District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NCS 1735235018
District RP	AP-126
Facility ID	
Application ID	

Release Notification

Reviewed By CS 8/6/19
Email to Operator Attached

Responsible Party

Responsible Party **Hilcorp Energy Company**	OGRID **372171**
Contact Name **Jennifer Deal**	Contact Telephone **505-801-6517**
Contact email **jdeal@hilcorp.com**	Incident **NCS 1735235018** AP-126
Contact mailing address **382 Road 3100 Aztec, NM 87410**	

Location of Release Source

Latitude **36.7536011** Longitude **-108.1002121**
(NAD 83 in decimal degrees to 5 decimal places)

Site Name **Standard #1**	Site Type **Gas Well**
Date Release Discovered **11/28/2017 A 10:15 am**	API# *(if applicable)* **30-045-08718**

Unit Letter	Section	Township	Range	County
J	**04**	**29N**	**12W**	**San Juan**

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) **unknown (historic)**	Volume Recovered (bbls) **0**
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☒ Condensate	Volume Released (bbls) **unknown (historic)**	Volume Recovered (bbls) **0**
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release
Operator discovered historic contamination while digging up the dump line to the tank.

Smith, Cory, EMNRD

From: Smith, Cory, EMNRD
Sent: Tuesday, August 6, 2019 9:21 AM
To: Jennifer Deal
Cc: Ashley Ager; Griswold, Jim, EMNRD; Powell, Brandon, EMNRD; Daniel Burns
Subject: RE: Hilcorp - Standard #1 Delineation

Jennifer,

OCD has reviewed the Q2 Quarterly Report for AP-126 (Standard #1) OCD concurs with LTE assessment and approves the path forward to pilot test in-situ remediation.

Also going forward in the future AP/Part 30 reports no longer have to be submitted on Form C-141 nor though the fee's portal. Please make sure you include all the relevant information on the first page of the Quarterly report directly behind the cover page. Ie (Operator, Ogrid, Incident#, RP/AP #, and some form of certification from the operator (Signature))

The quarterly report will be placed into AP-136 well file for record keeping. If you have any questions please give me a call.

Cory Smith
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

From: Daniel Burns <dburns@ltenv.com>
Sent: Friday, July 26, 2019 6:45 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ashley Ager <aager@ltenv.com>
Subject: [EXT] RE: Hilcorp - Standard #1 Delineation

Cory,

The abatement plan update report with delineation report and C-141 for the Standard #1 have been uploaded to NMOCD online portal.

Thanks,

Danny Burns
Project Geologist
Cell 701-570-4727

From: Daniel Burns
Sent: Monday, June 3, 2019 2:42 PM

To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Eric Carroll (ecarroll@ltenv.com) <ecarroll@ltenv.com>
Subject: Hilcorp - Standard #1 Delineation

Cory,

As we discussed in person last week, we are resuming additional delineation activities at the Standard #1 this week. We will be setting up and preparing to drill 4 additional wells to delineate groundwater. Permits from the NMOSE have been processed and received. We will be onsite starting Tuesday, 6/3/19, at 8 AM, if you plan on coming by. We should be done in 3 days.

Thanks,

Danny Burns
Project Geologist
701.570.4727 *cell*
970.385.1096 *office*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

State of New Mexico
Oil Conservation Division

Incident ID	NCS 1735235018
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Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? **Unknown volume released.**

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Notice given to Cory Smith, Vanessa Fields, and Whitney Thomas on November 28, 2017 at 10:15 am by Jennifer Deal (Hilcorp)

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: **Jennifer Deal** Title: **Environmental Specialist**

Signature: Jennifer Deal Date: 7/26/2019

email: **jdeal@hilcorp.com** Telephone: **505-324-5128**

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	NCS 1735235018
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	20 (ft bgs)
Did this release impact groundwater or surface water?	☒ Yes ☐ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☒ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
☒ Field data
☒ Data table of soil contaminant concentration data
☒ Depth to water determination
☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
☒ Boring or excavation logs
☒ Photographs including date and GIS information
☒ Topographic/Aerial maps
☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	NCS 1735235018
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I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: J**ennifer Deal** Title: **Environmental Specialist**

Signature: _____ Jennifer Deal _____ Date: 7/26/2019

email: **jdeal@hilcorp.com** Telephone: **505-324-5128**

OCD Only

Received by: _____ Date**:** _____

State of New Mexico
Oil Conservation Division

Incident ID	NCS 1735235018
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☐ Extents of contamination must be fully delineated.

☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	NCS 1735235018
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☐ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☐ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date**:** _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date**:** _____

Printed Name: _____ Title: _____

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

July 26, 2019

Mr. Cory Smith
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410

RE: Stage 1 Abatement Plan (AP-126-0) – July 2019 Update and Supplemental Report
Hilcorp Energy Company
Standard #1
API # 30-045-08718
NCS1735235018
San Juan County, New Mexico

Dear Mr. Smith:

LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), presents the following update and supplemental report to the *Stage 1 Abatement Plan* (AP-126-0; Abatement Plan) associated with subsurface hydrocarbon impacts encountered at the Standard #1 natural gas production well (Site) (Figure 1). This report details the activities conducted since approval of the Abatement Plan which received status as "administratively complete" by the New Mexico Oil Conservation Division (NMOCD) on January 22, 2019. This report documents the latest efforts to achieve full lateral and vertical delineation for approval by the NMOCD. Now that delineation is complete, continued monitoring is proposed with a schedule for subsequent submittal of the Stage 2 Abatement Plan per New Mexico Administrative Code (NMAC) 19.15.30.

STAGE 1 ABATEMENT PLAN

On November 30, 2018, LTE, on behalf of Hilcorp, submitted the Abatement Plan to the NMOCD and was approved on January 22, 2019. Public notice was served followed by a 30-day public comment period according to 19.15.30.15 NMAC. The Abatement Plan proposed additional soil boring investigation and quarterly groundwater monitoring. Additional delineation activities were conducted from March 19, 2019 to March 21, 2019 and reported to NMOCD in a letter dated May 13, 2109. The letter report proposed more soil borings and monitoring wells to finalize lateral delineation of the soil and groundwater impact. The report was approved by NMOCD and the results of the final delineation event are reported in the subsequent sections of this report.

Additional Investigation

From June 4, 2019, to June 5, 2019, LTE conducted additional soil and groundwater assessment activities at the Site. A total of four boreholes were advanced in locations approved in the May

13, 2019 letter report ranging from 30 feet to 45 feet below ground surface (bgs). Soil borings were advanced north, east, south and west of the known impacted area to define the lateral extent of previously identified impacted soil and groundwater. The soil borings were logged by an LTE geologist who inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil was characterized by visually inspecting the soil samples and field screening the soil headspace using a photo-ionization detector (PID) to monitor for the presence of volatile organic vapors (VOCs). Groundwater monitoring wells were constructed in each borehole by installing screened casing across the groundwater interface and solid casing to surface. Monitoring wells were constructed out of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to two feet above the screened interval, then two feet of hydrated bentonite seal, and then bentonite-cement slurry grout to ground surface. The wells were completed aboveground with a locking, steel protective casing cemented into the ground.

After construction, LTE surveyed the new groundwater monitoring wells with a Trimble® GeoExplorer® 3000 series Global Positioning System (GPS) to determine the latitude and longitude. Top-of-casing elevations were surveyed using a Dewalt® DW074 Rotary Laser Level to an accuracy of no less than plus or minus (±) 0.01 feet so that groundwater flow direction and gradient could be determined relative to mean seal level. Once the top of well casing was surveyed, the depth to groundwater or phase separated hydrocarbon (PSH) below top of casing was measured with an oil/water interface probe. The wells were developed by purging a minimum of ten casing volumes, or until the well was purged dry. Four additional monitoring wells were installed in an effort to fully delineate impacted soil and groundwater. Newly installed monitoring well locations are depicted on Figure 2. Soil boring logs and monitoring well construction diagrams are included as Attachment 1.

Soil Sampling

Two soil samples from each soil boring were submitted for laboratory analysis: the most impacted sample based on field screening techniques and the terminus of the boring above the field identified groundwater table. Each sample was analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (US EPA) Method 8021 and total petroleum hydrocarbons (TPH) – gasoline range organics (GRO), diesel range organics (DRO), and motor-oil range organics (MRO) via US EPA Method 8015.

Concentrations of benzene, BTEX, and TPH were all below laboratory reporting limits. No samples exceeded the NMOCD remediation action levels for benzene of five milligrams per kilogram (mg/kg), total BTEX of 50 mg/kg, or TPH of 100 mg/kg. The soil analytical results from existing and newly advanced soil borings are summarized and compared to the NMOCD remediation action levels in Figure 3 and Table 1. The laboratory analytical reports for the newly collected soil samples are included as Attachment 3.

Groundwater Monitoring

As required in the Abatement Plan, LTE conducted quarterly groundwater monitoring on all monitoring wells (newly installed and existing) in June 2019. Static groundwater level monitoring included measuring depth to groundwater and/or depth to PSH in all 26 monitoring wells with an oil/water interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with deionized water prior to each measurement.

Monitoring wells MW01, MW02, MW06, MW10, and MW14 contained measurable PSH. When PSH was measured in a monitoring well, a correction factor of 0.8 was applied to the elevation to account for the depression of the water column caused by the weight of the overlying PSH. Groundwater elevations and PSH thickness are summarized in Table 2 and depicted on Figure 4.

PSH removal was completed using a dedicated bailer and total volume removed was recorded. All PSH was disposed of in the onsite pit tank. Approximately 0.75 gallons of PSH was removed from five different monitoring wells during the June 2019 groundwater sampling event. A total of 3.15 gallons of PSH have been removed since remediation and site investigation activities began. MW01 generally has the greatest PSH thickness and, therefore, PSH recovery, which is nearly double the volume recovered from the other wells. The occurrence of PSH is greatest near the original release location but is present as far northeast as MW14. PSH thickness measurements are summarized in Table 2 and displayed on Figure 4.

Presence of groundwater is highly variable, and no continuous groundwater aquifer can be observed or defined. Ten monitoring wells are dry and have never contained groundwater or do not have an adequate volume of groundwater to collect a sample for submission of laboratory analysis. No saturated sediments were observed during soil boring advancement. It is difficult to interpret groundwater flow direction, as dry wells often exist between wells containing groundwater, and when water is present, it can exhibit large differences in elevation. Lithologic controls are not evident in the existing borehole/lithologic data. Interpretive geologic cross sections along the groundwater gradient (A to A') and cross-gradient (B to B') are shown in Figure 2 and included as Attachment 2. MW03 and MW15 are likely influenced by the presence of the open excavation.

The cross sections detail the heterogeneous geology throughout the Nacimiento Formation which the Site is located upon. The regional and local geology and hydrology were previously described in the *Stage 1 Abatement Plan*. As seen during the delineation events and in the open excavation, the majority of the location consists of coarse-grained dominated lithologies overlying a thinner layer of finer-grained sediments. There is no observable groundwater bearing strata with true aquifer properties, so the groundwater distribution at the Site varies. Any groundwater encountered at the Site has likely migrated from the surface from precipitation

events over time through preferential pathways and accumulated on the less porous, finer-grained sediments until they are partially saturated.

On June 18 and 28, 2019, groundwater samples were collected and submitted for analysis of BTEX from eleven monitoring wells (MW05, MW08, MW11, MW12, MW15, MW16, MW18, MW19, MW22, MW23 and MW26) that had adequate volume of groundwater for sampling and did not contain PSH. Groundwater samples were submitted under strict chain-of-custody protocol to Hall Environmental Analysis Laboratory (Hall) in Albuquerque, New Mexico, for analysis of BTEX by US EPA Method 8021B. Due to the variability of groundwater presence and recharge rates, LTE used new disposable polyethylene bailers on each well to collect grab samples before the wells purged dry or once stabilization parameters were met. LTE used a YSI 556 hand-held multi-probe water quality field meter to record pH, electric conductivity (EC), and temperature of the groundwater. Stabilization was defined as three consecutive stable readings for each water property (plus or minus (±) 0.4 units for pH, ±10 percent for EC, and ±2 degrees Celsius (°C) for temperature. There was a measurable depth to water in monitoring wells MW03, MW20 and MW25, but an insufficient volume within the water column to collect a groundwater sample for submission of laboratory analysis. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each use to prevent cross-contamination.

