03 | ug/L | 0.10 | 101 | 50 | 150 | | | |
| Benzo(k)fluoranthene | | 2.34 | ug/L | 0.10 | 117 | 50 | 150 | | | |
| Chrysene | | 2.07 | ug/L | 0.10 | 103 | 50 | 150 | | | |
| Dibenzo(a,h)anthracene | | 1.91 | ug/L | 0.10 | 96 | 50 | 150 | | | |
| Fluoranthene | | 2.05 | ug/L | 0.10 | 102 | 50 | 150 | | | |
| Fluorene | | 1.88 | ug/L | 0.10 | 94 | 50 | 150 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.05 | ug/L | 0.10 | 102 | 50 | 150 | | | |
| Naphthalene | | 1.96 | ug/L | 0.10 | 98 | 50 | 150 | | | |
| Phenanthrene | | 1.98 | ug/L | 0.10 | 99 | 50 | 150 | | | |
| Pyrene | | 2.26 | ug/L | 0.10 | 113 | 50 | 150 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 98 | 50 | 150 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 106 | 50 | 150 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 105 | 50 | 150 | | | |
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R271038 | |
| **Lab ID: 28-Nov-16_CCV_26** | 20 | Continuing Calibration Verification Standard | | | | | | | 11/29/16 04:53 | |
| 2-Methylnaphthalene | | 1.75 | ug/L | 0.10 | 88 | 80 | 120 | | | |
| Acenaphthene | | 2.04 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Acenaphthylene | | 1.75 | ug/L | 0.10 | 88 | 80 | 120 | | | |
| Anthracene | | 1.73 | ug/L | 0.10 | 87 | 80 | 120 | | | |
| Benzo(a)anthracene | | 1.83 | ug/L | 0.10 | 92 | 80 | 120 | | | |
| Benzo(a)pyrene | | 1.72 | ug/L | 0.10 | 86 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 1.62 | ug/L | 0.10 | 81 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 1.92 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.02 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Chrysene | | 1.77 | ug/L | 0.10 | 89 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 2.04 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Fluoranthene | | 1.91 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Fluorene | | 1.69 | ug/L | 0.10 | 84 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.27 | ug/L | 0.10 | 114 | 80 | 120 | | | |
| Naphthalene | | 1.79 | ug/L | 0.10 | 90 | 80 | 120 | | | |
| Phenanthrene | | 1.81 | ug/L | 0.10 | 91 | 80 | 120 | | | |
| Pyrene | | 1.73 | ug/L | 0.10 | 87 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 84 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 88 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 94 | 80 | 120 | | | |

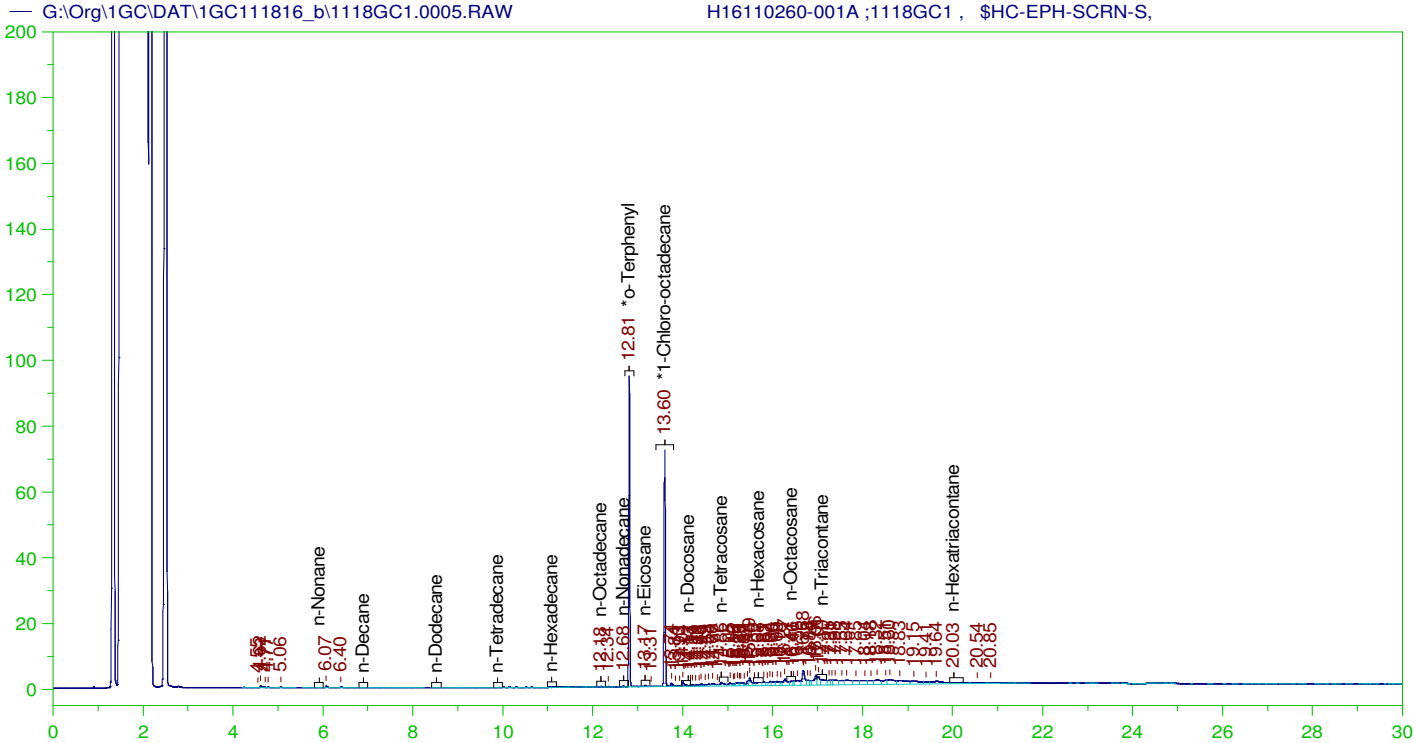
**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

**DIAP-3-S-East (0-2)** Batch ID: 35295

— G:\Org\1GC\DAT\1GC111816_b\1118GC1.0005.RAW H16110260-001A ;1118GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16110260-001A ;1118GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111816_b\1118GC1.0005.RAW
Date & Time Acquired: 11/18/2016 6:52:25 PM
Method File: G:\Org\1GC\Methods\11181605.MET
Calibration File: G:\Org\1GC\Cals\SR082516I.CAL
Sample Weight: 24.8 Dilution: 2 S.A.: 1

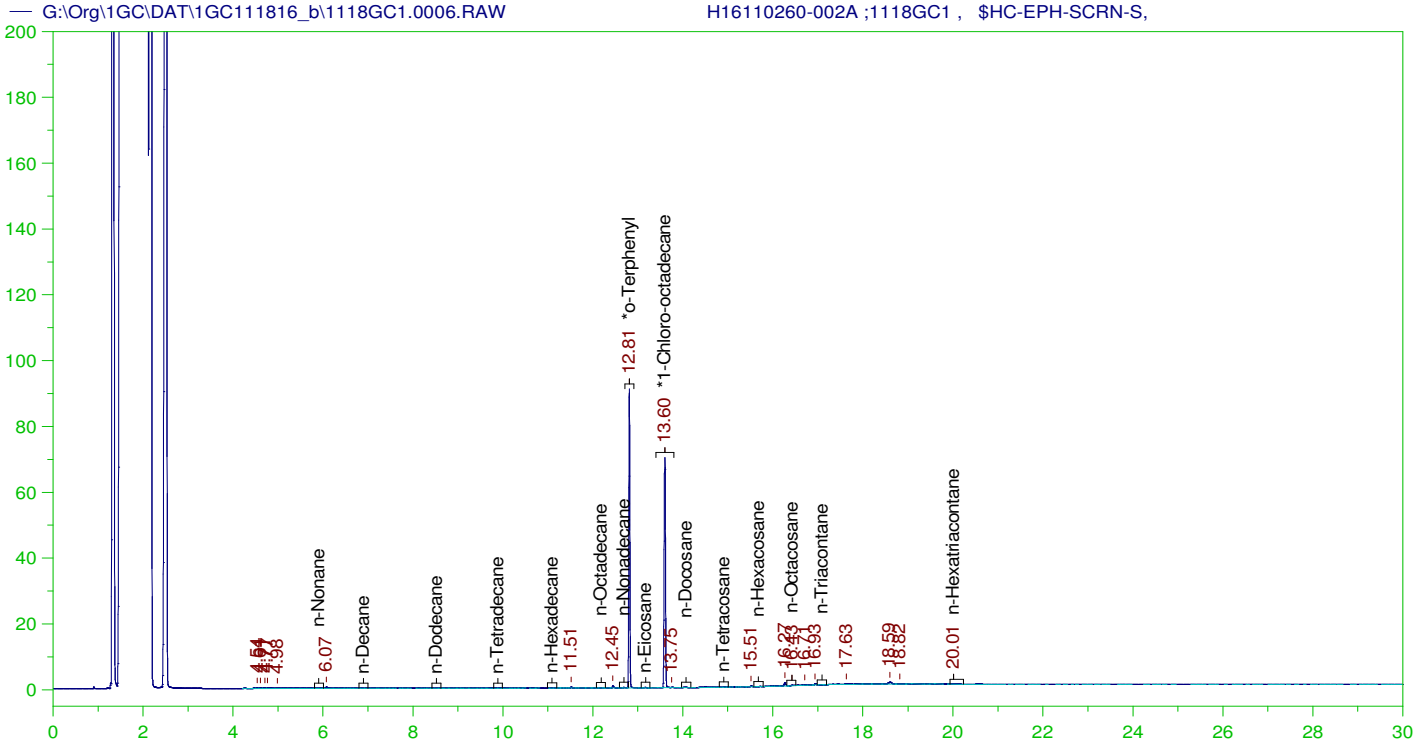
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.8 to 17.19
Rt range for C9 to C18 Hydrocarbons: 5.81 to 12.71
Rt range for C19 to C36 Hydrocarbons: 12.76 to 20.24

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.809 | 8.065 | 6.407 | 79.44 | - |
| *1-Chloro-octadecane | 13.598 | 8.065 | 6.625 | 82.15 | - |

DRO Area:205101 DRO Amount: 9.156741
TEH Area:390353.9 TEH Amount: 17.42736
C9-C18 Area:10157.99 C9-C18 Amount: 0.4663279
C19-C36 Area:366281.6 C19-C36 Amount: 15.91499

**DIAP-3-S-North (0-2)** Batch ID: 35295

— G:\Org\1GC\DAT\1GC111816_b\1118GC1.0006.RAW H16110260-002A ;1118GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16110260-002A ;1118GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111816_b\1118GC1.0006.RAW
Date & Time Acquired: 11/18/2016 7:36:59 PM
Method File: G:\Org\1GC\Methods\SR082516I.MET
Calibration File: G:\Org\1GC\Cals\SR082516I.CAL
Sample Weight: 25.3 Dilution: 2 S.A.: 1

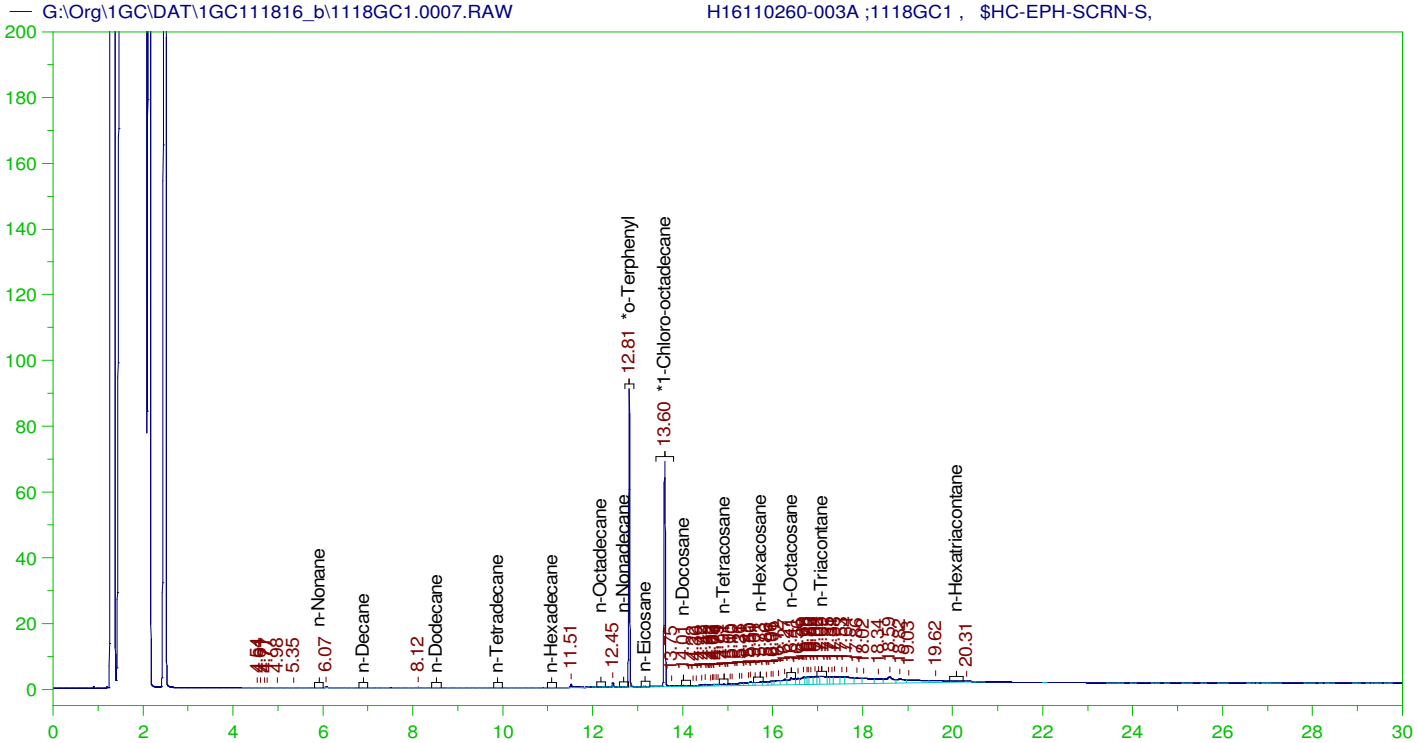
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.8 to 17.19
Rt range for C9 to C18 Hydrocarbons: 5.81 to 12.71
Rt range for C19 to C36 Hydrocarbons: 12.76 to 20.24

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.807 | 7.905 | 6.048 | 76.51 | - |
| *1-Chloro-octadecane | 13.596 | 7.905 | 6.317 | 79.9 | - |

DRO Area:17354.88 DRO Amount: 0.7594964
TEH Area:34798.75 TEH Amount: 1.522888
C9-C18 Area:7822.797 C9-C18 Amount: 0.3520276
C19-C36 Area:19159.47 C19-C36 Amount: 0.8160295

**DIAP-3-S-West (0-2)** Batch ID: 35295

— G:\Org\1GC\DAT\1GC111816_b\1118GC1.0007.RAW H16110260-003A ;1118GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16110260-003A ;1118GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111816_b\1118GC1.0007.RAW
Date & Time Acquired: 11/18/2016 8:21:28 PM
Method File: G:\Org\1GC\Methods\SR082516I.MET
Calibration File: G:\Org\1GC\Cals\SR082516I.CAL
Sample Weight: 25.2 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: 6.8 to 17.19
Rt range for C9 to C18 Hydrocarbons: 5.81 to 12.71
Rt range for C19 to C36 Hydrocarbons: 12.76 to 20.24

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.808 | 7.937 | 6.052 | 76.26 | - |
| *1-Chloro-octadecane | 13.596 | 7.937 | 6.192 | 78.02 | - |

DRO Area:200155.8 DRO Amount: 8.794119
TEH Area:410068.4 TEH Amount: 18.01692
C9-C18 Area:11777.85 C9-C18 Amount: 0.5321087
C19-C36 Area:390723.6 C19-C36 Amount: 16.70752

**DIAP-3-SS-F (2.0)** Batch ID: 35295

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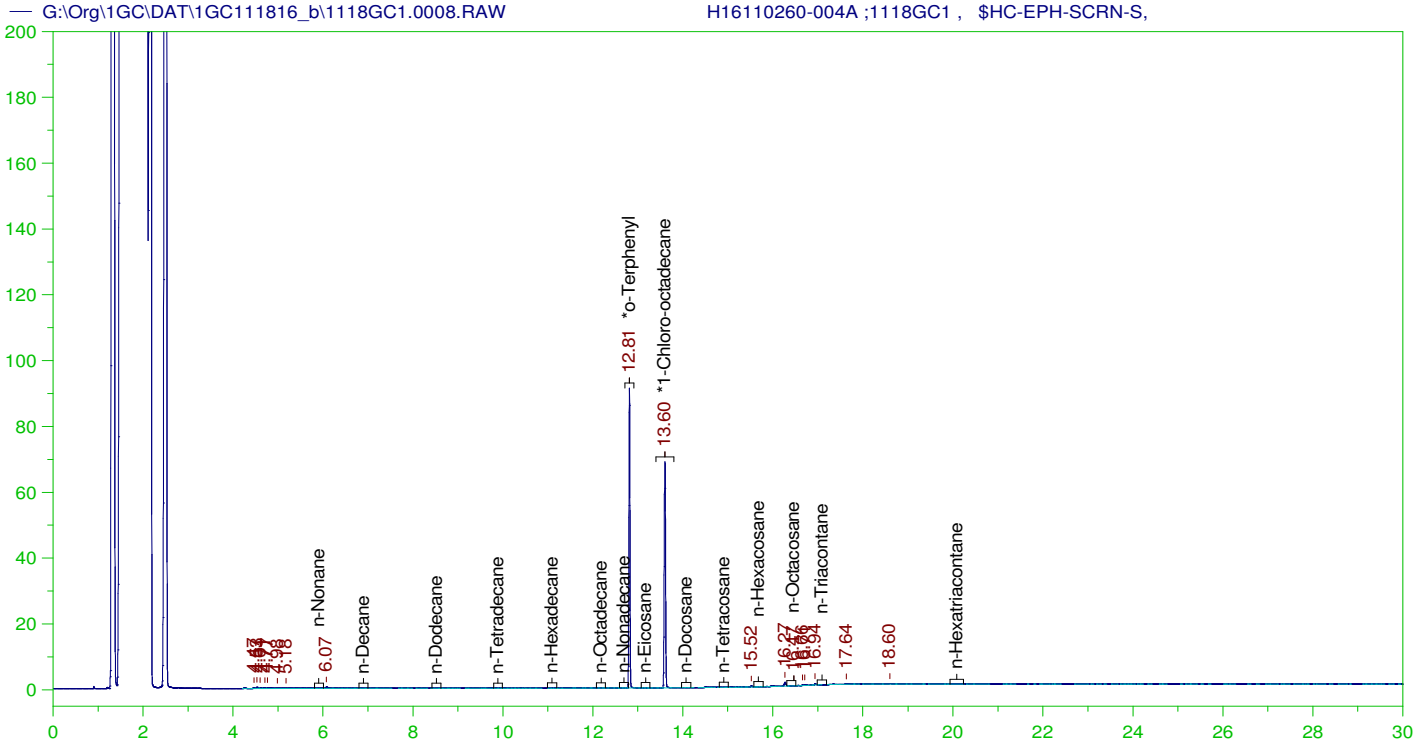



**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16110260-004A ;1118GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111816_b\1118GC1.0008.RAW
Date & Time Acquired: 11/18/2016 9:06:05 PM
Method File: G:\Org\1GC\Methods\SR082516I.MET
Calibration File: G:\Org\1GC\Cals\SR082516I.CAL
Sample Weight: 25.7 Dilution: 2 S.A.: 1

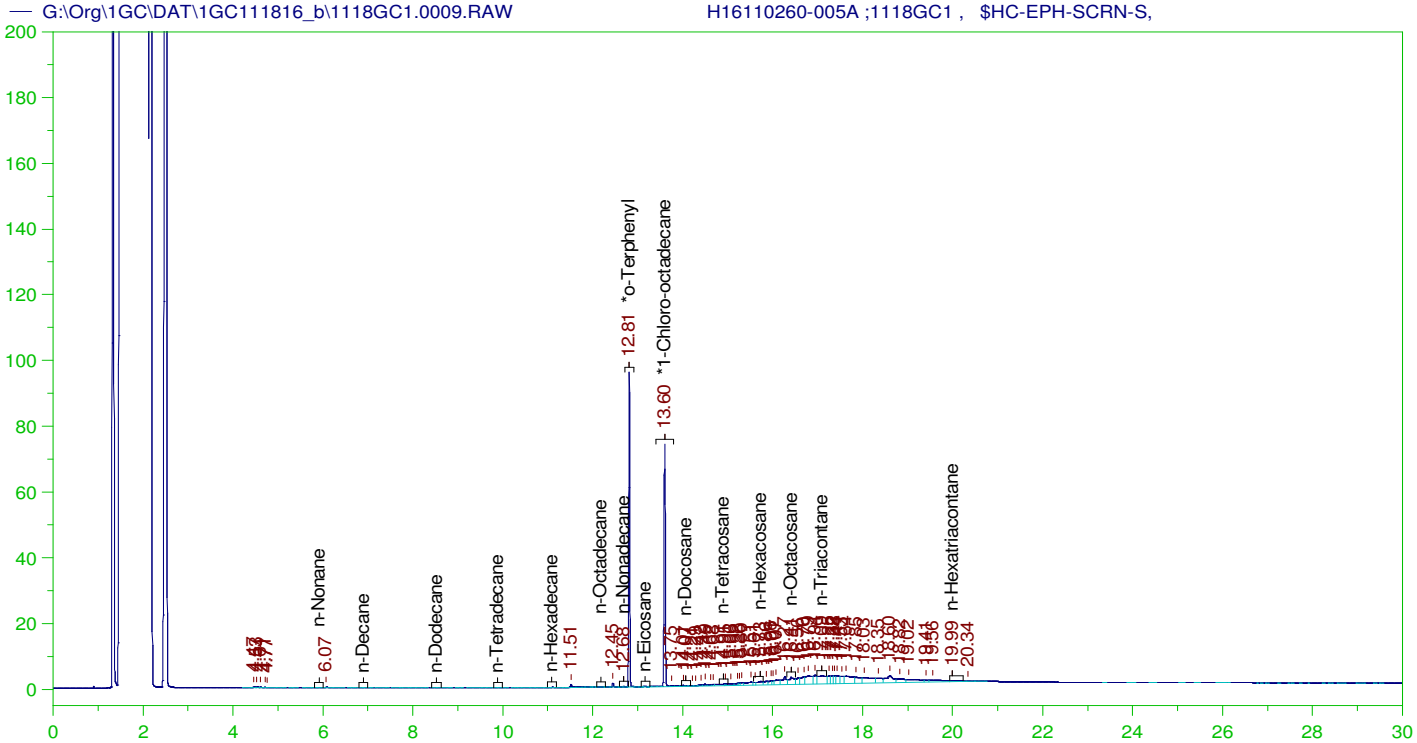
Mean RF for C9 to C18 Hydrocarbons: 1756.689
Mean RF for C19 to C36 Hydrocarbons: 1856.039
Mean RF for Total Extractable Hydrocarbons: 1806.364
Rt range for Diesel Range Organics: 6.8 to 17.19
Rt range for C9 to C18 Hydrocarbons: 5.81 to 12.71
Rt range for C19 to C36 Hydrocarbons: 12.76 to 20.24

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.809 | 7.782 | 5.957 | 76.55 | - |
| *1-Chloro-octadecane | 13.598 | 7.782 | 6.097 | 78.35 | - |

DRO Area:14038.96 DRO Amount: 0.6048205
TEH Area:29364.4 TEH Amount: 1.265065
C9-C18 Area:5528.728 C9-C18 Amount: 0.2449217
C19-C36 Area:14464.15 C19-C36 Amount: 0.6064606

**BD-20161112-01** Batch ID: 35295

— G:\Org\1GC\DAT\1GC111816_b\1118GC1.0009.RAW H16110260-005A ;1118GC1 , $HC-EPH-SCRN-S,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H16110260-005A ;1118GC1 , $HC-EPH-SCRN-S,
Raw File: G:\Org\1GC\DAT\1GC111816_b\1118GC1.0009.RAW
Date & Time Acquired: 11/18/2016 9:50:41 PM
Method File: G:\Org\1GC\Methods\11181609.MET
Calibration File: G:\Org\1GC\Cals\SR082516I.CAL
Sample Weight: 25.5 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: 6.8 to 17.19
Rt range for C9 to C18 Hydrocarbons: 5.81 to 12.71
Rt range for C19 to C36 Hydrocarbons: 12.76 to 20.24

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 12.809 | 7.843 | 6.316 | 80.53 | - |
| *1-Chloro-octadecane | 13.597 | 7.843 | 6.566 | 83.72 | - |

DRO Area:208899.9 DRO Amount: 9.070322
TEH Area:434297.4 TEH Amount: 18.85696
C9-C18 Area:9665.294 C9-C18 Amount: 0.431529
C19-C36 Area:419141.5 C19-C36 Amount: 17.71183

**Pace Analytical Services, Inc.**
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

## Report Prepared for:

Wanda Johnson
Energy Laboratories
PO Box 5688
Helena MT 59604

# REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

## Report Information:

**Pace Project #: 10370180**
**Sample Receipt Date: 11/16/2016**
**Client Project #: H16110260**
**Client Sub PO #: H13253**
**State Cert #: 92**

### Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Joanne Richardson, your Pace Project Manager.

### This report has been reviewed by:

Joanne Richardson

December 08, 2016

Joanne Richardson,
(612) 607-6453
(612) 607-6444 (fax)

**Report Prepared Date:**
December 8, 2016

## Report of Laboratory Analysis

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The results relate only to the samples included in this report.

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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

## DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of Energy Laboratories, Inc. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. The reporting limits were based on signal-to-noise measurements. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations at one-half of the reported concentrations.

The isotopically-labeled PCDD/PCDF internal standards in the sample extracts were recovered at 52-105%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain trace levels of selected congeners. These levels were below the calibration range of the method. The levels reported for the affected congeners in the associated field sample were higher than the corresponding blank levels by one or more orders of magnitude. These results indicate that the sample processing steps did not contribute signficantly to the levels reported for the field samples.

A laboratory spike sample wsa also prepared using clean reference matrix that had been fortified with native standard materials. The recoveries of the native compounds ranged from 102-129%. These results were within the target range for the method. Matrix spikes were prepared with the extraction batch using sample material from a separate project; results from these analyses will be provided upon request.



