District I
625 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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Hilcorp Energy Company	OGRID 372171
Contact Name Jennifer Deal	Contact Telephone 505-801-6517
Contact email jdeal@hilcorp.com	Incident # NVF1836050592
Contact mailing address 382 Road 3100, Aztec NM 87410	

NMOCD
DEC 24 2018
DISTRICT III

Location of Release Source

Latitude 36.88592353 Longitude -107.8994293
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Lambe 2C	Site Type Gas Well
Date Release Discovered 12/17/18 @ 10:30am	API# *30-045-30747*

Unit Letter	Section	Township	Range	County
H	20	31N	10W	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)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☒ Condensate	Volume Released (bbls) 97	Volume Recovered (bbls) 0
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Received by OCD: 8/30/2019 1:47:15 PM

Cause of Release
A release of ~97bbls of oil/condensate was released due to corrosion on the tank. MSO arrived on location and noticed oil in oil tank containment. MSO inspected tank and found corrosion on the bottom of the tank and a hole where the oil was leak was shut in and tank was taken out of service. Release remained inside the berm.

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Adrienne Sandoval, Division Director
Oil Conservation Division

September 9, 2019

Jennifer Deal
Hilcorp Energy Company
382 Road 3100
Aztec, New Mexico 87401
jdeal@hilcorp.com

RE: Lambe 2C (30-045-30747) Site Characterization and Remediation plan

Ms. Deal,

The New Mexico Oil Conservation Division (OCD) has received the site characterization and remediation plan for the Lambe 2C on August 30, 2019 for the Lambe 2C release and has approved the plan with the following conditions of approval:

- HEC will start SVE remediation no later than October 1, 2019
- HEC will achieve a run time of 90% or better of the proposed 8 hours per event.
- HEC will collect an initial gas sample for laboratory analysis shortly after startup of SVE operations after the initial gas sample an annual sample is required. The air sample must be collected prior to the inlet of the vacuum pump but, after the convergence of all SVE wells or alternativity an air sample from each SVE well is acceptable.
    - The gas sample will be analyzed for EPA Method 8260 Full List and include Carbon Dioxide and Oxygen.
- HEC quarterly report (If needed) will include at a minimum
    - Summary of remediation activity for the quarter
    - SVE Run time
    - SVE mass removal
    - Field notes (VOC readings, water/product recovery, inspection dates etc)
    - Amount of liquids/product recovered if any (This will be recorded from the knock out drum since ground water in not expected to be encountered)
- HEC will submit a detailed closure plan via email for OCD approval prior to the collection of any confirmation Borehole samples. The Closure plan will include at a minimum bore hole locations, sampling method and frequency.

OCD's approval of the characterization and remediation plan does not relieve Hilcorp of any other requirements imposed by any other regulatory agencies.

Respectfully,

Cory Smith
Environmental Specalist

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
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? This is a major release as the amount is >25bbls

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Immediate notification was given by Jennifer Deal by email on 12/17/2018 @ 1:02pm to Cory Smith, Vanessa Fields, and Jim Griswold with NMOCD, and Whitney Thomas and Emmanuel with BLM.

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: 12/21/2018

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: Vanessa Fields Date: 12/24/2018

State of New Mexico
Oil Conservation Division

Incident ID	NVF1836050592
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?	50-100 (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	
District RP	
Facility ID	
Application ID	

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: 8/30/19

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

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

- [X] Detailed description of proposed remediation technique
- [X] Scaled sitemap with GPS coordinates showing delineation points
- [X] Estimated volume of material to be remediated
- [X] Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- [X] 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: Jennifer Deal Title: Environmental Specialist

Signature: Jennifer Deal Date: 8/30/19

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: OCD Date: 8/30/19

- [ ] Approved
- [X] Approved with Attached Conditions of Approval
- [ ] Denied
- [ ] Deferral Approved

Signature: Date: 9/9/19

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

August 30, 2019

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

RE: Soil Delineation and Proposed Remediation Workplan
Hilcorp Energy Company
Lambe 2C
API # 30-045-30747
Incident # NVF1836050592
San Juan County, New Mexico

Dear Mr. Smith:

LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), presents the following summary report and remediation workplan discussing delineation soil sampling, monitoring well installation, and groundwater sampling activities conducted at the Lambe 2C natural gas production well (Site). The Site is on a mesa between Arch Rock Canyon and Hart Canyon, south of Cedar Hill, New Mexico, in Unit H of Section 20 of Township 31 North and Range 10 West in San Juan County (Figure 1). The purpose of the investigation was to evaluate potential hydrocarbon impacts in the subsurface following the discovery of a condensate release.

Background

On December 17, 2018, Hilcorp personnel discovered a pinhole leak due to corrosion in the bottom of a condensate tank. The leak resulted in approximately 97 barrels (bbls) of condensate draining onto the ground and infiltrating the subsurface. The release was contained within the earthen berm, but no liquids were recovered. The defective tank was immediately shut-in, drained of remaining liquids, and taken out of service. The release was reported to the New Mexico Oil Conservation Division (NMOCD) by Hilcorp on a Form C-141 Release Notification and Corrective Action Form dated December 24, 2018.

The nearest permitted water well (SJ-01198) is approximately 0.7 miles to the northwest. The permitted water well is used for one household domestic purposes and total depth is listed at 158 feet below ground surface (bgs). Depth to water in the water well is listed as 97 feet bgs. During excavation activities conducted during release response, water was encountered in the base of the excavation at 29 feet bgs. Additional investigation through groundwater monitoring wells did not identify groundwater and LTE estimates groundwater to be between 51 and 100 feet bgs based on nearby topographic features. Arch Rock Canyon is approximately 138 feet

lower in elevation than the Site, but Hart Canyon, to the south, is 91 feet lower in elevation. The nearest surface water feature is an unnamed, fourth-order tributary of the Animas River and 150 feet to the northwest. There is no lakebed, sinkhole, playa lake, wetland, mine, residence or other building nearby. The Site is not in an unstable area or the 100-year floodplain. Due to the proximity of the significant watercourse, the remediation action levels applied to the Site are 100 milligrams per kilogram (mg/kg) total petroleum hydrocarbons (TPH), 10 mg/kg benzene, 50 mg/kg total for the sum of benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 600 mg/kg chloride.

Release Response

Hilcorp responded to the release by conducting a preliminary delineation investigation to determine the extent of subsurface hydrocarbon impact. In January of 2019, soil samples were collected from soil borings via hand auger and a hollow-stem auger CME55 drill rig. Borings were advanced until refusal in cobbles at depths ranging from 9 feet to 12 feet bgs.

Upon encountering refusal with the hollow-stem drill rig due to cobbles at a relatively shallow depth, Hilcorp initiated remediation activities via excavation. Between January and May 2019, an estimated total of 5,000 cubic yards of impacted soil was excavated and hauled for disposal. The extent of the excavation is depicted in Figure 2 and pictures are included in a photo log in Attachment 1. The excavation depth ranged from 23 feet to 29 feet bgs, which required significant sloping of the sidewalls. The footprint of the excavation is included in Figure 2, and the actual excavation to full depth is differentiated from the footprint to better represent actual conditions. During excavation activities, potential groundwater was encountered at the base of the excavation at 29 feet bgs on May 3, 2019.

Based on the size of the excavation and the presence of water, a second attempt at subsurface delineation was conducted with a sonic drill rig on July 22, 2019. On June 22 through June 24, 2019, LTE used a sonic drill rig to advance boreholes (MW01 through MW08) to collect soil samples for laboratory analysis and determine the lateral and vertical impacts outside of the existing excavation extent. In anticipation of encountering groundwater, monitoring wells were permitted with the New Mexico Office of the State Engineer (NMOSE) and were installed following soil boring activities.

Subsurface Investigations

LTE conducted soil sampling during all phases of the release response. The following section provides a chronology of site work and describes methods used for sampling.

Hand Auger Investigation

LTE personnel collected soil samples via hand auger on January 4, 2019, to characterize soil impacts immediately within the bermed area. A hand auger was used to complete a borehole to a depth of 11.5 feet bgs within the bermed area containing the faulty condensate tank and a below grade tank. The borehole was advanced until refusal immediately next to the below grade tank and is identified as HA-1 on Figure 2.