Laboratory analytical results of groundwater samples indicated benzene concentrations exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard in MW05, MW12, MW15, MW16, MW18, and MW19 with concentrations ranging from 0.81 milligrams per liter (mg/L) in MW12 to 24mg/L in MW15. Toluene concentrations exceeded the NMWQCC standard in MW15 and MW18 with concentrations of 28 mg/L and 18 mg/L, respectively. Ethylbenzene concentrations exceeded the NMWQCC standard in MW12, MW15, MW18, and MW19, with concentrations ranging from 0.77 mg/L in MW18 to 1.1 mg/L in MW15. Total xylenes concentrations exceeded the NMWQCC standard in MW05, MW15, MW16, MW18 and MW19 ranging from 1.5 mg/L in MW12 to 11 mg/L in MW03. The groundwater analytical results as compared to the NMWQCC standards are presented on Figure 5 and summarized in Table 3. The laboratory analytical reports are included in Attachment 3.

QUALITY ASSURANCE

Sampling and analytical techniques have been identified in the text above and conform with the references identified in Subsection B of 20.6.2.3107 NMAC and with 20.6.4.14 NMAC of the water quality standards for interstate and intrastate surface waters in New Mexico.

CONCLUSIONS

With the installation of the new boreholes and monitoring wells, soil and groundwater are delineated vertically and laterally by borings from which soil and groundwater samples contain concentrations of constituents of concern below the applicable remediation action levels or by soil borings from which soil samples contain concentrations of constituents of concern below applicable remediation action levels and no groundwater. Results from previous delineation activities have been included in Table 1 and Figure 3 detailing the lateral and vertical extents of identified hydrocarbon impacts to soil. The volume of TPH impacted soil above NMOCD remediation standards is estimated to be between 25,000 cubic yards and 30,000 cubic yards, depending on thickness of impact in the subsurface. Groundwater delineation activities and quarterly sampling results are included in Table 3. The most recent groundwater sampling results are depicted on Figure 5. The inferred lateral extent of benzene impacts to groundwater is estimated to be an area approximately 66,700 square feet.

It appears groundwater is discontinuous, with isolated pockets or channels forming preferential pathways for any liquid migration that are difficult to identify or predict. Alternatively, the monitoring wells may be serving as sumps, collecting water over time that percolates into the wells from variable depths. Impact consists of a central area of soil impact, mostly restricted to depth intervals ranging from 15 feet bgs to 25 feet bgs, with impacts closer to the source extending to 35 feet bgs. Presence of PSH and/or groundwater containing dissolved phase impact occurs in isolated pockets that are extensive, but discontinuous. Impacts likely occurred, not from plume migration via continuously flowing groundwater, but from a long-term historical release that followed preferential pathways in the subsurface, mostly likely through the coarse grained (cobbles within sandy and silty matrix) lithology before perching above and within the finer grained (clay and silt) sediments.

PROPOSED GROUNDWATER MONITORING

LTE will continue quarterly groundwater monitoring of all existing wells that have adequate volume in the water column to collect a sample. Fluid-level measurements will be monitored in all wells using an oil/water interface probe. Based on fluid-level measurements, wells containing sufficient groundwater will be purged and sampled. Each well will be purged of three well casing volumes or until the well is purged dry. Groundwater samples will be collected from each monitoring and submitted for laboratory analysis of BTEX by USEPA 8021B. Wells with measurable PSH will not be sampled and PSH recovery will be conducted with the volume of recovered PSH recorded.

PROPOSED IN-SITU REMEDIATION PILOT TESTING

Based on the lateral extent of the impacts to the subsurface and the lithology encountered during delineation activities, LTE proposes an in-situ remediation pilot test using existing monitoring

wells. Due to the large cobbles and boulders encountered in the limited excavation trench and delineation activities, mechanical remediation via excavation would prove to be difficult, cost prohibitive, and would require hundreds of heavy truck loads of material passing through the nearby residential areas. The limited and variable groundwater at the Site is discontinuous which prevents the impacts to groundwater from migrating further.

The pilot test results will be used to determine if in-situ remediation technologies such as soil vapor extraction, air sparge, groundwater recovery and treatment, or any combination thereof are viable means of treating existing impacts to the subsurface. If pilot test results are conducive to in-situ remediation, additional remediation design testing and remediation well installation may be required.

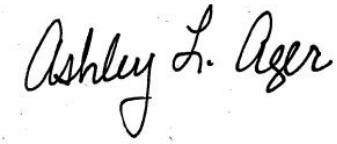
PROPOSED SCHEDULE

Quarterly groundwater sampling will resume in September 2019. The in-situ remediation pilot test will occur in August 2019. The results from the September 2019 groundwater sampling event and the pilot test will be summarized and submitted to the NMOCD as part of the Stage 2 Abatement Plan for approval from the NMOCD. The Stage 2 Abatement Plan will be submitted no later than September 30, 2019.

LTE appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this update to the Stage 1 Abatement Plan, do not hesitate to contact me at (970) 385-1096 or via email at dburns@ltenv.com or Jennifer Deal at (505) 324-5128 or at jdeal@hilcorp.com.

Sincerely,

LT ENVIRONMENTAL, INC.



Danny Burns
Project Geologist

Ashley Ager, P.G.
Senior Geologist

cc: Jennifer Deal, Hilcorp Energy Company

Attachments:

Figure 1 – Site Location Map
Figure 2 – Monitoring Well Locations
Figure 3 – Soil Analytical Results
Figure 4 – June 2019 Groundwater Potentiometric and PSH Thickness Map
Figure 5 – June 2019 Groundwater Analytical Results
Table 1 – Soil Analytical Results
Table 2 – Groundwater Elevations
Table 3 – Groundwater Analytical Results
Attachment 1 – Soil Boring Logs
Attachment 2 – Cross Sections
Attachment 3 – Laboratory Analytical Reports

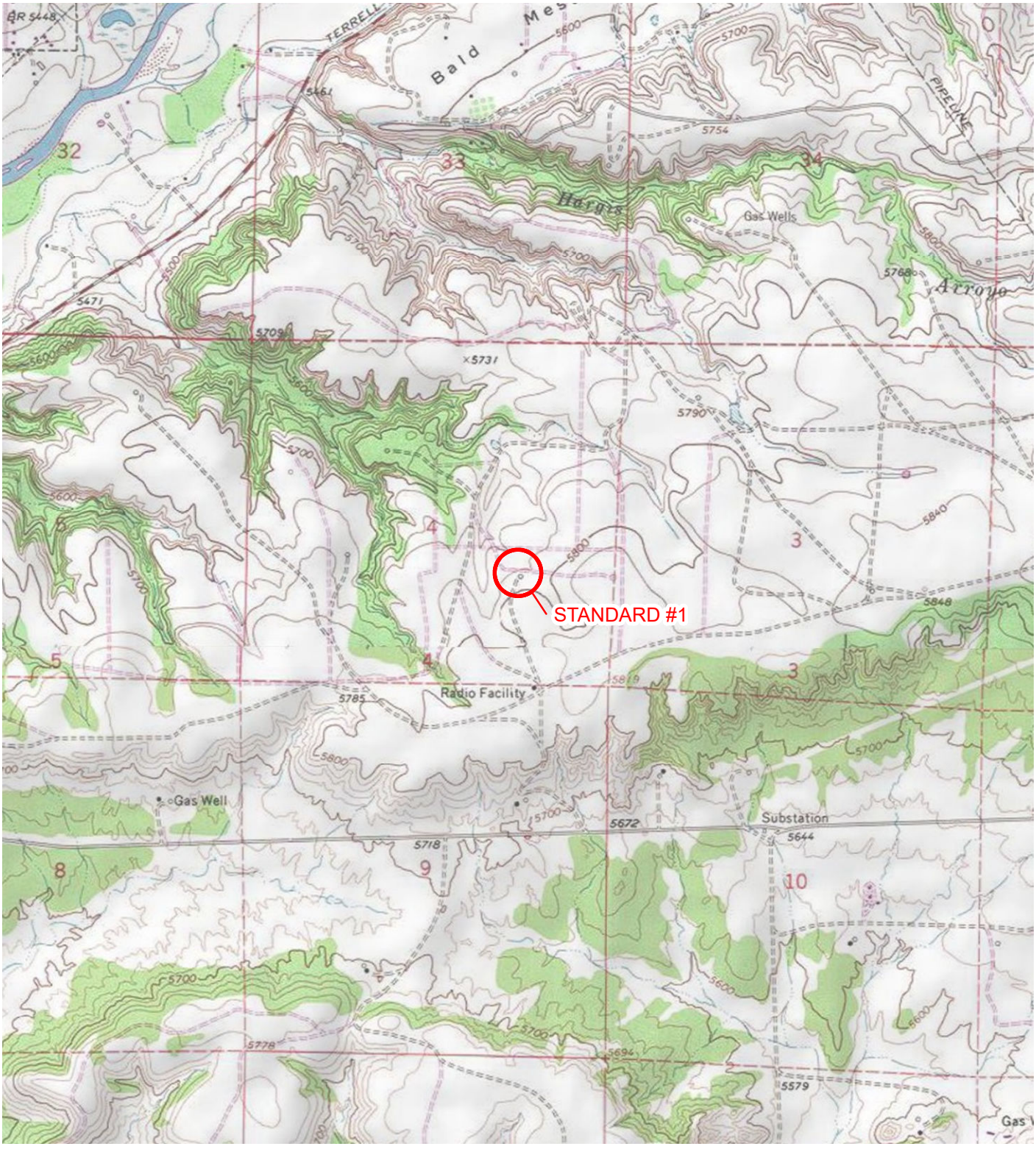


IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

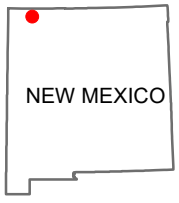


FIGURE 1
SITE LOCATION MAP
STANDARD #1
N 1/2 SE 1/4 SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG01_SL.mxd