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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Minnesota Laboratory Certifications

| Authority | Certificate # | Authority | Certificate # |
|---|---|---|---|
| A2LA | 2926.01 | Mississippi | MN00064 |
| Alabama | 40770 | Montana | 92 |
| Alaska | MN00064 | Nebraska | NE-OS-18-06 |
| Arizona | AZ0014 | Nevada | MN_00064_200 |
| Arkansas | 88-0680 | New Jersey (NE | MN002 |
| California | 01155CA | New York (NEL | 11647 |
| Colorado | MN00064 | North Carolina | 27700 |
| Connecticut | PH-0256 | North Dakota | R-036 |
| EPA Region 8 | 8TMS-Q | Ohio | 4150 |
| Florida (NELAP | E87605 | Oklahoma | D9922 |
| Georgia (DNR) | 959 | Oregon (ELAP) | MN200001-005 |
| Guam | 959 | Oregon (OREL | MN300001-001 |
| Hawaii | SLD | Pennsylvania | 68-00563 |
| Idaho | MN00064 | Puerto Rico | MN00064 |
| Illinois | 200012 | Saipan | MP0003 |
| Indiana | C-MN-01 | South Carolina | 74003001 |
| Indiana | C-MN-01 | Tennessee | TN02818 |
| Iowa | 368 | Texas | T104704192-08 |
| Kansas | E-10167 | Utah (NELAP) | MN00064 |
| Kentucky | 90062 | Virginia | 00251 |
| Louisiana | 03086 | Washington | C755 |
| Maine | 2007029 | West Virginia # | 9952C |
| Maryland | 322 | West Virginia D | 382 |
| Michigan | 9909 | Wisconsin | 999407970 |
| Minnesota | 027-053-137 | Wyoming | 8TMS-Q |

## REPORT OF LABORATORY ANALYSIS

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# Appendix A

Sample Management

**Energy Laboratories Inc**
3161 East Lyndale Avenue
Helena, MT 59601
(406) 442-0711

H16110260

# CHAIN-OF-CUSTODY RECORD


15-Nov-16

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

10376180

**Subcontractor:**
Pace Analytical-Minneapolis
1700 Elm St, Ste 200
Minneapolis, MN 55414
TEL: (612) 607-6331 FAX:
Acct #:

**Subcontractor's Client:**

| Rush | Sample ID | Matrix | Collection Date | Bottle Type | Requested Tests: DIOXIN-S-FULL-829 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | H16110260-001B | Soil | 11/12/16 09:20 A | 1-8OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 001 |
| ☐ | H16110260-002B | Soil | 11/12/16 09:25 A | 1-8OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 002 |
| ☐ | H16110260-003B | Soil | 11/12/16 09:30 A | 1-8OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 003 |
| ☐ | H16110260-004B | Soil | 11/12/16 09:35 A | 1-8OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 004 |
| ☐ | H16110260-005B | Soil | 11/12/16 09:40 A | 1-8OZ-AG-WM | 1 | | | | | | | | | | | | | | | | 005 |

**Earliest Due Date:** 11/28/2016

**Comments:** PO# H13253

QC Level:
**STD**

| | | Date/Time | | | |
|---|---|---|---|---|---|
| **Relinquished by:** | | | **Received by:** | | |
| **Relinquished by:** | Tracy Lovell | 11/15/16 10:01 | **Received by:** | PACE | 11/16/16 9:10 |

| Pace Analytical | Document Name: **Sample Condition Upon Receipt Form** | Document Revised: 02Aug2016 Page 1 of 2 |
|---|---|---|
| | Document No.: **F-MN-L-213-rev.17** | Issuing Authority: Pace Minnesota Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** Energy Laboratories Inc.

**Project #:** WO#: 10370180

10370180

**Courier:** ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

**Tracking Number:** 1Z 376 W97 01 5416 0320

**Custody Seal on Cooler/Box Present?** ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

**Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

**Thermometer Used:** ☑ 151401163 ☐ 151401164 ☐ B88A912167504 ☐ B88A0143310098 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 0.0 **Cooler Temp Corrected (°C):** -0.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.1 **Date and Initials of Person Examining Contents:** BC 11-16-16

**USDA Regulated Soil** ( ☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present? | ☑ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☑ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☑ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and/or Signature on COC? | ☐ Yes | ☑ No | ☐ N/A | 4. |
| Samples Arrived within Hold Time? | ☑ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☑ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☑ No | ☐ N/A | 7. |
| Sufficient Volume? | ☑ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☑ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☐ Yes | ☑ No | ☐ N/A | |
| Containers Intact? | ☑ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☑ N/A | 11. Note if sediment is visible in the dissolved container |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL | ☑ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☑ N/A | 13. ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) | ☐ Yes | ☐ No | ☑ N/A | |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC | ☐ Yes | ☐ No | ☑ N/A | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☑ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☑ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☑ N/A | |
| Pace Trip Blank Lot # (if purchased): | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** Joanne Richardson **Date:** 11-16-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion



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# Appendix B

Sample Analysis  Summary

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

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Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16110260-001B | | |
| Lab Sample ID | 10370180001 | | |
| Filename | U161126A_11 | | |
| Injected By | BAL | | |
| Total Amount Extracted | 1.30 g | Matrix | Soil |
| % Moisture | 17.7 | Dilution | NA |
| Dry Weight Extracted | 1.07 g | Collected | 11/12/2016 09:20 |
| ICAL ID | U161025 | Received | 11/16/2016 09:10 |
| CCal Filename(s) | U161126A_02 & U161126A_16 | Extracted | 11/18/2016 17:30 |
| Method Blank ID | BLANK-52845 | Analyzed | 11/26/2016 22:59 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.75 | | 2,3,7,8-TCDF-13C | 2.00 | 94 |
| Total TCDF | 19.0 | ----- | 0.75 | | 2,3,7,8-TCDD-13C | 2.00 | 101 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 96 |
| 2,3,7,8-TCDD | ND | ----- | 0.66 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 90 |
| Total TCDD | 1.8 | ----- | 0.66 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 96 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 94 |
| 1,2,3,7,8-PeCDF | 2.9 | ----- | 1.00 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 85 |
| 2,3,4,7,8-PeCDF | 5.2 | ----- | 0.56 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 97 |
| Total PeCDF | 130.0 | ----- | 0.80 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 104 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 91 |
| 1,2,3,7,8-PeCDD | 2.3 | ----- | 1.10 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 72 |
| Total PeCDD | 22.0 | ----- | 1.10 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 65 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 71 |
| 1,2,3,4,7,8-HxCDF | 16.0 | ----- | 1.00 | J | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 69 |
| 1,2,3,6,7,8-HxCDF | 21.0 | ----- | 1.10 | J | OCDD-13C | 4.00 | 60 |
| 2,3,4,6,7,8-HxCDF | 25.0 | ----- | 0.83 | J | | | |
| 1,2,3,7,8,9-HxCDF | ----- | 1.3 | 0.63 | IJ | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 550.0 | ----- | 0.88 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ----- | 7.7 | 1.20 | IJ | 2,3,7,8-TCDD-37Cl4 | 0.20 | 108 |
| 1,2,3,6,7,8-HxCDD | 52.0 | ----- | 1.30 | | | | |
| 1,2,3,7,8,9-HxCDD | 22.0 | ----- | 1.90 | J | | | |
| Total HxCDD | 280.0 | ----- | 1.50 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 800.0 | ----- | 0.53 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 32.0 | ----- | 2.60 | J | Equivalence: 42 ng/Kg | | |
| Total HpCDF | 1900.0 | ----- | 1.60 | | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 1200.0 | ----- | 1.10 | | | | |
| Total HpCDD | 2200.0 | ----- | 1.10 | | | | |
| OCDF | 2500.0 | ----- | 1.20 | | | | |
| OCDD | 9400.0 | ----- | 1.70 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

## REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16110260-002B | | |
| Lab Sample ID | 10370180002 | | |
| Filename | U161126A_12 | | |
| Injected By | BAL | | |
| Total Amount Extracted | 1.40 g | Matrix | Soil |
| % Moisture | 15.5 | Dilution | NA |
| Dry Weight Extracted | 1.18 g | Collected | 11/12/2016 09:25 |
| ICAL ID | U161025 | Received | 11/16/2016 09:10 |
| CCal Filename(s) | U161126A_02 & U161126A_16 | Extracted | 11/18/2016 17:30 |
| Method Blank ID | BLANK-52845 | Analyzed | 11/26/2016 23:46 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.72 | | 2,3,7,8-TCDF-13C | 2.00 | 94 |
| Total TCDF | 2.1 | ----- | 0.72 | J | 2,3,7,8-TCDD-13C | 2.00 | 105 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 97 |
| 2,3,7,8-TCDD | ND | ----- | 0.72 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 92 |
| Total TCDD | 1.1 | ----- | 0.72 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 98 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 97 |
| 1,2,3,7,8-PeCDF | 1.2 | ----- | 0.97 | J | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 88 |
| 2,3,4,7,8-PeCDF | ----- | 1.1 | 0.49 | IJ | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 95 |
| Total PeCDF | 52.0 | ----- | 0.73 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 103 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 92 |
| 1,2,3,7,8-PeCDD | ----- | 1.1 | 0.65 | IJ | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 74 |
| Total PeCDD | 11.0 | ----- | 0.65 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 69 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 75 |
| 1,2,3,4,7,8-HxCDF | 5.8 | ----- | 1.00 | J | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 70 |
| 1,2,3,6,7,8-HxCDF | 9.7 | ----- | 0.83 | J | OCDD-13C | 4.00 | 60 |
| 2,3,4,6,7,8-HxCDF | 11.0 | ----- | 0.68 | J | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | ----- | 0.53 | J | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 200.0 | ----- | 0.76 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 4.5 | ----- | 0.92 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 113 |
| 1,2,3,6,7,8-HxCDD | 17.0 | ----- | 1.10 | J | | | |
| 1,2,3,7,8,9-HxCDD | 9.1 | ----- | 1.30 | J | | | |
| Total HxCDD | 120.0 | ----- | 1.10 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 240.0 | ----- | 0.92 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 14.0 | ----- | 1.20 | J | Equivalence: 15 ng/Kg | | |
| Total HpCDF | 570.0 | ----- | 1.10 | | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 440.0 | ----- | 0.84 | | | | |
| Total HpCDD | 780.0 | ----- | 0.84 | | | | |
| OCDF | 700.0 | ----- | 0.85 | | | | |
| OCDD | 3700.0 | ----- | 0.72 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

## REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16110260-003B | | |
| Lab Sample ID | 10370180003 | | |
| Filename | U161205B_09 | | |
| Injected By | SMT | | |
| Total Amount Extracted | 1.40 g | Matrix | Soil |
| % Moisture | 17.8 | Dilution | NA |
| Dry Weight Extracted | 1.15 g | Collected | 11/12/2016 09:30 |
| ICAL ID | U161025 | Received | 11/16/2016 09:10 |
| CCal Filename(s) | U161205B_01 & U161205B_18 | Extracted | 11/18/2016 17:30 |
| Method Blank ID | BLANK-52845 | Analyzed | 12/05/2016 16:14 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.36 | | 2,3,7,8-TCDF-13C | 2.00 | 79 |
| Total TCDF | 2.5 | ----- | 0.36 | J | 2,3,7,8-TCDD-13C | 2.00 | 92 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 72 |
| 2,3,7,8-TCDD | ND | ----- | 0.38 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 70 |
| Total TCDD | 1.3 | ----- | 0.38 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 76 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 84 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.66 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 82 |
| 2,3,4,7,8-PeCDF | ----- | 0.66 | 0.39 | IJ | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 81 |
| Total PeCDF | 37.0 | ----- | 0.52 | J | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 92 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 82 |
| 1,2,3,7,8-PeCDD | ----- | 0.88 | 0.50 | IJ | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 76 |
| Total PeCDD | 4.6 | ----- | 0.50 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 69 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 72 |
| 1,2,3,4,7,8-HxCDF | ----- | 2.90 | 0.48 | IJ | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 68 |
| 1,2,3,6,7,8-HxCDF | ----- | 3.90 | 0.37 | IJ | OCDD-13C | 4.00 | 56 |
| 2,3,4,6,7,8-HxCDF | 4.5 | ----- | 0.31 | J | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.42 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 89.0 | ----- | 0.40 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 2.4 | ----- | 0.54 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 100 |
| 1,2,3,6,7,8-HxCDD | 7.4 | ----- | 0.27 | J | | | |
| 1,2,3,7,8,9-HxCDD | ----- | 4.40 | 0.31 | IJ | | | |
| Total HxCDD | 58.0 | ----- | 0.37 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 120.0 | ----- | 0.44 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 4.6 | ----- | 0.72 | J | Equivalence: 6.7 ng/Kg | | |
| Total HpCDF | 260.0 | ----- | 0.58 | | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 210.0 | ----- | 0.27 | | | | |
| Total HpCDD | 390.0 | ----- | 0.27 | | | | |
| OCDF | 280.0 | ----- | 0.47 | | | | |
| OCDD | 1600.0 | ----- | 0.69 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

## REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16110260-004B | | |
| Lab Sample ID | 10370180004 | | |
| Filename | U161126A_14 | | |
| Injected By | BAL | | |
| Total Amount Extracted | 1.30 g | Matrix | Soil |
| % Moisture | 15.8 | Dilution | NA |
| Dry Weight Extracted | 1.09 g | Collected | 11/12/2016 09:35 |
| ICAL ID | U161025 | Received | 11/16/2016 09:10 |
| CCal Filename(s) | U161126A_02 & U161126A_16 | Extracted | 11/18/2016 17:30 |
| Method Blank ID | BLANK-52845 | Analyzed | 11/27/2016 01:17 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.67 | | 2,3,7,8-TCDF-13C | 2.00 | 92 |
| Total TCDF | 6.3 | ----- | 0.67 | J | 2,3,7,8-TCDD-13C | 2.00 | 100 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 93 |
| 2,3,7,8-TCDD | ND | ----- | 0.73 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 88 |
| Total TCDD | ND | ----- | 0.73 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 95 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 93 |
| 1,2,3,7,8-PeCDF | ND | ----- | 1.10 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 91 |
| 2,3,4,7,8-PeCDF | 1.1 | ----- | 0.61 | J | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 93 |
| Total PeCDF | 40.0 | ----- | 0.85 | J | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 103 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 91 |
| 1,2,3,7,8-PeCDD | ND | ----- | 0.94 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 77 |
| Total PeCDD | 9.0 | ----- | 0.94 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 70 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 73 |
| 1,2,3,4,7,8-HxCDF | 3.4 | ----- | 0.56 | J | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 69 |
| 1,2,3,6,7,8-HxCDF | 5.4 | ----- | 0.69 | J | OCDD-13C | 4.00 | 55 |
| 2,3,4,6,7,8-HxCDF | 6.9 | ----- | 0.47 | J | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.38 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 120.0 | ----- | 0.53 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 2.5 | ----- | 0.97 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 108 |
| 1,2,3,6,7,8-HxCDD | ----- | 7.7 | 1.10 | IJ | | | |
| 1,2,3,7,8,9-HxCDD | ----- | 5.0 | 1.10 | IJ | | | |
| Total HxCDD | 67.0 | ----- | 1.10 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 130.0 | ----- | 0.43 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 6.7 | ----- | 1.80 | J | Equivalence: 7.9 ng/Kg | | |
| Total HpCDF | 280.0 | ----- | 1.10 | | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 220.0 | ----- | 0.45 | | | | |
| Total HpCDD | 410.0 | ----- | 0.45 | | | | |
| OCDF | 330.0 | ----- | 0.88 | | | | |
| OCDD | 1900.0 | ----- | 1.40 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Sample Analysis Results

Client - Energy Laboratories

| | | | |
|---|---|---|---|
| Client's Sample ID | H16110260-005B | | |
| Lab Sample ID | 10370180005 | | |
| Filename | U161126A_15 | | |
| Injected By | BAL | | |
| Total Amount Extracted | 1.30 g | Matrix | Soil |
| % Moisture | 18.2 | Dilution | NA |
| Dry Weight Extracted | 1.06 g | Collected | 11/12/2016 09:40 |
| ICAL ID | U161025 | Received | 11/16/2016 09:10 |
| CCal Filename(s) | U161126A_02 & U161126A_16 | Extracted | 11/18/2016 17:30 |
| Method Blank ID | BLANK-52845 | Analyzed | 11/27/2016 02:03 |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | ----- | 0.96 | | 2,3,7,8-TCDF-13C | 2.00 | 90 |
| Total TCDF | 6.90 | ----- | 0.96 | J | 2,3,7,8-TCDD-13C | 2.00 | 101 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 92 |
| 2,3,7,8-TCDD | ND | ----- | 0.56 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 88 |
| Total TCDD | 1.10 | ----- | 0.56 | J | 1,2,3,7,8-PeCDD-13C | 2.00 | 92 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 91 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.70 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 87 |
| 2,3,4,7,8-PeCDF | ----- | 0.87 | 0.42 | IJ | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 89 |
| Total PeCDF | 28.00 | ----- | 0.56 | J | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 102 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 85 |
| 1,2,3,7,8-PeCDD | 0.78 | ----- | 0.59 | J | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 76 |
| Total PeCDD | 1.60 | ----- | 0.59 | J | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 65 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 68 |
| 1,2,3,4,7,8-HxCDF | 3.70 | ----- | 0.91 | J | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 64 |
| 1,2,3,6,7,8-HxCDF | 5.40 | ----- | 0.85 | J | OCDD-13C | 4.00 | 52 |
| 2,3,4,6,7,8-HxCDF | 5.90 | ----- | 0.57 | J | | | |
| 1,2,3,7,8,9-HxCDF | ----- | 0.55 | 0.55 | IJ | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | 110.00 | ----- | 0.72 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | 2.80 | ----- | 1.40 | J | 2,3,7,8-TCDD-37Cl4 | 0.20 | 108 |
| 1,2,3,6,7,8-HxCDD | 7.80 | ----- | 1.60 | J | | | |
| 1,2,3,7,8,9-HxCDD | 6.50 | ----- | 1.40 | J | | | |
| Total HxCDD | 66.00 | ----- | 1.50 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 120.00 | ----- | 0.78 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | 5.70 | ----- | 1.50 | J | Equivalence: 8.9 ng/Kg | | |
| Total HpCDF | 270.00 | ----- | 1.10 | | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 240.00 | ----- | 0.87 | | | | |
| Total HpCDD | 410.00 | ----- | 0.87 | | | | |
| OCDF | 340.00 | ----- | 1.80 | | | | |
| OCDD | 2200.00 | ----- | 1.40 | | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Blank Analysis Results

| | | | |
|---|---|---|---|
| Lab Sample ID | BLANK-52845 | Matrix | Solid |
| Filename | F161122B_07 | Dilution | NA |
| Total Amount Extracted | 75.4 g | Extracted | 11/18/2016 17:30 |
| ICAL ID | F161011 | Analyzed | 11/22/2016 14:07 |
| CCal Filename(s) | F161122B_01 & F161122C_01 | Injected By | SMT |

| Native Isomers | Conc ng/Kg | EMPC ng/Kg | EDL ng/Kg | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ----- | 0.019 | 0.0110 | IJ | 2,3,7,8-TCDF-13C | 2.00 | 84 |
| Total TCDF | ND | ----- | 0.0110 | | 2,3,7,8-TCDD-13C | 2.00 | 91 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 2.00 | 82 |
| 2,3,7,8-TCDD | ND | ----- | 0.0120 | | 2,3,4,7,8-PeCDF-13C | 2.00 | 76 |
| Total TCDD | ND | ----- | 0.0120 | | 1,2,3,7,8-PeCDD-13C | 2.00 | 82 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 2.00 | 86 |
| 1,2,3,7,8-PeCDF | ND | ----- | 0.0100 | | 1,2,3,6,7,8-HxCDF-13C | 2.00 | 94 |
| 2,3,4,7,8-PeCDF | ND | ----- | 0.0059 | | 2,3,4,6,7,8-HxCDF-13C | 2.00 | 91 |
| Total PeCDF | ND | ----- | 0.0082 | | 1,2,3,7,8,9-HxCDF-13C | 2.00 | 91 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 2.00 | 75 |
| 1,2,3,7,8-PeCDD | ND | ----- | 0.0097 | | 1,2,3,6,7,8-HxCDD-13C | 2.00 | 76 |
| Total PeCDD | ND | ----- | 0.0097 | | 1,2,3,4,6,7,8-HpCDF-13C | 2.00 | 65 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.00 | 62 |
| 1,2,3,4,7,8-HxCDF | ND | ----- | 0.0061 | | 1,2,3,4,6,7,8-HpCDD-13C | 2.00 | 64 |
| 1,2,3,6,7,8-HxCDF | ND | ----- | 0.0068 | | OCDD-13C | 4.00 | 49 |
| 2,3,4,6,7,8-HxCDF | ND | ----- | 0.0053 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | ----- | 0.0075 | | 1,2,3,4-TCDD-13C | 2.00 | NA |
| Total HxCDF | ND | ----- | 0.0064 | | 1,2,3,7,8,9-HxCDD-13C | 2.00 | NA |
| 1,2,3,4,7,8-HxCDD | ND | ----- | 0.0140 | | 2,3,7,8-TCDD-37Cl4 | 0.20 | 92 |
| 1,2,3,6,7,8-HxCDD | ND | ----- | 0.0110 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | ----- | 0.0110 | | | | |
| Total HxCDD | 0.0300 | ----- | 0.0120 | J | | | |
| 1,2,3,4,6,7,8-HpCDF | 0.0075 | ----- | 0.0046 | J | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | ND | ----- | 0.0095 | | Equivalence: 0.016 ng/Kg | | |
| Total HpCDF | 0.0075 | ----- | 0.0071 | J | (Mid-bound - Using 2005 WHO Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | ND | ----- | 0.0100 | | | | |
| Total HpCDD | 0.0210 | ----- | 0.0100 | J | | | |
| OCDF | ND | ----- | 0.0220 | | | | |
| OCDD | ----- | 0.034 | 0.0200 | IJ | | | |

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

# Method 8290 Laboratory Control Spike Results

| | | | |
|---|---|---|---|
| Lab Sample ID | LCS-52846 | | |
| Filename | U161123A_01 | Matrix | Solid |
| Total Amount Extracted | 75.2 g | Dilution | NA |
| ICAL ID | U161025 | Extracted | 11/18/2016 17:30 |
| CCal Filename(s) | U161122C_17 & U161123A_17 | Analyzed | 11/23/2016 13:08 |
| Method Blank ID | BLANK-52845 | Injected By | SMT |

| Native Isomers | Qs (ng) | Qm (ng) | % Rec. | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | 0.20 | 0.25 | 123 | 2,3,7,8-TCDF-13C | 2.0 | 83 |
| Total TCDF | | | | 2,3,7,8-TCDD-13C | 2.0 | 92 |
| | | | | 1,2,3,7,8-PeCDF-13C | 2.0 | 76 |
| 2,3,7,8-TCDD | 0.20 | 0.20 | 102 | 2,3,4,7,8-PeCDF-13C | 2.0 | 73 |
| Total TCDD | | | | 1,2,3,7,8-PeCDD-13C | 2.0 | 80 |
| | | | | 1,2,3,4,7,8-HxCDF-13C | 2.0 | 84 |
| 1,2,3,7,8-PeCDF | 1.0 | 1.2 | 122 | 1,2,3,6,7,8-HxCDF-13C | 2.0 | 79 |
| 2,3,4,7,8-PeCDF | 1.0 | 1.3 | 128 | 2,3,4,6,7,8-HxCDF-13C | 2.0 | 84 |
| Total PeCDF | | | | 1,2,3,7,8,9-HxCDF-13C | 2.0 | 97 |
| | | | | 1,2,3,4,7,8-HxCDD-13C | 2.0 | 86 |
| 1,2,3,7,8-PeCDD | 1.0 | 1.1 | 113 | 1,2,3,6,7,8-HxCDD-13C | 2.0 | 69 |
| Total PeCDD | | | | 1,2,3,4,6,7,8-HpCDF-13C | 2.0 | 72 |
| | | | | 1,2,3,4,7,8,9-HpCDF-13C | 2.0 | 83 |
| 1,2,3,4,7,8-HxCDF | 1.0 | 1.3 | 125 | 1,2,3,4,6,7,8-HpCDD-13C | 2.0 | 77 |
| 1,2,3,6,7,8-HxCDF | 1.0 | 1.2 | 121 | OCDD-13C | 4.0 | 76 |
| 2,3,4,6,7,8-HxCDF | 1.0 | 1.2 | 116 | | | |
| 1,2,3,7,8,9-HxCDF | 1.0 | 1.1 | 113 | 1,2,3,4-TCDD-13C | 2.0 | NA |
| Total HxCDF | | | | 1,2,3,7,8,9-HxCDD-13C | 2.0 | NA |
| 1,2,3,4,7,8-HxCDD | 1.0 | 1.2 | 124 | 2,3,7,8-TCDD-37Cl4 | 0.20 | 105 |
| 1,2,3,6,7,8-HxCDD | 1.0 | 1.3 | 129 | | | |
| 1,2,3,7,8,9-HxCDD | 1.0 | 1.3 | 127 | | | |
| Total HxCDD | | | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.0 | 1.2 | 122 | | | |
| 1,2,3,4,7,8,9-HpCDF | 1.0 | 1.1 | 111 | | | |
| Total HpCDF | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 1.0 | 1.1 | 113 | | | |
| Total HpCDD | | | | | | |
| OCDF | 2.0 | 2.6 | 129 | | | |
| OCDD | 2.0 | 2.4 | 122 | | | |

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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# Work Order Receipt Checklist

## Trihydro-Laramie

## H16110260

Login completed by: Tracy L. Lorash
Reviewed by: BL2000\rwilliams
Reviewed Date: 11/23/2016

Date Received: 11/15/2016
Received by: TLL
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: | -1.8°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:

No collection time on COC or jars for BD-20161112-01. Estimated collection time in the laboratory. tl 11/15/16

ENERGY LABORATORIES

# Chain of Custody and Analytical Request Record

Page 1 of 1

**PLEASE PRINT** (Provide as much information as possible.)

Company Name: Trihydro

Project Name, PWS, Permit, Etc.: Diamond P Ranch

Sample Origin State: MT

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required):

Contact Name: Andrew Vonn Phone/Fax: 307 745 7474 Cell:

Sampler: (Please Print)

☐ No Hard Copy Email: cbullock@trihydro.com avonn@trihydro.com

Invoice Contact & Phone:

Purchase Order:

Quote/Bottle Order:

Invoice Address (Required):

☐ No Hard Copy Email: apc@trihydro.com

Special Report/Formats:

☐ DW ☒ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: Trihydro
☐ State: ☐ LEVEL IV
☐ Other: ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids
Vegetation Bioassay Other
DW - Drinking Water

ANALYSIS REQUESTED

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Hand

Cooler ID(s): 4

Receipt Temp -1.8 °C TB

On Ice: Y N

Custody Seal On Bottle Y N
On Cooler Y N
Intact Y N
Signature Match Y N

LABORATORY USE ONLY H16110260

| | SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) | Collection Date | Collection Time | MATRIX | PCP 8151 | EPH | PAH 8270C | RCRA 8 metals 6020 | Dioxins/Furans 8290 | | | | | SEE ATTACHED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIAP-3-S-EAST (0-2) | 11/17/16 | 0920 | Soil | X | X | X | X | X | | | | | |
| 2 | DIAP-3-S-NORTH (0-2) | | 0925 | | X | X | X | X | X | | | | | |
| 3 | DIAP-3-S-WEST (0-2) | | 0930 | | X | X | X | X | X | | | | | |
| 4 | DIAP-3-SS-F (2.0) | | 0935 | | X | X | X | X | X | | | | | |
| 5 | BD-20161112-01 | | — | | X | X | X | X | X | | | | | |
| 6 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |

**Custody Record MUST be Signed**

Relinquished by (print): L. Dowell Date/Time: 11/17/16 0800 Signature:

Received by (print): Date/Time: Signature:

Relinquished by (print): Date/Time: Signature:

Received by (print): Date/Time: Signature:

Received by Laboratory: Tracy Corah Date/Time: 11/15/16 8:00 Signature:

Sample Disposal: Return to Client: Lab Disposal:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.