Continuous soil samples were logged by an LTE geologist and described using the Unified Soil Classification System (USCS). Soil samples were field screened with a photo-ionization detector (PID) at one-foot intervals until refusal was encountered with the hand auger at just below 11 feet bgs. Two soil samples were collected from the hand auger borehole; one at the highest observed PID reading and one at the terminus of the boring. A soil boring log is included as Attachment 2.

Soil samples were labeled with the date and time of collection, sample name, sampler's name, and parameters to be analyzed. All samples collected were placed on ice to maintain a temperature of approximately 4 degrees Celsius (°C) and sealed in a cooler for delivery to Hall Environmental Analysis Laboratory (Hall), of Albuquerque, New Mexico, for analysis. Strict chain-of-custody procedures were documented including the date and time sampled, sample number, type of sample, sampler's name and signature, preservative used, and analyses required. Samples were analyzed for BTEX by United States Environmental Protection Agency (EPA) Method 8021 and TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), and TPH-motor oil range organics (MRO) by EPA Method 8015. Due to the condensate source, chloride was not analyzed.

Hollow-Stem Auger Investigation

Since hand augering was insufficient for penetrating the subsurface deeper than 11 feet bgs, four boreholes (BH-1 to BH-4) were advanced via hollow-stem auger outside of the bermed area in each cardinal direction from the known impacted area on January 4, 2019. Boreholes were advanced to 9 feet to 12 feet bgs before refusal was encountered at what was determined to be a cobble layer. Soil in the boreholes was described and field screened. No impacts were observed via field screening and no soil samples were collected from the hollow-stem boreholes. Soil boring logs are included as Attachment 2.

Excavation

While vertical delineation was not obtained during the previous investigations, the borings suggested lateral impact was restricted to the bermed area, so Hilcorp initiated excavation. Approximately 5,000 cubic yards of soil were removed between January and May of 2019. During

excavation activities, potential groundwater was encountered at the base of the excavation on May 3, 2019.

LTE personnel sampled the groundwater (GW01) and collected two grab samples (GR01 and GR02) from the sidewalls of the existing open excavation for characterization of the remaining impacts. LTE recommended additional excavation and investigation by trenching laterally outward in three directions. On May 29, 2019, discrete grab samples were collected from the investigation trenches (GR03, GR04, GR05), excavation soil samples (GR06, GR07, GR08, GR09, and GR10) were collected from the sidewalls, and a 5-point composite soil sample was collected from the floor of the excavation (FS01). All samples were handled as previously described. Soil samples were analyzed for BTEX and TPH. The groundwater sample was analyzed for BTEX by EPA Method 8260B. Based on results from the soil sampling that indicated a significant amount of clean overburden would be required to be removed before reaching impacted soil at depth, excavation activities were suspended, and additional subsurface delineation was scheduled following backfilling activities.

Sonic Drilling Investigation

A second attempt at subsurface delineation was conducted with a sonic drill rig on July 22, 2019. In anticipation of encountering groundwater, monitoring wells were permitted with the New Mexico Office of the State Engineer (NMOSE) and were installed following soil boring activities. On June 22 through June 24, 2019, LTE used a sonic drill rig to advance boreholes (MW01 through MW08) to collect soil samples for laboratory analysis and determine the lateral and vertical impacts outside of the existing excavation extent. Soil samples were collected in a continuous soil sampler by an LTE geologist, described, and field screened with a PID at six-inch to one-foot intervals based on sample recovery. Samples were collected and submitted for laboratory analysis at the depths where elevated field screening results were observed and at the bottom of the boring. The borings and monitoring well locations are identified in Figure 3. Soil boring logs are included as Attachment 1. Samples were analyzed for BTEX and TPH by methods previously listed.

The monitoring wells were constructed with 2-inch inside diameter (ID) schedule 40 polyvinyl chloride (PVC) casing and screen. The screen was factory-slotted with a slot size of 0.010 inches. The screened interval for each monitoring well was 15 feet in length. A 10-20 size silica sand pack was used to fill the annular space from the bottom of the screen to approximately 2 feet above the top of screen. The sand pack was overlain by hydrated bentonite chips to the ground surface. The monitoring wells were completed as stick-ups with approximately 3 feet of PVC riser extending above the excavation floor.

Results

The geology at the Site consists of dark reddish-brown, dry, silty sand to approximately 14 feet bgs, followed by a loose, dry, sand and gravel with cobbles greater than eight inches in diameter to approximately 25 feet bgs. From approximately 25 feet to 35 feet bgs, a dense, light brown, slightly moist, sandy silt was encountered. Moist sediments were encountered near 30 feet bgs, but no saturated sediments were observed and no clear water table was identified in the soil borings. LTE set the groundwater monitoring wells with screened intervals corresponding to the moist intervals and the depth of the excavation where potential groundwater was previously observed.

Field-identified soil impacts consisting of visual staining, hydrocarbon odors, and/or elevated field screening results were observed in the hand auger borehole HA-1 (9 to 11.5 ft bgs), excavation grab samples (GR01 @ 28', GR04 @ 28', GR05 @ 28', and GR06 @ 28'), and in monitoring well borehole sample MW01 @ 25'-30'. The TPH concentrations exceeding the NMOCD remediation action level ranged from 180 mg/kg in monitoring well borehole MW01 @ 25'-30' to 11,100 mg/kg in hand auger borehole HA-1 @ 11'. A benzene concentration of 20 mg/kg was detected in hand auger borehole HA-1 @ 11'. Total BTEX concentrations exceeding the NMOCD remediation action level ranged from 276 mg/kg in excavation grab sample GR06 @ 28' to 1,061 mg/kg in hand auger borehole HA-1 @ 11'.

All other soil samples were compliant with NMOCD remediation action levels for benzene, BTEX, and TPH, or were below laboratory detection limits for the listed parameters. The soil analytical results as compared to the NMOCD remediation action levels are presented in Table 1. The laboratory analytical reports are included as Attachment 3.

The grab sample of the groundwater accumulating in a trench at the lowest point of the excavation extent near 29 feet bgs exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard for benzene, toluene, and total xylenes. Results are presented in Table 2 and the laboratory analytical report is in Attachment 3.

Monitoring Well Groundwater Gauging

Following installation, LTE personnel were onsite to gauge groundwater levels and develop the monitoring wells on June 26, 2019. During this event, groundwater was not observed in any of the wells. On August 1, 2019, LTE return to the Site to determine if groundwater had infiltrated the monitoring wells with enough of a volume to develop or collect groundwater samples. Again, no groundwater was observed in any of the monitoring wells.

Conclusions

Based on the excavation characterization soil samples and monitoring well borehole soil samples, impacts to soil have been laterally and vertically defined at the Site. Excluding the already excavated impacted material, an estimated 600 cubic yards of impacted soil remain in place. Impacts appears to be confined to the dense, sandy silt beneath the cobble matrix, from approximately 25 feet to 30 feet bgs. Soil sample results exceeding NMOCD remediation action levels were limited to hand auger borehole HA-1, excavation grab samples GR01 @ 28', GR04 @ 28', GR05 @ 28', GR06 @ 28', and monitoring well borehole MW01 @ 25'-30'. All remaining soils samples are in compliant with NMOCD remediation action levels. The extent of the remaining impacted soil is identified on Figure 3.

Impacts to groundwater were not observed beyond the initial water sample collected in the base of the excavation which exceeds NMWQCC standards. No groundwater has been observed in any of the monitoring wells since installation. Based on the lack of groundwater in the monitoring wells, it is anticipated that the observed water in the excavation was a result of precipitation infiltrating over time into the open excavation and adsorbing into the finer grained, confining sandy silt lithology. At this time, LTE has estimated groundwater at the Site to be between 50 and 100 feet bgs based on nearby topographic features.

RECOMMENDATIONS

Based on the limited area of impact that exceeds the NMOCD remediation action level and the existing locations of the de facto soil vapor extraction wells, LTE recommends a multi-tiered, in-situ, intermittent SVE remediation approach. Due to the lack of observed groundwater in the monitoring wells, LTE proposes using the existing wells as soil vapor extraction (SVE) wells. The wells were completed with 2-inch diameter schedule 40 polyvinyl chloride (PVC) casing with 0.010" slotted screened intervals placed in the zone where field identified impacts were observed.