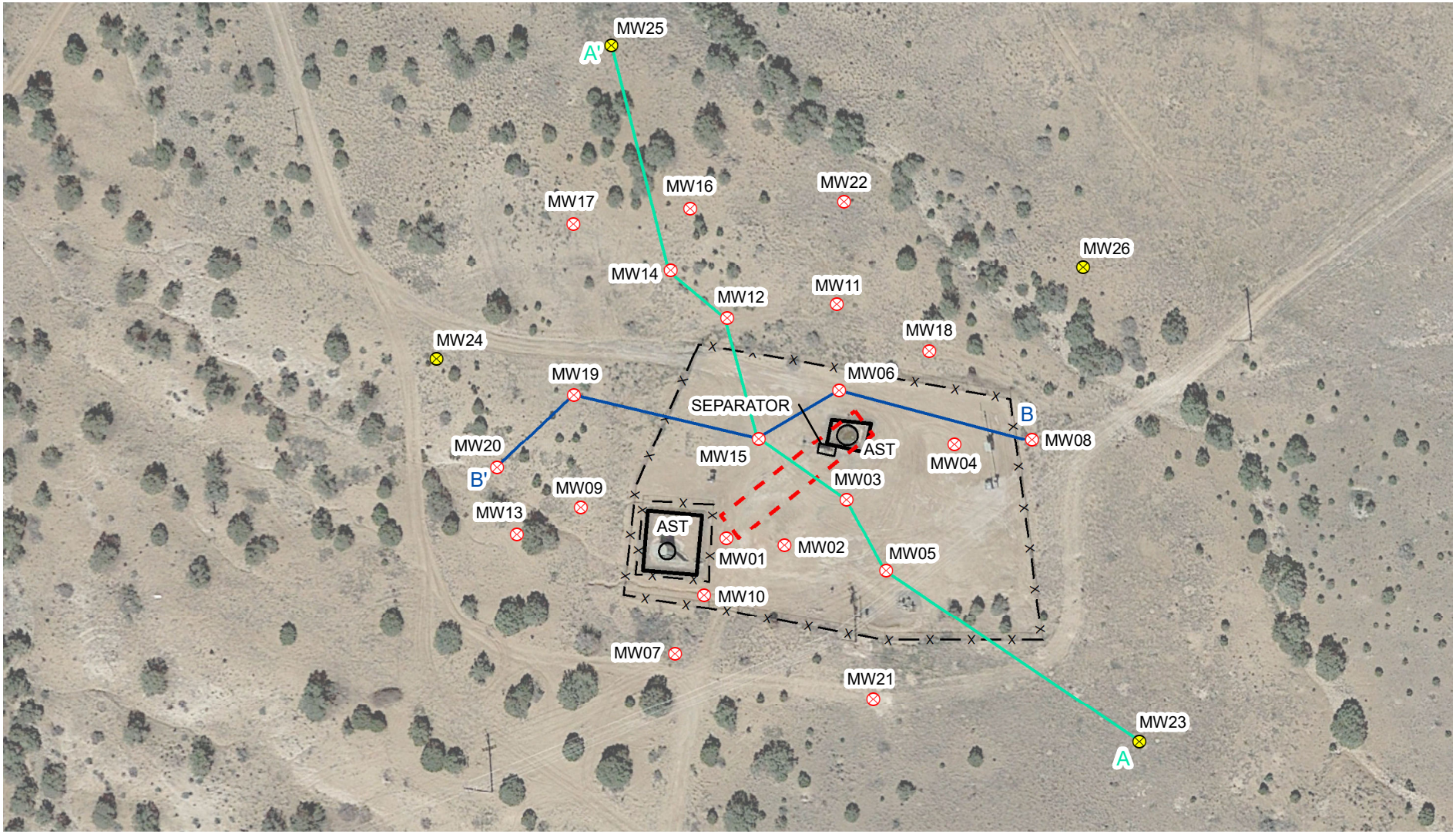


IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- NEWLY INSTALLED MONITORING WELLS
- EXISTING INSTALLED MONITORING WELL
- CROSS SECTION LINE A TO A'
- CROSS SECTION LINE B TO B'
- FENCE
- REMEDIATION EXCAVATION EXTENT
- BERM

AST: ABOVEGROUND STORAGE TANK

0 100 200
Feet

N

FIGURE 2
MONITORING WELL LOCATIONS
STANDARD #1
N 1/2 SE 1/4 SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG02_MW LOC_2019.mxd

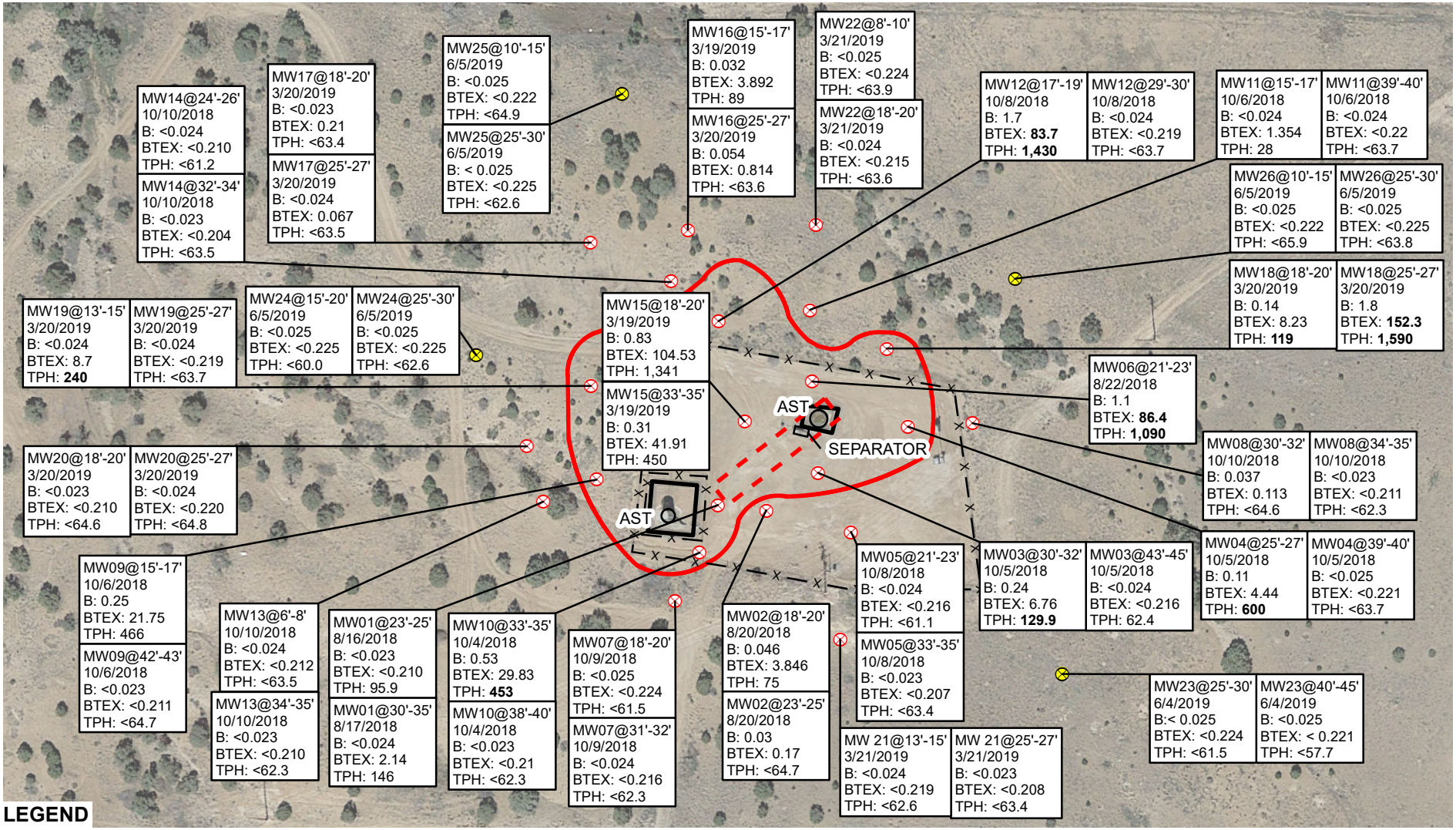


IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- NEWLY INSTALLED MONITORING WELLS
- EXISTING INSTALLED MONITORING WELL
- x — x FENCE
- EXCAVATION EXTENT
- TPH IMAPACTS TO SOIL
- BERM

AST: ABOVEGROUND STORAGE TANK

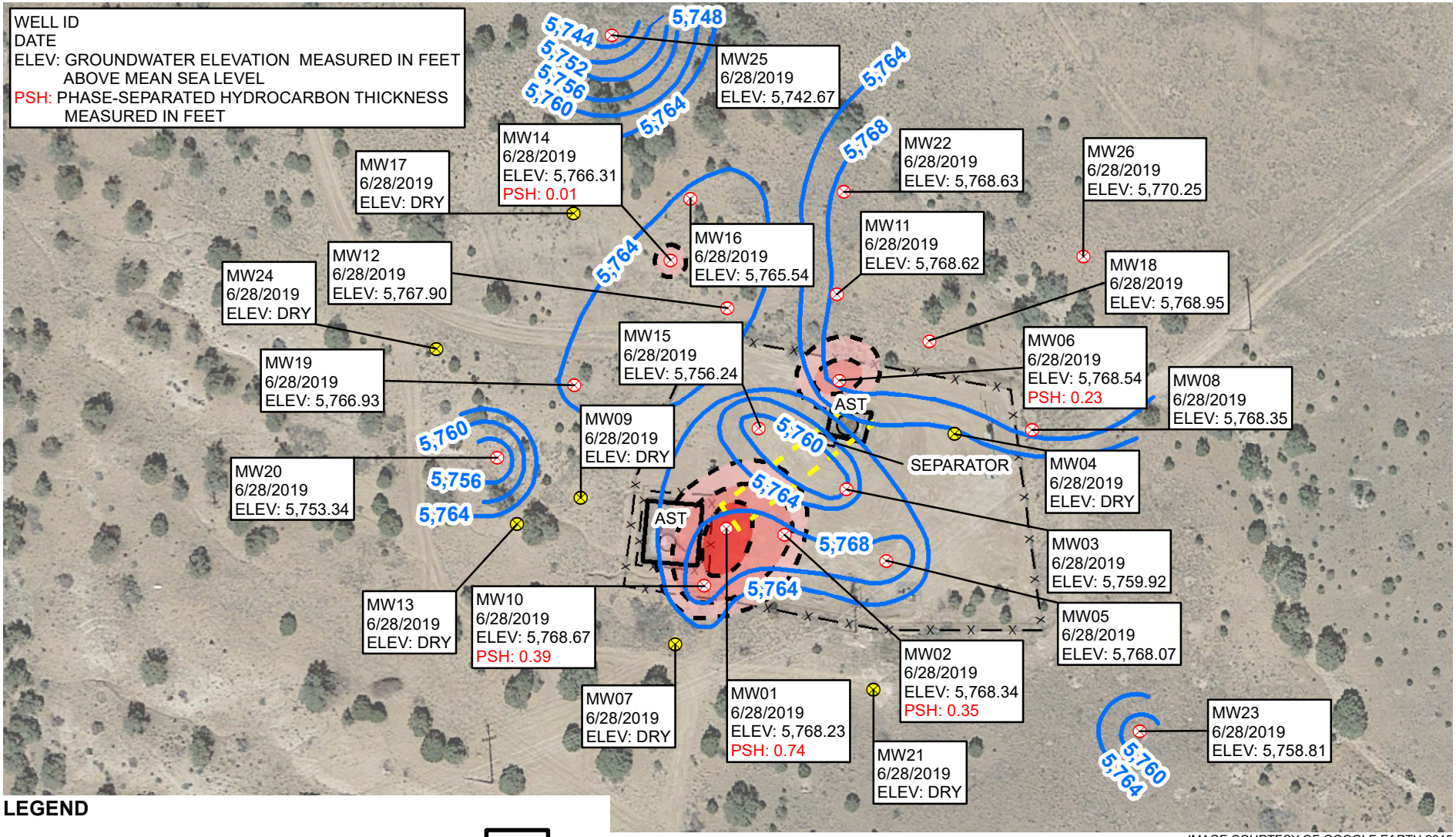
SAMPLE ID@DEPTH BELOW GROUND SURFACE (FT)
SAMPLE DATE
B: BENZENE (NMOCD = 10 mg/kg)
T: TOLUENE
E: ETHYLBENZENE
X: TOTAL XYLENES
BTEX: TOTAL BTEX (NMOCD = 50 mg/kg)
TPH: TOTAL PETROLEUM HYDROCARBONS (NMOCD = 100 mg/kg)
mg/kg: MILLIGRAMS PER KILOGRAM
BOLD: INDICATES RESULT EXCEEDS THE APPLICABLE STANDARD
<: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT
NMOCD: NEW MEXICO OIL CONSERVATION DIVISION REMEDIATION ACTION LEVEL

0 120 240
Feet

N

FIGURE 3
SOIL ANALYTICAL RESULTS
STANDARD #1
N 1/2 SE 1/4 SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG03_SOIL_ANALY_JUNE_2019.mxd



LEGEND

- DRY MONITORING WELL
- INSTALLED MONITORING WELL
- INFERRED GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 4.0 FEET
- x — x FENCE
- REMEDIATION EXCAVATION EXTENT
- BERM
- AST: ABOVEGROUND STORAGE TANK
- PRODUCT THICKNESS ISO-CONTOUR JUNE 2019