# ANALYTICAL SUMMARY REPORT

May 11, 2017

Trihydro-Laramie
1252 Commerce Dr
Laramie, WY 82070-7000

Work Order: H17040398 Quote ID: H1141

Project Name: Diamond P Ranch

Energy Laboratories Inc Helena MT received the following 5 samples for Trihydro-Laramie on 4/25/2017 for analysis.

| Lab ID | Client Sample ID | Collect Date | Receive Date | Matrix | Test |
|---|---|---|---|---|---|
| H17040398-001 | MW-1 | 04/24/17 12:30 | 04/25/17 | Aqueous | Metals by ICP/ICPMS, Dissolved<br>Mercury, Dissolved<br>Services Provided by Lab<br>EPH-Sep Funnel Extraction<br>Hydrocarbons, Extractable<br>Petroleum Screen<br>8151-Herbicides, Chlorinated<br>Preparation, Dissolved Filtration<br>Digestion, Mercury by CVAA<br>Separatory Funnel Liquid Liquid Ext.<br>Separatory Funnel Liquid-Liquid Ext.<br>Low Level PAH |
| H17040398-002 | MW-3 | 04/24/17 13:50 | 04/25/17 | Aqueous | Same As Above |
| H17040398-003 | MW-4 | 04/24/17 15:30 | 04/25/17 | Aqueous | Same As Above |
| H17040398-004 | House | 04/24/17 16:30 | 04/25/17 | Aqueous | Same As Above |
| H17040398-005 | BD-20170424 | 04/24/17 17:00 | 04/25/17 | Aqueous | 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Work Order:** H17040398

**Report Date:** 05/11/17

# 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H17040398-001
**Client Sample ID:** MW-1

**Report Date:** 05/11/17
**Collection Date:** 04/24/17 12:30
**DateReceived:** 04/25/17
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.001 | mg/L | | 0.001 | | SW6020 | 04/28/17 15:14 / dck |
| Barium | ND | mg/L | | 0.05 | | SW6020 | 04/28/17 15:14 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:14 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 04/28/17 15:14 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:14 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 04/27/17 14:23 / dck |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:14 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:14 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 300 | 1000 | SW8015M | 04/29/17 02:34 / JRS |
| Surr: o-Terphenyl | 85.0 | %REC | | 40-140 | | SW8015M | 04/29/17 02:34 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 1-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 20:00 / eli-b |
| Surr: 2-Fluorobiphenyl | 61.0 | %REC | | 25-94 | | SW8270C | 05/01/17 20:00 / eli-b |
| Surr: Nitrobenzene-d5 | 84.0 | %REC | | 19-102 | | SW8270C | 05/01/17 20:00 / eli-b |
| Surr: Terphenyl-d14 | 91.0 | %REC | | 39-106 | | SW8270C | 05/01/17 20:00 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 05/05/17 01:25 / eli-b |
| Surr: DCAA | 87.0 | %REC | | 50-125 | | SW8151A | 05/05/17 01:25 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H17040398-002
**Client Sample ID:** MW-3

**Report Date:** 05/11/17
**Collection Date:** 04/24/17 13:50
**DateReceived:** 04/25/17
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.002 | mg/L | | 0.001 | | SW6020 | 04/28/17 15:21 / dck |
| Barium | ND | mg/L | | 0.05 | | SW6020 | 04/28/17 15:21 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:21 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 04/28/17 15:21 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:21 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 04/27/17 14:27 / dck |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:21 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:21 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 314 | 1000 | SW8015M | 04/29/17 01:50 / JRS |
| Surr: o-Terphenyl | 87.0 | %REC | | 40-140 | | SW8015M | 04/29/17 01:50 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 1-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 21:05 / eli-b |
| Surr: 2-Fluorobiphenyl | 49.0 | %REC | | 25-94 | | SW8270C | 05/01/17 21:05 / eli-b |
| Surr: Nitrobenzene-d5 | 68.0 | %REC | | 19-102 | | SW8270C | 05/01/17 21:05 / eli-b |
| Surr: Terphenyl-d14 | 59.0 | %REC | | 39-106 | | SW8270C | 05/01/17 21:05 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 05/05/17 00:15 / eli-b |
| Surr: DCAA | 93.0 | %REC | | 50-125 | | SW8151A | 05/05/17 00:15 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H17040398-003
**Client Sample ID:** MW-4

**Report Date:** 05/11/17
**Collection Date:** 04/24/17 15:30
**DateReceived:** 04/25/17
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.001 | mg/L | | 0.001 | | SW6020 | 04/28/17 15:23 / dck |
| Barium | 0.06 | mg/L | | 0.05 | | SW6020 | 04/28/17 15:23 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:23 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 04/28/17 15:23 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:23 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 04/27/17 14:36 / dck |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:23 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:23 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 982 | ug/L | | 300 | 1000 | SW8015M | 04/29/17 01:06 / JRS |
| Surr: o-Terphenyl | 78.0 | %REC | | 40-140 | | SW8015M | 04/29/17 01:06 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 1-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:11 / eli-b |
| Surr: 2-Fluorobiphenyl | 57.0 | %REC | | 25-94 | | SW8270C | 05/01/17 22:11 / eli-b |
| Surr: Nitrobenzene-d5 | 72.0 | %REC | | 19-102 | | SW8270C | 05/01/17 22:11 / eli-b |
| Surr: Terphenyl-d14 | 77.0 | %REC | | 39-106 | | SW8270C | 05/01/17 22:11 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 354 | ug/L | | 4.0 | | SW8151A | 05/05/17 03:44 / eli-b |
| Surr: DCAA | 70.0 | %REC | | 50-125 | | SW8151A | 05/02/17 22:32 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H17040398-004
**Client Sample ID:** House

**Report Date:** 05/11/17
**Collection Date:** 04/24/17 16:30
**DateReceived:** 04/25/17
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:25 / dck |
| Barium | 0.06 | mg/L | | 0.05 | | SW6020 | 04/28/17 15:25 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:25 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 04/28/17 15:25 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:25 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 04/27/17 14:45 / dck |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:25 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:25 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | ND | ug/L | | 300 | 1000 | SW8015M | 04/29/17 00:22 / JRS |
| Surr: o-Terphenyl | 83.0 | %REC | | 40-140 | | SW8015M | 04/29/17 00:22 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 1-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/01/17 22:44 / eli-b |
| Surr: 2-Fluorobiphenyl | 49.0 | %REC | | 25-94 | | SW8270C | 05/01/17 22:44 / eli-b |
| Surr: Nitrobenzene-d5 | 56.0 | %REC | | 19-102 | | SW8270C | 05/01/17 22:44 / eli-b |
| Surr: Terphenyl-d14 | 95.0 | %REC | | 39-106 | | SW8270C | 05/01/17 22:44 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | ND | ug/L | | 0.10 | | SW8151A | 05/05/17 00:50 / eli-b |
| Surr: DCAA | 76.0 | %REC | | 50-125 | | SW8151A | 05/05/17 00:50 / 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:** Trihydro-Laramie
**Project:** Diamond P Ranch
**Lab ID:** H17040398-005
**Client Sample ID:** BD-20170424

**Report Date:** 05/11/17
**Collection Date:** 04/24/17 17:00
**DateReceived:** 04/25/17
**Matrix:** Aqueous

| Analyses | Result | Units | Qualifiers | RL | MCL/ QCL | Method | Analysis Date / By |
|---|---|---|---|---|---|---|---|
| **METALS, DISSOLVED** | | | | | | | |
| Arsenic | 0.001 | mg/L | | 0.001 | | SW6020 | 04/28/17 15:27 / dck |
| Barium | 0.06 | mg/L | | 0.05 | | SW6020 | 04/28/17 15:27 / dck |
| Cadmium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:27 / dck |
| Chromium | ND | mg/L | | 0.005 | | SW6020 | 04/28/17 15:27 / dck |
| Lead | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:27 / dck |
| Mercury | ND | mg/L | | 0.0001 | | SW7470A | 04/27/17 14:48 / dck |
| Selenium | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:27 / dck |
| Silver | ND | mg/L | | 0.001 | | SW6020 | 04/28/17 15:27 / dck |
| **EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN ANALYSIS** | | | | | | | |
| Total Extractable Hydrocarbons | 624 | ug/L | | 300 | 1000 | SW8015M | 04/28/17 22:54 / JRS |
| Surr: o-Terphenyl | 82.0 | %REC | | 40-140 | | SW8015M | 04/28/17 22:54 / JRS |
| - Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time. | | | | | | | |
| **SEMI-VOLATILE ORGANIC COMPOUNDS (LOW LEVEL)** | | | | | | | |
| 1-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| 2-Methylnaphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Acenaphthene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Acenaphthylene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Benzo(a)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Benzo(a)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Benzo(b)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Benzo(g,h,i)perylene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Benzo(k)fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Chrysene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Dibenzo(a,h)anthracene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Fluoranthene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Fluorene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Indeno(1,2,3-cd)pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Naphthalene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Phenanthrene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Pyrene | ND | ug/L | | 0.10 | | SW8270C | 05/02/17 11:43 / eli-b |
| Surr: 2-Fluorobiphenyl | 50.0 | %REC | | 25-94 | | SW8270C | 05/02/17 11:43 / eli-b |
| Surr: Nitrobenzene-d5 | 58.0 | %REC | | 19-102 | | SW8270C | 05/02/17 11:43 / eli-b |
| Surr: Terphenyl-d14 | 72.0 | %REC | | 39-106 | | SW8270C | 05/02/17 11:43 / eli-b |
| **HERBICIDES, CHLORINATED** | | | | | | | |
| Pentachlorophenol | 333 | ug/L | | 4.0 | | SW8151A | 05/05/17 04:19 / eli-b |
| Surr: DCAA | 71.0 | %REC | | 50-125 | | SW8151A | 05/02/17 23:42 / 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:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **E245.1** | | | | | | | | Analytical Run: HGCV202-H_170428A | | |
| **Lab ID:** | **ICV** | | Initial Calibration Verification Standard | | | | | | | 04/27/17 13:46 | |
| Mercury | | | 9.66E-05 | mg/L | 0.00010 | 97 | 90 | 110 | | | |
| **Lab ID:** | **CCV1** | | Continuing Calibration Verification Standard | | | | | | | 04/27/17 13:49 | |
| Mercury | | | 0.000101 | mg/L | 0.00010 | 101 | 95 | 105 | | | |
| **Lab ID:** | **CCV** | | Continuing Calibration Verification Standard | | | | | | | 04/27/17 14:30 | |
| Mercury | | | 0.000102 | mg/L | 0.00010 | 102 | 90 | 110 | | | |
| **Method:** | **E245.1** | | | | | | | | | | Batch: 37039 |
| **Lab ID:** | **MB-37039** | | Method Blank | | | | Run: HGCV202-H_170428A | | | 04/27/17 13:58 | |
| Mercury | | | ND | mg/L | 2E-06 | | | | | | |
| **Lab ID:** | **LCS-37039** | | Laboratory Control Sample | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:02 | |
| Mercury | | | 7.08E-05 | mg/L | 0.00010 | 94 | 90 | 110 | | | |
| **Lab ID:** | **H17040398-003AMS** | | Sample Matrix Spike | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:39 | |
| Mercury | | | 0.000149 | mg/L | 0.00010 | 95 | 70 | 130 | | | |
| **Lab ID:** | **H17040398-003AMSD** | | Sample Matrix Spike Duplicate | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:42 | |
| Mercury | | | 0.000148 | mg/L | 0.00010 | 94 | 70 | 130 | 0.5 | 20 | |
| **Lab ID:** | **H17040416-014CMS** | | Sample Matrix Spike | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:55 | |
| Mercury | | | 7.0E-05 | mg/L | 0.00010 | 93 | 70 | 130 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW6020** | | | | | | | | Analytical Run: ICPMS205-H_170428D | | |
| **Lab ID:** | **ICV** | 7 | Initial Calibration Verification Standard | | | | | | | 04/28/17 14:36 | |
| Arsenic | | | 0.0621 | mg/L | 0.0010 | 104 | 90 | 110 | | | |
| Barium | | | 0.0596 | mg/L | 0.0010 | 99 | 90 | 110 | | | |
| Cadmium | | | 0.0299 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| Chromium | | | 0.0619 | mg/L | 0.0010 | 103 | 90 | 110 | | | |
| Lead | | | 0.0598 | mg/L | 0.0010 | 100 | 90 | 110 | | | |
| Selenium | | | 0.0606 | mg/L | 0.0010 | 101 | 90 | 110 | | | |
| Silver | | | 0.0305 | mg/L | 0.0010 | 102 | 90 | 110 | | | |
| **Method:** | **SW6020** | | | | | | | | | Batch: R124681 | |
| **Lab ID:** | **LRB** | 7 | Method Blank | | | | Run: ICPMS205-H_170428D | | | 04/28/17 14:50 | |
| Arsenic | | | ND | mg/L | 1E-05 | | | | | | |
| Barium | | | ND | mg/L | 2E-05 | | | | | | |
| Cadmium | | | ND | mg/L | 5E-06 | | | | | | |
| Chromium | | | ND | mg/L | 2E-05 | | | | | | |
| Lead | | | ND | mg/L | 1E-05 | | | | | | |
| Selenium | | | ND | mg/L | 2E-05 | | | | | | |
| Silver | | | ND | mg/L | 3E-06 | | | | | | |
| **Lab ID:** | **LFB** | 7 | Laboratory Fortified Blank | | | | Run: ICPMS205-H_170428D | | | 04/28/17 14:51 | |
| Arsenic | | | 0.0509 | mg/L | 0.0010 | 102 | 80 | 120 | | | |
| Barium | | | 0.0494 | mg/L | 0.0010 | 99 | 80 | 120 | | | |
| Cadmium | | | 0.0494 | mg/L | 0.0010 | 99 | 80 | 120 | | | |
| Chromium | | | 0.0507 | mg/L | 0.0010 | 101 | 80 | 120 | | | |
| Lead | | | 0.0492 | mg/L | 0.0010 | 98 | 80 | 120 | | | |
| Selenium | | | 0.0498 | mg/L | 0.0010 | 100 | 80 | 120 | | | |
| Silver | | | 0.0196 | mg/L | 0.0010 | 98 | 80 | 120 | | | |
| **Lab ID:** | **H17040398-001AMS** | 7 | Sample Matrix Spike | | | | Run: ICPMS205-H_170428D | | | 04/28/17 15:18 | |
| Arsenic | | | 0.0526 | mg/L | 0.0010 | 103 | 75 | 125 | | | |
| Barium | | | 0.0898 | mg/L | 0.050 | 101 | 75 | 125 | | | |
| Cadmium | | | 0.0504 | mg/L | 0.0010 | 101 | 75 | 125 | | | |
| Chromium | | | 0.0532 | mg/L | 0.0050 | 102 | 75 | 125 | | | |
| Lead | | | 0.0494 | mg/L | 0.0010 | 99 | 75 | 125 | | | |
| Selenium | | | 0.0530 | mg/L | 0.0010 | 106 | 75 | 125 | | | |
| Silver | | | 0.0198 | mg/L | 0.0010 | 99 | 75 | 125 | | | |
| **Lab ID:** | **H17040398-001AMSD** | 7 | Sample Matrix Spike Duplicate | | | | Run: ICPMS205-H_170428D | | | 04/28/17 15:20 | |
| Arsenic | | | 0.0528 | mg/L | 0.0010 | 103 | 75 | 125 | 0.3 | 20 | |
| Barium | | | 0.0893 | mg/L | 0.050 | 100 | 75 | 125 | 0.6 | 20 | |
| Cadmium | | | 0.0499 | mg/L | 0.0010 | 100 | 75 | 125 | 0.9 | 20 | |
| Chromium | | | 0.0539 | mg/L | 0.0050 | 103 | 75 | 125 | 1.3 | 20 | |
| Lead | | | 0.0495 | mg/L | 0.0010 | 99 | 75 | 125 | 0.2 | 20 | |
| Selenium | | | 0.0522 | mg/L | 0.0010 | 104 | 75 | 125 | 1.6 | 20 | |
| Silver | | | 0.0198 | mg/L | 0.0010 | 99 | 75 | 125 | 0.4 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method:** | **SW7470A** | | | | | | | | | Batch: 37039 |
| **Lab ID:** | **H17040398-003AMS** | Sample Matrix Spike | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:39 | |
| Mercury | | 0.00015 | mg/L | 0.00010 | 95 | 70 | 130 | | | |
| **Lab ID:** | **H17040398-003AMSD** | Sample Matrix Spike Duplicate | | | | Run: HGCV202-H_170428A | | | 04/27/17 14:42 | |
| Mercury | | 0.00015 | mg/L | 0.00010 | 94 | 70 | 130 | 0.5 | 20 | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8015M** | | | | | | | | | | Batch: 37021 |
| **Lab ID: MB-37021** | 2 | Method Blank | | | | Run: HHP2_170425A | | | | 04/25/17 14:32 |
| Total Extractable Hydrocarbons | | ND | ug/L | 300 | | | | | | |
| Surr: o-Terphenyl | | | | | 83 | 40 | 140 | | | |
| **Lab ID: LCS-37021** | 2 | Laboratory Control Sample | | | | Run: HHP2_170425A | | | | 04/25/17 15:21 |
| Total Extractable Hydrocarbons | | 6610 | ug/L | 300 | 103 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | | 89 | 40 | 140 | | | |
| **Lab ID: H17040333-001BMS** | 2 | Sample Matrix Spike | | | | Run: HHP2_170425A | | | | 04/25/17 16:59 |
| Total Extractable Hydrocarbons | | 15300 | ug/L | 600 | 99 | 60 | 140 | | | |
| Surr: o-Terphenyl | | | | | 90 | 40 | 140 | | | |
| **Lab ID: H17040333-001BMSD** | 2 | Sample Matrix Spike Duplicate | | | | Run: HHP_170501A | | | | 05/01/17 12:31 |
| Total Extractable Hydrocarbons | | 13300 | ug/L | 600 | 83 | 60 | 140 | 14 | 20 | |
| Surr: o-Terphenyl | | | | | 91 | 40 | 140 | | | |
| **Method: SW8015M** | | | | | | | | | | Analytical Run: R124634 |
| **Lab ID: CCV_0428GC114r-W** | 15 | Continuing Calibration Verification Standard | | | | | | | | 04/28/17 19:57 |
| n-Nonane | | 234 | ug/L | | 117 | 75 | 125 | | | |
| n-Decane | | 236 | ug/L | | 118 | 75 | 125 | | | |
| n-Dodecane | | 221 | ug/L | | 111 | 75 | 125 | | | |
| n-Tetradecane | | 219 | ug/L | | 109 | 75 | 125 | | | |
| n-Hexadecane | | 217 | ug/L | | 108 | 75 | 125 | | | |
| n-Octadecane | | 216 | ug/L | | 108 | 75 | 125 | | | |
| n-Nonadecane | | 214 | ug/L | | 107 | 75 | 125 | | | |
| n-Eicosane | | 213 | ug/L | | 106 | 75 | 125 | | | |
| n-Docosane | | 208 | ug/L | | 104 | 75 | 125 | | | |
| n-Tetracosane | | 204 | ug/L | | 102 | 75 | 125 | | | |
| n-Hexacosane | | 215 | ug/L | | 107 | 75 | 125 | | | |
| n-Octacosane | | 218 | ug/L | | 109 | 75 | 125 | | | |
| n-Triacontane | | 217 | ug/L | | 109 | 75 | 125 | | | |
| n-Hexatriacontane | | 215 | ug/L | | 108 | 75 | 125 | | | |
| Surr: o-Terphenyl | | | | | 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:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8151A** | | | | | | | | | | Batch: B_109020 |
| **Lab ID: LCS-109020** | 2 | Laboratory Control Sample | | | | Run: SUB-B279350 | | | | 05/04/17 23:05 |
| Pentachlorophenol | | 4.10 | ug/L | 0.10 | 82 | 61 | 122 | | | |
| Surr: DCAA | | | | 0.10 | 80 | 50 | 125 | | | |
| **Lab ID: MB-109020** | 2 | Method Blank | | | | Run: SUB-B279350 | | | | 05/04/17 23:40 |
| Pentachlorophenol | | ND | ug/L | 0.10 | | | | | | |
| Surr: DCAA | | | | 0.10 | 84 | 50 | 125 | | | |
| **Lab ID: H17040398-001C** | 2 | Sample Matrix Spike | | | | Run: SUB-B279350 | | | | 05/05/17 01:59 |
| Pentachlorophenol | | 3.40 | ug/L | 0.10 | 68 | 61 | 122 | | | |
| Surr: DCAA | | | | 0.10 | 60 | 50 | 125 | | | |
| **Lab ID: H17040398-001C** | 2 | Sample Matrix Spike Duplicate | | | | Run: SUB-B279350 | | | | 05/05/17 02:34 |
| Pentachlorophenol | | 3.65 | ug/L | 0.10 | 73 | 61 | 122 | 7.1 | 40 | |
| Surr: DCAA | | | | 0.10 | 80 | 50 | 125 | | | |
| **Method: SW8151A** | | | | | | | | | | Analytical Run: B_R279350 |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | | 05/04/17 22:30 |
| Pentachlorophenol | | 0.474 | ug/L | 0.10 | 100 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.10 | 100 | 85 | 115 | | | |
| **Lab ID: CK6** | 2 | Continuing Calibration Verification Standard | | | | | | | | 05/05/17 05:28 |
| Pentachlorophenol | | 0.505 | ug/L | 0.10 | 106 | 85 | 115 | | | |
| Surr: DCAA | | | | 0.10 | 109 | 85 | 115 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_108984 | |
| **Lab ID: LMB-108984** | 21 | Method Blank | | | | Run: SUB-B279027 | | | 05/01/17 18:55 | |
| 1-Methylnaphthalene | | ND | ug/L | 0.10 | | | | | | |
| 2-Methylnaphthalene | | ND | ug/L | 0.10 | | | | | | |
| Acenaphthene | | ND | ug/L | 0.10 | | | | | | |
| Acenaphthylene | | ND | ug/L | 0.10 | | | | | | |
| Anthracene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(a)anthracene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(a)pyrene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(b)fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(g,h,i)perylene | | ND | ug/L | 0.10 | | | | | | |
| Benzo(k)fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Chrysene | | ND | ug/L | 0.10 | | | | | | |
| Dibenzo(a,h)anthracene | | ND | ug/L | 0.10 | | | | | | |
| Fluoranthene | | ND | ug/L | 0.10 | | | | | | |
| Fluorene | | ND | ug/L | 0.10 | | | | | | |
| Indeno(1,2,3-cd)pyrene | | ND | ug/L | 0.10 | | | | | | |
| Naphthalene | | ND | ug/L | 0.10 | | | | | | |
| Phenanthrene | | ND | ug/L | 0.10 | | | | | | |
| Pyrene | | ND | ug/L | 0.10 | | | | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 47 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 58 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 67 | 39 | 106 | | | |
| **Lab ID: LLCS-108984** | 21 | Sample Matrix Spike | | | | Run: SUB-B279027 | | | 05/01/17 19:27 | |
| 1-Methylnaphthalene | | 3.59 | ug/L | 0.10 | 72 | 18 | 117 | | | |
| 2-Methylnaphthalene | | 3.75 | ug/L | 0.10 | 75 | 17 | 118 | | | |
| Acenaphthene | | 4.03 | ug/L | 0.10 | 81 | 40 | 92 | | | |
| Acenaphthylene | | 3.62 | ug/L | 0.10 | 72 | 37 | 96 | | | |
| Anthracene | | 4.21 | ug/L | 0.10 | 84 | 46 | 108 | | | |
| Benzo(a)anthracene | | 3.78 | ug/L | 0.10 | 76 | 41 | 105 | | | |
| Benzo(a)pyrene | | 4.25 | ug/L | 0.10 | 85 | 42 | 110 | | | |
| Benzo(b)fluoranthene | | 3.81 | ug/L | 0.10 | 76 | 27 | 121 | | | |
| Benzo(g,h,i)perylene | | 4.71 | ug/L | 0.10 | 94 | 44 | 108 | | | |
| Benzo(k)fluoranthene | | 5.03 | ug/L | 0.10 | 101 | 44 | 111 | | | |
| Chrysene | | 4.61 | ug/L | 0.10 | 92 | 50 | 106 | | | |
| Dibenzo(a,h)anthracene | | 4.22 | ug/L | 0.10 | 84 | 47 | 111 | | | |
| Fluoranthene | | 4.06 | ug/L | 0.10 | 81 | 44 | 111 | | | |
| Fluorene | | 4.02 | ug/L | 0.10 | 80 | 42 | 99 | | | |
| Indeno(1,2,3-cd)pyrene | | 3.83 | ug/L | 0.10 | 77 | 33 | 112 | | | |
| Naphthalene | | 3.27 | ug/L | 0.10 | 65 | 22 | 108 | | | |
| Phenanthrene | | 4.14 | ug/L | 0.10 | 83 | 43 | 106 | | | |
| Pyrene | | 4.50 | ug/L | 0.10 | 90 | 41 | 106 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 41 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 73 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 71 | 39 | 106 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Batch: B_108984 | |
| **Lab ID: LLCS-108984** | 21 | Sample Matrix Spike | | | | Run: SUB-B279027 | | | 05/01/17 19:27 | |
| **Lab ID: B17042061-001DLMS** | 21 | Sample Matrix Spike | | | | Run: SUB-B279027 | | | 05/01/17 20:33 | |
| 1-Methylnaphthalene | | 7.40 | ug/L | 0.20 | 74 | 18 | 117 | | | |
| 2-Methylnaphthalene | | 8.28 | ug/L | 0.20 | 83 | 17 | 118 | | | |
| Acenaphthene | | 8.26 | ug/L | 0.20 | 83 | 40 | 92 | | | |
| Acenaphthylene | | 7.42 | ug/L | 0.20 | 74 | 37 | 96 | | | |
| Anthracene | | 8.50 | ug/L | 0.20 | 85 | 46 | 108 | | | |
| Benzo(a)anthracene | | 8.40 | ug/L | 0.20 | 84 | 41 | 105 | | | |
| Benzo(a)pyrene | | 9.52 | ug/L | 0.20 | 95 | 42 | 110 | | | |
| Benzo(b)fluoranthene | | 9.18 | ug/L | 0.20 | 92 | 27 | 121 | | | |
| Benzo(g,h,i)perylene | | 10.4 | ug/L | 0.20 | 104 | 44 | 108 | | | |
| Benzo(k)fluoranthene | | 10.5 | ug/L | 0.20 | 105 | 44 | 111 | | | |
| Chrysene | | 10.4 | ug/L | 0.20 | 104 | 50 | 106 | | | |
| Dibenzo(a,h)anthracene | | 8.92 | ug/L | 0.20 | 89 | 47 | 111 | | | |
| Fluoranthene | | 8.96 | ug/L | 0.20 | 90 | 44 | 111 | | | |
| Fluorene | | 8.40 | ug/L | 0.20 | 84 | 42 | 99 | | | |
| Indeno(1,2,3-cd)pyrene | | 7.70 | ug/L | 0.20 | 77 | 33 | 112 | | | |
| Naphthalene | | 6.80 | ug/L | 0.20 | 68 | 22 | 108 | | | |
| Phenanthrene | | 9.26 | ug/L | 0.20 | 93 | 43 | 106 | | | |
| Pyrene | | 10.1 | ug/L | 0.20 | 101 | 41 | 106 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.20 | 61 | 25 | 94 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.20 | 76 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.20 | 79 | 39 | 106 | | | |
| **Lab ID: B17042061-002DLMS** | 21 | Sample Matrix Spike | | | | Run: SUB-B279027 | | | 05/01/17 21:38 | |
| 1-Methylnaphthalene | | 9.58 | ug/L | 0.20 | 96 | 18 | 117 | | | |
| 2-Methylnaphthalene | | 7.68 | ug/L | 0.20 | 77 | 17 | 118 | | | |
| Acenaphthene | | 8.50 | ug/L | 0.20 | 85 | 40 | 92 | | | |
| Acenaphthylene | | 7.82 | ug/L | 0.20 | 78 | 37 | 96 | | | |
| Anthracene | | 8.50 | ug/L | 0.20 | 85 | 46 | 108 | | | |
| Benzo(a)anthracene | | 7.96 | ug/L | 0.20 | 80 | 41 | 105 | | | |
| Benzo(a)pyrene | | 8.66 | ug/L | 0.20 | 87 | 42 | 110 | | | |
| Benzo(b)fluoranthene | | 7.58 | ug/L | 0.20 | 76 | 27 | 121 | | | |
| Benzo(g,h,i)perylene | | 9.28 | ug/L | 0.20 | 93 | 44 | 108 | | | |
| Benzo(k)fluoranthene | | 10.1 | ug/L | 0.20 | 101 | 44 | 111 | | | |
| Chrysene | | 9.86 | ug/L | 0.20 | 99 | 50 | 106 | | | |
| Dibenzo(a,h)anthracene | | 8.06 | ug/L | 0.20 | 81 | 47 | 111 | | | |
| Fluoranthene | | 8.54 | ug/L | 0.20 | 85 | 44 | 111 | | | |
| Fluorene | | 8.54 | ug/L | 0.20 | 85 | 42 | 99 | | | |
| Indeno(1,2,3-cd)pyrene | | 7.48 | ug/L | 0.20 | 75 | 33 | 112 | | | |
| Naphthalene | | 6.86 | ug/L | 0.20 | 69 | 22 | 108 | | | |
| Phenanthrene | | 9.08 | ug/L | 0.20 | 91 | 43 | 106 | | | |
| Pyrene | | 9.60 | ug/L | 0.20 | 96 | 41 | 106 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.20 | 42 | 25 | 94 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | | Batch: B_108984 |
| **Lab ID: B17042061-002DLMS** | 21 | Sample Matrix Spike | | | | Run: SUB-B279027 | | | | 05/01/17 21:38 |
| Surr: Nitrobenzene-d5 | | | | 0.20 | 55 | 19 | 102 | | | |
| Surr: Terphenyl-d14 | | | | 0.20 | 74 | 39 | 106 | | | |
| **Method: SW8270C** | | | | | | | | | | Analytical Run: B_R279027 |
| **Lab ID: 01-May-17_CCV_2** | 21 | Continuing Calibration Verification Standard | | | | | | | | 05/01/17 12:55 |
| 1-Methylnaphthalene | | 2.13 | ug/L | 0.10 | 106 | 80 | 120 | | | |
| 2-Methylnaphthalene | | 2.30 | ug/L | 0.10 | 115 | 80 | 120 | | | |
| Acenaphthene | | 2.04 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Acenaphthylene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Anthracene | | 2.09 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Benzo(a)anthracene | | 2.12 | ug/L | 0.10 | 106 | 80 | 120 | | | |
| Benzo(a)pyrene | | 2.16 | ug/L | 0.10 | 108 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 2.06 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.08 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Chrysene | | 2.03 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 2.07 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Fluoranthene | | 2.03 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Fluorene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.18 | ug/L | 0.10 | 109 | 80 | 120 | | | |
| Naphthalene | | 2.20 | ug/L | 0.10 | 110 | 80 | 120 | | | |
| Phenanthrene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Pyrene | | 2.02 | ug/L | 0.10 | 101 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 103 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 112 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 106 | 80 | 120 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Trihydro-Laramie **Report Date:** 05/11/17