LTE proposes utilizing a portable air compressor and installing Venturi-style "T" fittings on the SVE wells. The Venturi T contains a nozzle that increases air velocity through the fitting. When air flow is applied, the air velocity increases which creates a pressure differential that induces vacuum and air flow from the SVE well. The resulting vacuum draws hydrocarbon impacts from the subsurface towards the SVE well. The exhaust of the SVE well is piped into a 55-gallon drum which acts as a knockout tank to capture and contain any fluids recovered while SVE operations are conducted. Induced vacuum gauge, volumetric air flow, and PID field screening will be recorded during each event.

During the first SVE event, LTE proposes using the Venturi T on monitoring wells MW02, MW03, MM05, MW06, and MW07 to observe if any soil vapor is recovered from these wells and determine if additional soil vapor recovery locations are viable. While these monitoring wells did

not exhibit any soil impacts during installation, there is potential to recover soil vapor and remediate existing impacts within the radius of influence of the induced vacuum from the Venturi T.

Subsequent to the first testing event, LTE recommends conducting dual SVE/bioventing events with the portable air compressor every week for four weeks. During each event, the air compressor will be used for eight consecutive hours to induce vacuum via the Venturi T on all wells that demonstrated recoverable vapor. Wells that are not being pulled on or did not recovery vapors during the initial event will be used as biovent wells. Ambient air from the portable air compressor will be directed via a manifold into the biovent wells to introduce supplemental oxygen into the subsurface to promote biological activity and the biodegradation of recalcitrant hydrocarbon impacts. Indigenous aerobic bacterial activity is enhanced with the addition of oxygen and encourages the biodegradation of excess organic material, such as hydrocarbons, in an in-situ remediation method known as bioventing. Additionally, the bioventing wells will facilitate ambient air advection and optimize the SVE progress.

An air sample will be collected and submitted for laboratory analysis during the first and fourth SVE/bioventing event to determine the effective reduction and remediation of impacts. Once laboratory analytical results are received, LTE will propose additional SVE events or conduct confirmation closure sampling. If remediation progress and effectiveness are not observed within the first four events, LTE will propose alternative means of achieving cleanup at that time. However, SVE is a tested remediation technology and is well suited for this site-specific application.

If a significant decline in air sample laboratory analytical results is observed, indicating sufficient mass source removal, confirmation soil samples will be collected via hollow-stem auger in the areas where previous soil samples were collected that exceeded NMOCD remediation action levels. Soil samples will be submitted for laboratory analysis of BTEX and TPH. If laboratory analytical results indicate that confirmation soil sample TPH, benzene, and BTEX concentrations are compliant with NMOCD remediation action levels, Hilcorp will request that this Site be granted a No Further Action status. A letter report detailing closure sampling will be submitted under separate cover. Existing AS/SVE wells will be plugged with hydrated bentonite and abandoned in place following status approval.

During each of the SVE events, LTE will continue gauging the monitoring wells to determine if groundwater has infiltrated the wells. If groundwater is encountered in the monitoring wells, a grab sample will be collected and submitted for analysis of volatile organic compounds (full list VOCs) by EPA Method 8260, total dissolved solids, pH, and cations and anions by EPA Method 300.0.

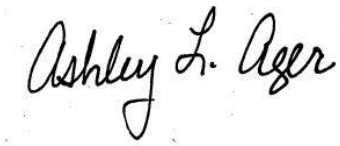
SCHEDULE

Hilcorp will initiate the first remediation event within 3 weeks of approval of this remediation work plan.

LTE appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work 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, M.S., P.G.
Senior Geologist

cc: Jennifer Deal, Hilcorp Energy Company

Attachments:

Figure 1 – Site Location Map
Figure 2 – Initial Site Investigation Map
Figure 3 – Monitoring Well Borehole Map
Table 1 – Soil Analytical Results
Table 2 – Water Analytical Results
Attachment 1 – Photo Log
Attachment 2 - Soil Boring Logs
Attachment 3 – Laboratory Analytical Reports

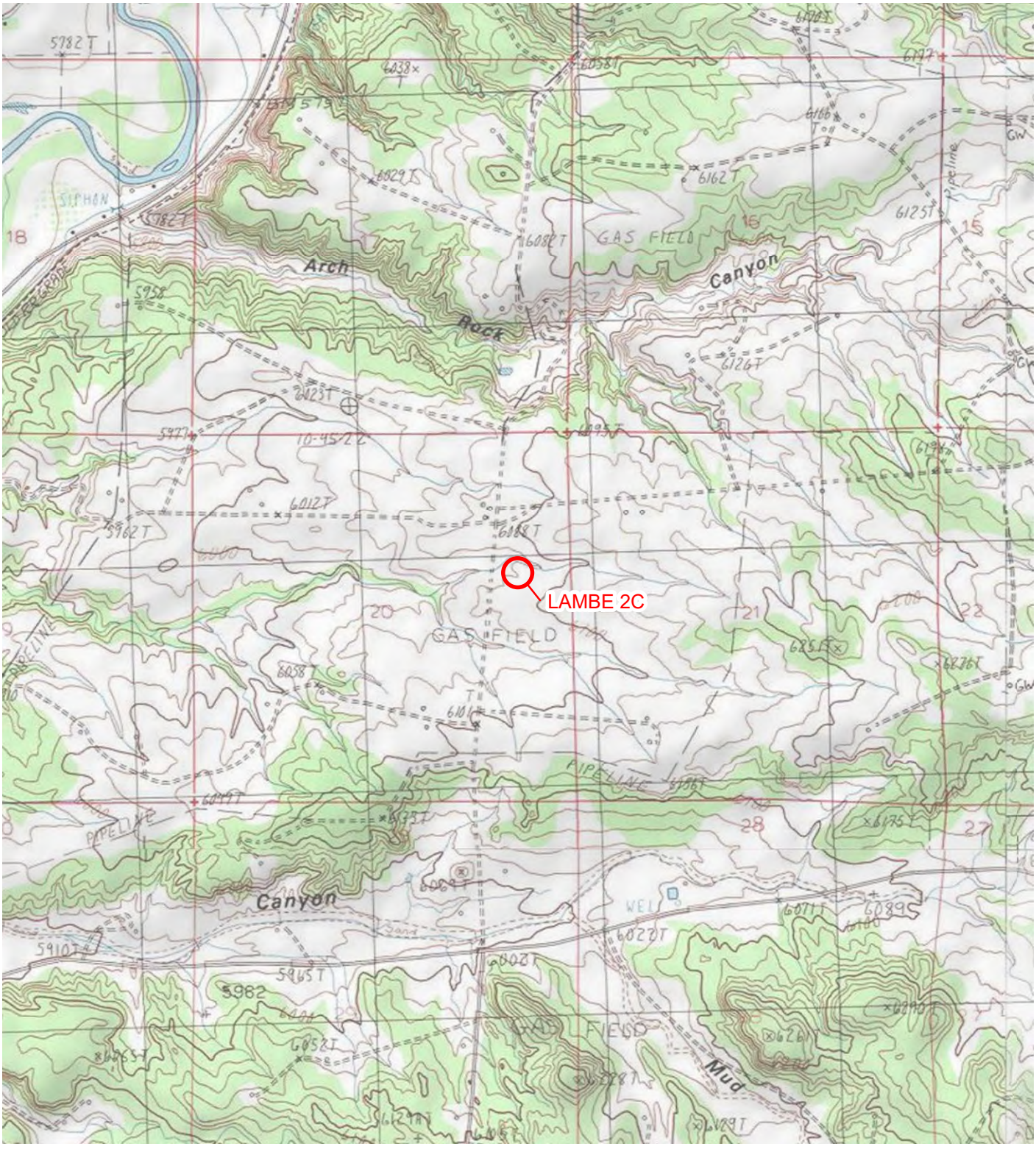


IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

NEW MEXICO

FIGURE 1
SITE LOCATION MAP
LAMBE 2C
SENE SEC 20 T31N R10W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017818055_LAMBE 2C\017818055_FIG01_SL_2019.mxd

SAMPLE ID @ DEPTH BELOW GROUND SURFACE (FEET)
SAMPLE DATE
B: BENZENE IN MILLIGRAMS PER KILOGRAM (mg/kg)
BTEX: TOTAL BTEX (mg/kg)
TPH: TOTAL PETROLEUM HYDROCARBONS (mg/kg)
BOLD: INDICATES RESULT EXCEEDS THE APPLICABLE STANDARD
<: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT
*GW01 RESULTS ARE IN MILLIGRAMS PER LITER (mg/L)