INFERRED PRODUCT THICKNESS

- 0.01 - 0.2 FEET
- 0.2 - 0.4 FEET
- 0.4 - 0.8 FEET

IMAGE COURTESY OF GOOGLE EARTH 2015

0 100 200 Feet

N

FIGURE 4
JUNE 2019 GROUNDWATER POTENTIOMETRIC AND PSH THICKNESS MAP
STANDARD #1
N 1/2 SE 1/4 SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG04_POTENTIOMETRIC_PSH_JUNE_2019.mxd

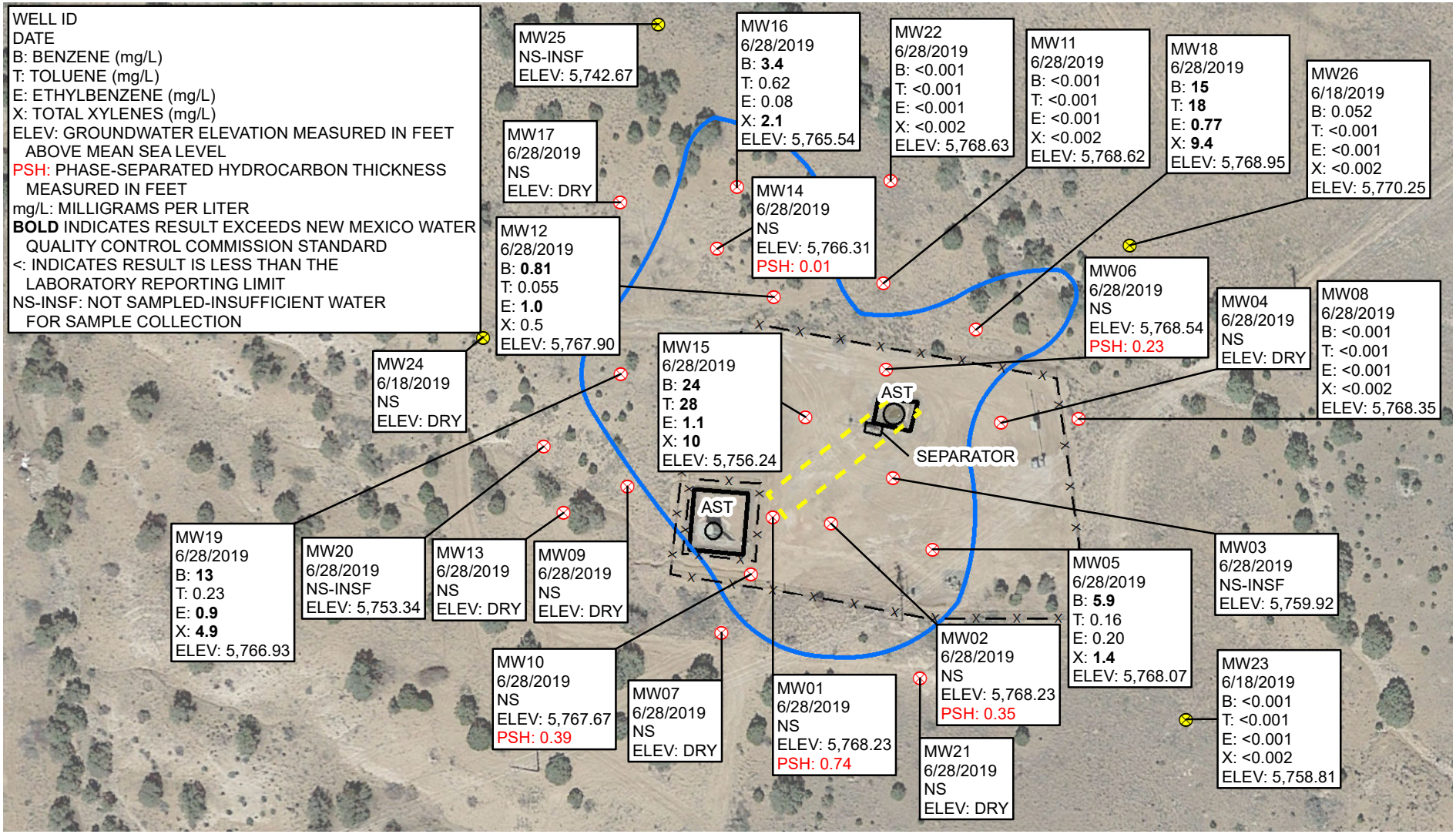


IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- EXISTING INSTALLED MONITORING WELL
- NEWLY INSTALLED MONITORING WELLS
- x — x FENCE
- REMEDIATION EXCAVATION EXTENT
- INFERRED BENZENE IMPACTS
- BERM
- AST: ABOVEGROUND STORAGE TANK

0 100 200
Feet

N

FIGURE 5
JUNE 2019 GROUNDWATER ANALYTICAL RESULTS
STANDARD #1
N 1/2 SE 1/4 SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG05_GWA_GWE_JUNE_2019_1.mxd

TABLE 1
SOIL ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW01 @ 23' - 25'	8/16/2018	111	<0.023	<0.047	<0.047	<0.093	<0.210	9.9	16	70	95.9
MW01 @ 30' - 35'	8/17/2018	67.3	<0.024	0.20	0.14	1.8	2.14	46	26	74	**146**
MW02 @ 18' - 20'	8/20/2018	1,809	0.046	0.64	0.26	2.9	3.85	38	37	<49	75
MW02 @ 23' - 25'	8/20/2018	11.0	0.030	0.14	<0.047	<0.094	0.17	<4.7	<10	<50	<64.7
MW03 @ 30' - 32'	10/5/2018	24.79	0.24	1.7	0.42	4.4	6.76	120	9.9	<49	**129.9**
MW03 @ 43' - 45'	10/5/2018	11.8	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.6	<48	62.4
MW04 @ 25' - 27'	10/5/2018	2,014	0.11	0.82	0.31	3.2	4.44	150	330	120	**600**
MW04 @ 39' - 40'	10/5/2018	51.4	<0.025	<0.049	<0.049	<0.098	<0.221	<4.9	<9.8	<49	<63.7
MW05 @ 21' - 23'	10/8/2018	496.7	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.3	<47	<61.1
MW05 @ 33' - 35'	10/8/2018	19.2	<0.023	<0.046	<0.046	<0.092	<0.207	<4.6	<9.8	<49	<63.4
MW06 @ 21' - 23'	8/22/2018	233	1.1	25	5.3	55	**86.4**	950	140	<49	**1,090**
MW07 @ 18' - 20'	10/9/2018	18.6	<0.025	<0.050	<0.050	<0.099	<0.224	<5.0	<9.5	<47	<61.5
MW07 @ 31' - 32'	10/9/2018	4.2	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.5	<48	<62.3
MW08 @ 30' - 32'	10/10/2018	11.5	0.037	0.076	<0.047	<0.095	0.113	<4.7	<9.9	<50	<64.6
MW08 @ 34' - 35'	10/10/2018	10.6	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.6	<48	<62.3
MW09 @ 15' - 17'	10/6/2018	1,821	0.25	3.0	1.5	17	21.75	430	36	<46	**466**
MW09 @ 42' - 43'	10/6/2018	5.6	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<10	<50	<64.7
MW10 @ 33' - 35'	10/4/2018	2,615	0.53	8.2	2.1	19	29.83	360	93	<48	**453**
MW10 @ 38' - 40'	10/4/2018	6.5	<0.023	<0.047	<0.047	<0.093	<0.21	<4.7	<9.6	<48	<62.3
MW11 @ 15' - 17'	10/6/2018	32.8	<0.024	0.060	0.094	1.2	1.354	28	<9.5	<47	28
MW11 @ 39' - 40'	10/6/2018	8	<0.024	<0.049	<0.049	<0.098	<0.22	<4.9	<9.8	<49	<63.7
MW12 @ 17' - 19'	10/8/2018	28.9	1.7	19	6.0	57	**83.7**	1,300	130	<46	**1,430**
MW12 @ 29' - 30'	10/8/2018	10	<0.024	<0.049	<0.049	<0.097	<0.219	<4.9	<9.8	<49	<63.7

TABLE 1
SOIL ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW13 @ 6' - 8'	10/10/2018	10	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.8	<49	<63.5
MW13 @ 34' - 35'	10/10/2018	3	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.6	<48	<62.3
MW14 @ 24' - 26'	10/10/2018	18.8	<0.024	<0.047	<0.047	<0.095	<0.210	<4.7	<9.5	<47	<61.2
MW14 @ 32' - 34'	10/10/2018	2.3	<0.023	<0.046	<0.046	<0.092	<0.204	<4.6	<9.9	<49	<63.5
MW15 @ 18' - 20'	3/19/2019	1,569	0.83	23	6.7	74	**104.53**	800	231	310	**1,341**
MW15 @ 33' - 35'	3/19/2019	129.7	0.31	8.9	2.7	30	41.91	350	100	<47	**450**
MW16 @15' - 17'	3/19/2019	1,417	0.032	0.28	0.28	3.3	3.892	55	34	<50	89
MW16 @ 25' - 27'	3/20/2019	4.6	0.054	0.38	<0.048	0.38	0.814	<4.8	<9.8	<49	<63.6
MW17 @ 18' - 20'	3/20/2019	12.8	<0.023	0.11	<0.046	0.10	0.210	<4.6	<9.8	<49	<63.4
MW17 @ 25' - 27'	3/20/2019	11.5	<0.024	0.067	<0.048	<0.097	0.067	<4.8	<9.7	<49	<63.5
MW18 @ 18' - 20'	3/20/2019	2,642	0.14	1.9	0.19	6.0	8.23	48	71	<48	**119**
MW18 @ 25' - 27'	3/20/2019	2,222	1.8	41	9.5	100	152.30	1,400	190	<48	**1,590**
MW19 @ 13' - 15'	3/20/2019	2,580	<0.024	1.3	0.7	6.7	8.7	220	20	<49	**240**
MW19 @ 25' - 27'	3/20/2019	11.3	<0.024	<0.049	<0.049	<0.097	<0.219	<4.9	<9.8	<49	<63.7
MW20 @ 18' - 20'	3/20/2019	26.3	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.9	<50	<64.6
MW20 @ 25' - 27'	3/20/2019	26.0	<0.024	<0.049	<0.049	<0.098	<0.220	<4.9	<9.9	<50	<64.8
MW21 @ 13' - 15'	3/21/2019	2.6	<0.024	<0.049	<0.049	<0.097	<0.219	<4.9	<9.7	<48	<62.6
MW21 @ 25' - 27'	3/21/2019	2.3	<0.023	<0.046	<0.046	<0.093	<0.208	<4.6	<9.8	<49	<63.4
MW22 @ 8' - 10'	3/21/2019	0.6	<0.025	<0.050	<0.050	<0.099	<0.224	<5.0	<9.9	<49	<63.9
MW22 @ 18' - 20'	3/21/2019	0.3	<0.024	<0.048	<0.048	<0.095	<0.215	<4.8	<9.8	<49	<63.6
MW23 @ 25'-30'	6/4/2019	11.4	<0.025	<0.050	<0.050	<0.099	<0.224	<5.0	<9.5	<47	<61.5
MW23 @ 40'-45'	6/4/2019	3.4	<0.025	<0.049	<0.049	<0.098	<0.221	<4.9	<8.8	<44	<57.7
MW24 @ 15'-20'	6/5/2019	19.1	<0.025	<0.050	<0.050	<0.10	<0.225	<4.9	<9.1	<46	<60

TABLE 1
SOIL ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW24 @ 25'-30'	6/5/2019	5.8	<0.025	<0.050	<0.050	<0.10	<0.225	<5.0	<9.6	<48	<62.6
MW25 @ 10'-15'	6/5/2019	10.1	<0.025	<0.049	<0.049	<0.099	<0.222	<4.9	<10	<50	<64.9
MW25 @ 25'-30'	6/5/2019	3.1	<0.025	<0.050	<0.050	<0.10	<0.225	<5.0	<9.6	<48	<62.6
MW26 @ 10'-15'	6/5/2019	10.4	<0.025	<0.049	<0.049	<0.099	<0.222	<4.9	<10	<51	<65.9
MW26 @ 25'-30'	6/5/2019	1.7	<0.025	<0.050	<0.050	<0.10	<0.225	<5.0	<9.8	<49	<63.8
NMOCD Remediation Action Level			**10**	NE	NE	NE	**50**	NE	NE	NE	**100**