**Project:** Diamond P Ranch **Work Order:** H17040398

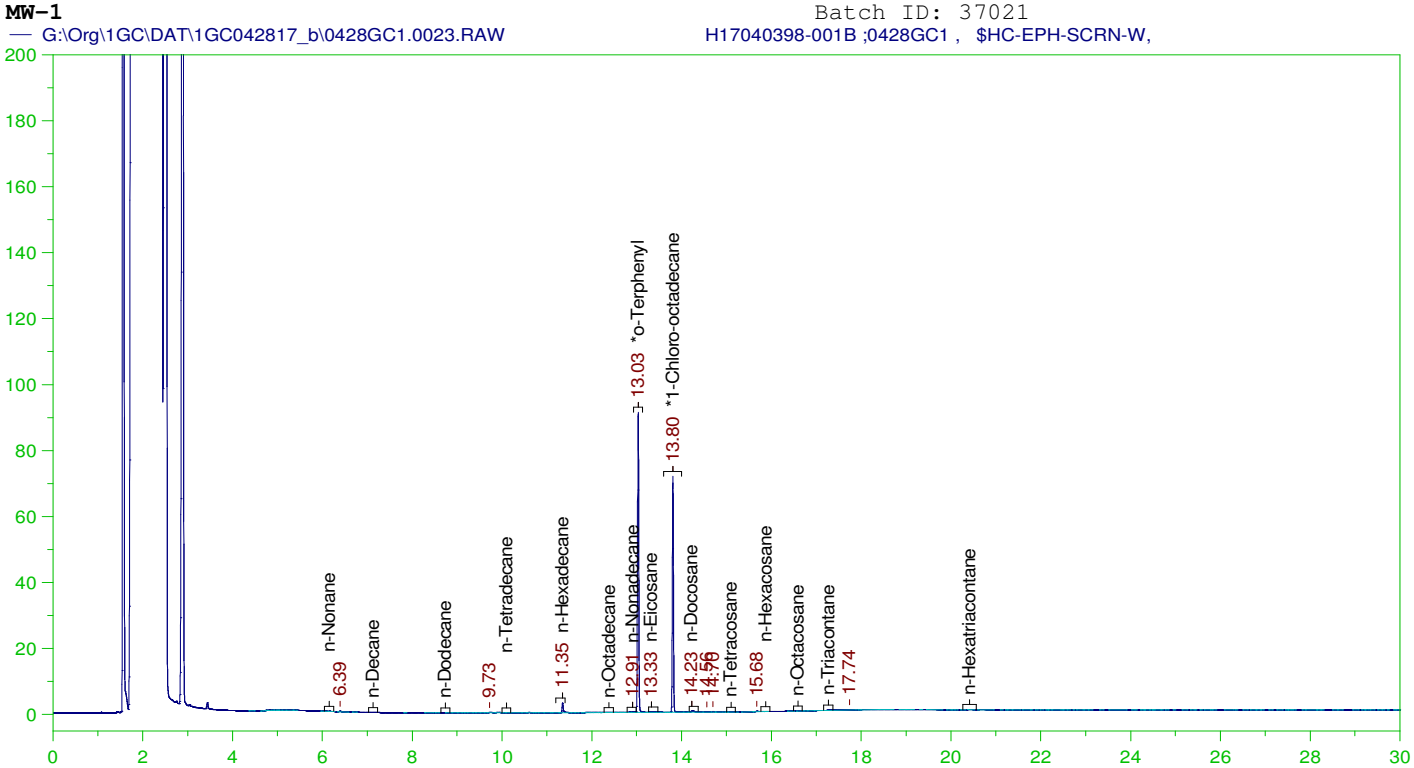
| Analyte | Count | Result | Units | RL | %REC | Low Limit | High Limit | RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Method: SW8270C** | | | | | | | | | Analytical Run: B_R279111 | |
| **Lab ID: 02-May-17_CCV_2** | 21 | Continuing Calibration Verification Standard | | | | | | | 05/02/17 10:05 | |
| 1-Methylnaphthalene | | 2.12 | ug/L | 0.10 | 106 | 80 | 120 | | | |
| 2-Methylnaphthalene | | 2.18 | ug/L | 0.10 | 109 | 80 | 120 | | | |
| Acenaphthene | | 1.91 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Acenaphthylene | | 2.06 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Anthracene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Benzo(a)anthracene | | 1.99 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Benzo(a)pyrene | | 2.06 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Benzo(b)fluoranthene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Benzo(g,h,i)perylene | | 2.08 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Benzo(k)fluoranthene | | 2.08 | ug/L | 0.10 | 104 | 80 | 120 | | | |
| Chrysene | | 2.00 | ug/L | 0.10 | 100 | 80 | 120 | | | |
| Dibenzo(a,h)anthracene | | 1.97 | ug/L | 0.10 | 99 | 80 | 120 | | | |
| Fluoranthene | | 1.92 | ug/L | 0.10 | 96 | 80 | 120 | | | |
| Fluorene | | 1.96 | ug/L | 0.10 | 98 | 80 | 120 | | | |
| Indeno(1,2,3-cd)pyrene | | 2.07 | ug/L | 0.10 | 103 | 80 | 120 | | | |
| Naphthalene | | 2.04 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Phenanthrene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Pyrene | | 2.05 | ug/L | 0.10 | 102 | 80 | 120 | | | |
| Surr: 2-Fluorobiphenyl | | | | 0.10 | 103 | 80 | 120 | | | |
| Surr: Nitrobenzene-d5 | | | | 0.10 | 109 | 80 | 120 | | | |
| Surr: Terphenyl-d14 | | | | 0.10 | 101 | 80 | 120 | | | |

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

**MW-1** Batch ID: 37021




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

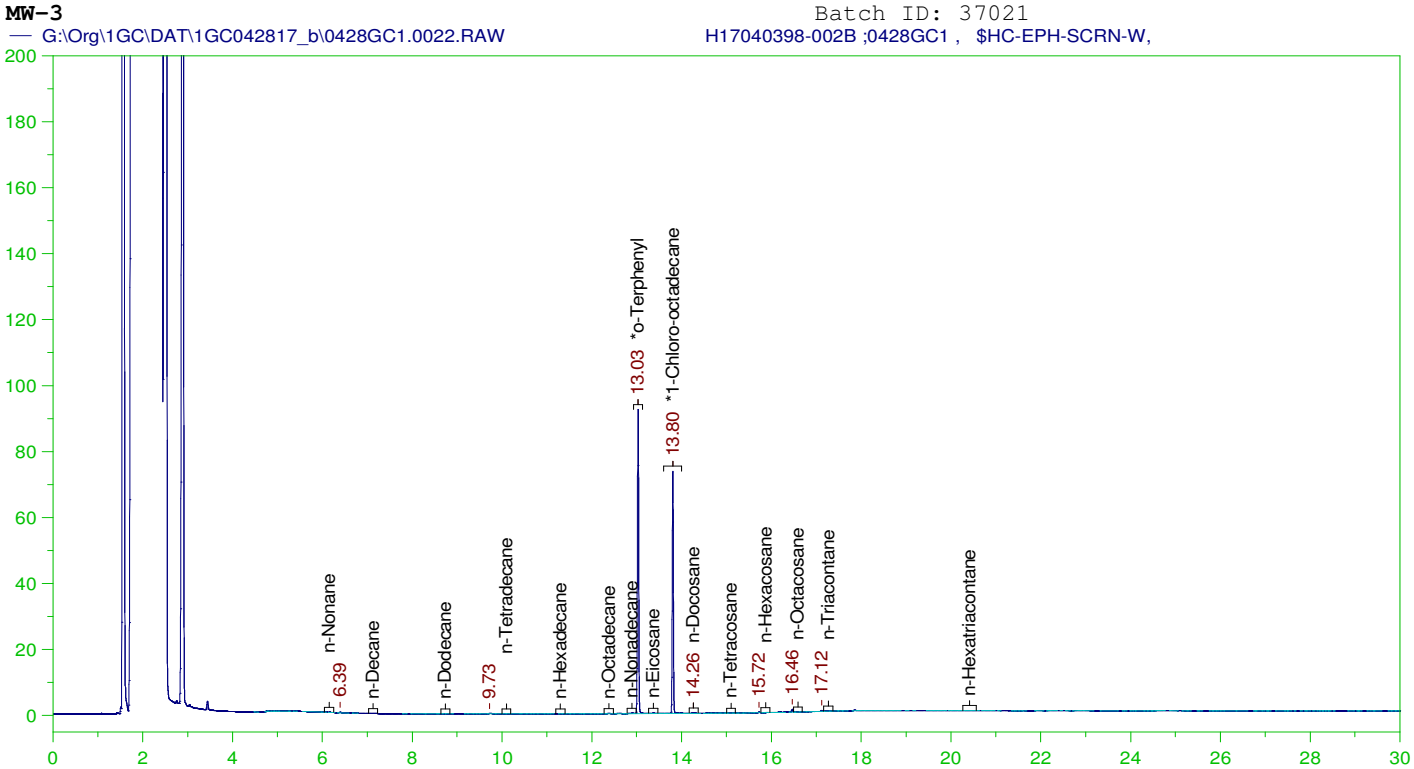
Sample Name: H17040398-001B ;0428GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC042817_b\0428GC1.0023.RAW
Date & Time Acquired: 4/29/2017 2:34:38 AM
Method File: G:\Org\1GC\Methods\04281723.MET
Calibration File: G:\Org\1GC\Cals\SR013017G.CAL
Sample Weight: 0.9989 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 1590.485
Mean RF for C19 to C36 Hydrocarbons: 1678.009
Mean RF for Total Extractable Hydrocarbons: 1634.247
Rt range for Diesel Range Organics: 7.03 to 17.37
Rt range for C9 to C18 Hydrocarbons: 6.05 to 12.93
Rt range for C19 to C36 Hydrocarbons: 12.98 to 20.57

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.031 | 200.22 | 170.997 | 85.4 | - |
| *1-Chloro-octadecane | 13.804 | 200.22 | 174.933 | 87.37 | - |

DRO Area:17761.98 DRO Amount: 21.76114
TEH Area:22292.76 TEH Amount: 27.31204
C9-C18 Area:11163.5 C9-C18 Amount: 14.05332
C19-C36 Area:9178.133 C19-C36 Amount: 10.95136

**MW-3** Batch ID: 37021




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H17040398-002B ;0428GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC042817_b\0428GC1.0022.RAW
Date & Time Acquired: 4/29/2017 1:50:32 AM
Method File: G:\Org\1GC\Methods\SR013017G.MET
Calibration File: G:\Org\1GC\Cals\SR013017G.CAL
Sample Weight: 0.9563 Dilution: 2 S.A.: 1

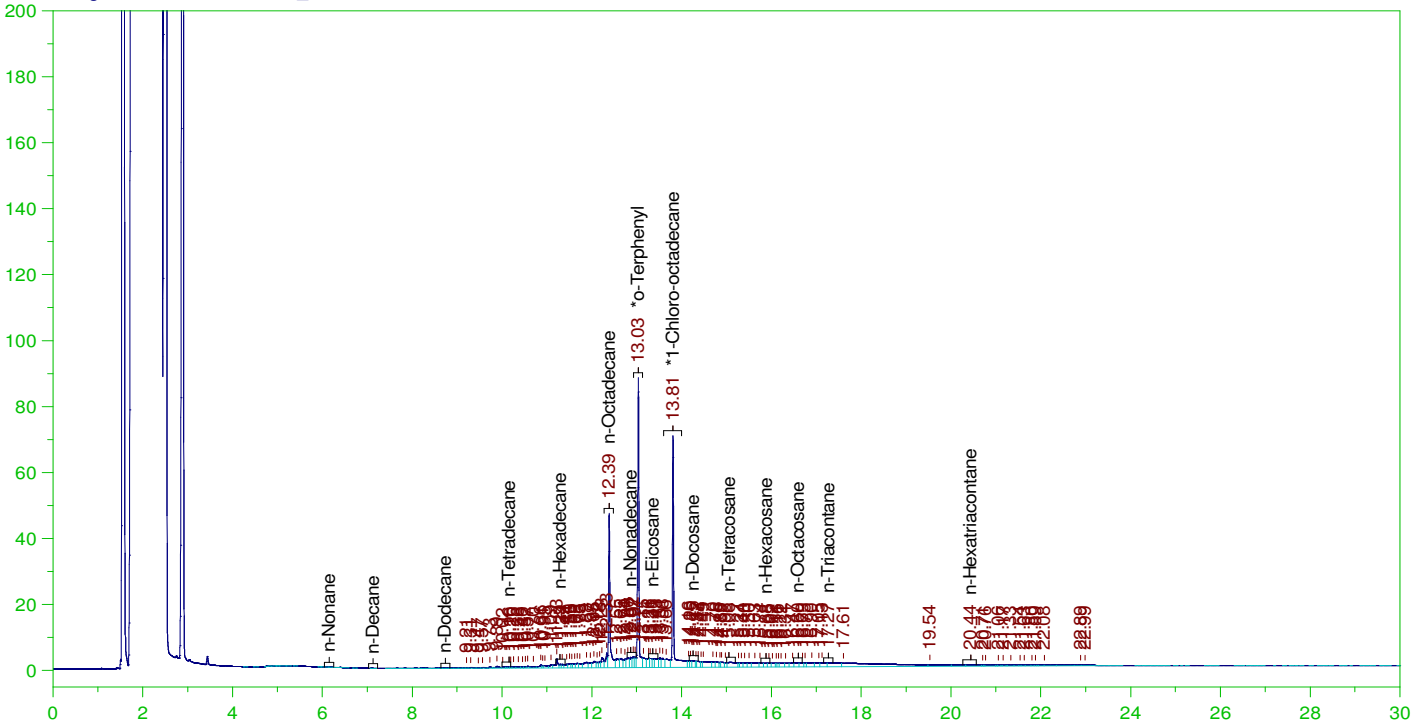
Mean RF for C9 to C18 Hydrocarbons: 1590.485
Mean RF for C19 to C36 Hydrocarbons: 1678.009
Mean RF for Total Extractable Hydrocarbons: 1634.247
Rt range for Diesel Range Organics: 7.03 to 17.37
Rt range for C9 to C18 Hydrocarbons: 6.05 to 12.93
Rt range for C19 to C36 Hydrocarbons: 12.98 to 20.57

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.03 | 209.139 | 181.674 | 86.87 | - |
| *1-Chloro-octadecane | 13.802 | 209.139 | 185.15 | 88.53 | - |

DRO Area:12019.86 DRO Amount: 15.38217
TEH Area:16411.02 TEH Amount: 21.00166
C9-C18 Area:4458.342 C9-C18 Amount: 5.862458
C19-C36 Area:9643.172 C19-C36 Amount: 12.01881

**MW-4** Batch ID: 37021

G:\Org\1GC\DAT\1GC042817_b\0428GC1.0021.RAW H17040398-003B ;0428GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

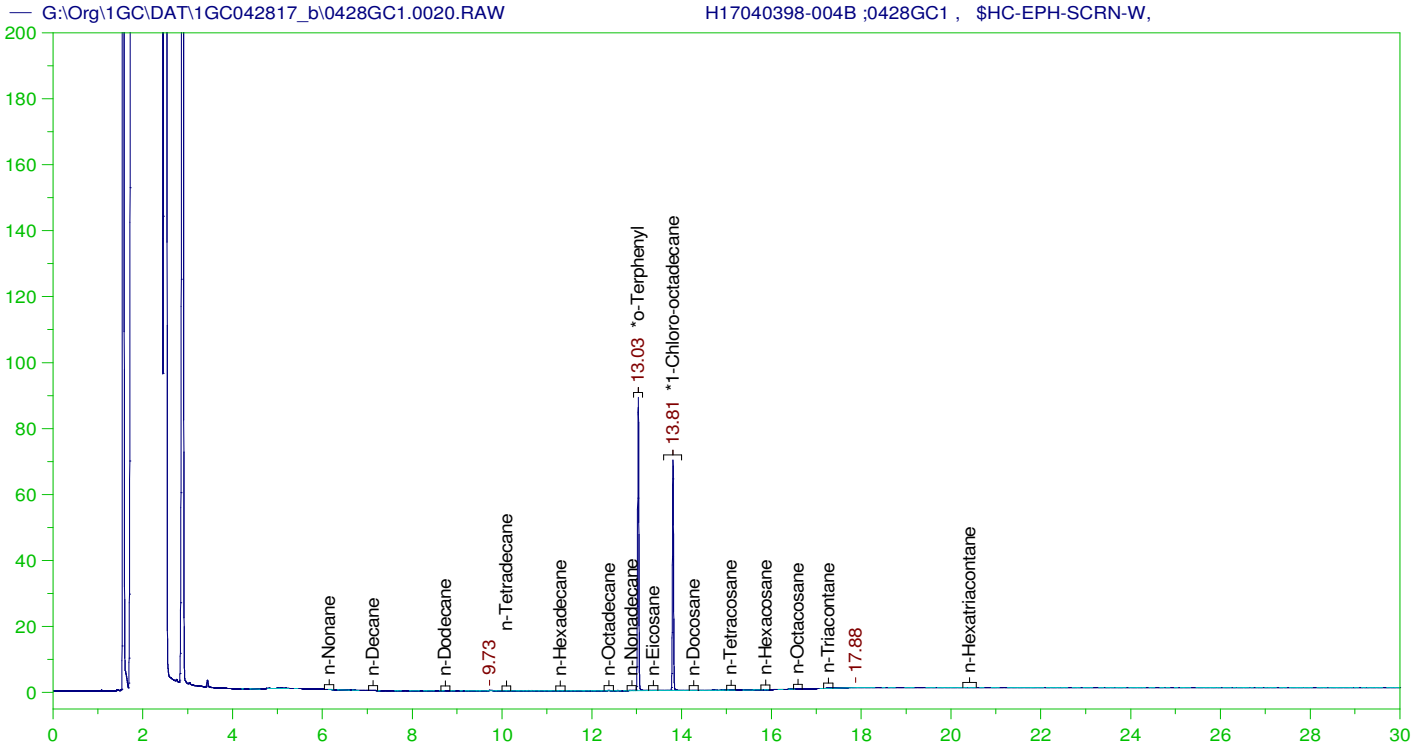
Sample Name: H17040398-003B ;0428GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC042817_b\0428GC1.0021.RAW
Date & Time Acquired: 4/29/2017 1:06:21 AM
Method File: G:\Org\1GC\Methods\04281721.MET
Calibration File: G:\Org\1GC\Cals\SR013017G.CAL
Sample Weight: 1.0284 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 1590.485
Mean RF for C19 to C36 Hydrocarbons: 1678.009
Mean RF for Total Extractable Hydrocarbons: 1634.247
Rt range for Diesel Range Organics: 7.03 to 17.37
Rt range for C9 to C18 Hydrocarbons: 6.05 to 12.93
Rt range for C19 to C36 Hydrocarbons: 12.98 to 20.57

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.034 | 194.477 | 178.667 | 91.87 | - |
| *1-Chloro-octadecane | 13.807 | 194.477 | 218.377 | 112.29 | - |

DRO Area:702126.7 DRO Amount: 835.5372
TEH Area:825343.8 TEH Amount: 982.1666
C9-C18 Area:332520.8 C9-C18 Amount: 406.5905
C19-C36 Area:465428.7 C19-C36 Amount: 539.4196

**House** Batch ID: 37021




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H17040398-004B ;0428GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC042817_b\0428GC1.0020.RAW
Date & Time Acquired: 4/29/2017 12:22:24 AM
Method File: G:\Org\1GC\Methods\04281720.MET
Calibration File: G:\Org\1GC\Cals\SR013017G.CAL
Sample Weight: 1.029 Dilution: 2 S.A.: 1