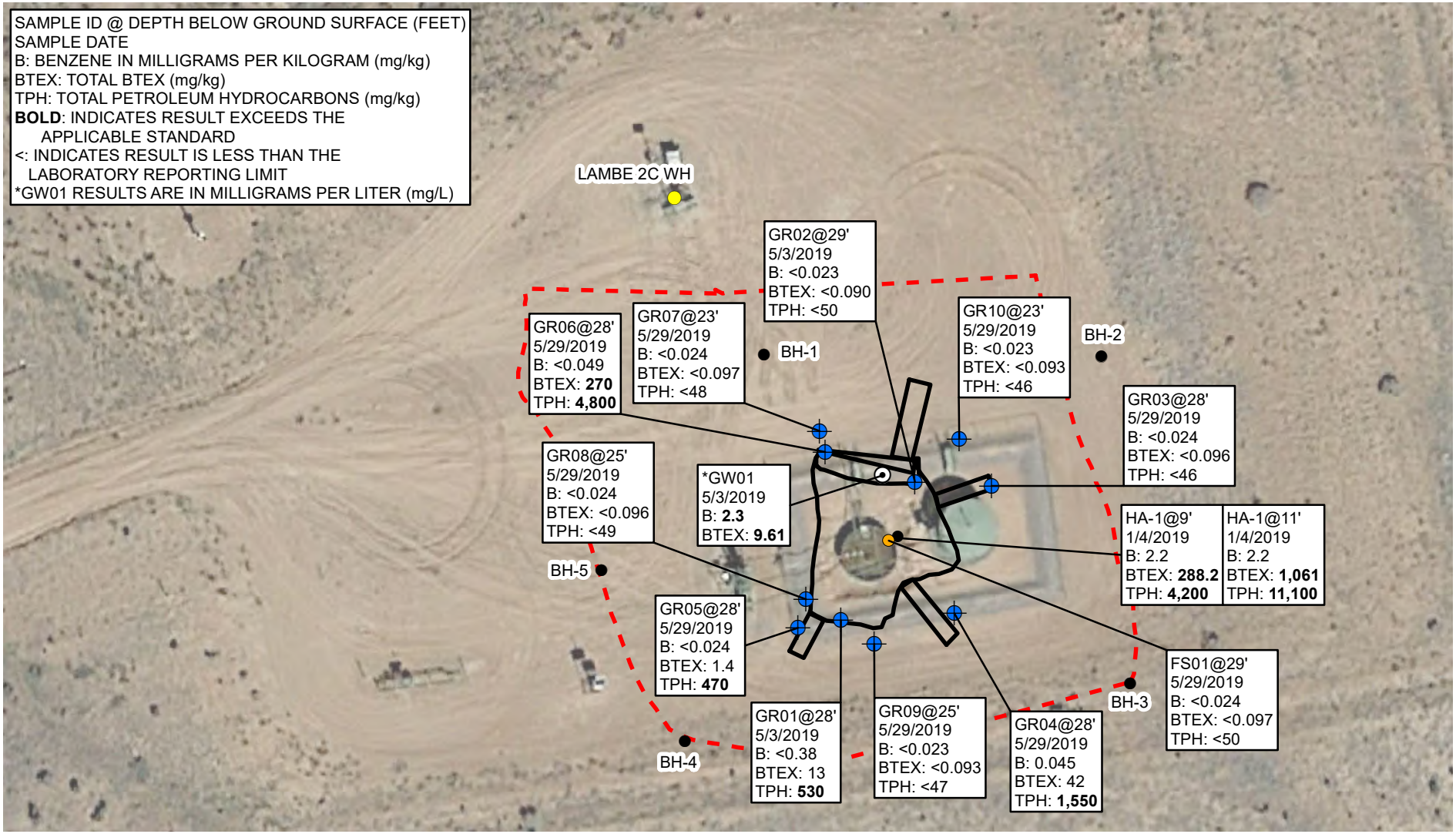


IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- WELLHEAD
- BOREHOLE
- COMPOSITE SOIL SAMPLE
- DISCRETE SOIL SAMPLE
- GROUNDWATER GRAB SAMPLE
- EXCAVATION EXTENT 05/03/2019
- BASE OF EXCAVATION

0 40 80
Feet

N

FIGURE 2
INITIAL SITE INVESTIGATION AND RESULTS
LAMBE 2C
SENE SEC 20 T31N R10W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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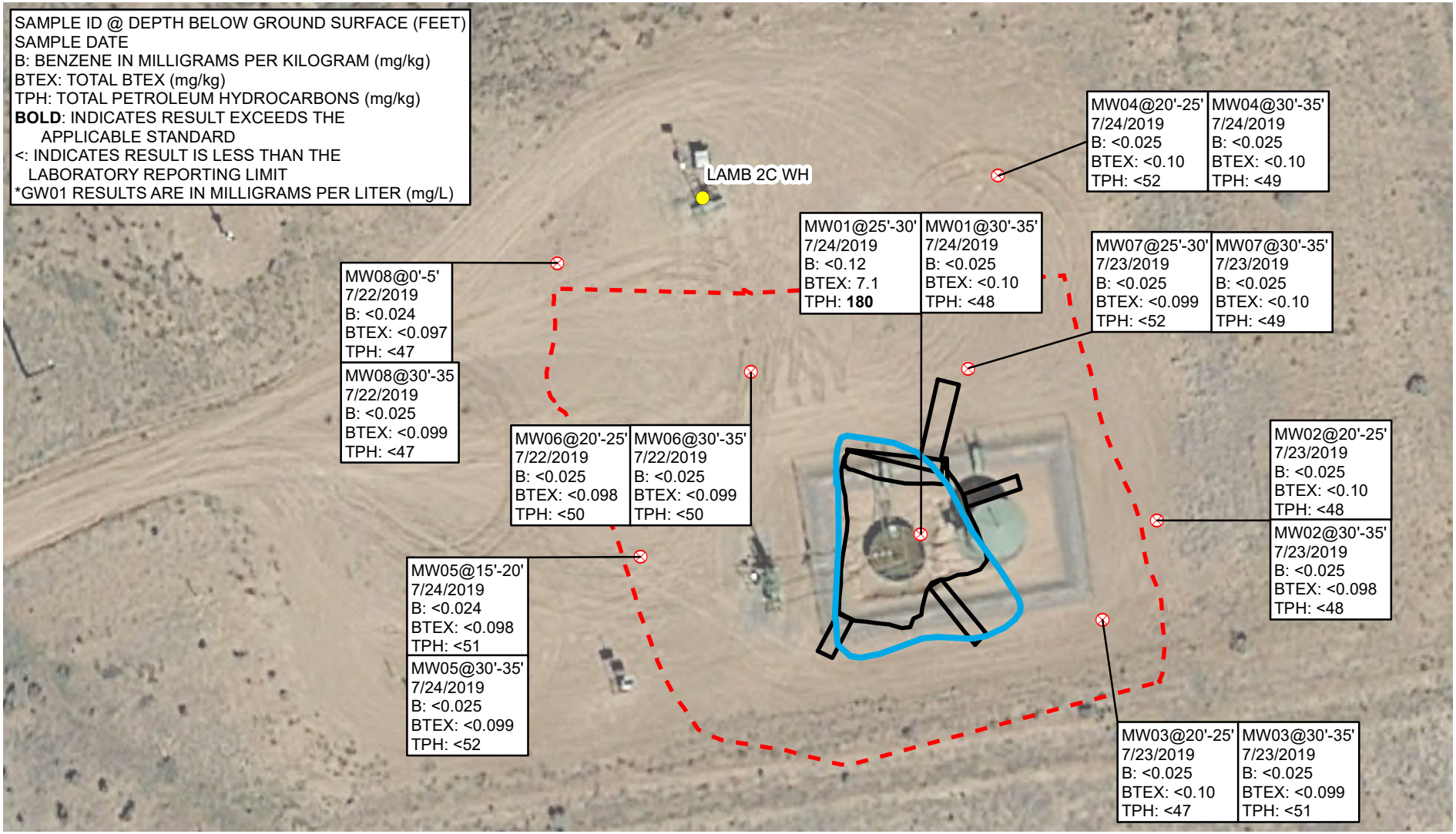

IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- MONITORING WELL
- WELLHEAD
- EXCAVATION EXTENT 05/03/2019
- BASE OF EXCAVATION
- REMAINING IMPACTED SOIL

0 40 80
Feet

N

FIGURE 3
MONITORING WELL BOREHOLE RESULTS
LAMBE 2C
SENE SEC 20 T31N R10W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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TABLE 1
SOIL ANALYTICAL RESULTS

LAMBE 2C
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)
Initial Hand Auger Investigation Samples											
HA-1 @ 9'	1/4/2019	2,639	2.2	57	19	210.0	**288.2**	3,200	1,000	<490	**4,200**
HA-1 @ 11'	1/4/2019	1,760	**20**	270	61	710.0	**1,061**	7,300	3,800	<470	**11,100**
Open Excavation Grab/Characterization Samples											
GR01 @ 28'	5/3/2019	3,512	<0.38	0.89	0.81	11.0	12.70	200	330	<46	**530**
GR02 @ 29'	5/3/2019	98.1	<0.023	<0.045	<0.045	<0.090	<0.090	<4.5	<9.9	<50	<50
GR03 @ 28'	5/29/2019	3.2	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.1	<46	<46
GR04 @ 28'	5/29/2019	4,852	0.045	2.5	2.5	37.0	42.05	550	1,000	<480	**1,550**
GR05 @ 28'	5/29/2019	2,460	<0.024	<0.048	<0.048	1.4	1.40	50	420	<46	**470**
GR06 @ 28'	5/29/2019	7,348	<0.49	35	21	220.0	**276**	2,600	2,200	<490	**4,800**
GR07 @ 23'	5/29/2019	3.8	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	<9.6	<48	<48
GR08 @ 25'	5/29/2019	3.1	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.9	<49	<49
GR09 @ 25'	5/29/2019	3.1	<0.023	<0.047	<0.047	<0.093	<0.093	<4.7	<9.3	<47	<47
GR10 @ 23'	5/29/2019	2.4	<0.023	<0.046	<0.046	<0.093	<0.093	<4.6	<9.2	<46	<46
FS01 @ 29'	5/29/2019	3.5	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<10	<50	<50
Monitoring Well Installation/Soil Boring Samples											
MW01 @ 25' - 30'	7/24/2019	>5,000	<0.12	0.36	0.56	6.2	7.1	120	60	<50	**180**
MW01 @ 30' - 35'	7/24/2019	18.6	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.5	<48	<48
MW02 @ 20' - 25'	7/23/2019	3.5	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.5	<48	<48
MW02 @ 30' - 35'	7/23/2019	1.1	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<9.6	<48	<48
MW03 @ 20' -25'	7/23/2019	7.5	<0.025	<0.025	<0.050	<0.10	<0.10	<5.0	<9.4	<47	<47
MW03 @ 30' - 35'	7/23/2019	5.3	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<10	<51	<51
MW04 @ 20' - 25'	7/24/2019	7	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<10	<52	<52
MW04 @ 30' - 35'	7/24/2019	2.2	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.8	<49	<49
MW05 @ 15' - 20'	7/24/2019	19.9	<0.024	<0.024	<0.049	<0.049	<0.098	<4.9	<10	<51	<51
MW05 @ 30' - 35'	7/24/2019	7.2	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<52	<52

TABLE 1
SOIL ANALYTICAL RESULTS

LAMBE 2C
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)
MW06 @ 20' - 25'	7/22/2019	20	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<10	<50	<50
MW06 @ 30' - 35'	7/22/2019	0.0	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<50	<50
MW07 @ 25' - 30'	7/23/2019	>5,000	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<10	<52	<52
MW07 @ 30' - 35'	7/23/2019	42.3	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.9	<49	<49
MW08 @ 0' - 5'	7/22/2019	11.8	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<9.4	<47	<47
MW08 @ 30' - 35'	7/22/2019	3.0	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.3	<47	<47
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

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
WATER ANALYTICAL RESULTS

LAMBE 2C
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
GW01	05/03/2019	**2.3**	**4.5**	0.210	**2.6**
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: PHOTO LOG

Excavation Extent

	Lambe 2C Hilcorp Energy Company	LTE Advancing Opportunity
May 6, 2019	Photographic Log	

Cobbles in the subsurface

	Lambe 2C Hilcorp Energy Company	LTE Advancing Opportunity
May 6, 2019	Photographic Log	

Trenching Activities

	Lambe 2C Hilcorp Energy Company	LTE Advancing Opportunity
May 6, 2019	Photographic Log	

ATTACHMENT 2: SOIL BORING LOGS

LTE Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: HA-1	Project: Lambe 2C
Date: 1-4-2019	Project Number: 017818055
Logged By: Josh Adams	Drilled By: Geomat
Elevation:	Detector: PID
Drilling Method: ~~Hollow Stem~~ Hand Auger	Sampling Method: Continuous/~~Split Spoon~~
Gravel Pack:	Seal:
Grout:	
Casing Type:	Diameter: 2" Length:
Hole Diameter:	Depth to Liquid:
Screen Type:	Slot: Diameter: 2" Length:
Total Depth: 11.5	Depth to Water:

Vapor | Moisture

Penetration Resistance	~~Moisture Content~~	~~Vapor (ppm)~~	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
									Hand Auger in BGT hole top 4-4.5' removed already	
					0				7.5 YR 4/6 dark brown	
					1					
					2					
					3					
					4					
	2133	M	N		5		E	ML	7.5 YR 4/6 dark brown sandy silt, cohesive, plastic, no stain Strong HC odor	
	1781	M	N		6		E	ML		
	1863	M	N		7		E	ML		
	2550	M	N		8			ML		
	2639	M	N	HA1 @9' 1106	9			CL	7.5YR 4/6 dark brown sandy leancley very cohesive, plastic, no stain Strong HC odor	
	2631	M	N		10					
	1760	M	N	HA1 @11' 1115	11				SAA w/ some gravel intermixed	
					12				refusal @ 11.5' cobble	
					13					
					14					
					15					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: BH-1	Project: Lambe 2C
Date: 1-3-2019	Project Number: 017818055
Logged By: Josh Adams	Drilled By: Geomat
Elevation:	Detector: PID
Drilling Method: Hollow Stem	Sampling Method: Continuous/Split Spoon
Gravel Pack:	Seal:
Grout:	
Casing Type:	Diameter: 2" Length:
Hole Diameter:	Depth to Liquid:
Screen Type: Slot:	Diameter: 2" Length:
Total Depth: 12'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0	0-5			NR	
					1					
					2					
	M	0.6	N		3	0-5		mL	light brown/brow sandy Silt, 2.5YR 4/8, no sheen or odor cohesive, plastic	
					4					
	M	0.4	N		5	0-5		mL	SAA	
	M	0.8	N		6	5-9		mL	SAA w/ ~~light brown~~ white/pink clays (10R 8/4) intermixed + fe stain increased clay content	
					7					
	M	1.1	N		8	5-9		mL		
					9					
	D	0.8	N		10	9-10		SP	poorly graded sand w/gravel) 9-12' sampled w/ split spoon due to increased penetration resistance	
	M	1.0	N		11	10-12		SP	SAA	
					12					
					13				refusal @ 12' cobbles	
					14					
					15					

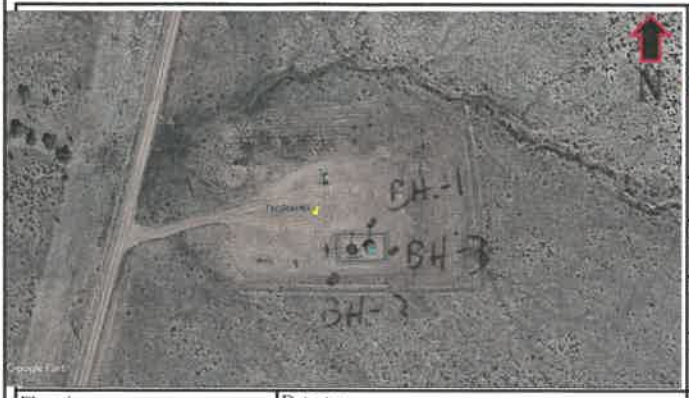
Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: BH-2	Project: Lambe 2C
Date: 1-3-2019	Project Number: 017818055
Logged By: Josh Adams	Drilled By: Geomat
Elevation:	Detector: PID
Drilling Method: Hollow Stem	Sampling Method: Continuous/Split Spoon
Gravel Pack:	Seal:
Grout:	
Casing Type:	Diameter: 2" Length:
Hole Diameter:	Depth to Liquid:
Screen Type: Slot:	Diameter: 2" Length:
Total Depth: 10'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	M	0.4	N		0 1 2	0.5'		ML	7.5YR 5/8 Brown Silty Sand cohesive, slightly plastic, no stain or odor	
	M	0.1	N		3 4 5	0.5'		ML	SAA	
					6 7 8 9	5-9'			gravel/cobbles encountered ≈6' remove continous sampler NR Sampled 9-10' w/split spoon due to cobbles	
					10	9-10'		SP	No sample, cobble	
					11 12 13 14 15				Refusal @ 10' cobble	



Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: BH-3	Project: Lambe 2C
Date: 1-3-2019	Project Number: 017818005
Logged By: Josh Adams	Drilled By: Geomat
Elevation:	Detector: PID
Drilling Method: Hollow Stem	Sampling Method: Continuous/Split Spoon
Gravel Pack:	Seal:
Grout:	
Casing Type:	Diameter: 2" Length:
Hole Diameter:	Depth to Liquid:
Screen Type: Slot:	Diameter: 2" Length:
Total Depth: 4.5'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0	0-5	X	NR	7.5YR 5/8 Brown, sandy silt, cohesive, slightly plastic, no odor or stain	
	M	0.2	N		2	0-5		ML	↓	
	M	0.3	N		4	0-5		ML	SAA	
	M	0.3	N		6	5-7.5		ML	SAA	
	D	0.1	N		7	5-7.5		SP	brown poorly graded Sand w/gravel	
					8				cobbles encountered, remake sampler, NR	
					9					
					10				refusal @ 9.5' cobbles	
					11					
					12					
					13					
					14					
					15					

Advancing Opportunity
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Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: BH-4	Project: Lambe 2C
Date: 1-3-2019	Project Number: 0178180055
Logged By: Josh Adams	Drilled By: Geomat
Elevation:	Detector: PID
Drilling Method: Hollow Stem	Sampling Method: Continuous/Split Spoon
Gravel Pack:	Seal:
Grout:	
Casing Type:	Diameter: 2" Length:
Hole Diameter:	Depth to Liquid:
Screen Type: Slot:	Diameter: 2" Length:
Total Depth: 9.0'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0	0-5	X	NR	10YR 3/6 dark brown sandy silt cohesive, plastic no odor or stain	
					1					
	M	0.6	N		2	0-5	≈	ML		
					3					
	M	0.4	N		4	0-5	≈	ML	SAA	
					5					
					6	5-8	X		NR	
		0.4			7	5-8	≈	CH	10YR 3/6 dark brown sandy fat clay some gravel @ bottom of sampler	
					8					
					9				cobbles/gravel encountered ≈8' bgs, remove sampler	
					10					
					11				refusal @ 9' cobbles	
					12					
					13					
					14					
					15					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW01	Project: Lambe 2C
Date: 7/24/19	Project Number: 0178180SS
Logged By: E. Carroll	Drilled By: Cascade
Elevation:	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand	Seal: Bentonite
Grout: Bentonite	
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: 15'
Total Depth: 35'	Depth to Water: 29'

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		0			SP-SM	med. dense, red brown silty sand Excavation backfill to ~20'	
					1					
					2					
					3					
					4					
	moist	1.6	NO		5					
					6					
					7					
					8					
					9					
	moist	4.2	NO		10					
					11					
					12					
					13					
					14					
	moist	6.3	NO		15					

Advancing Opportunity

Boring/Well #	MW01
Project:	Lambe 2c
Project #	0117818055
Date	7/24/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16				Excavation backfill	
					17					
					18					
	moist	10.6	NP		19			SP-SM		
					20					
					21			GP	Loose, lt brown, coarse sand and gravel Cobbles >8" diameter	
					22	5				
					23					
					24					
	Dry	14.3	NO		25					
					26				Dense, dark brown/black Silty Sand, some clay <25% small band of staining, Strong odor	
					27			SC		
					28	6				
					29					
	moist	>5,000	yes small band ~1.5"		30					
					31					
					32					
					33	7				
					34				Dense, lt brown, Silty Sand trace clay <10% no Stain	
					35			SM		
	moist	~~186~~ 18.6	NO		36					
					37					

Advancing Opportunity

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW02		Project: Lambe 2C	
Date: 7/23/19		Project Number: 017818055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: Continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15	Total Depth: 35'	Depth to Water: 29'

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		0			SP-SM	Dense, reddish brown Coarse Sand some gravel no stain/odor	
					1					
					2					
					3	1				
	Dry	1.1	No		4					
					5			SP-SM	SAA no Stain/odor	
					6					
					7					
					8	2				
					9					
	Dry	1.3	No		10			SP-SM	SAA no Stain/odor	
					11					
					12					
					13	3				
					14				Loose, lt brown coarse sand	
	Dry	0.8	No		15			GP	and gravel cobbles 78" diameter	

Advancing Opportunity

Boring/Well #	MW02
Project:	Lambe QC
Project #	017818055
Date	7/23/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
					17	4				
					18					
	Dry	2.1	No		19			GP	Loose, lt brown coarse Sand and gravel cobbles 7-8" diameter no stain/odor	
					20					
					21					
					22					
					23	5				
	Dry	3.5	NO	MW02 20'-25' 1400	24			GP	SAA no stain/odor	
					25					
					26					
	Wet	0.6	NO		27			SM	Dense, lt brown, med. Sand some Silt <15% no Stain odor	
					28					
					29	6		GW		GW
	moist	0.4	No		30					
					31			SM	Compact, yellow brown Sandy Silt no Stain/odor	
					32					
					33			SC	Compact, dark brown/black, Sandy Silt, some clay <20% no Stain/odor	
					34	7				
	moist	1.1	NO	MW02 30'-35' 1500	35			SM	Compact, yellow brown, Sandy Silt no Stain/odor	
					36					
					37					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW03		Project: Lambe 2C	
Date: 7/23/19		Project Number: 017818055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: Continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15'	Total Depth: 35' Depth to Water: 27'

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		0			SP-SM	Dry med. dense, reddish brown Silty sand (backfill) no stain/odor	
					1					
					2	1				
					3					
					4					
	Dry	1.1	NO		5			SP-SM	SAA	
					6					
					7					
					8	2				
					9					
	Dry	1.4	NO		10			SP-SM	SAA	
					11					
					12					
					13	3				
					14					
	Dry ~~0.6~~	0.6	NO		15			SP-SM	SAA	

Advancing Opportunity

Boring/Well #	MW03
Project:	Lambe 2C
Project #	017818055
Date	7/23/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16			SP-SM	SAA no stain/odor	
					17	4				
					18				Loose, lt brown, Sand and gravel	
	Dry	4.4	NO		19			GP	Cobbles > 6"	
					20				no stain/odor	
					21					
					22					
					23	5				
	Dry	7.5	NO		24			GP	SAA no Stain/odor	
					25					
					26			GP. GW	Loose, dark red brown, coarse Sand and gravel, wet no Stain/odor	GW
	wet	3.0	NO		27					
					28	6		SM	dense, med silty Sand, trace clay < 10%	
	moist	3.3	NO		29				no Stain/odor	
					30					
					31				Compact, dark brown/black, Silty Sand	
	moist	5.0	NO		32			SC	some clay < 25% no stain/odor	
					33	7				
					34			SM	Dense, lt brown silty Sand, trace clay < 10% no stain/odor	
	moist	5.3	NO		35					
					36				TD = 35'	
					37					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW04		Project: Lambe 2C	
Date: 7/24/19		Project Number: 017818055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: Continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15'	Total Depth: 35' / Depth to Water: 27'

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		0			SP-SM	Dry, lt. reddish brown, silty sand	
					1					
					2					
					3	1				
					4					
	Dry	1.3	No		5			SP-SM	SAA no stain/odor	
					6					
					7					
					8	2				
					9					
	Dry	1.1	No		10			SP-SM	SAA no stain/odor	
					11					
					12					
					13	3				
					14			GP	Loose, lt. brown coarse sand and gravel cobbles > 8" diameter no stain/odor	
	Dry	2.0	No		15					