NOTES:

BTEX - benzene, toluene, ethylbenzene, and total xylenes analyzed by US EPA Method 8021B

DRO - diesel range organics analyzed by US EPA Method 8015D

GRO - gasoline range organics analyzed by US EPA Method 8015D

mg/kg - milligrams per kilogram

MRO - motor oil range organics analyzed by US EPA method 8015D

NA - not applicable

NE - not established

NMOCD - New Mexico Oil Conservation Division

PID - photo-ionization detector

ppm - parts per million

Table 1 - Closure Criteria for Soils Impacted by a Release per 19.15.19 August 2018

TPH - total petroleum hydrocarbons (sum of GRO, DRO, and MRO)

< - indicates result is less than the stated laboratory reporting limit

Bold - indicates value exceeds stated NMOCD standard

TABLE 2
GROUNDWATER ELEVATION SUMMARY

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well Name	Date	Top of Casing Elevation (feet)	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet)
MW01	10/17/2018	5,789.08	20.85	21.00	0.15	5,768.20
	10/22/2018		20.80	20.97	0.17	5,768.25
	3/29/2019		20.69	21.35	0.66	5,768.26
	6/28/2019		20.70	21.44	0.74	5,768.23
MW02	10/17/2018	5,789.36	--	21.22	--	5,768.14
	10/22/2018		--	21.12	--	5,768.24
	3/29/2019		20.85	21.11	0.26	5,768.46
	6/28/2019		20.95	21.30	0.35	5,768.34
MW03	10/17/2018	5,792.06	--	32.52	--	5,759.54
	10/22/2018		--	DRY	--	DRY
	3/29/2019		--	30.90	--	5,761.16
	6/28/2019		--	32.14	--	5,759.92
MW04	10/17/2018	5,792.35	--	31.84	--	5,760.51
	10/22/2018		--	31.80	--	5,760.55
	3/29/2019		--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW05	10/17/2018	5,792.60	--	28.54	--	5,764.06
	10/22/2018		--	28.39	--	5,764.21
	3/29/2019		--	24.65	--	5,767.95
	6/28/2019		--	24.53	--	5,768.07
MW06	10/17/2018	5,792.31	24.60	24.93	0.33	5,767.64
	10/22/2018		24.08	24.48	0.40	5,768.15
	3/29/2019		23.55	24.00	0.45	5,768.67
	6/28/2019		23.72	23.95	0.23	5,768.54
MW07	10/17/2018	5,791.15	--	DRY	--	DRY
	10/22/2018		--	DRY	--	DRY
	3/29/2019		--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW08	10/17/2018	5,792.42	--	DRY	--	DRY
	10/22/2018		--	DRY	--	DRY
	3/29/2019		--	DRY	--	DRY
	6/28/2019		--	24.07	--	5,768.35

TABLE 2
GROUNDWATER ELEVATION SUMMARY

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well Name	Date	Top of Casing Elevation (feet)	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet)
MW09	10/17/2018	5,786.16	--	DRY	--	DRY
	10/22/2018		--	DRY	--	DRY
	3/29/2019		--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW10	10/17/2018	5,789.30	--	DRY	--	DRY
	10/22/2018		--	32.26	--	5,757.04
	3/29/2019		21.73	22.04	0.31	5,767.51
	6/28/2019		21.55	21.94	0.39	5,767.67
MW11	10/17/2018	5,787.99	--	20.00	--	5,767.99
	10/22/2018		--	19.89	--	5,768.10
	3/29/2019		--	19.63	--	5,768.36
	6/28/2019		--	19.37	--	5,768.62
MW12	10/17/2018	5,789.57	--	21.90	--	5,767.67
	10/22/2018		--	21.77	--	5,767.80
	3/29/2019		--	21.88	--	5,767.69
	6/28/2019		--	21.67	--	5,767.90
MW13	10/17/2018	5,785.16	--	DRY	--	DRY
	10/22/2018		--	DRY	--	DRY
	3/29/2019		--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW14	10/17/2018	5,785.46	--	DRY	--	DRY
	10/22/2018		--	22.87	--	5,762.59
	3/29/2019		20.26	20.47	0.21	5,765.16
	6/28/2019		19.15	19.16	0.01	5,766.31
MW15	3/29/2019	5,792.19	--	DRY	--	DRY
	6/28/2019		--	35.95	--	5,756.24
MW16	3/29/2019	5,786.54	--	28.59	--	5,757.95
	6/28/2019		--	21.00	--	5,765.54
MW17	3/29/2019	5,785.25	--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW18	3/29/2019	5,789.34	--	DRY	--	DRY
	6/28/2019		--	20.39	--	5,768.95

TABLE 2
GROUNDWATER ELEVATION SUMMARY

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well Name	Date	Top of Casing Elevation (feet)	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet)
MW19	3/29/2019	5,786.48	--	19.60	--	5,766.88
	6/28/2019		--	19.55	--	5,766.93
MW20	3/29/2019	5,783.34	--	29.61	--	5,753.73
	6/28/2019		--	30.00	--	5,753.34
MW21	3/29/2019	5,800.30	--	DRY	--	DRY
	6/28/2019		--	DRY	--	DRY
MW22	3/29/2019	5,786.25	--	22.56	--	5,763.69
	6/28/2019		--	17.62	--	5,768.63
MW23	6/28/2019	5,804.80	--	45.99	--	5,758.81
MW24	6/28/2019	5,782.50	--	DRY	--	DRY
MW25	6/28/2019	5,775.65	--	32.98	--	5,742.67
MW26	6/28/2019	5,789.96	--	19.71	--	5,770.25

Notes:

BTOC - below top of casing

NA- not assessed

A product density factor of 0.8 was used to account for the presence of free product.

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Monitoring Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
MW02	10/22/2018	**14**	**7.1**	**1.2**	**12**
MW03	3/29/2019	**21**	0.110	0.270	**11**
MW05	3/29/2019	**10**	**0.880**	0.450	**2.9**
	6/28/2019	**5.9**	0.160	0.200	**1.4**
MW08	6/28/2019	<0.001	<0.001	<0.001	<0.002
MW10	10/22/2018	**22**	**21**	**1.6**	**13**
MW11	10/22/2018	<0.001	<0.001	<0.001	<0.0015
	3/29/2019	0.0036	<0.001	<0.001	<0.0015
	6/28/2019	<0.001	<0.001	<0.001	<0.0015
MW12	10/22/2018	**2.4**	**3.8**	**1.1**	**5.0**
	3/29/2019	**0.870**	0.018	**1.2**	**1.5**
	6/28/2019	**0.810**	0.055	**1.0**	0.5
MW14	10/22/2018	**13**	**26**	**1.1**	**10**
MW15	6/28/2019	**24**	**28**	**1.1**	**10**
MW16	3/29/2019	**7.7**	**14**	**0.940**	**8.6**
	6/28/2019	**3.4**	0.620	0.080	**2.1**
MW18	6/28/2019	**15**	**18**	**0.770**	**9.4**
MW19	3/29/2019	**14**	**10**	**0.930**	**6.2**
	6/28/2019	**13**	0.230	**0.900**	**4.9**
MW20	3/29/2019	**1.0**	**0.900**	0.030	0.230
MW22	3/29/2019	0.001	0.002	<0.001	0.002
	6/28/2019	<0.001	<0.001	<0.001	<0.002
MW23	6/18/2019	<0.001	<0.001	<0.001	<0.002
MW26	6/18/2019	0.0052	<0.001	<0.001	<0.002
NMWQCC Standard		**0.01**	**0.750**	**0.750**	**0.620**

NOTES: mg/L - milligrams per liter

NMWQCC - New Mexico Water Quality Control Commission

< - indicates result is less than the stated laboratory reporting limit

Bold - indicates value exceeds stated NMWQCC standard

ATTACHMENT 1: SOIL BORING LOGS

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-23	Project: Standard #1
Date: 4/6/2019	Project Number: 017817006
Logged By: Eric Carroll	Drilled By: Cascade
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand ~~(15' - 27')~~	Seal: Bentonite Chips ~~(14' - 15')~~
Grout: Bentonite Slurry ~~(0' - 14')~~	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 35'
Hole Diameter: 6"	Depth to Liquid: ~~3~~ N/A
Screen Type: Schedule 40 PVC	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 45'	Depth to Water: 35-40'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.0	NO		1	1		SP	Dry, loose, Sand and gravel very lt reddish brown	
					2					
					3					
	Dry	0.0	NO		4			GP	Dry, loose, lt reddish brown, Sand and gravel, Cobbles up to 8" no Stain/odor	
					5					
					6					
					7					
					8	2			moist, med. dense, poorly graded	
	moist	0.4	NO		9			SP	~~loose~~ Coarse Sand w/gravel	
					10				lt. brown, cobbles up to 8"	
					11					
					12					
					13	3				
	Dry	3.2	NO		14				Dry, med dense, lt brown, poorly graded Sand w/gravel cobbles 7 8" moist 15.5' - 16.0'	
					15					

Advancing Opportunity

Well ID	MW-23
Location	Standard #1
Project #	017817006
Date	4/16/19

Penetration Resistance	Moisture	Vapor	HC Stain	Sample #		Sample Run	Rock Soil Type	Lithology
					15			
					16			
					17	4		
					18			
	Dry	9.8	NO		19		SP	SAA no stain/odor
					20			
					21			
					22			
					23	5		
					24		SP	SAA no stain/odor
	Dry	11.4	NO		25			
					26			
					27			
					28	6		
				MW-23 25-30	29		SP	Dry, med dense, brown, coarse sand w gravel, poorly sorted trace green dark brown & moist clay no stain/odor
	Dry	11.4	NO		30			
					31			
					32	7		
					33			
					34		CL	moist, compact, dark brown, lean clay some sand and gravel < 20% no stain/odor
	moist	9.7	NO		35			35'
					36			
	moist lower?	6.0	NO		37	6	SP-SM	moist, ~~com~~ dense, lt yellow brown fine sand with silt no stain/odor
					40			45'

moist 3.4 NO MW-23 40-45 45 CL moist, compact, black ~~Organic~~ clay ~~Stone~~ (organics) no stain/odor

ee

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-24	Project: Standard #1
Date: 6/5/2019	Project Number: 017817006
Logged By: Eric Carroll	Drilled By: Cascade
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (15' - 27')	Seal: Bentonite Chips (14' - 15')
Grout: Bentonite Slurry (0' - 14')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 25'
Hole Diameter: 6"	Depth to Liquid: NA
Screen Type: Schedule 40 PVC	Slot: 0.010"
Diameter: 2" Length: 10'	Total Depth: 30'
Depth to Water: 26'	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.4	No		1			SP	Dry, loose, lt reddish brown, silty Sand no stain/odor	
					2	1				
					3					
	Dry	6.4	No		4			SP	~~Dry~~ SAA no stain/odor	
					5					
					6					
					7					
					8	2		SP	Dry, loose, lt brown, silty sand, w/ gravel, cobbles up to 8" dia no stain/odor	
	Dry	8.1	No		9					
					10					
					11					
	Dry	6.1	No		12			SP	SAA no stain/odor	
					13					
					14				moist, compact, dark brown, silty clay, rust mottling, no stain/odor	
	Moist	2.9	No		15					

Advancing Opportunity

6/5/2014
MW-24
Standard #1
0178170006

Penetration Resistance								
				15				
				16				
				17	4			
				18				
moist	19.1	NO	MW-24 15-20	19		CL	moist, compact, yellow brown silty lean clay, no stain/odor	
				20				
				21				
				22				
				23	5			
moist	12.0	NO		24		CL	SAA no stain/odor	
				25				WL
				26			Saturated, dense, fine sand and silt lt reddish brown, no stain/odor	
wet	7.3	NO		27		ML		
				28				
				29			moist, ~~dark~~ compact, lt brown, lean clay no stain odor	
moist	5.8	NO	MW-24 25-30	30		CL		
				31				
				32				
				33				
				34			TD = 30'	
				35				
				36				
				37				