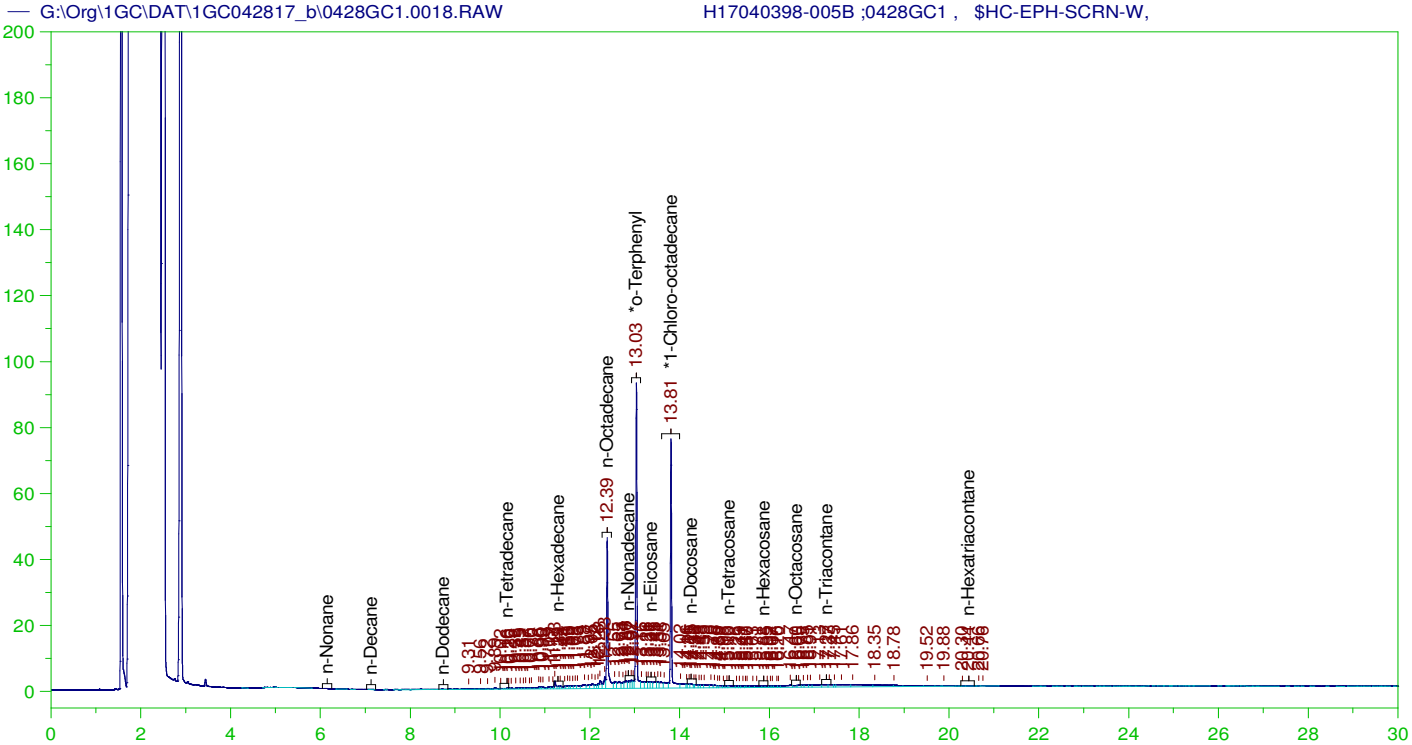
Mean RF for C9 to C18 Hydrocarbons: 1590.485
Mean RF for C19 to C36 Hydrocarbons: 1678.009
Mean RF for Total Extractable Hydrocarbons: 1634.247
Rt range for Diesel Range Organics: 7.03 to 17.37
Rt range for C9 to C18 Hydrocarbons: 6.05 to 12.93
Rt range for C19 to C36 Hydrocarbons: 12.98 to 20.57

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.033 | 194.363 | 161.529 | 83.11 | - |
| *1-Chloro-octadecane | 13.806 | 194.363 | 164.43 | 84.6 | - |

DRO Area:4478.961 DRO Amount: 5.326896
TEH Area:7546.711 TEH Amount: 8.975417
C9-C18 Area:3399 C9-C18 Amount: 4.15371
C19-C36 Area:2643.805 C19-C36 Amount: 3.062313

**BD-20170424** Batch ID: 37021

— G:\Org\1GC\DAT\1GC042817_b\0428GC1.0018.RAW H17040398-005B ;0428GC1 , $HC-EPH-SCRN-W,




**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: H17040398-005B ;0428GC1 , $HC-EPH-SCRN-W,
Raw File: G:\Org\1GC\DAT\1GC042817_b\0428GC1.0018.RAW
Date & Time Acquired: 4/28/2017 10:54:17 PM
Method File: G:\Org\1GC\Methods\04281718.MET
Calibration File: G:\Org\1GC\Cals\SR013017G.CAL
Sample Weight: 1.0401 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 1590.485
Mean RF for C19 to C36 Hydrocarbons: 1678.009
Mean RF for Total Extractable Hydrocarbons: 1634.247
Rt range for Diesel Range Organics: 7.03 to 17.37
Rt range for C9 to C18 Hydrocarbons: 6.05 to 12.93
Rt range for C19 to C36 Hydrocarbons: 12.98 to 20.57

| SURROGATE COMPOUND | RT | ACTUAL | MEASURED | %REC | |
|---|---|---|---|---|---|
| *o-Terphenyl | 13.035 | 192.289 | 177.979 | 92.56 | - |
| *1-Chloro-octadecane | 13.807 | 192.289 | 193.398 | 100.58 | - |

DRO Area:466316.1 DRO Amount: 548.6781
TEH Area:530020.9 TEH Amount: 623.6346
C9-C18 Area:261012.2 C9-C18 Amount: 315.5631
C19-C36 Area:259491.7 C19-C36 Amount: 297.3611

# Work Order Receipt Checklist

Trihydro-Laramie H17040398

Login completed by: Brandy J. Seher
Reviewed by: BL2000\wjohnson
Reviewed Date: 4/25/2017

Date Received: 4/25/2017
Received by: wjj
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: | °C See Comm. | | |
| Water - VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA vials submitted ☑ |
| 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:

Cooler 1 was received at 5.0 °C, Cooler 2 at 1.8 °C, Cooler3 at 2.6 C all coolers received on ice. Sample labels smeared & diff. to read for MW-4 & BD-20170424.No coll. time avail. for BD-20170424 on COC or samp. cont.. Samples were left in locked entry way. Samples for Dissolved Metals will be subsampled, filtered, and preserved to pH <2 with 2 mL of Nitric acid per 250 mL in the laboratory. According to 40CFR136, samples for Dissolved Metals should be filtered and preserved within 15 minutes of collection. Collection time estimated in laboratory for BD-20170424.
BS 04/25/2017

ENERGY LAB
Trust our People. Trust our Data.

# Chain of Custody & Analytical Request Record

www.energylab.com



## Account Information (Billing information)

| | |
|---|---|
| Company/Name | Trihydro Corporation |
| Contact | Andrew Vann |
| Phone | 307 745 7474 |
| Mailing Address | 1252 Commerce Dr |
| City, State, Zip | Laramie, WY 82070 |
| Email | avann@trihydro.com |
| Receive Invoice | ☐Hard Copy ☑Email |
| Receive Report | ☐Hard Copy ☑Email |
| Purchase Order | |
| Quote | |
| Bottle Order | |

## Report Information (if different than Account Information)

| | |
|---|---|
| Company/Name | |
| Contact | |
| Phone | |
| Mailing Address | |
| City, State, Zip | |
| Email | |
| Receive Report | ☐Hard Copy ☐Email |

Special Report/Formats:
☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

## Comments

## Project Information

| | |
|---|---|
| Project Name, PWSID, Permit, etc. | Diamond P Ranch |
| Sampler Name | L. Darnell |
| Sampler Phone | 555 4150 |
| Sample Origin State | MT |
| EPA/State Compliance | ☑Yes ☐ No |

MINING CLIENTS, please indicate sample type.
*If ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

**Matrix Codes**
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

| | Sample Identification (Name, Location, Interval, etc.) | Collection Date | Collection Time | Number of Containers | Matrix (See Codes Above) | Dissolved Lab Filter Methods | EPH 8015 M | PCP 8151A | PAH 8270C | See Attached | RUSH TAT | ELI LAB ID (Laboratory Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C2 1 | MW-1 | 4/24/17 | 1230 | 6 | W | X | X | X | X | | | H17040398 |
| C2 2 | MW-3 | | 1350 | 6 | W | X | X | X | X | | | |
| C1 3 | MW-4 | | 1530 | 6 | W | X | X | X | X | | | |
| CS 4 | HOUSE | | 1630 | 6 | W | X | X | X | X | | | |
| C1 5 | BD-20170424 | | — | 6 | W | X | X | X | X | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

| Custody Record MUST be signed | Relinquished by (print) | Date/Time | Signature | Received by (print) | Date/Time | Signature |
|---|---|---|---|---|---|---|
| | L. Darnell | 4/24/17 20:00 | | Received by Laboratory (print) Wardson | Date/Time 4-25-17 7:00 | Signature WM |
| | Relinquished by (print) | Date/Time | Signature | | | |

**LABORATORY USE ONLY**

| Shipped By | Cooler ID(s) | Custody Seals | Intact | Receipt Temp | Temp Blank | On Ice | Payment Type | Amount | Receipt Number (cash/check only) |
|---|---|---|---|---|---|---|---|---|---|
| hand left in locked entry | y | N C B | N | C-1 5.0C C-2 1.8 C3 2.4 | N | N | CC Cash Check_____ | $ | |

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

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October 14, 2016

Andrew Vann
Trihydro
2707 Broadwater Ave

Helena, MT 59620

Work Order: **HS16100416**

Laboratory Results for: **Milwaukee Roundhouse MRH-Phase 2**

Dear Andrew,

ALS Environmental received 8 sample(s) on Oct 11, 2016 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: Bernadette.Fini**

Bernadette A. Fini
Project Manager

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**Work Order:** HS16100416

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS16100416-01 | MRH-BKFL-306 | Soil | | 10-Oct-2016 11:00 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-02 | MRH-BKFL-307 | Soil | | 10-Oct-2016 11:05 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-03 | MRH-BKFL-308 | Soil | | 10-Oct-2016 11:10 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-04 | MRH-BKFL-309 | Soil | | 10-Oct-2016 11:15 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Soil | | 10-Oct-2016 11:30 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Soil | | 10-Oct-2016 11:35 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-07 | BD-20161010-01 | Soil | | 10-Oct-2016 00:00 | 11-Oct-2016 08:35 | ☐ |
| HS16100416-08 | TB-20161010-01 | Water | | 10-Oct-2016 00:00 | 11-Oct-2016 08:35 | ☐ |

**Client:** Trihydro **CASE NARRATIVE**
**Project:** Milwaukee Roundhouse MRH-Phase 2
**Work Order:** HS16100416

## ECD Organics by Method SW8082

### Batch ID: 108829a

Sample ID: **HS16100524-01**
- MS and MSD are for an unrelated sample

### Batch ID: 108766a

Sample ID: **MRH-BKFL-306 (HS16100416-01)**
- Due to sample matrix interferences, the surrogate recovery was outside of the established control limits.

## GC Semivolatiles by Method MA EPH

### Batch ID: 108786

Sample ID: **MRH-BKFL-306 (HS16100416-01)**
Sample ID: **MRH-BKFL-TS-401 (0-0.5) (HS16100416-06)**
- Due to sample matrix interferences, the surrogate recovery was outside of the established control limits.

Sample ID: **MRH-BKFL-307 (HS16100416-02)**
- One or more surrogate recoveries were above the upper control limits. No target analytes were detected in the sample. The high surrogate recoveries did not impact the non-detect results for target analytes.

## GCMS Semivolatiles by Method SW8270

### Batch ID: 108781

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## GCMS Volatiles by Method SW8260

### Batch ID: R282848

Sample ID: **HS16100415-01**
- MS and MSD are for an unrelated sample

### Batch ID: R282834

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## Metals by Method SW7471A

### Batch ID: 108782

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## Metals by Method SW6020

### Batch ID: 108759

Sample ID: **MRH-BKFL-306 (HS16100416-01MS)**
- Arsenic, Chromium, Selenium, and Silver failed in the MS but passed in the MSD and PDS.

Sample ID: **MRH-BKFL-306 (HS16100416-01MS)**
- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium.

## WetChemistry by Method SW3550

### Batch ID: R282829

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

| | | | |
|---|---|---|---|
| Client: | Trihydro | **ANALYTICAL REPORT** | |
| Project: | Milwaukee Roundhouse MRH-Phase 2 | WorkOrder:HS16100416 | |
| Sample ID: | MRH-BKFL-306 | Lab ID:HS16100416-01 | |
| Collection Date: | 10-Oct-2016 11:00 | Matrix:Soil | |

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00051 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 00:19 |
| Methylene chloride | | U | 0.0010 | 0.010 | mg/Kg-dry | 1 | 12-Oct-2016 00:19 |
| Naphthalene | | U | 0.00081 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 00:19 |
| Trichloroethene | | U | 0.00061 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 00:19 |
| *Surr: 1,2-Dichloroethane-d4* | *91.9* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 00:19* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 00:19* |
| *Surr: Dibromofluoromethane* | *93.7* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 00:19* |
| *Surr: Toluene-d8* | *107* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 00:19* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0015 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| 2-Methylnaphthalene | | U | 0.00051 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Benz(a)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Benzo(a)pyrene | | U | 0.0010 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Benzo(b)fluoranthene | | U | 0.0012 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Benzo(k)fluoranthene | | U | 0.00092 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Chrysene | | U | 0.00082 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Dibenz(a,h)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00082 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 14:57 |
| *Surr: 2,4,6-Tribromophenol* | *64.0* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 14:57* |
| *Surr: 2-Fluorobiphenyl* | *72.6* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 14:57* |
| *Surr: 2-Fluorophenol* | *90.3* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 14:57* |
| *Surr: 4-Terphenyl-d14* | *80.3* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 14:57* |
| *Surr: Nitrobenzene-d5* | *72.0* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 14:57* |
| *Surr: Phenol-d6* | *95.2* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 14:57* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| **C9-C18 Aliphatics** | **5.90** | | **5.12** | **5.12** | **mg/Kg-dry** | 1 | 13-Oct-2016 20:08 |
| C11-C22 Aromatics (unadjusted) | | U | 5.12 | 5.12 | mg/Kg-dry | 1 | 13-Oct-2016 22:14 |
| *Surr: 1-Chlorooctadecane* | *94.8* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 20:08* |
| *Surr: 2-Bromonaphthalene* | *153* | *S* | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:14* |
| *Surr: 2-Fluorobiphenyl* | *138* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:14* |
| *Surr: o-Terphenyl* | *108* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:14* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 11-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0025 | 0.017 | mg/Kg-dry | 1 | 13-Oct-2016 01:32 |
| *Surr: Decachlorobiphenyl* | *156* | *S* | | *54-143* | *%REC* | *1* | *13-Oct-2016 01:32* |
| *Surr: Tetrachloro-m-xylene* | *115* | | | *50-140* | *%REC* | *1* | *13-Oct-2016 01:32* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-306
Collection Date: 10-Oct-2016 11:00

WorkOrder:HS16100416
Lab ID:HS16100416-01
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **2.55** | | **0.0987** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| **Barium** | **85.9** | | **0.0790** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| **Cadmium** | **0.100** | J | **0.0494** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| **Chromium** | **4.17** | | **0.0888** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| **Lead** | **7.62** | | **0.0494** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| **Selenium** | **0.431** | J | **0.178** | **0.494** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:13 |
| Silver | U | | 0.0790 | 0.494 | mg/Kg-dry | 1 | 12-Oct-2016 20:13 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.00267** | J | **0.000522** | **0.00369** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:16 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **2.43** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

| | | | |
|---|---|---|---|
| Client: | Trihydro | **ANALYTICAL REPORT** | |
| Project: | Milwaukee Roundhouse MRH-Phase 2 | WorkOrder:HS16100416 | |
| Sample ID: | MRH-BKFL-307 | Lab ID:HS16100416-02 | |
| Collection Date: | 10-Oct-2016 11:05 | Matrix:Soil | |

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00050 | 0.0050 | mg/Kg-dry | 1 | 12-Oct-2016 00:42 |
| Methylene chloride | | U | 0.0010 | 0.010 | mg/Kg-dry | 1 | 12-Oct-2016 00:42 |
| Naphthalene | | U | 0.00080 | 0.0050 | mg/Kg-dry | 1 | 12-Oct-2016 00:42 |
| Trichloroethene | | U | 0.00060 | 0.0050 | mg/Kg-dry | 1 | 12-Oct-2016 00:42 |
| *Surr: 1,2-Dichloroethane-d4* | *102* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 00:42* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 00:42* |
| *Surr: Dibromofluoromethane* | *103* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 00:42* |
| *Surr: Toluene-d8* | *102* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 00:42* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0015 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| 2-Methylnaphthalene | | U | 0.00051 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Benz(a)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Benzo(a)pyrene | | U | 0.0010 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Benzo(b)fluoranthene | | U | 0.0012 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Benzo(k)fluoranthene | | U | 0.00092 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Chrysene | | U | 0.00081 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Dibenz(a,h)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00081 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 16:55 |
| *Surr: 2,4,6-Tribromophenol* | *64.8* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 16:55* |
| *Surr: 2-Fluorobiphenyl* | *65.6* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 16:55* |
| *Surr: 2-Fluorophenol* | *82.9* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 16:55* |
| *Surr: 4-Terphenyl-d14* | *84.0* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 16:55* |
| *Surr: Nitrobenzene-d5* | *73.3* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 16:55* |
| *Surr: Phenol-d6* | *98.7* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 16:55* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| **C9-C18 Aliphatics** | **6.57** | | **5.09** | **5.09** | **mg/Kg-dry** | 1 | 13-Oct-2016 20:39 |
| C11-C22 Aromatics (unadjusted) | | U | 5.09 | 5.09 | mg/Kg-dry | 1 | 13-Oct-2016 22:46 |
| *Surr: 1-Chlorooctadecane* | *97.8* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 20:39* |
| *Surr: 2-Bromonaphthalene* | *189* | *S* | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:46* |
| *Surr: 2-Fluorobiphenyl* | *173* | *S* | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:46* |
| *Surr: o-Terphenyl* | *139* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:46* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 11-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0024 | 0.017 | mg/Kg-dry | 1 | 13-Oct-2016 01:48 |
| *Surr: Decachlorobiphenyl* | *78.6* | | | *54-143* | *%REC* | *1* | *13-Oct-2016 01:48* |
| *Surr: Tetrachloro-m-xylene* | *75.6* | | | *50-140* | *%REC* | *1* | *13-Oct-2016 01:48* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-307
Collection Date: 10-Oct-2016 11:05

WorkOrder:HS16100416
Lab ID:HS16100416-02
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **2.24** | | **0.0962** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| **Barium** | **87.5** | | **0.0770** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| **Cadmium** | **0.0897** | J | **0.0481** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| **Chromium** | **3.66** | | **0.0866** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| **Lead** | **7.14** | | **0.0481** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| **Selenium** | **0.336** | J | **0.173** | **0.481** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:44 |
| Silver | U | | 0.0770 | 0.481 | mg/Kg-dry | 1 | 12-Oct-2016 20:44 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.00259** | J | **0.000493** | **0.00349** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:17 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **2.13** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-308
Collection Date: 10-Oct-2016 11:10

WorkOrder:HS16100416
Lab ID:HS16100416-03
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00051 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:05 |
| Methylene chloride | | U | 0.0010 | 0.010 | mg/Kg-dry | 1 | 12-Oct-2016 01:05 |
| Naphthalene | | U | 0.00082 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:05 |
| Trichloroethene | | U | 0.00062 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:05 |
| *Surr: 1,2-Dichloroethane-d4* | *87.7* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 01:05* |
| *Surr: 4-Bromofluorobenzene* | *99.1* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 01:05* |
| *Surr: Dibromofluoromethane* | *91.5* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 01:05* |
| *Surr: Toluene-d8* | *103* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 01:05* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0015 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| 2-Methylnaphthalene | | U | 0.00051 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Benz(a)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Benzo(a)pyrene | | U | 0.0010 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Benzo(b)fluoranthene | | U | 0.0012 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Benzo(k)fluoranthene | | U | 0.00092 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Chrysene | | U | 0.00082 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Dibenz(a,h)anthracene | | U | 0.0016 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00082 | 0.0034 | mg/Kg-dry | 1 | 12-Oct-2016 17:15 |
| *Surr: 2,4,6-Tribromophenol* | *59.6* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 17:15* |
| *Surr: 2-Fluorobiphenyl* | *65.4* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 17:15* |
| *Surr: 2-Fluorophenol* | *78.1* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:15* |
| *Surr: 4-Terphenyl-d14* | *74.4* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 17:15* |
| *Surr: Nitrobenzene-d5* | *68.2* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:15* |
| *Surr: Phenol-d6* | *74.1* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 17:15* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| **C9-C18 Aliphatics** | **7.91** | | **5.10** | **5.10** | **mg/Kg-dry** | 1 | 13-Oct-2016 21:11 |
| C11-C22 Aromatics (unadjusted) | | U | 5.10 | 5.10 | mg/Kg-dry | 1 | 13-Oct-2016 23:18 |
| *Surr: 1-Chlorooctadecane* | *96.5* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 21:11* |
| *Surr: 2-Bromonaphthalene* | *113* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:18* |
| *Surr: 2-Fluorobiphenyl* | *101* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:18* |
| *Surr: o-Terphenyl* | *81.0* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:18* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 11-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0025 | 0.017 | mg/Kg-dry | 1 | 13-Oct-2016 02:05 |
| *Surr: Decachlorobiphenyl* | *71.0* | | | *54-143* | *%REC* | *1* | *13-Oct-2016 02:05* |
| *Surr: Tetrachloro-m-xylene* | *66.4* | | | *50-140* | *%REC* | *1* | *13-Oct-2016 02:05* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-308
Collection Date: 10-Oct-2016 11:10

WorkOrder:HS16100416
Lab ID:HS16100416-03
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **1.66** | | **0.0975** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| **Barium** | **61.0** | | **0.0780** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| **Cadmium** | **0.0633** | J | **0.0488** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| **Chromium** | **2.75** | | **0.0878** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| **Lead** | **5.85** | | **0.0488** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| **Selenium** | **0.243** | J | **0.176** | **0.488** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:49 |
| Silver | U | | 0.0780 | 0.488 | mg/Kg-dry | 1 | 12-Oct-2016 20:49 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.00121** | J | **0.000503** | **0.00356** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:19 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **2.48** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

| | | | |
|---|---|---|---|
| Client: | Trihydro | **ANALYTICAL REPORT** | |
| Project: | Milwaukee Roundhouse MRH-Phase 2 | WorkOrder:HS16100416 | |
| Sample ID: | MRH-BKFL-309 | Lab ID:HS16100416-04 | |
| Collection Date: | 10-Oct-2016 11:15 | Matrix:Soil | |

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00051 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:29 |
| Methylene chloride | | U | 0.0010 | 0.010 | mg/Kg-dry | 1 | 12-Oct-2016 01:29 |
| Naphthalene | | U | 0.00081 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:29 |
| Trichloroethene | | U | 0.00061 | 0.0051 | mg/Kg-dry | 1 | 12-Oct-2016 01:29 |
| *Surr: 1,2-Dichloroethane-d4* | *89.7* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 01:29* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 01:29* |
| *Surr: Dibromofluoromethane* | *93.8* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 01:29* |
| *Surr: Toluene-d8* | *103* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 01:29* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0016 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| 2-Methylnaphthalene | | U | 0.00052 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Benz(a)anthracene | | U | 0.0017 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Benzo(a)pyrene | | U | 0.0010 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Benzo(b)fluoranthene | | U | 0.0013 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Benzo(k)fluoranthene | | U | 0.00094 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Chrysene | | U | 0.00084 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Dibenz(a,h)anthracene | | U | 0.0017 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00084 | 0.0035 | mg/Kg-dry | 1 | 12-Oct-2016 17:34 |
| *Surr: 2,4,6-Tribromophenol* | *70.4* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 17:34* |
| *Surr: 2-Fluorobiphenyl* | *67.2* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 17:34* |
| *Surr: 2-Fluorophenol* | *66.6* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:34* |
| *Surr: 4-Terphenyl-d14* | *84.0* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 17:34* |
| *Surr: Nitrobenzene-d5* | *70.1* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:34* |
| *Surr: Phenol-d6* | *84.1* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 17:34* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| **C9-C18 Aliphatics** | **6.35** | | **5.21** | **5.21** | **mg/Kg-dry** | 1 | 13-Oct-2016 21:43 |
| C11-C22 Aromatics (unadjusted) | | U | 5.21 | 5.21 | mg/Kg-dry | 1 | 13-Oct-2016 23:49 |
| *Surr: 1-Chlorooctadecane* | *95.9* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 21:43* |
| *Surr: 2-Bromonaphthalene* | *118* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:49* |
| *Surr: 2-Fluorobiphenyl* | *91.2* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:49* |
| *Surr: o-Terphenyl* | *70.8* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:49* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 13-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0025 | 0.017 | mg/Kg-dry | 1 | 14-Oct-2016 04:11 |
| *Surr: Decachlorobiphenyl* | *101* | | | *54-143* | *%REC* | *1* | *14-Oct-2016 04:11* |
| *Surr: Tetrachloro-m-xylene* | *77.0* | | | *50-140* | *%REC* | *1* | *14-Oct-2016 04:11* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-309
Collection Date: 10-Oct-2016 11:15

WorkOrder:HS16100416
Lab ID:HS16100416-04
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **2.76** | | **0.0961** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| **Barium** | **103** | | **0.0769** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| **Cadmium** | **0.116** | J | **0.0480** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| **Chromium** | **4.98** | | **0.0865** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| **Lead** | **8.37** | | **0.0480** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| **Selenium** | **0.430** | J | **0.173** | **0.480** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:53 |
| Silver | U | | 0.0769 | 0.480 | mg/Kg-dry | 1 | 12-Oct-2016 20:53 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.00269** | J | **0.000526** | **0.00372** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:21 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **4.48** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2 WorkOrder:HS16100416
Sample ID: MRH-BKFL-TS-400 (0-0.5) Lab ID:HS16100416-05
Collection Date: 10-Oct-2016 11:30 Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00055 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 01:52 |
| Methylene chloride | | U | 0.0011 | 0.011 | mg/Kg-dry | 1 | 12-Oct-2016 01:52 |
| Naphthalene | | U | 0.00087 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 01:52 |
| Trichloroethene | | U | 0.00065 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 01:52 |
| *Surr: 1,2-Dichloroethane-d4* | *103* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 01:52* |
| *Surr: 4-Bromofluorobenzene* | *99.3* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 01:52* |
| *Surr: Dibromofluoromethane* | *102* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 01:52* |
| *Surr: Toluene-d8* | *100* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 01:52* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0017 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| 2-Methylnaphthalene | | U | 0.00055 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Benz(a)anthracene | | U | 0.0018 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Benzo(a)pyrene | | U | 0.0011 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Benzo(b)fluoranthene | | U | 0.0013 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Benzo(k)fluoranthene | | U | 0.0010 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Chrysene | | U | 0.00089 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Dibenz(a,h)anthracene | | U | 0.0018 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00089 | 0.0037 | mg/Kg-dry | 1 | 12-Oct-2016 17:54 |
| *Surr: 2,4,6-Tribromophenol* | *61.1* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 17:54* |
| *Surr: 2-Fluorobiphenyl* | *59.4* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 17:54* |
| *Surr: 2-Fluorophenol* | *69.6* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:54* |
| *Surr: 4-Terphenyl-d14* | *70.5* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 17:54* |
| *Surr: Nitrobenzene-d5* | *65.7* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 17:54* |
| *Surr: Phenol-d6* | *73.2* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 17:54* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| C9-C18 Aliphatics | | U | 5.52 | 5.52 | mg/Kg-dry | 1 | 13-Oct-2016 22:14 |
| C11-C22 Aromatics (unadjusted) | | U | 5.52 | 5.52 | mg/Kg-dry | 1 | 14-Oct-2016 00:21 |
| *Surr: 1-Chlorooctadecane* | *57.6* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:14* |
| *Surr: 2-Bromonaphthalene* | *119* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:21* |
| *Surr: 2-Fluorobiphenyl* | *106* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:21* |
| *Surr: o-Terphenyl* | *54.2* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:21* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 13-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0027 | 0.018 | mg/Kg-dry | 1 | 14-Oct-2016 05:49 |
| *Surr: Decachlorobiphenyl* | *94.7* | | | *54-143* | *%REC* | *1* | *14-Oct-2016 05:49* |
| *Surr: Tetrachloro-m-xylene* | *74.9* | | | *50-140* | *%REC* | *1* | *14-Oct-2016 05:49* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-TS-400 (0-0.5)
Collection Date: 10-Oct-2016 11:30