Advancing Opportunity

Boring/Well #	MW04
Project:	Lambe 2C
Project #	C17818055
Date	7/24/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
					17	4				
					18					
					19			GP	Loose, lt brown, Sand and gravel, cobbles >8" diameter	
	Dry	5.8	NO		20				no stain/odor	
					21					
					22					
					23	5				
					24			GP	SAA, no stain/odor	
	Dry	6.6	NO		25					
					26					
					27			GW	Loose, saturated, coarse Sand	
	wet	6.5	NO		28	6		GP	and gravel, no stain/odor	
					29			SM	Dense, lt. brown silty sand, trace clay < 10% no stain/odor	
	moist	5.2	NO		30					
					31					
					32	7				
					33					
					34			SM	SAA no stain/odor	
	moist	2.2	no		35					
					36				TD = 35'	
					37					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05		Project: Lambe 2C	
Date: 7/24/19		Project Number: 01781805	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15'	Total Depth: 35' / 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
	wet	0.8	no		0			SP-SM	wet, dark reddish brown, silty sand no stain/odor	
					1					
					2					
					3	1				
					4					
	Dry	1.1	no		5			SP-SM	SAA no stain/odor	
					6					
					7					
					8	2				
					9					
	Dry	1.3	no		10			SP-SM	SAA no stain/odor	
					11					
					12					
					13	3				
					14				loose, lt. brown, sand and gravel cobbles > 8" diameter no stain/odor	
	Dry	1.2	no		15			GP		

Advancing Opportunity

Boring/Well #	MW05
Project:	Lambe 7C
Project #	
Date	7/24/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
					17	4				
					18					
	Dry	19.9	NO	MW05 15'-20' 940	19			GP	SAA no Stain/Odor	
					20					
					21					
					22					
					23	5		GP	SAA no Stain/Odor	
					24					
	Dry	13.4	NO		25					
								GW		GW
					26					
	Wet	0.3	NO		27			SM	Dense, lt. brown, Silty Sand trace Clay < 10% no Stain/Odor	
					28	6				
	moist	7.8	NO		29					
					30			SC	Dense, dark brown black Silty Sand Some Clay < 25% no Stain/Odor	
					31					
					32					
					33					
					34			SM	Dense, lt brown, Silty Sand, trace Clay < 10% no Stain/Odor	
	moist	7.2	NO	MW05 30'-35' 1100	35					
					36					
					37					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW06		Project: Lambe 2C	
Date: 7/22/19		Project Number: 017816055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15'	Total Depth: 35'	Depth to Water: 28'

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		0	1		SP-SM	compact, lt. reddish brown, medium grain poorly sorted, trace silt clots	
					1					
					2					
					3	1				
					4					
					5			SP-SM	SAA no stain/odor	
					6					
					7					
					8	2				
	Dry	1.1	NO		9			GP	Loose, lt. brown, Poorly Sorted coarse sand and gravel, cobbles up to 8" diameter no stain/odor	
					10					
					11					
					12					
					13	3				
					14					
		9.8			15			GP	SAA, cobbles < 8" diameter no stain/odor	

LTE Advancing Opportunity

Boring/Well #	MW06
Project:	Lambe 2C
Project #	0178180055
Date	7/22/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
					17					
					18	4		GP	SAA no stain/odor	
	Dry	5.1	NO		19					
					20					
					21					
					22					
					23	5				
				MW06	24			GP	SAA no stain/odor	
	moist	19.9	NO	20-25' 8:15	25					
					26					
					27			GP	SAA no stain/odor	
	wet					GW				GW
					28	6				
					29				compact, dark brown black, fine sand and silt, some clay <15% no stain/odor	
	moist	1.6	NO		30			SM		
					31					
					32	7				
					33					
				MW06	34			SM	Compact, lt brown, fine sandy silt some clay <15% no stain/odor	
	moist	0.0	NO	30-35' 9:00	35					
					36					
					37					

Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW07		Project: Lambe 2C	
Date: 7/23/19		Project Number: 017818055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15	Total Depth: 35 / Depth to Water: 28'

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		0			SP-SM	medium dense, lt reddish brown coarse sand, some gravel <20% (backfill) no stain/odor	
					1					
					2					
					3	1				
					4					
					5					
					6					
					7					
					8	2				
	Moist	2.3	No		9			SP-SM	SAA no stain/odor	
					10					
					11					
					12					
					13	3				
					14			SP-SM	SAA no stain/odor	
	Moist	3.4	No		15					

Advancing Opportunity

Boring/Well #	MW07
Project:	Lambe 2C
Project #	
Date	7/23/19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
					17	4				
					18					
	moist	10.6	NO		19			GP	loose, lt brown, coarse sand and gravel cobbles > 8" no stain/odor	
					20					
					21					
					22					
					23	5				
					24			GP	SAA no stain/odor	
	moist	17.8	No		25					
					26					
					27					
					28	6		GW	compact, fine sandy silt, trace clay <10%, no stain strong odor	GW
	moist	75,000	NO	MW07 25'-30' 10:30	29			SM		
					30					
					31					
					32					
					33	7				
					34			SC	compact, fine sandy silt some clay <20% no stain/odor	
	moist	42.3	no	MW07 30'-35' 11:00	35					
					36				TD: 35'	
					37					

LTE Advancing Opportunity

848 E. 2nd Ave
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW08		Project: Lambe 2C	
Date: 7/22/2019		Project Number: 017618055	
Logged By: E. Carroll		Drilled By: Cascade	
Elevation:	Detector: PID	Drilling Method: Sonic	Sampling Method: Continous
Gravel Pack: 10-20 Silica Sand		Seal: Bentonite	Grout: Bentonite
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: 15'	Total Depth: 35' 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	0.0	No		0			SP-SM	Compact, lt. reddish brown, medium Poorly Sorted Sand, trace silt <10%	Stickup
					1					
					2	1				
					3					
					4					
	Dry	11.8	No		5			SP-SM	SAA	
					6					
					7				Loose, lt brown, poorly sorted coarse sand and gravel, cobbles up to 8" diameter	
					8	2				
					9			GP		
	Dry	4.7	No		10				no stain/odor	
					11					
					12					
					13	3				
					14			GP	SAA, cobbles greater than 8"	
	Dry	0.9	NO		15				no Stain/odor	

Advancing Opportunity

Boring/Well #	MW08
Project:	Lambe 2C
Project #	01781805 5
Date	7/22/2019

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.1	No		15–20	4		GP	SAA no stain/odor	
	Dry	3.6	No		21–25	5		GP	SAA no stain/odor	
					25			GW	Wet, to dark red fine ~~coarse~~ sand and gravel	GW
					26–30	6		SM / SC	Very dense, yellow brown, platy clay and silt no stain/odor	
	moist	2.7	no							
					31–35	7		SC	SAA no stain/odor	
	moist	3.0	NP							
					36				TD = 35'	
					37					

ATTACHMENT 3: LABORATORY ANALYTICAL REPORTS

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

January 11, 2019

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

RE: Lambe 2C OrderNo.: 1901177

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 2 sample(s) on 1/5/2019 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 **1901177**
Date Reported: **1/11/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: HA-1@9'
Project: Lambe 2C
Collection Date: 1/4/2019 11:00:00 AM
Lab ID: 1901177-001 **Matrix:** SOIL
Received Date: 1/5/2019 11:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	1000	97		mg/Kg	10	1/9/2019 3:07:21 PM
Motor Oil Range Organics (MRO)	ND	490		mg/Kg	10	1/9/2019 3:07:21 PM
Surr: DNOP	0	50.6-138	S	%Rec	10	1/9/2019 3:07:21 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	3200	98		mg/Kg	20	1/9/2019 9:37:44 AM
Surr: BFB	376	73.8-119	S	%Rec	20	1/9/2019 9:37:44 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	2.2	0.49		mg/Kg	20	1/9/2019 9:37:44 AM
Toluene	57	0.98		mg/Kg	20	1/9/2019 9:37:44 AM
Ethylbenzene	19	0.98		mg/Kg	20	1/9/2019 9:37:44 AM
Xylenes, Total	210	2.0		mg/Kg	20	1/9/2019 9:37:44 AM
Surr: 4-Bromofluorobenzene	130	80-120	S	%Rec	20	1/9/2019 9:37:44 AM
EPA METHOD 300.0: ANIONS						Analyst: **smb**
Chloride	ND	30		mg/Kg	20	1/9/2019 12:25:07 PM