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-~~26~~ 25		Project: Standard #1	
Date: 6/5/19		Project Number: 017817006	
Logged By: Eric Carroll		Drilled By: Cascade	
Elevation: 5,795	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (15' - 27')		Seal: Bentonite Chips (14' - 15')	Grout: Bentonite Slurry (0' - 14')
Casing Type: Schedule 40 PVC		Diameter: 2" Length: 10'	Hole Diameter: 6" Depth to Liquid: NA
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" Length: 25'	Total Depth: 30' Depth to Water: 25'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.0	No		1	1		SP	Dry, loose, reddish brown silty sand	
					2					
					3					
					4					
	Dry	1.7	No		5			SP	SAA no stain/odor	
					6	2				
					7					
					8					
	moist	4.1	No		9			CL	moist compact, dark brown ~~clay~~ silty clay no stain/odor	
					10			SP	coal present	
					11	3				
					12					
					13					
					14				moist, compact, yellow brown	
	moist	10.1	No	MW25 10-15	15			CL	silty clay, no stain/odor	

Advancing Opportunity

MW-25
Standard #1
01781006
6/5/2019

Penetrat Resistar								
				15				
				16				
				17	4			
				18				
				19				
	moist	9.9	NO	20		CL	moist, compact, dark brown lean clay no stain/odor	
				21				
				22				
				23	5			
	moist	8.4	NO	24		ML	moist, dense, lt reddish brown fine sand & silt, no stain/odor	WL
				25				
				26				
				27				
				28				
				29	6			
	moist	3.1	NO	30		CL	moist, compact, very lt brown sandey clay, no stain/odor	
			MW 25 25-30'	31				
				32				
				33			TD = 30'	
				34				
				35				
				36				
				37				

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-26	Project: Standard #1
Date: 6/5/2019	Project Number: 017817006
Logged By: Eric Carroll	Drilled By: Cascade
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (15' - 27')	Seal: Bentonite Chips (14' - 15')
Grout: Bentonite Slurry (0' - 14')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 10'
Hole Diameter: 6"	Depth to Liquid: NA
Screen Type: Schedule 40 PVC	Slot: 0.010" Diameter: 2" Length: 25'
Total Depth: 30'	Depth to Water: 21

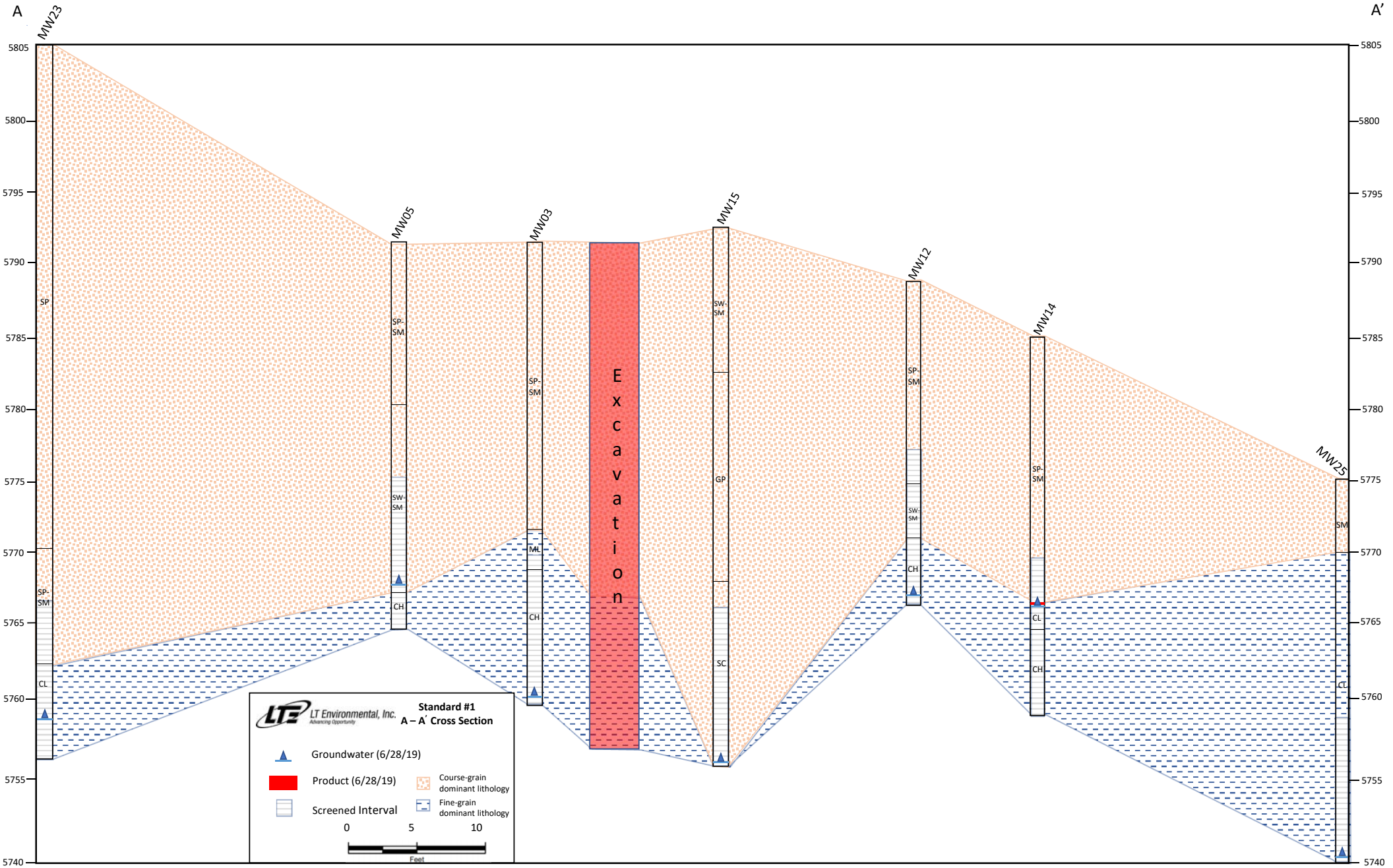
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist	9.3	No		1			SP-SM	loose, dark reddish brown, silty sand organics, no stain/odor	
					2					
					3					
	Dry				4					
	~~9.8~~	9.8	NO		5			SP	Dry loose, lt brown, silty sand with gravel, cobbles 7 6" no stain/odor	
					6					
					7					
					8					
	Dry				9			SP	SAA no stain/odor	
	~~10.2~~	10.2	NO		10					
					11					
					12					
					13					
				MW-26	14					
	Dry	10.4	NO	10-15	15			SP	SAA no stain/odor	

Advancing Opportunity

6/5/2019
MW-26
Standard #1
CU781906

Penetration Resistance								
				15				
				16				
				17	4			
				18				
				19				
	moist	4.0	NO	20			CL	moist, compact, yellow brown, sandy clay, no stain/odor
				21				
	wet	5.3	NO	22	5		SP	wet (saturated), med dense, dark brown sand and gravel, rust coating sands, no stain/odor
				23				
				24				
	moist	3.8	NO	25			CL	moist, dark brown, compact silty clay, trace sand <5%, no stain/odor
				26				
				27				
				28	6		CL	moist, dark brown/yellow brown, lean clay, some black (organic) clay no stain/odor
			MW-26	29				
	moist	1.7	NO	25-30				
				30				
				31				
				32				TD = 30'
				33				
				34				
				35				
				36				
				37				

WL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Excavation
LT Environmental, Inc.
Advancing Opportunity
Standard #1
A – A' Cross Section
Groundwater (6/28/19)
Product (6/28/19)
Screened Interval
Course-grain dominant lithology
Fine-grain dominant lithology
0
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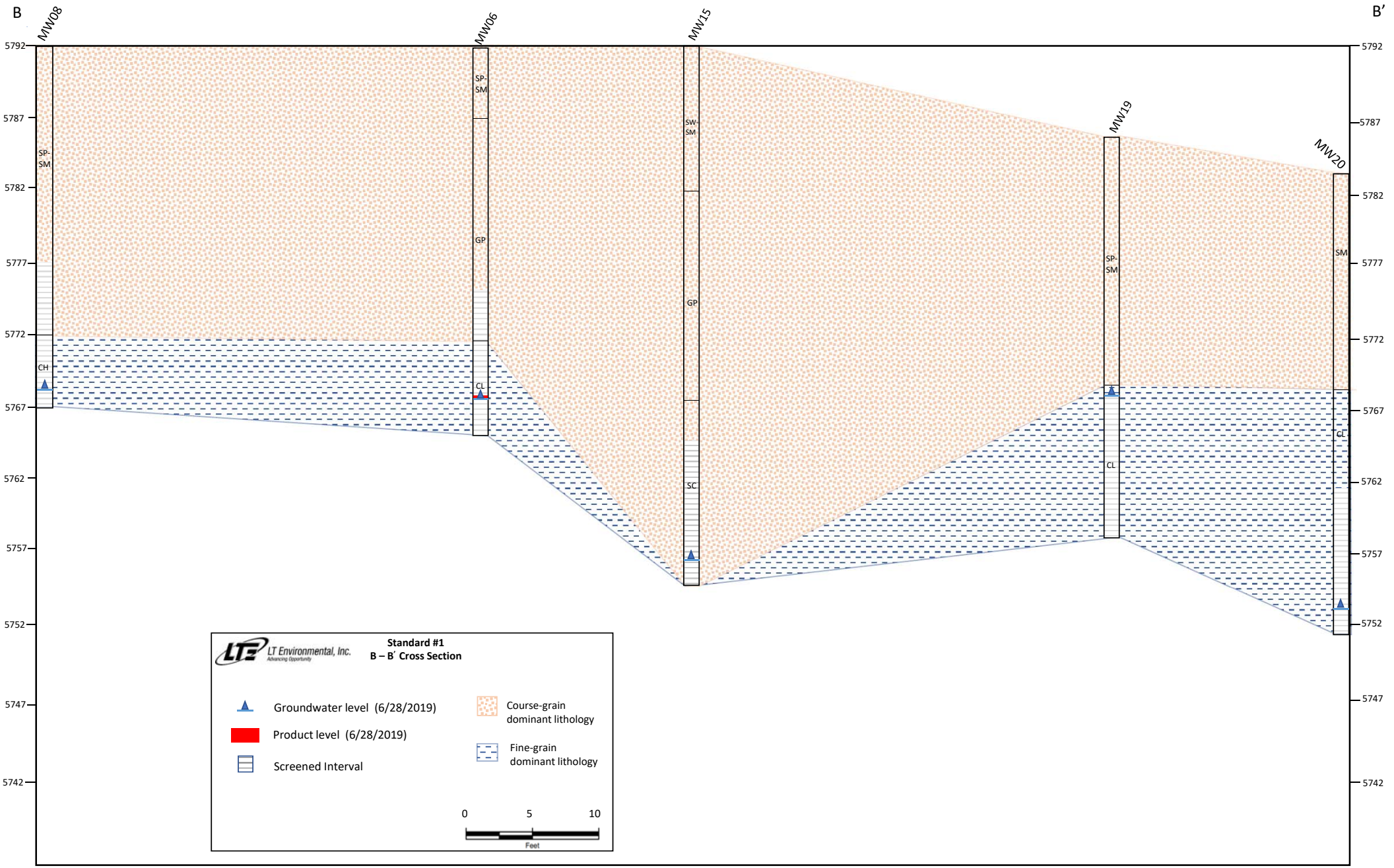
Feet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5792
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5782
5777
5772
5767
5762
5757
5752
5747
5742
SP-SM
GP
SW-SM
SC
CH
CL
SM
LT Environmental, Inc.
Standard #1
B – B' Cross Section
Groundwater level (6/28/2019)
Product level (6/28/2019)
Screened Interval
Course-grain dominant lithology
Fine-grain dominant lithology
0
5
10
Feet