WorkOrder:HS16100416
Lab ID:HS16100416-05
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **16.3** | | **0.108** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Barium** | **111** | | **0.0863** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Cadmium** | **0.863** | | **0.0539** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Chromium** | **11.3** | | **0.0971** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Lead** | **12.1** | | **0.0539** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Selenium** | **0.459** | J | **0.194** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **Silver** | **0.160** | J | **0.0863** | **0.539** | **mg/Kg-dry** | 1 | 12-Oct-2016 20:58 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.0319** | | **0.000559** | **0.00395** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:23 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **10.1** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

| | | | |
|---|---|---|---|
| Client: | Trihydro | **ANALYTICAL REPORT** | |
| Project: | Milwaukee Roundhouse MRH-Phase 2 | WorkOrder:HS16100416 | |
| Sample ID: | MRH-BKFL-TS-401 (0-0.5) | Lab ID:HS16100416-06 | |
| Collection Date: | 10-Oct-2016 11:35 | Matrix:Soil | |

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | U | | 0.00053 | 0.0053 | mg/Kg-dry | 1 | 12-Oct-2016 02:15 |
| Methylene chloride | U | | 0.0011 | 0.011 | mg/Kg-dry | 1 | 12-Oct-2016 02:15 |
| Naphthalene | U | | 0.00085 | 0.0053 | mg/Kg-dry | 1 | 12-Oct-2016 02:15 |
| Trichloroethene | U | | 0.00064 | 0.0053 | mg/Kg-dry | 1 | 12-Oct-2016 02:15 |
| *Surr: 1,2-Dichloroethane-d4* | *91.7* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 02:15* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 02:15* |
| *Surr: Dibromofluoromethane* | *96.4* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 02:15* |
| *Surr: Toluene-d8* | *105* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 02:15* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | U | | 0.0016 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:13 |
| 2-Methylnaphthalene | U | | 0.00055 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:13 |
| Benz(a)anthracene | U | | 0.0018 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:13 |
| **Benzo(a)pyrene** | **0.0017** | J | **0.0011** | **0.0036** | **mg/Kg-dry** | 1 | 12-Oct-2016 18:13 |
| **Benzo(b)fluoranthene** | **0.0028** | J | **0.0013** | **0.0036** | **mg/Kg-dry** | 1 | 12-Oct-2016 18:13 |
| **Benzo(k)fluoranthene** | **0.0020** | J | **0.00099** | **0.0036** | **mg/Kg-dry** | 1 | 12-Oct-2016 18:13 |
| **Chrysene** | **0.0018** | J | **0.00088** | **0.0036** | **mg/Kg-dry** | 1 | 12-Oct-2016 18:13 |
| Dibenz(a,h)anthracene | U | | 0.0018 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:13 |
| **Indeno(1,2,3-cd)pyrene** | **0.0029** | J | **0.00088** | **0.0036** | **mg/Kg-dry** | 1 | 12-Oct-2016 18:13 |
| *Surr: 2,4,6-Tribromophenol* | *62.9* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 18:13* |
| *Surr: 2-Fluorobiphenyl* | *68.2* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 18:13* |
| *Surr: 2-Fluorophenol* | *80.4* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 18:13* |
| *Surr: 4-Terphenyl-d14* | *83.0* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 18:13* |
| *Surr: Nitrobenzene-d5* | *73.2* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 18:13* |
| *Surr: Phenol-d6* | *77.3* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 18:13* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| **C9-C18 Aliphatics** | **103** | | **5.49** | **5.49** | **mg/Kg-dry** | 1 | 13-Oct-2016 22:46 |
| **C11-C22 Aromatics (unadjusted)** | **59.4** | | **5.49** | **5.49** | **mg/Kg-dry** | 1 | 14-Oct-2016 00:53 |
| *Surr: 1-Chlorooctadecane* | *319* | *S* | | *40-140* | *%REC* | *1* | *13-Oct-2016 22:46* |
| *Surr: 2-Bromonaphthalene* | *115* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:53* |
| *Surr: 2-Fluorobiphenyl* | *104* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:53* |
| *Surr: o-Terphenyl* | *101* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 00:53* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 11-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | U | | 0.0026 | 0.018 | mg/Kg-dry | 1 | 13-Oct-2016 02:53 |
| *Surr: Decachlorobiphenyl* | *65.8* | | | *54-143* | *%REC* | *1* | *13-Oct-2016 02:53* |
| *Surr: Tetrachloro-m-xylene* | *84.7* | | | *50-140* | *%REC* | *1* | *13-Oct-2016 02:53* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: MRH-BKFL-TS-401 (0-0.5)
Collection Date: 10-Oct-2016 11:35

WorkOrder:HS16100416
Lab ID:HS16100416-06
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | 22.1 | | 0.105 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Barium** | 111 | | 0.0837 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Cadmium** | 1.04 | | 0.0523 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Chromium** | 10.9 | | 0.0942 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Lead** | 14.6 | | 0.0523 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Selenium** | 0.427 | J | 0.188 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **Silver** | 0.189 | J | 0.0837 | 0.523 | mg/Kg-dry | 1 | 12-Oct-2016 21:02 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | 0.0387 | | 0.000556 | 0.00394 | mg/Kg-dry | 1 | 12-Oct-2016 15:24 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | 8.95 | | 0.0100 | 0.0100 | wt% | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: BD-20161010-01
Collection Date: 10-Oct-2016 00:00

WorkOrder:HS16100416
Lab ID:HS16100416-07
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES BY SW8260C** | | **Method:SW8260** | | | | | Analyst: WLR |
| Benzene | | U | 0.00055 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 02:38 |
| Methylene chloride | | U | 0.0011 | 0.011 | mg/Kg-dry | 1 | 12-Oct-2016 02:38 |
| Naphthalene | | U | 0.00089 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 02:38 |
| Trichloroethene | | U | 0.00066 | 0.0055 | mg/Kg-dry | 1 | 12-Oct-2016 02:38 |
| *Surr: 1,2-Dichloroethane-d4* | *84.0* | | | *70-128* | *%REC* | *1* | *12-Oct-2016 02:38* |
| *Surr: 4-Bromofluorobenzene* | *98.3* | | | *73-126* | *%REC* | *1* | *12-Oct-2016 02:38* |
| *Surr: Dibromofluoromethane* | *90.1* | | | *71-128* | *%REC* | *1* | *12-Oct-2016 02:38* |
| *Surr: Toluene-d8* | *104* | | | *73-127* | *%REC* | *1* | *12-Oct-2016 02:38* |
| **LOW-LEVEL SEMIVOLATILES** | | **Method:SW8270** | | | Prep:SW3541 / 12-Oct-2016 | | Analyst: LG |
| 1-Methylnaphthalene | | U | 0.0017 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| 2-Methylnaphthalene | | U | 0.00055 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Benz(a)anthracene | | U | 0.0018 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Benzo(a)pyrene | | U | 0.0011 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Benzo(b)fluoranthene | | U | 0.0013 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Benzo(k)fluoranthene | | U | 0.0010 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Chrysene | | U | 0.00088 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Dibenz(a,h)anthracene | | U | 0.0018 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| Indeno(1,2,3-cd)pyrene | | U | 0.00088 | 0.0036 | mg/Kg-dry | 1 | 12-Oct-2016 18:32 |
| *Surr: 2,4,6-Tribromophenol* | *65.7* | | | *36-126* | *%REC* | *1* | *12-Oct-2016 18:32* |
| *Surr: 2-Fluorobiphenyl* | *66.7* | | | *43-125* | *%REC* | *1* | *12-Oct-2016 18:32* |
| *Surr: 2-Fluorophenol* | *85.0* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 18:32* |
| *Surr: 4-Terphenyl-d14* | *85.2* | | | *32-125* | *%REC* | *1* | *12-Oct-2016 18:32* |
| *Surr: Nitrobenzene-d5* | *70.1* | | | *37-125* | *%REC* | *1* | *12-Oct-2016 18:32* |
| *Surr: Phenol-d6* | *84.5* | | | *40-125* | *%REC* | *1* | *12-Oct-2016 18:32* |
| **MASSACHUSETTS EPH** | | **Method:MA EPH** | | | Prep:MA EPH / 12-Oct-2016 | | Analyst: AAP |
| C9-C18 Aliphatics | | U | 5.51 | 5.51 | mg/Kg-dry | 1 | 13-Oct-2016 23:18 |
| C11-C22 Aromatics (unadjusted) | | U | 5.51 | 5.51 | mg/Kg-dry | 1 | 14-Oct-2016 12:10 |
| *Surr: 1-Chlorooctadecane* | *72.6* | | | *40-140* | *%REC* | *1* | *13-Oct-2016 23:18* |
| *Surr: 2-Bromonaphthalene* | *136* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 12:10* |
| *Surr: 2-Fluorobiphenyl* | *126* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 12:10* |
| *Surr: o-Terphenyl* | *83.2* | | | *40-140* | *%REC* | *1* | *14-Oct-2016 12:10* |
| **PCBS BY SW8082A** | | **Method:SW8082** | | | Prep:SW3546/3665A / 11-Oct-2016 | | Analyst: STH |
| Aroclor 1260 | | U | 0.0027 | 0.018 | mg/Kg-dry | 1 | 13-Oct-2016 03:09 |
| *Surr: Decachlorobiphenyl* | *76.8* | | | *54-143* | *%REC* | *1* | *13-Oct-2016 03:09* |
| *Surr: Tetrachloro-m-xylene* | *58.1* | | | *50-140* | *%REC* | *1* | *13-Oct-2016 03:09* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: BD-20161010-01
Collection Date: 10-Oct-2016 00:00

WorkOrder:HS16100416
Lab ID:HS16100416-07
Matrix:Soil

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **METALS BY SW6020A** | | **Method:SW6020** | | | Prep:SW3050A / 11-Oct-2016 | | Analyst: JDE |
| **Arsenic** | **19.5** | | **0.108** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Barium** | **126** | | **0.0865** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Cadmium** | **0.956** | | **0.0541** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Chromium** | **14.8** | | **0.0973** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Lead** | **13.8** | | **0.0541** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Selenium** | **0.512** | J | **0.195** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **Silver** | **0.196** | J | **0.0865** | **0.541** | **mg/Kg-dry** | 1 | 12-Oct-2016 21:06 |
| **MERCURY BY SW7471B** | | **Method:SW7471A** | | | Prep:SW7471A / 12-Oct-2016 | | Analyst: JCJ |
| **Mercury** | **0.0292** | | **0.000562** | **0.00398** | **mg/Kg-dry** | 1 | 12-Oct-2016 15:26 |
| **MOISTURE** | | **Method:SW3550** | | | | | Analyst: DFF |
| **Percent Moisture** | **9.67** | | **0.0100** | **0.0100** | **wt%** | 1 | 11-Oct-2016 11:45 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**ANALYTICAL REPORT**

Client: Trihydro
Project: Milwaukee Roundhouse MRH-Phase 2
Sample ID: TB-20161010-01
Collection Date: 10-Oct-2016 00:00

WorkOrder:HS16100416
Lab ID:HS16100416-08
Matrix:Water

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|
| **VOLATILES - SW8260C** | | **Method:SW8260** | | | | | Analyst: PC |
| Benzene | | U | 0.00060 | 0.0050 | mg/L | 1 | 11-Oct-2016 17:45 |
| Methylene chloride | | U | 0.0010 | 0.010 | mg/L | 1 | 11-Oct-2016 17:45 |
| Naphthalene | | U | 0.00070 | 0.0050 | mg/L | 1 | 11-Oct-2016 17:45 |
| Trichloroethene | | U | 0.00050 | 0.0050 | mg/L | 1 | 11-Oct-2016 17:45 |
| *Surr: 1,2-Dichloroethane-d4* | *89.1* | | | *70-125* | *%REC* | *1* | *11-Oct-2016 17:45* |
| *Surr: 4-Bromofluorobenzene* | *92.1* | | | *72-125* | *%REC* | *1* | *11-Oct-2016 17:45* |
| *Surr: Dibromofluoromethane* | *101* | | | *71-125* | *%REC* | *1* | *11-Oct-2016 17:45* |
| *Surr: Toluene-d8* | *99.2* | | | *75-125* | *%REC* | *1* | *11-Oct-2016 17:45* |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

**Batch ID:** 1288 **Method:** VOLATILES BY SW8260C

| SampID | Container | Sample Wt/Vol | Final Volume | Weight Factor | Container Type |
|---|---|---|---|---|---|
| HS16100416-01 | 1 | 5.049 (g) | 5 (mL) | 0.99 | Bulk (5030B) |
| HS16100416-02 | 1 | 5.114 (g) | 5 (mL) | 0.98 | Bulk (5030B) |
| HS16100416-03 | 1 | 5.002 (g) | 5 (mL) | 1 | Bulk (5030B) |
| HS16100416-04 | 1 | 5.144 (g) | 5 (mL) | 0.97 | Bulk (5030B) |
| HS16100416-05 | 1 | 5.116 (g) | 5 (mL) | 0.98 | Bulk (5030B) |
| HS16100416-06 | 1 | 5.142 (g) | 5 (mL) | 0.97 | Bulk (5030B) |
| HS16100416-07 | 1 | 4.991 (g) | 5 (mL) | 1 | Bulk (5030B) |

**Batch ID:** 108759 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---|---|---|---|---|
| HS16100416-01 | 1 | 0.5192 | 50 (mL) | 96.3 |
| HS16100416-02 | 1 | 0.5308 | 50 (mL) | 94.2 |
| HS16100416-03 | 1 | 0.5258 | 50 (mL) | 95.09 |
| HS16100416-04 | 1 | 0.5449 | 50 (mL) | 91.76 |
| HS16100416-05 | 1 | 0.5157 | 50 (mL) | 96.96 |
| HS16100416-06 | 1 | 0.5248 | 50 (mL) | 95.27 |
| HS16100416-07 | 1 | 0.5118 | 50 (mL) | 97.69 |

**Batch ID:** 108781 **Method:** LOW-LEVEL SEMIVOLATILES **Prep:** 3541_B_LOW

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---|---|---|---|---|
| HS16100416-01 | 1 | 30.04 | 1 (mL) | 0.03329 |
| HS16100416-02 | 1 | 30.09 | 1 (mL) | 0.03323 |
| HS16100416-03 | 1 | 30.06 | 1 (mL) | 0.03327 |
| HS16100416-04 | 1 | 30.03 | 1 (mL) | 0.0333 |
| HS16100416-05 | 1 | 30.1 | 1 (mL) | 0.03322 |
| HS16100416-06 | 1 | 30.01 | 1 (mL) | 0.03332 |
| HS16100416-07 | 1 | 30.03 | 1 (mL) | 0.0333 |

**Batch ID:** 108782 **Method:** MERCURY BY SW7471B **Prep:** HG_S_LOWPR

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---|---|---|---|---|
| HS16100416-01 | 1 | 0.5537 | 40 (mL) | 72.24 |
| HS16100416-02 | 1 | 0.5845 | 40 (mL) | 68.43 |
| HS16100416-03 | 1 | 0.5752 | 40 (mL) | 69.54 |
| HS16100416-04 | 1 | 0.5612 | 40 (mL) | 71.28 |
| HS16100416-05 | 1 | 0.5612 | 40 (mL) | 71.28 |
| HS16100416-06 | 1 | 0.5567 | 40 (mL) | 71.85 |
| HS16100416-07 | 1 | 0.5554 | 40 (mL) | 72.02 |

## WEIGHT LOG

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

**Batch ID:** 108786 **Method:** MASSACHUSETTS EPH **Prep:** MAEPH_MICROWAVE

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---|---|---|---|---|
| HS16100416-01 | 1 | 10.01 | 2 (mL) | 0.1998 |
| HS16100416-02 | 1 | 10.03 | 2 (mL) | 0.1994 |
| HS16100416-03 | 1 | 10.05 | 2 (mL) | 0.199 |
| HS16100416-04 | 1 | 10.04 | 2 (mL) | 0.1992 |
| HS16100416-05 | 1 | 10.07 | 2 (mL) | 0.1986 |
| HS16100416-06 | 1 | 10.01 | 2 (mL) | 0.1998 |
| HS16100416-07 | 1 | 10.05 | 2 (mL) | 0.199 |

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | TCLP Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID** 108759 | **Test Name :** METALS BY SW6020A | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 11 Oct 2016 12:45 | 12 Oct 2016 20:13 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 11 Oct 2016 12:45 | 12 Oct 2016 20:44 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 11 Oct 2016 12:45 | 12 Oct 2016 20:49 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 11 Oct 2016 12:45 | 12 Oct 2016 20:53 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 11 Oct 2016 12:45 | 12 Oct 2016 20:58 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 11 Oct 2016 12:45 | 12 Oct 2016 21:02 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 11 Oct 2016 12:45 | 12 Oct 2016 21:06 | 1 |
| **Batch ID** 108766a | **Test Name :** PCBS BY SW8082A | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 11 Oct 2016 13:38 | 13 Oct 2016 01:32 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 11 Oct 2016 13:38 | 13 Oct 2016 01:48 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 11 Oct 2016 13:38 | 13 Oct 2016 02:05 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 11 Oct 2016 13:38 | 13 Oct 2016 02:53 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 11 Oct 2016 13:38 | 13 Oct 2016 03:09 | 1 |
| **Batch ID** 108781 | **Test Name :** LOW-LEVEL SEMIVOLATILES | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 12 Oct 2016 09:00 | 12 Oct 2016 14:57 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 12 Oct 2016 09:00 | 12 Oct 2016 16:55 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 12 Oct 2016 09:00 | 12 Oct 2016 17:15 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 12 Oct 2016 09:00 | 12 Oct 2016 17:34 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 12 Oct 2016 09:00 | 12 Oct 2016 17:54 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 12 Oct 2016 09:00 | 12 Oct 2016 18:13 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 12 Oct 2016 09:00 | 12 Oct 2016 18:32 | 1 |
| **Batch ID** 108782 | **Test Name :** MERCURY BY SW7471B | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:16 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:17 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:19 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:21 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:23 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:24 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 12 Oct 2016 09:02 | 12 Oct 2016 15:26 | 1 |

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

# DATES REPORT

| Sample ID | Client Samp ID | Collection Date | TCLP Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID** 108786 | **Test Name :** MASSACHUSETTS EPH | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 12 Oct 2016 10:15 | 13 Oct 2016 22:14 | 1 |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | 12 Oct 2016 10:15 | 13 Oct 2016 20:08 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 12 Oct 2016 10:15 | 13 Oct 2016 22:46 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | 12 Oct 2016 10:15 | 13 Oct 2016 20:39 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 12 Oct 2016 10:15 | 13 Oct 2016 23:18 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | 12 Oct 2016 10:15 | 13 Oct 2016 21:11 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 12 Oct 2016 10:15 | 13 Oct 2016 23:49 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 12 Oct 2016 10:15 | 13 Oct 2016 21:43 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 12 Oct 2016 10:15 | 14 Oct 2016 00:21 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 12 Oct 2016 10:15 | 13 Oct 2016 22:14 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 12 Oct 2016 10:15 | 14 Oct 2016 00:53 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | 12 Oct 2016 10:15 | 13 Oct 2016 22:46 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 12 Oct 2016 10:15 | 14 Oct 2016 12:10 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | 12 Oct 2016 10:15 | 13 Oct 2016 23:18 | 1 |
| **Batch ID** 108829a | **Test Name :** PCBS BY SW8082A | | | **Matrix:** Soil | | |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | 13 Oct 2016 12:04 | 14 Oct 2016 04:11 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | 13 Oct 2016 12:04 | 14 Oct 2016 05:49 | 1 |
| **Batch ID** R282829 | **Test Name :** MOISTURE | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | | 11 Oct 2016 11:45 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | | 11 Oct 2016 11:45 | 1 |
| **Batch ID** R282834 | **Test Name :** VOLATILES - SW8260C | | | **Matrix:** Water | | |
| HS16100416-08 | TB-20161010-01 | 10 Oct 2016 00:00 | | | 11 Oct 2016 17:45 | 1 |
| **Batch ID** R282848 | **Test Name :** VOLATILES BY SW8260C | | | **Matrix:** Soil | | |
| HS16100416-01 | MRH-BKFL-306 | 10 Oct 2016 11:00 | | | 12 Oct 2016 00:19 | 1 |
| HS16100416-02 | MRH-BKFL-307 | 10 Oct 2016 11:05 | | | 12 Oct 2016 00:42 | 1 |
| HS16100416-03 | MRH-BKFL-308 | 10 Oct 2016 11:10 | | | 12 Oct 2016 01:05 | 1 |
| HS16100416-04 | MRH-BKFL-309 | 10 Oct 2016 11:15 | | | 12 Oct 2016 01:29 | 1 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | 10 Oct 2016 11:30 | | | 12 Oct 2016 01:52 | 1 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | 10 Oct 2016 11:35 | | | 12 Oct 2016 02:15 | 1 |
| HS16100416-07 | BD-20161010-01 | 10 Oct 2016 00:00 | | | 12 Oct 2016 02:38 | 1 |

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108766a** **Instrument: ECD_7** **Method: SW8082**

**MBLK** Sample ID: **MBLK-108766** Units: **ug/Kg** Analysis Date: **12-Oct-2016 07:56**
Client ID: Run ID: **ECD_7_282845** SeqNo: **3856892** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | U | 17 | | | | | | | | |
| *Surr: Decachlorobiphenyl* | *6.362* | *1.6* | *6.667* | *0* | *95.4* | *54 - 143* | | | | |
| *Surr: Tetrachloro-m-xylene* | *5.165* | *1.6* | *6.667* | *0* | *77.5* | *50 - 140* | | | | |

**LCS** Sample ID: **LCS-108766** Units: **ug/Kg** Analysis Date: **12-Oct-2016 08:13**
Client ID: Run ID: **ECD_7_282845** SeqNo: **3856893** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 151.1 | 17 | 166.7 | 0 | 90.6 | 54 - 137 | | | | |
| *Surr: Decachlorobiphenyl* | *6.326* | *1.6* | *6.667* | *0* | *94.9* | *54 - 143* | | | | |
| *Surr: Tetrachloro-m-xylene* | *5.943* | *1.6* | *6.667* | *0* | *89.1* | *50 - 140* | | | | |

**MS** Sample ID: **HS16100403-01MS** Units: **ug/Kg** Analysis Date: **12-Oct-2016 08:45**
Client ID: Run ID: **ECD_7_282845** SeqNo: **3856895** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 138.9 | 17 | 165.8 | 0 | 83.8 | 54 - 137 | | | | |
| *Surr: Decachlorobiphenyl* | *5.214* | *1.6* | *6.632* | *0* | *78.6* | *54 - 143* | | | | |
| *Surr: Tetrachloro-m-xylene* | *4.661* | *1.6* | *6.632* | *0* | *70.3* | *50 - 140* | | | | |

**MSD** Sample ID: **HS16100403-01MSD** Units: **ug/Kg** Analysis Date: **12-Oct-2016 09:01**
Client ID: Run ID: **ECD_7_282845** SeqNo: **3856896** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 132.8 | 17 | 166.3 | 0 | 79.9 | 54 - 137 | 138.9 | 4.53 | 30 | |
| *Surr: Decachlorobiphenyl* | *4.905* | *1.6* | *6.649* | *0* | *73.8* | *54 - 143* | *5.214* | *6.11* | *30* | |
| *Surr: Tetrachloro-m-xylene* | *4.412* | *1.6* | *6.649* | *0* | *66.4* | *50 - 140* | *4.661* | *5.49* | *30* | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108829a** **Instrument: ECD_7** **Method: SW8082**

**MBLK** Sample ID: **MBLK-108829** Units: **ug/Kg** Analysis Date: **13-Oct-2016 22:29**
Client ID: Run ID: **ECD_7_283000** SeqNo: **3858158** PrepDate: **13-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | U | 17 | | | | | | | | |
| *Surr: Decachlorobiphenyl* | *7.215* | *1.6* | *6.667* | *0* | *108* | *54 - 143* | | | | |
| *Surr: Tetrachloro-m-xylene* | *5.04* | *1.6* | *6.667* | *0* | *75.6* | *50 - 140* | | | | |

**LCS** Sample ID: **LCS-108829** Units: **ug/Kg** Analysis Date: **13-Oct-2016 22:45**
Client ID: Run ID: **ECD_7_283000** SeqNo: **3858159** PrepDate: **13-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 171.6 | 17 | 166.7 | 0 | 103 | 54 - 137 | | | | |
| *Surr: Decachlorobiphenyl* | *7.037* | *1.6* | *6.667* | *0* | *106* | *54 - 143* | | | | |
| *Surr: Tetrachloro-m-xylene* | *5.834* | *1.6* | *6.667* | *0* | *87.5* | *50 - 140* | | | | |

**MS** Sample ID: **HS16100524-01MS** Units: **ug/Kg** Analysis Date: **13-Oct-2016 23:18**
Client ID: Run ID: **ECD_7_283000** SeqNo: **3858161** PrepDate: **13-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 3334 | 17 | 166 | 2766 | 342 | 54 - 137 | | | | SEO |
| *Surr: Decachlorobiphenyl* | *12.51* | *1.6* | *6.64* | *0* | *188* | *54 - 143* | | | | S |
| *Surr: Tetrachloro-m-xylene* | *989.3* | *1.6* | *6.64* | *0* | *14900* | *50 - 140* | | | | S |