ATTACHMENT 3: LABORATORY ANALYTICAL REPORTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 13, 2019

Jennifer Deal

Hilcorp Energy
PO Box 61529
Houston, TX 77208-1529
TEL: (337) 276-7676
FAX

RE: Standard 1 OrderNo.: 1906389

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 8 sample(s) on 6/7/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-23 25'-30'
Project: Standard 1
Collection Date: 6/4/2019 12:00:00 PM
Lab ID: 1906389-001 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	6/12/2019 4:42:10 PM	45482
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/12/2019 4:42:10 PM	45482
Surr: DNOP	120	70-130		%Rec	1	6/12/2019 4:42:10 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	6/11/2019 11:03:48 AM	45462
Surr: BFB	104	73.8-119		%Rec	1	6/11/2019 11:03:48 AM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 11:03:48 AM	45462
Toluene	ND	0.050		mg/Kg	1	6/11/2019 11:03:48 AM	45462
Ethylbenzene	ND	0.050		mg/Kg	1	6/11/2019 11:03:48 AM	45462
Xylenes, Total	ND	0.099		mg/Kg	1	6/11/2019 11:03:48 AM	45462
Surr: 4-Bromofluorobenzene	98.7	80-120		%Rec	1	6/11/2019 11:03:48 AM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-23 40'-45'
Project: Standard 1
Collection Date: 6/4/2019 1:00:00 PM
Lab ID: 1906389-002 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	6/12/2019 5:56:18 PM	45482
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	6/12/2019 5:56:18 PM	45482
Surr: DNOP	124	70-130		%Rec	1	6/12/2019 5:56:18 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/11/2019 12:11:54 PM	45462
Surr: BFB	103	73.8-119		%Rec	1	6/11/2019 12:11:54 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 12:11:54 PM	45462
Toluene	ND	0.049		mg/Kg	1	6/11/2019 12:11:54 PM	45462
Ethylbenzene	ND	0.049		mg/Kg	1	6/11/2019 12:11:54 PM	45462
Xylenes, Total	ND	0.098		mg/Kg	1	6/11/2019 12:11:54 PM	45462
Surr: 4-Bromofluorobenzene	98.1	80-120		%Rec	1	6/11/2019 12:11:54 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-24 15'-20'
Project: Standard 1
Collection Date: 6/5/2019 1:30:00 PM
Lab ID: 1906389-003 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	6/12/2019 6:21:16 PM	45482
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/12/2019 6:21:16 PM	45482
Surr: DNOP	112	70-130		%Rec	1	6/12/2019 6:21:16 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/11/2019 12:34:40 PM	45462
Surr: BFB	105	73.8-119		%Rec	1	6/11/2019 12:34:40 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 12:34:40 PM	45462
Toluene	ND	0.049		mg/Kg	1	6/11/2019 12:34:40 PM	45462
Ethylbenzene	ND	0.049		mg/Kg	1	6/11/2019 12:34:40 PM	45462
Xylenes, Total	ND	0.099		mg/Kg	1	6/11/2019 12:34:40 PM	45462
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	6/11/2019 12:34:40 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-24 25'-30'
Project: Standard 1
Collection Date: 6/5/2019 2:15:00 PM
Lab ID: 1906389-004 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	6/12/2019 6:45:58 PM	45482
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/12/2019 6:45:58 PM	45482
Surr: DNOP	108	70-130		%Rec	1	6/12/2019 6:45:58 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	6/11/2019 12:57:26 PM	45462
Surr: BFB	107	73.8-119		%Rec	1	6/11/2019 12:57:26 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 12:57:26 PM	45462
Toluene	ND	0.050		mg/Kg	1	6/11/2019 12:57:26 PM	45462
Ethylbenzene	ND	0.050		mg/Kg	1	6/11/2019 12:57:26 PM	45462
Xylenes, Total	ND	0.10		mg/Kg	1	6/11/2019 12:57:26 PM	45462
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	6/11/2019 12:57:26 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-25 10'-15'
Project: Standard 1
Collection Date: 6/5/2019 4:00:00 PM
Lab ID: 1906389-005 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/12/2019 7:10:35 PM	45482
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/12/2019 7:10:35 PM	45482
Surr: DNOP	105	70-130		%Rec	1	6/12/2019 7:10:35 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/11/2019 1:20:10 PM	45462
Surr: BFB	107	73.8-119		%Rec	1	6/11/2019 1:20:10 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 1:20:10 PM	45462
Toluene	ND	0.049		mg/Kg	1	6/11/2019 1:20:10 PM	45462
Ethylbenzene	ND	0.049		mg/Kg	1	6/11/2019 1:20:10 PM	45462
Xylenes, Total	ND	0.099		mg/Kg	1	6/11/2019 1:20:10 PM	45462
Surr: 4-Bromofluorobenzene	99.4	80-120		%Rec	1	6/11/2019 1:20:10 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-25 25'-30'
Project: Standard 1
Collection Date: 6/5/2019 4:45:00 PM
Lab ID: 1906389-006 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	6/12/2019 7:35:08 PM	45482
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/12/2019 7:35:08 PM	45482
Surr: DNOP	128	70-130		%Rec	1	6/12/2019 7:35:08 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	6/11/2019 1:42:59 PM	45462
Surr: BFB	107	73.8-119		%Rec	1	6/11/2019 1:42:59 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 1:42:59 PM	45462
Toluene	ND	0.050		mg/Kg	1	6/11/2019 1:42:59 PM	45462
Ethylbenzene	ND	0.050		mg/Kg	1	6/11/2019 1:42:59 PM	45462
Xylenes, Total	ND	0.10		mg/Kg	1	6/11/2019 1:42:59 PM	45462
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	6/11/2019 1:42:59 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-26 10'-15'
Project: Standard 1
Collection Date: 6/5/2019 10:20:00 AM
Lab ID: 1906389-007 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/12/2019 7:59:40 PM	45482
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	6/12/2019 7:59:40 PM	45482
Surr: DNOP	134	70-130	S	%Rec	1	6/12/2019 7:59:40 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/11/2019 2:05:47 PM	45462
Surr: BFB	107	73.8-119		%Rec	1	6/11/2019 2:05:47 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 2:05:47 PM	45462
Toluene	ND	0.049		mg/Kg	1	6/11/2019 2:05:47 PM	45462
Ethylbenzene	ND	0.049		mg/Kg	1	6/11/2019 2:05:47 PM	45462
Xylenes, Total	ND	0.099		mg/Kg	1	6/11/2019 2:05:47 PM	45462
Surr: 4-Bromofluorobenzene	98.4	80-120		%Rec	1	6/11/2019 2:05:47 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Client Sample ID: MW-26 25'-30'
Project: Standard 1
Collection Date: 6/5/2019 11:00:00 AM
Lab ID: 1906389-008 **Matrix:** SOIL **Received Date:** 6/7/2019 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	6/12/2019 8:24:07 PM	45482
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/12/2019 8:24:07 PM	45482
Surr: DNOP	131	70-130	S	%Rec	1	6/12/2019 8:24:07 PM	45482
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	6/11/2019 2:28:39 PM	45462
Surr: BFB	109	73.8-119		%Rec	1	6/11/2019 2:28:39 PM	45462
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	6/11/2019 2:28:39 PM	45462
Toluene	ND	0.050		mg/Kg	1	6/11/2019 2:28:39 PM	45462
Ethylbenzene	ND	0.050		mg/Kg	1	6/11/2019 2:28:39 PM	45462
Xylenes, Total	ND	0.10		mg/Kg	1	6/11/2019 2:28:39 PM	45462
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	6/11/2019 2:28:39 PM	45462

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906389**

13-Jun-19

Client: Hilcorp Energy

Project: Standard 1

Sample ID: **MB-45482**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **45482**	RunNo: **60572**
Prep Date: **6/10/2019**	Analysis Date: **6/12/2019**	SeqNo: **2050612** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	14		10.00		138	70	130			S

Sample ID: **LCS-45482**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **45482**	RunNo: **60572**
Prep Date: **6/10/2019**	Analysis Date: **6/12/2019**	SeqNo: **2050615** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	58	10	50.00	0	116	63.9	124			
Surr: DNOP	6.5		5.000		130	70	130			S

Sample ID: **1906389-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW-23 25'-30'**	Batch ID: **45482**	RunNo: **60572**
Prep Date: **6/10/2019**	Analysis Date: **6/12/2019**	SeqNo: **2050628** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.7	48.54	0	105	57	142			
Surr: DNOP	5.5		4.854		113	70	130			

Sample ID: **1906389-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW-23 25'-30'**	Batch ID: **45482**	RunNo: **60572**
Prep Date: **6/10/2019**	Analysis Date: **6/12/2019**	SeqNo: **2050660** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	9.8	48.97	0	110	57	142	5.61	20	
Surr: DNOP	5.7		4.897		117	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906389**

13-Jun-19

Client: Hilcorp Energy

Project: Standard 1

Sample ID: **MB-45462**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049131** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		104	73.8	119			

Sample ID: **LCS-45462**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049132** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.7	80.1	123			
Surr: BFB	1100		1000		115	73.8	119			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906389**

13-Jun-19

Client: Hilcorp Energy

Project: Standard 1

Sample ID: **MB-45462**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049158** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.99		1.000		98.6	80	120			

Sample ID: **LCS-45462**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049159** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	103	80	120			
Toluene	1.0	0.050	1.000	0	103	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.0	0.10	3.000	0	99.9	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID: **1906389-001AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW-23 25'-30'**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049161** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9930	0	109	63.9	127			
Toluene	1.1	0.050	0.9930	0	110	69.9	131			
Ethylbenzene	1.1	0.050	0.9930	0	109	71	132			
Xylenes, Total	3.2	0.099	2.979	0	107	71.8	131			
Surr: 4-Bromofluorobenzene	1.0		0.9930		103	80	120			

Sample ID: **1906389-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW-23 25'-30'**	Batch ID: **45462**	RunNo: **60551**
Prep Date: **6/10/2019**	Analysis Date: **6/11/2019**	SeqNo: **2049162** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9843	0	107	63.9	127	2.95	20	
Toluene	1.1	0.049	0.9843	0	107	69.9	131	4.08	20	
Ethylbenzene	1.0	0.049	0.9843	0	107	71	132	3.18	20	
Xylenes, Total	3.1	0.098	2.953	0	104	71.8	131	3.59	20	
Surr: 4-Bromofluorobenzene	1.0		0.9843		106	80	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **1906389** RcptNo: **1**

Received By: **Jevon Campisi** **6/7/2019 7:55:00 AM** Jevon Campisi

Completed By: **Erin Melendrez** **6/7/2019 2:54:41 PM**

Reviewed By: ENM 6/7/19

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Tmm 6-7-19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.9	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal
Mailing Address: 382 Rd. 3100
Aztec, NM 87410
Phone #: 505-599-3400
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: Standard 1
Project #:
Project Manager: Jennifer Deal - Hilcorp
Danny Burns - LTE
Sampler: Eric Carroll
On Ice: ☑ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 4.5°C + 0.4CF = 4.9°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1906389	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
6/4	1200	Soil	MW-23 25'-30'	1 4oz	cool	-001	X	X								
6/4	1300		MW-23 40'-45'			-002	X	X								
6/5	1330		MW-24 15'-20'			-003	X	X								
	1415		MW-24 25'-30'			-004	X	X								
	1600		MW-25 10'-15'			-005	X	X								
	1645		MW-25 25'-30'			-006	X	X								
	1020		MW-26 10'-15'			-007	X	X								
	1100		MW-26 25'-30'			-008	X	X								

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6/6/19	1426	Eric Carroll	Chris Walsh		6/6/19	1426
6/6/19	1750	Christa Walsh		Via: Courier	6-7-19	7:55

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 21, 2019

Jennifer Deal

Hilcorp Energy
PO Box 61529
Houston, TX 77208-1529
TEL: (337) 276-7676
FAX

RE: Standard 1 OrderNo.: 1906A31

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/19/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1906A31**
Date Reported: **6/21/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab Order: 1906A31