**MSD** Sample ID: **HS16100524-01MSD** Units: **ug/Kg** Analysis Date: **13-Oct-2016 23:34**
Client ID: Run ID: **ECD_7_283000** SeqNo: **3858162** PrepDate: **13-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aroclor 1260 | 3446 | 17 | 166.6 | 2766 | 408 | 54 - 137 | 3334 | 3.31 | 30 | SEO |
| *Surr: Decachlorobiphenyl* | *7.77* | *1.6* | *6.663* | *0* | *117* | *54 - 143* | *12.51* | *46.8* | *30* | R |
| *Surr: Tetrachloro-m-xylene* | *1030* | *1.6* | *6.663* | *0* | *15500* | *50 - 140* | *989.3* | *4.03* | *30* | S |

**The following samples were analyzed in this batch:** HS16100416-04 HS16100416-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108786** **Instrument: FID-7** **Method: MA EPH**

**MBLK** Sample ID: **MBLK-108786** Units: **mg/Kg** Analysis Date: **13-Oct-2016 17:29**
Client ID: Run ID: **FID-7_282995** SeqNo: **3858074** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C9-C18 Aliphatics | U | 5.00 | | | | | | | | |
| *Surr: 1-Chlorooctadecane* | *4.05* | *0.100* | *4* | *0* | *101* | *40 - 140* | | | | |

**MBLK** Sample ID: **MBLK-108786** Units: **mg/Kg** Analysis Date: **13-Oct-2016 17:29**
Client ID: Run ID: **FID-7_282995** SeqNo: **3857962** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C11-C22 Aromatics (unadjusted) | U | 5.00 | | | | | | | | |
| *Surr: 2-Bromonaphthalene* | *5.512* | *0.100* | *4* | *0* | *138* | *40 - 140* | | | | |
| *Surr: 2-Fluorobiphenyl* | *5.423* | *0.100* | *4* | *0* | *136* | *40 - 140* | | | | |
| *Surr: o-Terphenyl* | *4.163* | *0.100* | *4* | *0* | *104* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-108786** Units: **mg/Kg** Analysis Date: **13-Oct-2016 18:00**
Client ID: Run ID: **FID-7_282995** SeqNo: **3858075** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C9-C18 Aliphatics | 35.77 | 5.00 | 60 | 0 | 59.6 | 40 - 140 | | | | |
| *Surr: 1-Chlorooctadecane* | *3.875* | *0.100* | *4* | *0* | *96.9* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-108786** Units: **mg/Kg** Analysis Date: **13-Oct-2016 18:00**
Client ID: Run ID: **FID-7_282995** SeqNo: **3857963** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C11-C22 Aromatics (unadjusted) | 90.85 | 5.00 | 170 | 0 | 53.4 | 40 - 140 | | | | |
| *Surr: 2-Bromonaphthalene* | *5.596* | *0.100* | *4* | *0* | *140* | *40 - 140* | | | | |
| *Surr: 2-Fluorobiphenyl* | *5.433* | *0.100* | *4* | *0* | *136* | *40 - 140* | | | | |
| *Surr: o-Terphenyl* | *3.757* | *0.100* | *4* | *0* | *93.9* | *40 - 140* | | | | |

**MS** Sample ID: **HS16100415-01MS** Units: **mg/Kg** Analysis Date: **13-Oct-2016 19:04**
Client ID: Run ID: **FID-7_282995** SeqNo: **3858077** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C9-C18 Aliphatics | 61.73 | 4.99 | 59.82 | 19.97 | 69.8 | 40 - 140 | | | | |
| *Surr: 1-Chlorooctadecane* | *5.539* | *0.0997* | *3.988* | *0* | *139* | *40 - 140* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108786** **Instrument: FID-7** **Method: MA EPH**

**MS** Sample ID: **HS16100415-01MS** Units: **mg/Kg** Analysis Date: **13-Oct-2016 19:04**
Client ID: Run ID: **FID-7_282995** SeqNo: **3857965** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C11-C22 Aromatics (unadjusted) | 112.9 | 4.99 | 169.5 | 22.57 | 53.3 | 40 - 140 | | | | |
| *Surr: 2-Bromonaphthalene* | *5.329* | *0.0997* | *3.988* | *0* | *134* | *40 - 140* | | | | |
| *Surr: 2-Fluorobiphenyl* | *4.776* | *0.0997* | *3.988* | *0* | *120* | *40 - 140* | | | | |
| *Surr: o-Terphenyl* | *3.947* | *0.0997* | *3.988* | *0* | *99.0* | *40 - 140* | | | | |

**MSD** Sample ID: **HS16100415-01MSD** Units: **mg/Kg** Analysis Date: **13-Oct-2016 19:36**
Client ID: Run ID: **FID-7_282995** SeqNo: **3858078** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C9-C18 Aliphatics | 51.01 | 4.97 | 59.58 | 19.97 | 52.1 | 40 - 140 | 61.73 | 19 | 25 | |
| *Surr: 1-Chlorooctadecane* | *4.665* | *0.0993* | *3.972* | *0* | *117* | *40 - 140* | *5.539* | *17.1* | *25* | |

**MSD** Sample ID: **HS16100415-01MSD** Units: **mg/Kg** Analysis Date: **13-Oct-2016 19:36**
Client ID: Run ID: **FID-7_282995** SeqNo: **3857966** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| C11-C22 Aromatics (unadjusted) | 95.78 | 4.97 | 168.8 | 22.57 | 43.4 | 40 - 140 | 112.9 | 16.4 | 25 | |
| *Surr: 2-Bromonaphthalene* | *5.045* | *0.0993* | *3.972* | *0* | *127* | *40 - 140* | *5.329* | *5.48* | *25* | |
| *Surr: 2-Fluorobiphenyl* | *4.439* | *0.0993* | *3.972* | *0* | *112* | *40 - 140* | *4.776* | *7.33* | *25* | |
| *Surr: o-Terphenyl* | *3.35* | *0.0993* | *3.972* | *0* | *84.3* | *40 - 140* | *3.947* | *16.4* | *25* | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108759** **Instrument: ICPMS04** **Method: SW6020**

**MBLK** Sample ID: **MBLK-108759** Units: **mg/Kg** Analysis Date: **12-Oct-2016 19:38**
Client ID: Run ID: **ICPMS04_282839** SeqNo: **3855967** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | U | 0.500 | | | | | | | | |
| Barium | U | 0.500 | | | | | | | | |
| Cadmium | U | 0.500 | | | | | | | | |
| Chromium | U | 0.500 | | | | | | | | |
| Lead | U | 0.500 | | | | | | | | |
| Selenium | U | 0.500 | | | | | | | | |
| Silver | U | 0.500 | | | | | | | | |

**LCS** Sample ID: **LCS-108759** Units: **mg/Kg** Analysis Date: **12-Oct-2016 19:42**
Client ID: Run ID: **ICPMS04_282839** SeqNo: **3855968** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8.65 | 0.500 | 10 | 0 | 86.5 | 80 - 120 | | | | |
| Barium | 9.267 | 0.500 | 10 | 0 | 92.7 | 80 - 120 | | | | |
| Cadmium | 8.961 | 0.500 | 10 | 0 | 89.6 | 80 - 120 | | | | |
| Chromium | 8.766 | 0.500 | 10 | 0 | 87.7 | 80 - 120 | | | | |
| Lead | 8.953 | 0.500 | 10 | 0 | 89.5 | 80 - 120 | | | | |
| Selenium | 8.42 | 0.500 | 10 | 0 | 84.2 | 80 - 120 | | | | |
| Silver | 8.73 | 0.500 | 10 | 0 | 87.3 | 80 - 120 | | | | |

**MS** Sample ID: **HS16100416-01MS** Units: **mg/Kg** Analysis Date: **12-Oct-2016 20:31**
Client ID: **MRH-BKFL-306** Run ID: **ICPMS04_282839** SeqNo: **3855979** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 9.6 | 0.481 | 9.614 | 2.483 | 74.0 | 75 - 125 | | | | S |
| Barium | 88.59 | 0.481 | 9.614 | 83.77 | 50.2 | 75 - 125 | | | | SO |
| Cadmium | 7.718 | 0.481 | 9.614 | 0.09775 | 79.3 | 75 - 125 | | | | |
| Chromium | 11.05 | 0.481 | 9.614 | 4.064 | 72.7 | 75 - 125 | | | | S |
| Lead | 14.74 | 0.481 | 9.614 | 7.433 | 76.0 | 75 - 125 | | | | |
| Selenium | 7.513 | 0.481 | 9.614 | 0.4207 | 73.8 | 75 - 125 | | | | S |
| Silver | 7.141 | 0.481 | 9.614 | 0 | 74.3 | 75 - 125 | | | | S |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID:** 108759 **Instrument:** ICPMS04 **Method:** SW6020

**MSD** Sample ID: **HS16100416-01MSD** Units: **mg/Kg** Analysis Date: **12-Oct-2016 20:35**
Client ID: **MRH-BKFL-306** Run ID: **ICPMS04_282839** SeqNo: **3855980** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 10.26 | 0.479 | 9.586 | 2.483 | 81.2 | 75 - 125 | 9.6 | 6.68 | 20 | |
| Barium | 92 | 0.479 | 9.586 | 83.77 | 85.9 | 75 - 125 | 88.59 | 3.77 | 20 | O |
| Cadmium | 8.658 | 0.479 | 9.586 | 0.09775 | 89.3 | 75 - 125 | 7.718 | 11.5 | 20 | |
| Chromium | 11.86 | 0.479 | 9.586 | 4.064 | 81.3 | 75 - 125 | 11.05 | 7 | 20 | |
| Lead | 15.97 | 0.479 | 9.586 | 7.433 | 89.1 | 75 - 125 | 14.74 | 8.02 | 20 | |
| Selenium | 8.026 | 0.479 | 9.586 | 0.4207 | 79.3 | 75 - 125 | 7.513 | 6.6 | 20 | |
| Silver | 7.982 | 0.479 | 9.586 | 0 | 83.3 | 75 - 125 | 7.141 | 11.1 | 20 | |

**PDS** Sample ID: **HS16100416-01BS** Units: **mg/Kg** Analysis Date: **12-Oct-2016 20:40**
Client ID: **MRH-BKFL-306** Run ID: **ICPMS04_282839** SeqNo: **3855981** PrepDate: **11-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 10.69 | 0.482 | 9.63 | 2.483 | 85.2 | 75 - 125 | | | | |
| Barium | 92.68 | 0.482 | 9.63 | 83.77 | 92.6 | 75 - 125 | | | | O |
| Cadmium | 8.638 | 0.482 | 9.63 | 0.09775 | 88.7 | 75 - 125 | | | | |
| Chromium | 12.17 | 0.482 | 9.63 | 4.064 | 84.2 | 75 - 125 | | | | |
| Lead | 16.15 | 0.482 | 9.63 | 7.433 | 90.5 | 75 - 125 | | | | |
| Selenium | 8.393 | 0.482 | 9.63 | 0.4207 | 82.8 | 75 - 125 | | | | |
| Silver | 7.444 | 0.482 | 9.63 | 0 | 77.3 | 75 - 125 | | | | |

**SD** Sample ID: **HS16100416-01 DIL** Units: **mg/Kg** Analysis Date: **12-Oct-2016 20:17**
Client ID: **MRH-BKFL-306** Run ID: **ICPMS04_282839** SeqNo: **3855976** PrepDate: **11-Oct-2016** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.587 | 2.41 | | | | | 2.483 | 4.16 | 10 | |
| Barium | 85.75 | 2.41 | | | | | 83.77 | 2.37 | 10 | |
| Cadmium | U | 2.41 | | | | | 0.09775 | 0 | 10 | |
| Chromium | 4.265 | 2.41 | | | | | 4.064 | 4.94 | 10 | |
| Lead | 7.993 | 2.41 | | | | | 7.433 | 7.53 | 10 | |
| Selenium | 1.104 | 2.41 | | | | | 0.4207 | 0 | 10 | J |
| Silver | U | 2.41 | | | | | 0.01926 | 0 | 10 | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108782** **Instrument: HG03** **Method: SW7471A**

**MBLK** Sample ID: **MBLK-108782** Units: **ug/Kg** Analysis Date: **12-Oct-2016 14:16**
Client ID: Run ID: **HG03_282880** SeqNo: **3855533** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | U | 3.33 | | | | | | | | |

**LCS** Sample ID: **LCS-108782** Units: **ug/Kg** Analysis Date: **12-Oct-2016 14:17**
Client ID: Run ID: **HG03_282880** SeqNo: **3855534** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 324.8 | 3.33 | 334.1 | 0 | 97.2 | 85 - 115 | | | | |

**MS** Sample ID: **HS16100430-02MS** Units: **ug/Kg** Analysis Date: **12-Oct-2016 15:35**
Client ID: Run ID: **HG03_282880** SeqNo: **3855556** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 355.3 | 3.59 | 359.6 | 26.75 | 91.4 | 85 - 115 | | | | |

**MSD** Sample ID: **HS16100430-02MSD** Units: **ug/Kg** Analysis Date: **12-Oct-2016 15:36**
Client ID: Run ID: **HG03_282880** SeqNo: **3855557** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 357.3 | 3.52 | 353.1 | 26.75 | 93.6 | 85 - 115 | 355.3 | 0.583 | 20 | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108781** **Instrument: SV-7** **Method: SW8270**

**MBLK** Sample ID: **MBLK-108781** Units: **ug/Kg** Analysis Date: **12-Oct-2016 11:04**
Client ID: Run ID: **SV-7_282925** SeqNo: **3856693** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | U | 3.3 | | | | | | | | |
| 2-Methylnaphthalene | U | 3.3 | | | | | | | | |
| Benz(a)anthracene | U | 3.3 | | | | | | | | |
| Benzo(a)pyrene | U | 3.3 | | | | | | | | |
| Benzo(b)fluoranthene | U | 3.3 | | | | | | | | |
| Benzo(k)fluoranthene | U | 3.3 | | | | | | | | |
| Chrysene | U | 3.3 | | | | | | | | |
| Dibenz(a,h)anthracene | U | 3.3 | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | U | 3.3 | | | | | | | | |
| *Surr: 2,4,6-Tribromophenol* | *118.9* | *0* | *167* | *0* | *71.2* | *36 - 126* | | | | |
| *Surr: 2-Fluorobiphenyl* | *132.2* | *0* | *167* | *0* | *79.2* | *43 - 125* | | | | |
| *Surr: 2-Fluorophenol* | *150.4* | *0* | *167* | *0* | *90.1* | *37 - 125* | | | | |
| *Surr: 4-Terphenyl-d14* | *133.4* | *0* | *167* | *0* | *79.9* | *32 - 125* | | | | |
| *Surr: Nitrobenzene-d5* | *144.3* | *0* | *167* | *0* | *86.4* | *37 - 125* | | | | |
| *Surr: Phenol-d6* | *161.1* | *0* | *167* | *0* | *96.5* | *40 - 125* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108781** **Instrument: SV-7** **Method: SW8270**

**LCS** Sample ID: **LCS-108781** Units: **ug/Kg** Analysis Date: **12-Oct-2016 11:23**
Client ID: Run ID: **SV-7_282925** SeqNo: **3856694** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 119.1 | 3.3 | 167 | 0 | 71.3 | 50 - 120 | | | | |
| 2-Methylnaphthalene | 118.2 | 3.3 | 167 | 0 | 70.8 | 50 - 120 | | | | |
| Benz(a)anthracene | 115.9 | 3.3 | 167 | 0 | 69.4 | 50 - 131 | | | | |
| Benzo(a)pyrene | 118.5 | 3.3 | 167 | 0 | 70.9 | 50 - 130 | | | | |
| Benzo(b)fluoranthene | 136.6 | 3.3 | 167 | 0 | 81.8 | 50 - 137 | | | | |
| Benzo(k)fluoranthene | 123.8 | 3.3 | 167 | 0 | 74.1 | 50 - 143 | | | | |
| Chrysene | 118.8 | 3.3 | 167 | 0 | 71.1 | 50 - 130 | | | | |
| Dibenz(a,h)anthracene | 130.8 | 3.3 | 167 | 0 | 78.3 | 50 - 130 | | | | |
| Indeno(1,2,3-cd)pyrene | 136.2 | 3.3 | 167 | 0 | 81.6 | 45 - 139 | | | | |
| *Surr: 2,4,6-Tribromophenol* | *108.4* | *0* | *167* | *0* | *64.9* | *36 - 126* | | | | |
| *Surr: 2-Fluorobiphenyl* | *125.3* | *0* | *167* | *0* | *75.0* | *43 - 125* | | | | |
| *Surr: 2-Fluorophenol* | *145.5* | *0* | *167* | *0* | *87.1* | *37 - 125* | | | | |
| *Surr: 4-Terphenyl-d14* | *125.3* | *0* | *167* | *0* | *75.1* | *32 - 125* | | | | |
| *Surr: Nitrobenzene-d5* | *138.6* | *0* | *167* | *0* | *83.0* | *37 - 125* | | | | |
| *Surr: Phenol-d6* | *145.5* | *0* | *167* | *0* | *87.1* | *40 - 125* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID:** **108781** **Instrument:** **SV-7** **Method:** **SW8270**

**MS** Sample ID: **HS16100416-01MS** Units: **ug/Kg** Analysis Date: **12-Oct-2016 15:16**
Client ID: **MRH-BKFL-306** Run ID: **SV-7_282925** SeqNo: **3856696** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 102.2 | 3.3 | 166.9 | 0 | 61.2 | 50 - 120 | | | | |
| 2-Methylnaphthalene | 103.9 | 3.3 | 166.9 | 0 | 62.2 | 50 - 120 | | | | |
| Benz(a)anthracene | 140.4 | 3.3 | 166.9 | 0 | 84.1 | 50 - 131 | | | | |
| Benzo(a)pyrene | 135.6 | 3.3 | 166.9 | 0 | 81.2 | 50 - 130 | | | | |
| Benzo(b)fluoranthene | 158.1 | 3.3 | 166.9 | 0 | 94.7 | 50 - 137 | | | | |
| Benzo(k)fluoranthene | 139.3 | 3.3 | 166.9 | 0 | 83.4 | 50 - 143 | | | | |
| Chrysene | 131.9 | 3.3 | 166.9 | 0 | 79.0 | 50 - 130 | | | | |
| Dibenz(a,h)anthracene | 150.1 | 3.3 | 166.9 | 0 | 89.9 | 50 - 130 | | | | |
| Indeno(1,2,3-cd)pyrene | 156 | 3.3 | 166.9 | 0 | 93.5 | 45 - 139 | | | | |
| *Surr: 2,4,6-Tribromophenol* | *118.2* | *0* | *166.9* | *0* | *70.8* | *36 - 126* | | | | |
| *Surr: 2-Fluorobiphenyl* | *101.4* | *0* | *166.9* | *0* | *60.7* | *43 - 125* | | | | |
| *Surr: 2-Fluorophenol* | *99.59* | *0* | *166.9* | *0* | *59.7* | *37 - 125* | | | | |
| *Surr: 4-Terphenyl-d14* | *133.2* | *0* | *166.9* | *0* | *79.8* | *32 - 125* | | | | |
| *Surr: Nitrobenzene-d5* | *112.5* | *0* | *166.9* | *0* | *67.4* | *37 - 125* | | | | |
| *Surr: Phenol-d6* | *123.9* | *0* | *166.9* | *0* | *74.2* | *40 - 125* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: 108781** **Instrument: SV-7** **Method: SW8270**

**MSD** Sample ID: **HS16100416-01MSD** Units: **ug/Kg** Analysis Date: **12-Oct-2016 15:36**
Client ID: **MRH-BKFL-306** Run ID: **SV-7_282925** SeqNo: **3856703** PrepDate: **12-Oct-2016** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 123.6 | 3.3 | 166.8 | 0 | 74.1 | 50 - 120 | 102.2 | 18.9 | 30 | |
| 2-Methylnaphthalene | 118.3 | 3.3 | 166.8 | 0 | 70.9 | 50 - 120 | 103.9 | 13 | 30 | |
| Benz(a)anthracene | 137.7 | 3.3 | 166.8 | 0 | 82.6 | 50 - 131 | 140.4 | 1.9 | 30 | |
| Benzo(a)pyrene | 140.9 | 3.3 | 166.8 | 0 | 84.4 | 50 - 130 | 135.6 | 3.79 | 30 | |
| Benzo(b)fluoranthene | 160.2 | 3.3 | 166.8 | 0 | 96.0 | 50 - 137 | 158.1 | 1.32 | 30 | |
| Benzo(k)fluoranthene | 146.1 | 3.3 | 166.8 | 0 | 87.6 | 50 - 143 | 139.3 | 4.78 | 30 | |
| Chrysene | 133.7 | 3.3 | 166.8 | 0 | 80.2 | 50 - 130 | 131.9 | 1.34 | 30 | |
| Dibenz(a,h)anthracene | 157.4 | 3.3 | 166.8 | 0 | 94.3 | 50 - 130 | 150.1 | 4.71 | 30 | |
| Indeno(1,2,3-cd)pyrene | 156.7 | 3.3 | 166.8 | 0 | 93.9 | 45 - 139 | 156 | 0.459 | 30 | |
| *Surr: 2,4,6-Tribromophenol* | *116.8* | *0* | *166.8* | *0* | *70.0* | *36 - 126* | *118.2* | *1.22* | *30* | |
| *Surr: 2-Fluorobiphenyl* | *121.2* | *0* | *166.8* | *0* | *72.6* | *43 - 125* | *101.4* | *17.8* | *30* | |
| *Surr: 2-Fluorophenol* | *132.8* | *0* | *166.8* | *0* | *79.6* | *37 - 125* | *99.59* | *28.6* | *30* | |
| *Surr: 4-Terphenyl-d14* | *132.4* | *0* | *166.8* | *0* | *79.4* | *32 - 125* | *133.2* | *0.569* | *30* | |
| *Surr: Nitrobenzene-d5* | *132.4* | *0* | *166.8* | *0* | *79.3* | *37 - 125* | *112.5* | *16.2* | *30* | |
| *Surr: Phenol-d6* | *138.6* | *0* | *166.8* | *0* | *83.1* | *40 - 125* | *123.9* | *11.2* | *30* | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: R282834** **Instrument: VOA6** **Method: SW8260**

**MBLK** Sample ID: **VBLKW-161011** Units: **ug/L** Analysis Date: **11-Oct-2016 12:35**
Client ID: Run ID: **VOA6_282834** SeqNo: **3854766** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | U | 5.0 | | | | | | | | |
| Methylene chloride | U | 10 | | | | | | | | |
| Naphthalene | U | 5.0 | | | | | | | | |
| Trichloroethene | U | 5.0 | | | | | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *44.01* | *0* | *50* | *0* | *88.0* | *70 - 125* | | | | |
| *Surr: 4-Bromofluorobenzene* | *44.43* | *0* | *50* | *0* | *88.9* | *72 - 125* | | | | |
| *Surr: Dibromofluoromethane* | *51.18* | *0* | *50* | *0* | *102* | *71 - 125* | | | | |
| *Surr: Toluene-d8* | *48.78* | *0* | *50* | *0* | *97.6* | *75 - 125* | | | | |

**LCS** Sample ID: **VLCSW-161011** Units: **ug/L** Analysis Date: **11-Oct-2016 11:47**
Client ID: Run ID: **VOA6_282834** SeqNo: **3854765** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 51.15 | 5.0 | 50 | 0 | 102 | 73 - 121 | | | | |
| Methylene chloride | 46.14 | 10 | 50 | 0 | 92.3 | 65 - 133 | | | | |
| Naphthalene | 40.74 | 5.0 | 50 | 0 | 81.5 | 65 - 135 | | | | |
| Trichloroethene | 54.24 | 5.0 | 50 | 0 | 108 | 80 - 120 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *44.02* | *0* | *50* | *0* | *88.0* | *70 - 125* | | | | |
| *Surr: 4-Bromofluorobenzene* | *45.97* | *0* | *50* | *0* | *91.9* | *72 - 125* | | | | |
| *Surr: Dibromofluoromethane* | *50.38* | *0* | *50* | *0* | *101* | *71 - 125* | | | | |
| *Surr: Toluene-d8* | *48.89* | *0* | *50* | *0* | *97.8* | *75 - 125* | | | | |

**MS** Sample ID: **HS16100296-01MS** Units: **ug/L** Analysis Date: **11-Oct-2016 16:33**
Client ID: Run ID: **VOA6_282834** SeqNo: **3854768** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 58.88 | 5.0 | 50 | 0 | 118 | 73 - 121 | | | | |
| Methylene chloride | 44.92 | 10 | 50 | 0 | 89.8 | 65 - 133 | | | | |
| Naphthalene | 38.07 | 5.0 | 50 | 0 | 76.1 | 65 - 135 | | | | |
| Trichloroethene | 51.98 | 5.0 | 50 | 0 | 104 | 80 - 120 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *43.81* | *0* | *50* | *0* | *87.6* | *70 - 125* | | | | |
| *Surr: 4-Bromofluorobenzene* | *46.22* | *0* | *50* | *0* | *92.4* | *72 - 125* | | | | |
| *Surr: Dibromofluoromethane* | *50.26* | *0* | *50* | *0* | *101* | *71 - 125* | | | | |
| *Surr: Toluene-d8* | *49.31* | *0* | *50* | *0* | *98.6* | *75 - 125* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID:** **R282834** **Instrument:** **VOA6** **Method:** **SW8260**

**MSD** Sample ID: **HS16100296-01MSD** Units: **ug/L** Analysis Date: **11-Oct-2016 16:57**
Client ID: Run ID: **VOA6_282834** SeqNo: **3854769** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 53.78 | 5.0 | 50 | 0 | 108 | 73 - 121 | 58.88 | 9.05 | 20 | |
| Methylene chloride | 45.84 | 10 | 50 | 0 | 91.7 | 65 - 133 | 44.92 | 2.02 | 20 | |
| Naphthalene | 43.39 | 5.0 | 50 | 0 | 86.8 | 65 - 135 | 38.07 | 13.1 | 20 | |
| Trichloroethene | 53.06 | 5.0 | 50 | 0 | 106 | 80 - 120 | 51.98 | 2.06 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *42.82* | *0* | *50* | *0* | *85.6* | *70 - 125* | *43.81* | *2.3* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *45.33* | *0* | *50* | *0* | *90.7* | *72 - 125* | *46.22* | *1.93* | *20* | |
| *Surr: Dibromofluoromethane* | *49.89* | *0* | *50* | *0* | *99.8* | *71 - 125* | *50.26* | *0.738* | *20* | |
| *Surr: Toluene-d8* | *48.42* | *0* | *50* | *0* | *96.8* | *75 - 125* | *49.31* | *1.82* | *20* | |

**The following samples were analyzed in this batch:** HS16100416-08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID: R282848** **Instrument: VOA5** **Method: SW8260**