Lab ID: 1906A31-001
Collection Date: 6/18/2019 2:40:00 PM
Client Sample ID: MW-26
Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	5.2	1.0		µg/L	1	6/20/2019 3:06:57 PM	B60803
Toluene	ND	1.0		µg/L	1	6/20/2019 3:06:57 PM	B60803
Ethylbenzene	ND	1.0		µg/L	1	6/20/2019 3:06:57 PM	B60803
Xylenes, Total	ND	2.0		µg/L	1	6/20/2019 3:06:57 PM	B60803
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/20/2019 3:06:57 PM	B60803

Lab ID: 1906A31-002
Collection Date: 6/18/2019 3:00:00 PM
Client Sample ID: MW-23
Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	6/20/2019 3:30:34 PM	B60803
Toluene	ND	1.0		µg/L	1	6/20/2019 3:30:34 PM	B60803
Ethylbenzene	ND	1.0		µg/L	1	6/20/2019 3:30:34 PM	B60803
Xylenes, Total	ND	2.0		µg/L	1	6/20/2019 3:30:34 PM	B60803
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	6/20/2019 3:30:34 PM	B60803

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906A31**

21-Jun-19

Client: Hilcorp Energy

Project: Standard 1

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **B60803**	RunNo: **60803**
Prep Date:	Analysis Date: **6/20/2019**	SeqNo: **2058308** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	20		20.00		102	80	120			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **B60803**	RunNo: **60803**
Prep Date:	Analysis Date: **6/20/2019**	SeqNo: **2058309** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	98.1	80	120			
Toluene	20	1.0	20.00	0	102	80	120			
Ethylbenzene	21	1.0	20.00	0	104	80	120			
Xylenes, Total	62	2.0	60.00	0	104	80	120			
Surr: 4-Bromofluorobenzene	22		20.00		108	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **1906A31** RcptNo: **1**

Received By: **Anne Thorne** **6/19/2019 8:10:00 AM**

Completed By: **Erin Melendrez** **6/19/2019 5:06:47 PM**

Reviewed By: 6/19

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

TO 6/20/19

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.3	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp

Jennifer Deal

Mailing Address:

Phone #: 970-385-1096

email or Fax#: JDeal@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☒ EDD (Type) PDF

Turn-Around Time:

☒ Standard ☐ **Rush**

Project Name: Standard #1

Project #:

Project Manager: Jennifer Deal - Hilcorp, Danny Burns - LTE

Sampler: Eric Carroll

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 1.8-0.5(CF)=1.3°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1906941	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)						
6/18	1440	Gw	MW-26	3 VOA	HCl	-001	X															
6/18	1500	Gw	MW-23	3 VOA	HCl	-002	X															

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6/18	1636				6/18/19	1636
6/18/19	1906				06/18/19	0810

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 10, 2019

Danny Burns
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX:

RE: Standard 1 OrderNo.: 1906G46

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 9 sample(s) on 6/29/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Lab Order: 1906G46
Project: Standard 1

Lab ID: 1906G46-001 **Collection Date:** 6/28/2019 8:00:00 AM
Client Sample ID: MW-15 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	24000	500		µg/L	500	7/8/2019 10:10:07 AM	B61223
Toluene	28000	500		µg/L	500	7/8/2019 10:10:07 AM	B61223
Ethylbenzene	1100	50		µg/L	50	7/6/2019 3:04:24 AM	A61170
Xylenes, Total	10000	1000		µg/L	500	7/8/2019 10:10:07 AM	B61223
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	50	7/6/2019 3:04:24 AM	A61170

Lab ID: 1906G46-002 **Collection Date:** 6/28/2019 8:40:00 AM
Client Sample ID: MW 05 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	5900	200		µg/L	200	7/6/2019 3:28:19 AM	A61170
Toluene	160	20		µg/L	20	7/6/2019 3:52:17 AM	A61170
Ethylbenzene	200	20		µg/L	20	7/6/2019 3:52:17 AM	A61170
Xylenes, Total	1400	40		µg/L	20	7/6/2019 3:52:17 AM	A61170
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	20	7/6/2019 3:52:17 AM	A61170

Lab ID: 1906G46-003 **Collection Date:** 6/28/2019 11:00:00 AM
Client Sample ID: MW 19 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	13000	200		µg/L	200	7/8/2019 10:32:47 AM	B61223
Toluene	230	20		µg/L	20	7/5/2019 6:46:55 PM	A61171
Ethylbenzene	900	20		µg/L	20	7/5/2019 6:46:55 PM	A61171
Xylenes, Total	4900	400		µg/L	200	7/5/2019 6:24:09 PM	A61171
Surr: 4-Bromofluorobenzene	118	80-120		%Rec	20	7/5/2019 6:46:55 PM	A61171

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Lab Order: 1906G46
Project: Standard 1

Lab ID: 1906G46-004 **Collection Date:** 6/28/2019 9:25:00 AM
Client Sample ID: MW 18 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	15000	500		µg/L	500	7/8/2019 10:55:28 AM	B61223
Toluene	18000	500		µg/L	500	7/8/2019 10:55:28 AM	B61223
Ethylbenzene	770	500		µg/L	500	7/8/2019 10:55:28 AM	B61223
Xylenes, Total	9400	1000		µg/L	500	7/8/2019 10:55:28 AM	B61223
Surr: 4-Bromofluorobenzene	94.9	80-120		%Rec	500	7/8/2019 10:55:28 AM	B61223

Lab ID: 1906G46-005 **Collection Date:** 6/28/2019 8:40:00 AM
Client Sample ID: MW 12 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	810	50		µg/L	50	7/8/2019 11:18:06 AM	B61223
Toluene	55	5.0		µg/L	5	7/5/2019 9:02:56 PM	A61171
Ethylbenzene	1000	50		µg/L	50	7/5/2019 8:40:17 PM	A61171
Xylenes, Total	500	10		µg/L	5	7/5/2019 9:02:56 PM	A61171
Surr: 4-Bromofluorobenzene	157	80-120	S	%Rec	5	7/5/2019 9:02:56 PM	A61171

Lab ID: 1906G46-006 **Collection Date:** 6/28/2019 10:10:00 AM
Client Sample ID: MW 08 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 11:40:49 AM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 11:40:49 AM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 11:40:49 AM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 11:40:49 AM	B61223
Surr: 4-Bromofluorobenzene	93.4	80-120		%Rec	1	7/8/2019 11:40:49 AM	B61223

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Lab Order: 1906G46
Project: Standard 1

Lab ID: 1906G46-007 **Collection Date:** 6/28/2019 7:45:00 AM
Client Sample ID: MW 11 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 12:03:34 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 12:03:34 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 12:03:34 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 12:03:34 PM	B61223
Surr: 4-Bromofluorobenzene	94.5	80-120		%Rec	1	7/8/2019 12:03:34 PM	B61223

Lab ID: 1906G46-008 **Collection Date:** 6/28/2019 8:15:00 AM
Client Sample ID: MW 22 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 12:26:16 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 12:26:16 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 12:26:16 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 12:26:16 PM	B61223
Surr: 4-Bromofluorobenzene	95.8	80-120		%Rec	1	7/8/2019 12:26:16 PM	B61223

Lab ID: 1906G46-009 **Collection Date:** 6/28/2019 11:00:00 AM
Client Sample ID: MW 16 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	3400	200		µg/L	200	7/8/2019 12:48:57 PM	B61223
Toluene	620	20		µg/L	20	7/5/2019 10:56:54 PM	A61171
Ethylbenzene	80	20		µg/L	20	7/5/2019 10:56:54 PM	A61171
Xylenes, Total	2100	40		µg/L	20	7/5/2019 10:56:54 PM	A61171
Surr: 4-Bromofluorobenzene	116	80-120		%Rec	20	7/5/2019 10:56:54 PM	A61171

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906G46**

10-Jul-19

Client: HILCORP ENERGY

Project: Standard 1

Sample ID: **RB-II**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **A61170**	RunNo: **61170**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2073608** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	20		20.00		97.6	80	120			

Sample ID: **100NG BTEX LCS-II**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **A61170**	RunNo: **61170**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2073609** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.5	80	120			
Toluene	20	1.0	20.00	0	101	80	120			
Ethylbenzene	20	1.0	20.00	0	102	80	120			
Xylenes, Total	60	2.0	60.00	0	101	80	120			
Surr: 4-Bromofluorobenzene	19		20.00		96.0	80	120			

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **A61171**	RunNo: **61171**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2073643** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		97.2	80	120			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **A61171**	RunNo: **61171**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2073644** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	19	1.0	20.00	0	93.6	80	120			
Ethylbenzene	19	1.0	20.00	0	94.0	80	120			
Xylenes, Total	56	2.0	60.00	0	92.8	80	120			
Surr: 4-Bromofluorobenzene	21		20.00		103	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906G46**

10-Jul-19

Client: HILCORP ENERGY

Project: Standard 1

Sample ID: **1906G46-003AMS** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW 19** Batch ID: **A61171** RunNo: **61171**

Prep Date: Analysis Date: **7/5/2019** SeqNo: **2073646** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	700	20	400.0	230.7	119	80	120			
Ethylbenzene	1300	20	400.0	903.5	109	80	120			
Xylenes, Total	6200	40	1200	4959	103	80	120			E
Surr: 4-Bromofluorobenzene	480		400.0		119	80	120			

Sample ID: **1906G46-003AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW 19** Batch ID: **A61171** RunNo: **61171**

Prep Date: Analysis Date: **7/5/2019** SeqNo: **2073647** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	700	20	400.0	230.7	118	80	120	0.270	20	
Ethylbenzene	1300	20	400.0	903.5	106	80	120	0.933	20	
Xylenes, Total	6100	40	1200	4959	93.4	80	120	1.92	20	E
Surr: 4-Bromofluorobenzene	480		400.0		119	80	120	0	0	

Sample ID: **RB** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBW** Batch ID: **B61223** RunNo: **61223**

Prep Date: Analysis Date: **7/8/2019** SeqNo: **2075449** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		96.9	80	120			

Sample ID: **100NG BTEX LCS** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSW** Batch ID: **B61223** RunNo: **61223**

Prep Date: Analysis Date: **7/8/2019** SeqNo: **2075450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	92.1	80	120			
Toluene	18	1.0	20.00	0	91.0	80	120			
Ethylbenzene	18	1.0	20.00	0	90.7	80	120			
Xylenes, Total	54	2.0	60.00	0	90.2	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **HILCORP ENERGY FAR** Work Order Number: **1906G46** RcptNo: **1**

Received By: **Erin Melendrez** **6/29/2019 9:30:00 AM**

Completed By: **Erin Melendrez** **6/29/2019 10:38:39 AM**

Reviewed By: DAD 07/01/19

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: (<2 or >12 unless noted)
Adjusted? NC
Checked by: 7-1-19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp L 48
Jennifer Deal
Mailing Address: 382 Aztec Road 3100
Aztec, NM 87410
Phone #: 505 793 27 84
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: Standard #1
Project #: 01781700G
Project Manager: Danny Burns
Sampler: JA/MM
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp (including CF): 1.2+0.0(CF)=1.2°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1906G446
6/25/19	0800	GW	MW-15	(3) VOA's	HCL	-001
	0840		MW05		$HgCl_2$	-002
	~~0900~~		~~MW03~~			
	1100		MW 19	(3) VOA's	$HgCl_2$	-003
	0925		MW 18		$HgCl_2$	-004
	0840		MW 12		$HgCl_2$	-005
	1010		MW 08		$HgCl_2$	-006
	0745		MW 11		HCL	-007
	0815		MW 22		HCL	-008
	1100		MW 16		HCL	-009

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
X									
X									
~~X~~									
X									
X									
X									
X									
X									
X									
X									

Date	Time	Relinquished by:	Received by:	Via	Date	Time
6/28/19	1340			Courier	6/28/19	1340
6/28/19	1360			Courier	6/29/19	0930

Remarks: cc: dburns@henv.com
jadams@henv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.