**MBLK** Sample ID: **VBLKS2-101116** Units: **ug/Kg** Analysis Date: **11-Oct-2016 22:23**
Client ID: Run ID: **VOA5_282848** SeqNo: **3855044** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | U | 5.0 | | | | | | | | |
| Methylene chloride | U | 10 | | | | | | | | |
| Naphthalene | U | 5.0 | | | | | | | | |
| Trichloroethene | U | 5.0 | | | | | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *52.2* | *0* | *50* | *0* | *104* | *70 - 128* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.49* | *0* | *50* | *0* | *103* | *73 - 126* | | | | |
| *Surr: Dibromofluoromethane* | *53.52* | *0* | *50* | *0* | *107* | *71 - 128* | | | | |
| *Surr: Toluene-d8* | *51.08* | *0* | *50* | *0* | *102* | *73 - 127* | | | | |

**LCS** Sample ID: **VLCSS2-101116** Units: **ug/Kg** Analysis Date: **11-Oct-2016 21:37**
Client ID: Run ID: **VOA5_282848** SeqNo: **3855043** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 47.35 | 5.0 | 50 | 0 | 94.7 | 79 - 122 | | | | |
| Methylene chloride | 54.4 | 10 | 50 | 0 | 109 | 65 - 130 | | | | |
| Naphthalene | 54.13 | 5.0 | 50 | 0 | 108 | 71 - 128 | | | | |
| Trichloroethene | 46.81 | 5.0 | 50 | 0 | 93.6 | 75 - 123 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *48.01* | *0* | *50* | *0* | *96.0* | *70 - 128* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.43* | *0* | *50* | *0* | *105* | *73 - 126* | | | | |
| *Surr: Dibromofluoromethane* | *49.79* | *0* | *50* | *0* | *99.6* | *71 - 128* | | | | |
| *Surr: Toluene-d8* | *51.5* | *0* | *50* | *0* | *103* | *73 - 127* | | | | |

**MS** Sample ID: **HS16100415-01MS** Units: **ug/Kg** Analysis Date: **11-Oct-2016 23:10**
Client ID: Run ID: **VOA5_282848** SeqNo: **3855046** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 29.25 | 5.0 | 49.5 | 0 | 59.1 | 79 - 122 | | | | S |
| Methylene chloride | 33.87 | 9.9 | 49.5 | 0 | 68.4 | 65 - 130 | | | | |
| Naphthalene | 5.976 | 5.0 | 49.5 | 0 | 12.1 | 71 - 128 | | | | S |
| Trichloroethene | 24.11 | 5.0 | 49.5 | 0 | 48.7 | 75 - 123 | | | | S |
| *Surr: 1,2-Dichloroethane-d4* | *46.97* | *0* | *49.5* | *0* | *94.9* | *70 - 128* | | | | |
| *Surr: 4-Bromofluorobenzene* | *48.27* | *0* | *49.5* | *0* | *97.5* | *73 - 126* | | | | |
| *Surr: Dibromofluoromethane* | *49.66* | *0* | *49.5* | *0* | *100* | *71 - 128* | | | | |
| *Surr: Toluene-d8* | *55.92* | *0* | *49.5* | *0* | *113* | *73 - 127* | | | | |

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID:** **R282848** **Instrument:** **VOA5** **Method:** **SW8260**

**MSD** Sample ID: **HS16100415-01MSD** Units: **ug/Kg** Analysis Date: **11-Oct-2016 23:33**
Client ID: Run ID: **VOA5_282848** SeqNo: **3855047** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 32.2 | 5.0 | 50.5 | 0 | 63.8 | 79 - 122 | 29.25 | 0 | 30 | S |
| Methylene chloride | 39.78 | 10 | 50.5 | 0 | 78.8 | 65 - 130 | 33.87 | 0 | 30 | |
| Naphthalene | 6.538 | 5.0 | 50.5 | 0 | 12.9 | 71 - 128 | 5.976 | 0 | 30 | S |
| Trichloroethene | 26.84 | 5.0 | 50.5 | 0 | 53.1 | 75 - 123 | 24.11 | 0 | 30 | S |
| *Surr: 1,2-Dichloroethane-d4* | *55.77* | *0* | *50.5* | *0* | *110* | *70 - 128* | *46.97* | *0* | *30* | |
| *Surr: 4-Bromofluorobenzene* | *51.67* | *0* | *50.5* | *0* | *102* | *73 - 126* | *48.27* | *0* | *30* | |
| *Surr: Dibromofluoromethane* | *57.13* | *0* | *50.5* | *0* | *113* | *71 - 128* | *49.66* | *0* | *30* | |
| *Surr: Toluene-d8* | *54.97* | *0* | *50.5* | *0* | *109* | *73 - 127* | *55.92* | *0* | *30* | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** HS16100416

## QC BATCH REPORT

**Batch ID:** **R282829** **Instrument:** **Balance1** **Method:** **SW3550**

**DUP** Sample ID: **HS16100416-07DUP** Units: **wt%** Analysis Date: **11-Oct-2016 11:45**
Client ID: **BD-20161010-01** Run ID: **Balance1_282829** SeqNo: **3854593** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 10.3 | 0.0100 | | | | | 9.67 | 6.31 | 20 | |

**The following samples were analyzed in this batch:** HS16100416-01 HS16100416-02 HS16100416-03 HS16100416-04 HS16100416-05 HS16100416-06 HS16100416-07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**WorkOrder:** **HS16100416**

## QUALIFIERS, ACRONYMS, UNITS

| Qualifier | Description |
|---|---|
| * | Value exceeds Regulatory Limit |
| a | Not accredited |
| B | Analyte detected in the associated Method Blank above the Reporting Limit |
| E | Value above quantitation range |
| H | Analyzed outside of Holding Time |
| J | Analyte detected below quantitation limit |
| M | Manually integrated, see raw data for justification |
| n | Not offered for accreditation |
| ND | Not Detected at the Reporting Limit |
| O | Sample amount is > 4 times amount spiked |
| P | Dual Column results percent difference > 40% |
| R | RPD above laboratory control limit |
| S | Spike Recovery outside laboratory control limits |
| U | Analyzed but not detected above the MDL/SDL |

| Acronym | Description |
|---|---|
| DCS | Detectability Check Study |
| DUP | Method Duplicate |
| LCS | Laboratory Control Sample |
| LCSD | Laboratory Control Sample Duplicate |
| MBLK | Method Blank |
| MDL | Method Detection Limit |
| MQL | Method Quantitation Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| PDS | Post Digestion Spike |
| PQL | Practical Quantitaion Limit |
| SD | Serial Dilution |
| SDL | Sample Detection Limit |
| TRRP | Texas Risk Reduction Program |

| Unit Reported | Description |
|---|---|
| mg/Kg-dry | Milligrams per Kilogram- Dry weight corrected |
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 16-022-1 | 27-Mar-2017 |
| California | 2919 2016-2018 | 31-Jul-2018 |
| Illinois | 003872 | 09-May-2017 |
| Kansas | E-10352 2016-2017 | 31-Jul-2017 |
| Kentucky | 96 2016-2017 | 30-Apr-2017 |
| Louisiana | 03087 2016-2017 | 30-Jun-2017 |
| North Carolina | 624 - 2016 | 31-Dec-2016 |
| North Dakota | R193 2016-2017 | 30-Apr-2017 |
| Oklahoma | 2016-122 | 31-Aug-2017 |
| Texas | TX104704231-16-17 | 30-Apr-2017 |

**Client:** Trihydro
**Project:** Milwaukee Roundhouse MRH-Phase 2
**Work Order:** HS16100416

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS16100416-01 | MRH-BKFL-306 | Login | 10/11/2016 11:00:34 AM | PMG | VW-2 |
| HS16100416-01 | MRH-BKFL-306 | Login | 10/11/2016 11:00:34 AM | PMG | 11D |
| HS16100416-02 | MRH-BKFL-307 | Login | 10/11/2016 11:07:09 AM | PMG | VW-2 |
| HS16100416-02 | MRH-BKFL-307 | Login | 10/11/2016 11:07:09 AM | PMG | 11D |
| HS16100416-03 | MRH-BKFL-308 | Login | 10/11/2016 11:07:09 AM | PMG | VW-2 |
| HS16100416-03 | MRH-BKFL-308 | Login | 10/11/2016 11:07:09 AM | PMG | 11D |
| HS16100416-04 | MRH-BKFL-309 | Login | 10/11/2016 11:07:09 AM | PMG | VW-2 |
| HS16100416-04 | MRH-BKFL-309 | Login | 10/11/2016 11:07:09 AM | PMG | 11D |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Login | 10/11/2016 11:07:10 AM | PMG | VW-2 |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Login | 10/11/2016 11:07:10 AM | PMG | 11D |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Login | 10/11/2016 11:07:10 AM | PMG | VW-2 |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Login | 10/11/2016 11:07:10 AM | PMG | 11D |
| HS16100416-07 | BD-20161010-01 | Login | 10/11/2016 11:07:10 AM | PMG | VW-2 |
| HS16100416-07 | BD-20161010-01 | Login | 10/11/2016 11:07:10 AM | PMG | 11D |
| HS16100416-08 | TB-20161010-01 | Login | 10/11/2016 11:07:40 AM | PMG | VW-3 |
| HS16100416-01 | MRH-BKFL-306 | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-02 | MRH-BKFL-307 | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-03 | MRH-BKFL-308 | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-04 | MRH-BKFL-309 | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-07 | BD-20161010-01 | Return | 10/11/2016 1:18:51 PM | PVL | 11D |
| HS16100416-01 | MRH-BKFL-306 | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-02 | MRH-BKFL-307 | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-03 | MRH-BKFL-308 | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-04 | MRH-BKFL-309 | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-07 | BD-20161010-01 | Out | 10/12/2016 9:07:41 AM | JCJ | METPREP |
| HS16100416-01 | MRH-BKFL-306 | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-02 | MRH-BKFL-307 | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-03 | MRH-BKFL-308 | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-04 | MRH-BKFL-309 | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-05 | MRH-BKFL-TS-400 (0-0.5) | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-06 | MRH-BKFL-TS-401 (0-0.5) | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |
| HS16100416-07 | BD-20161010-01 | Return | 10/12/2016 9:09:56 AM | JCJ | 11D |

**ALS Group USA, Corp** Date: 14-Oct-16

## Sample Receipt Checklist

| | | | |
|---|---|---|---|
| Client Name: | Trihydro Helena | Date/Time Received: | **11-Oct-2016 08:35** |
| Work Order: | HS16100416 | Received by: | **Jared R. Makan** |

Checklist completed by: *Paresh M. Giga* (eSignature) 11-Oct-2016 (Date)

Reviewed by: *Bernadette A. Fini* (eSignature) 11-Oct-2016 (Date)

Matrices: **Soil/Water** Carrier name: **FedEx**

| | Yes | No | Not Present / N/A |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☑ | Not Present ☐ |
| Chain of custody present? | ☑ | ☐ | |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| TX1005 solids received in hermetically sealed vials? | ☐ | ☑ | N/A ☐ |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |
| Temperature(s)/Thermometer(s): | 2.1c/2.6c U/C | | IR5 |
| Cooler(s)/Kit(s): | 24545 | | |
| Date/Time sample(s) sent to storage: | 10/11/16 1140 | | |
| Water - VOA vials have zero headspace? | ☑ | ☐ | No VOA vials submitted ☐ |
| Water - pH acceptable upon receipt? | ☑ | ☐ | N/A ☐ |
| pH adjusted? | ☐ | ☑ | N/A ☐ |
| pH adjusted by: | | | |

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Laboratory Group
10450 Stancliff Rd. #210
Houston, Texas 77099
(Tel) 281.530.5656
(Fax) 281.530.5887

# Backfill Chain of Custody Form

Page 1 of 1

HS16100416

Trihydro

Milwaukee Roundhouse MRH-Phase 2

ALS Project Manager:

| Customer Information | | Project Information | | Parameter/Method Request for Analysis | |
|---|---|---|---|---|---|
| Purchase Order | Quote: 06302015 BS-01 | Project Name | Milwaukee Roundhouse Investigation Phase 2 | A | RCRA 8 Metals |
| Work Order | HS15080623 | Project Number | 776-019-003 | B | SVOCs 8270 - 1-methylnapthalene, 2-methylnapthalene |
| Company Name | Trihydro | Bill To Company | Trihydro | C | PAHs 8270 - benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, |
| Send Report To | Charlie Ballek | Invoice Attn. | AP@trihydro.com | D | EPH - C11-C22 Aromatics, C9-C18 Aliphatics |
| Address | 2707 Broadwater Ave. | Address | 1252 Commerce Dr. | E | PCB 8082 - Aroclor 1260 |
| | | | | F | VOC - trichloroethane (TCE), methylene chloride, benzene, napthalene |
| City/State/Zip | Helena, MT 59601 | City/State/Zip | Laramie, WY 82070 | G | MOISTURE |
| Phone | 307-745-7474 | Phone | 307-745-7474 | H | |
| Fax | | Fax | | I | |
| e-Mail Address | cballek@trihydro.com | e-Mail Address | AP@trihydro.com | J | |

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MRH-BKFL-306 | 10/10/16 | 1100 | Soil | N | 2 | X | X | X | X | X | X | X | | | | |
| 2 | MRH-BKFL-307 | 10/10/16 | 1105 | | | | X | X | X | X | X | X | X | | | | |
| 3 | MRH-BKFL-308 | | 1110 | | | | X | X | X | X | X | X | X | | | | |
| 4 | MRH-BKFL-309 | | 1115 | | | | X | X | X | X | X | X | X | | | | |
| 5 | MRH-BKFL-TS-400 (0-0.5) | | 1130 | | | | X | X | X | X | X | X | X | | | | |
| 6 | MRH-BKFL-TS-401 (0-0.5) | | 1135 | | | | X | X | X | X | X | X | X | | | | |
| 7 | BD-20161010-01 | | — | | | | X | X | X | X | X | X | X | | | | |
| 8 | TB-20161010-01 | — | — | W | Y | 2 | | | | | | X | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Sampler(s): Please Print & Sign
Sarah Seitz L. Daniel / [signature]

Shipment Method: FEDEX

Required Turnaround Time: ☐STD 10 Wk Days ☐5 Wk Days ☐2 Wk Days ☐24 Hour ☑Other 3 Day

Results Due Date:

| Relinquished by: | Date: | Time: | Received by: | Notes: |
|---|---|---|---|---|
| [signature] | 10/10/16 | 1700 | | |
| Relinquished by: | Date: | Time: | Received by (Laboratory): JM 10/11/16 08:35 | Cooler Temp. 3.1 |
| Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory): | |

QC Package: (Check Box Below)

| | | |
|---|---|---|
| X | Level II: Standard QC | TRRP-Checklist |
| | Level III: Std QC + Raw Data | TRRP Level IV |
| | Level IV: SW846 CLP-Like | |
| | Other: | |

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.

Cooler - 24545
1125
[illegible]

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**ALS Environmental**
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

24545

**CUSTODY SEAL**

Date: 10/10/16 Time: 1349
Name: Syris Trahan
Company: Wynnd Corporation

Seal Broken By: [illegible]
Date: 10/11/16

24545 OCT 1 1 2016

FedEx
TRK# 0221 6786 7199 9908

TUE - 11 OCT 10:30A
PRIORITY OVERNIGHT

XH SGRA 24545 TX-US 77099 IAH

#5193430 10/10 544J3/FB42/14E8

**ATTACHMENT E**

| Location ID | Date Sampled | ıl PAH TEQ (mg/kg· | WHO 2005 Toxicity Equivalence Quotient (ng/kg) |
|---|---|---|---|
| DIAP-3-S-East (0-2 ft) | 11/12/16 | -- | 42 |
| DIAP-3-S-East (0-2 ft) | 11/12/16 | 0.1421 | -- |
| DIAP-3-S-North (0-2 ft) | 11/12/16 | -- | 15 |
| DIAP-3-S-North (0-2 ft) | 11/12/16 | 0.0285853 | -- |
| DIAP-3-S-West (0-2 ft) | 11/12/16 | -- | 6.7 |
| DIAP-3-S-West (0-2 ft) | 11/12/16 | 0.03578 | -- |
| DIAP-3-S-West (0-2 ft) Dup | 11/12/16 | -- | 8.9 |
| DIAP-3-S-West (0-2 ft) Dup | 11/12/16 | 0.0286101 | -- |
| DIAP-S-EAST (0-2 ft) | 07/11/16 | -- | 440 |
| DIAP-S-EAST (0-2 ft) | 07/11/16 | 0.082839 | -- |
| DIAP-S-South-01 (0-2 ft) | 09/12/16 | -- | 23 |
| DIAP-S-South-01 (0-2 ft) | 09/12/16 | 0.00404425 | -- |
| DIAP-S-WEST (0-2 ft) | 07/11/16 | -- | 17 |
| DIAP-S-WEST (0-2 ft) | 07/11/16 | 0.0138121 | -- |
| , | Residential Direct Contact SSSL | 0.1 | 34.4 |
| , | Construction Direct Contact SSSL | NA | 455 |
| , | Leaching to Groundwater SSSL | NA | 66.64 |

| Total PAH TEQ | d_Total PAH TEQ | WHO | d_WHO |
|---|---|---|---|
| 0.1421 | 1 | 42 | 1 |
| 0.0285853 | 1 | 15 | 1 |
| 0.03578 | 1 | 6.7 | 1 |
| 0.082839 | 1 | 440 | 1 |
| 0.00404425 | 1 | 23 | 1 |
| 0.0138121 | 1 | 17 | 1 |
| 0.1 | 1 | 34.4 | 1 |
| | | 455 | 1 |
| | | 66.64 | 1 |

## UCL Statistics for Data Sets with Non-Detects

| | |
|---|---|
| User Selected Options | |
| Date/Time of Computation | ProUCL 5.16/14/2017 11:12:48 AM |
| From File | DIAMOND P_IN.xls |
| Full Precision | OFF |
| Confidence Coefficient | 95% |
| Number of Bootstrap Operations | 2000 |

### Total PAH TEQ

**General Statistics**

| | | | |
|---|---|---|---|
| Total Number of Observations | 7 | Number of Distinct Observations | 7 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.00404 | Mean | 0.0582 |
| Maximum | 0.142 | Median | 0.0358 |
| SD | 0.0511 | Std. Error of Mean | 0.0193 |
| Coefficient of Variation | 0.879 | Skewness | 0.693 |

**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1**

**Normal GOF Test**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.915 | **Shapiro Wilk GOF Test** |
| 5% Shapiro Wilk Critical Value | 0.803 | Data appear Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.241 | **Lilliefors GOF Test** |
| 5% Lilliefors Critical Value | 0.304 | Data appear Normal at 5% Significance Level |

**Data appear Normal at 5% Significance Level**

**Assuming Normal Distribution**

| **95% Normal UCL** | | **95% UCLs (Adjusted for Skewness)** | |
|---|---|---|---|
| 95% Student's-t UCL | 0.0957 | 95% Adjusted-CLT UCL (Chen-1995) | 0.0954 |
| | | 95% Modified-t UCL (Johnson-1978) | 0.0966 |

**Gamma GOF Test**

| | | |
|---|---|---|
| A-D Test Statistic | 0.211 | **Anderson-Darling Gamma GOF Test** |
| 5% A-D Critical Value | 0.726 | Detected data appear Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.189 | **Kolmogorov-Smirnov Gamma GOF Test** |
| 5% K-S Critical Value | 0.319 | Detected data appear Gamma Distributed at 5% Significance Level |

**Detected data appear Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

| | | | |
|---|---|---|---|
| k hat (MLE) | 1.134 | k star (bias corrected MLE) | 0.743 |
| Theta hat (MLE) | 0.0513 | Theta star (bias corrected MLE) | 0.0782 |
| nu hat (MLE) | 15.88 | nu star (bias corrected) | 10.41 |
| MLE Mean (bias corrected) | 0.0582 | MLE Sd (bias corrected) | 0.0675 |
| | | Approximate Chi Square Value (0.05) | 4.199 |
| Adjusted Level of Significance | 0.0158 | Adjusted Chi Square Value | 3.095 |

**Assuming Gamma Distribution**

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50)) | 0.144 | 95% Adjusted Gamma UCL (use when n<50) | 0.196 |

**Lognormal GOF Test**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.94 | **Shapiro Wilk Lognormal GOF Test** |
| 5% Shapiro Wilk Critical Value | 0.803 | Data appear Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.182 | **Lilliefors Lognormal GOF Test** |
| 5% Lilliefors Critical Value | 0.304 | Data appear Lognormal at 5% Significance Level |

Data appear Lognormal at 5% Significance Level

**Lognormal Statistics**

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -5.51 | Mean of logged Data | -3.346 |
| Maximum of Logged Data | -1.951 | SD of logged Data | 1.25 |

**Assuming Lognormal Distribution**

| | | | |
|---|---|---|---|
| 95% H-UCL | 0.735 | 90% Chebyshev (MVUE) UCL | 0.158 |
| 95% Chebyshev (MVUE) UCL | 0.2 | 97.5% Chebyshev (MVUE) UCL | 0.258 |
| 99% Chebyshev (MVUE) UCL | 0.372 | | |

**Nonparametric Distribution Free UCL Statistics**

Data appear to follow a Discernible Distribution at 5% Significance Level

**Nonparametric Distribution Free UCLs**

| | | | |
|---|---|---|---|
| 95% CLT UCL | 0.0899 | 95% Jackknife UCL | 0.0957 |
| 95% Standard Bootstrap UCL | 0.0884 | 95% Bootstrap-t UCL | 0.105 |
| 95% Hall's Bootstrap UCL | 0.0893 | 95% Percentile Bootstrap UCL | 0.0913 |
| 95% BCA Bootstrap UCL | 0.0885 | | |
| 90% Chebyshev(Mean, Sd) UCL | 0.116 | 95% Chebyshev(Mean, Sd) UCL | 0.142 |
| 97.5% Chebyshev(Mean, Sd) UCL | 0.179 | 99% Chebyshev(Mean, Sd) UCL | 0.25 |

**Suggested UCL to Use**

| | |
|---|---|
| 95% Student's-t UCL | 0.0957 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

WHO

**General Statistics**

| | | | |
|---|---|---|---|
| Total Number of Observations | 9 | Number of Distinct Observations | 9 |
| | | Number of Missing Observations | 0 |
| Minimum | 8.9 | Mean | 122.4 |
| Maximum | 455 | Median | 34.4 |
| SD | 185.1 | Std. Error of Mean | 61.71 |
| Coefficient of Variation | 1.512 | Skewness | 1.585 |

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

**Normal GOF Test**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.619 | **Shapiro Wilk GOF Test** |
| 5% Shapiro Wilk Critical Value | 0.829 | Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.396 | **Lilliefors GOF Test** |
| 5% Lilliefors Critical Value | 0.274 | Data Not Normal at 5% Significance Level |

Data Not Normal at 5% Significance Level

**Assuming Normal Distribution**

| **95% Normal UCL** | | **95% UCLs (Adjusted for Skewness)** | |
|---|---|---|---|
| 95% Student's-t UCL | 237.2 | 95% Adjusted-CLT UCL (Chen-1995) | 258.8 |
| | | 95% Modified-t UCL (Johnson-1978) | 242.6 |

**Gamma GOF Test**

| | | |
|---|---|---|
| A-D Test Statistic | 0.962 | **Anderson-Darling Gamma GOF Test** |
| 5% A-D Critical Value | 0.76 | Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.278 | **Kolmogorov-Smirnov Gamma GOF Test** |
| 5% K-S Critical Value | 0.292 | Detected data appear Gamma Distributed at 5% Significance Level |

Detected data follow Appr. Gamma Distribution at 5% Significance Level

**Gamma Statistics**

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.633 | k star (bias corrected MLE) | 0.496 |
| Theta hat (MLE) | 193.6 | Theta star (bias corrected MLE) | 247 |
| nu hat (MLE) | 11.39 | nu star (bias corrected) | 8.924 |
| MLE Mean (bias corrected) | 122.4 | MLE Sd (bias corrected) | 173.9 |
| | | Approximate Chi Square Value (0.05) | 3.281 |
| Adjusted Level of Significance | 0.0231 | Adjusted Chi Square Value | 2.602 |

**Assuming Gamma Distribution**

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50) | 333 | 95% Adjusted Gamma UCL (use when n<50) | 419.9 |

**Lognormal GOF Test**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.874 | **Shapiro Wilk Lognormal GOF Test** |
| 5% Shapiro Wilk Critical Value | 0.829 | Data appear Lognormal at 5% Significance Level |
| Lilliefors Test Statistic | 0.195 | **Lilliefors Lognormal GOF Test** |
| 5% Lilliefors Critical Value | 0.274 | Data appear Lognormal at 5% Significance Level |

Data appear Lognormal at 5% Significance Level

**Lognormal Statistics**

| | | | |
|---|---|---|---|
| Minimum of Logged Data | 2.186 | Mean of logged Data | 3.838 |
| Maximum of Logged Data | 6.12 | SD of logged Data | 1.414 |

**Assuming Lognormal Distribution**

| | | | |
|---|---|---|---|
| 95% H-UCL | 1045 | 90% Chebyshev (MVUE) UCL | 260.7 |
| 95% Chebyshev (MVUE) UCL | 330.8 | 97.5% Chebyshev (MVUE) UCL | 428.2 |
| 99% Chebyshev (MVUE) UCL | 619.5 | | |

**Nonparametric Distribution Free UCL Statistics**

Data appear to follow a Discernible Distribution at 5% Significance Level

**Nonparametric Distribution Free UCLs**

| | | | |
|---|---|---|---|
| 95% CLT UCL | 223.9 | 95% Jackknife UCL | 237.2 |
| 95% Standard Bootstrap UCL | 218.9 | 95% Bootstrap-t UCL | 1102 |
| 95% Hall's Bootstrap UCL | 1005 | 95% Percentile Bootstrap UCL | 218.7 |
| 95% BCA Bootstrap UCL | 259.5 | | |
| 90% Chebyshev(Mean, Sd) UCL | 307.6 | 95% Chebyshev(Mean, Sd) UCL | 391.4 |
| 97.5% Chebyshev(Mean, Sd) UCL | 507.8 | 99% Chebyshev(Mean, Sd) UCL | 736.5 |

**Suggested UCL to Use**

| | |
|---|---|
| 95% Adjusted Gamma UCL | 419.9 |

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

| ANALYTE | NUMBER OF SAMPLES | PERCENT DETECTED | SAMPLE MEAN | STANDARD DEVIATION | MINIMUM DETECT | MAXIMUM DETECT | DATA DISTRIBUTION | 95% UCL |
|---|---|---|---|---|---|---|---|---|
| PAH TEQ, Total | 7 | 100% | 0.0582 | 0.0511 | 0.00404 | 0.142 | Normal | 0.0957 |
| WHO | 9 | 100% | 122.4 | 185.1 | 8.9 | 455 | Approximate Gamma | 419.9 |

Note: All values given in units og mg/kg