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: HA-1@11'
Project: Lambe 2C
Collection Date: 1/4/2019 11:15:00 AM
Lab ID: 1901177-002 **Matrix:** SOIL
Received Date: 1/5/2019 11:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	3800	93		mg/Kg	10	1/9/2019 3:55:20 PM
Motor Oil Range Organics (MRO)	ND	470		mg/Kg	10	1/9/2019 3:55:20 PM
Surr: DNOP	0	50.6-138	S	%Rec	10	1/9/2019 3:55:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	7300	940		mg/Kg	200	1/9/2019 7:01:49 PM
Surr: BFB	182	73.8-119	S	%Rec	200	1/9/2019 7:01:49 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	20	0.47		mg/Kg	20	1/9/2019 10:01:11 AM
Toluene	270	9.4		mg/Kg	200	1/9/2019 7:01:49 PM
Ethylbenzene	61	0.94		mg/Kg	20	1/9/2019 10:01:11 AM
Xylenes, Total	710	19		mg/Kg	200	1/9/2019 7:01:49 PM
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	200	1/9/2019 7:01:49 PM
EPA METHOD 300.0: ANIONS						Analyst: **smb**
Chloride	48	30		mg/Kg	20	1/9/2019 12:37:32 PM

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901177**

11-Jan-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID **MB-42496**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **42496**	RunNo: **56853**
Prep Date: **1/8/2019**	Analysis Date: **1/9/2019**	SeqNo: **1902954** 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	9.7		10.00		96.8	50.6	138			

Sample ID **LCS-42496**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **42496**	RunNo: **56853**
Prep Date: **1/8/2019**	Analysis Date: **1/9/2019**	SeqNo: **1902975** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	100	70	130			
Surr: DNOP	4.6		5.000		91.3	50.6	138			

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901177**

11-Jan-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID	**MB-42491**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBS**	Batch ID:	**42491**		RunNo:	**56872**				
Prep Date:	**1/8/2019**	Analysis Date:	**1/9/2019**		SeqNo:	**1903162**	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	980		1000		98.0	73.8	119			

Sample ID	**LCS-42491**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSS**	Batch ID:	**42491**		RunNo:	**56872**				
Prep Date:	**1/8/2019**	Analysis Date:	**1/9/2019**		SeqNo:	**1903163**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	103	80.1	123			
Surr: BFB	1100		1000		110	73.8	119			

Sample ID	**MB-42518**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBS**	Batch ID:	**42518**		RunNo:	**56885**				
Prep Date:	**1/9/2019**	Analysis Date:	**1/10/2019**		SeqNo:	**1904141**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	970		1000		97.3	73.8	119			

Sample ID	**LCS-42518**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSS**	Batch ID:	**42518**		RunNo:	**56885**				
Prep Date:	**1/9/2019**	Analysis Date:	**1/10/2019**		SeqNo:	**1904142**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1100		1000		110	73.8	119			

Sample ID	**MB-42514**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBS**	Batch ID:	**42514**		RunNo:	**56885**				
Prep Date:	**1/9/2019**	Analysis Date:	**1/10/2019**		SeqNo:	**1904148**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	940		1000		94.1	73.8	119			

Sample ID	**LCS-42514**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSS**	Batch ID:	**42514**		RunNo:	**56885**				
Prep Date:	**1/9/2019**	Analysis Date:	**1/10/2019**		SeqNo:	**1904149**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1100		1000		110	73.8	119			

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901177**

11-Jan-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID **MB-42491**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **42491**	RunNo: **56872**
Prep Date: **1/8/2019**	Analysis Date: **1/9/2019**	SeqNo: **1903187** 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	1.0		1.000		99.9	80	120			

Sample ID **LCS-42491**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **42491**	RunNo: **56872**
Prep Date: **1/8/2019**	Analysis Date: **1/9/2019**	SeqNo: **1903188** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	92.1	80	120			
Toluene	0.96	0.050	1.000	0	96.2	80	120			
Ethylbenzene	0.97	0.050	1.000	0	96.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.9	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID **MB-42518**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **42518**	RunNo: **56885**
Prep Date: **1/9/2019**	Analysis Date: **1/10/2019**	SeqNo: **1904170** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.99		1.000		99.4	80	120			

Sample ID **LCS-42518**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **42518**	RunNo: **56885**
Prep Date: **1/9/2019**	Analysis Date: **1/10/2019**	SeqNo: **1904171** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.0		1.000		102	80	120			

Sample ID **MB-42514**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **42514**	RunNo: **56885**
Prep Date: **1/9/2019**	Analysis Date: **1/10/2019**	SeqNo: **1904177** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.96		1.000		95.8	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901177**

11-Jan-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID	**LCS-42514**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**
Client ID:	**LCSS**	Batch ID:	**42514**	RunNo:	**56885**
Prep Date:	**1/9/2019**	Analysis Date:	**1/10/2019**	SeqNo:	**1904178** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.96		1.000		96.0	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: 1901177 RcptNo: 1

Received By: **Anne Thorne** 1/5/2019 11:50:00 AM Anne Thorne

Completed By: **Isaiah Ortiz** 1/7/2019 3:12:49 PM I-Ok

Reviewed By: ENM 1/7/19

LB: DAD 1/7/19

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: DAD 1/7/19

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	1.3	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy - L48 West
Jennifer Deal

Mailing Address:

Phone #: 505-324-5128

email or Fax#: jdeal@hilcorp.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☒ EDD (Type) PDF

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Lambe 2C

Project #: 017818055

Project Manager: Devin Hencmann

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.7 + CF -0.4 = 1.3°

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 Request ID	Container Type and #	Preservative Type	HEAL No. 1901197	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	chlorides (300.0)				Air Bubbles (Y or N)
1-4-19	1100	soil	HA-1 @ 9'	(1) 4oz	cool	-001	X		X									X				
↓	1115	↓	HA-1 @ 11'	↓	↓	-002	X		X									X				

Date: 1-4-19 Time: 1445 Relinquished by: Josh Adams Received by: [signature] Date: 1/4/19 Time: 1445

Date: 1/4/19 Time: 1811 Relinquished by: [signature] Received by: [signature] Date: 1/5/19 Time: 0711

Remarks: cc: dhencmann@ltenv.com
jadams@ltenv.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.

A 01104119

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

May 15, 2019

Jennifer Deal

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

RE: Lambe 2C OrderNo.: 1905231

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/4/2019 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: GW01
Project: Lambe 2C
Collection Date: 5/3/2019 2:00:00 PM
Lab ID: 1905231-001
Matrix: AQUEOUS
Received Date: 5/4/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Benzene	2300	25		µg/L	50	5/7/2019 1:52:09 PM	R59702
Toluene	4500	25		µg/L	50	5/7/2019 1:52:09 PM	R59702
Ethylbenzene	210	25		µg/L	50	5/7/2019 1:52:09 PM	R59702
Xylenes, Total	2600	38		µg/L	50	5/7/2019 1:52:09 PM	R59702
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	50	5/7/2019 1:52:09 PM	R59702
Surr: 4-Bromofluorobenzene	92.5	70-130		%Rec	50	5/7/2019 1:52:09 PM	R59702
Surr: Dibromofluoromethane	101	70-130		%Rec	50	5/7/2019 1:52:09 PM	R59702
Surr: Toluene-d8	94.9	70-130		%Rec	50	5/7/2019 1:52:09 PM	R59702

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: GR01@28'
Project: Lambe 2C
Collection Date: 5/3/2019 2:05:00 PM
Lab ID: 1905231-002
Matrix: MEOH (SOIL)
Received Date: 5/4/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	330	9.1		mg/Kg	1	5/7/2019 2:17:16 PM	44736
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/7/2019 2:17:16 PM	44736
Surr: DNOP	97.8	70-130		%Rec	1	5/7/2019 2:17:16 PM	44736
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	200	76		mg/Kg	20	5/6/2019 11:25:08 AM	G59658
Surr: BFB	191	73.8-119	S	%Rec	20	5/6/2019 11:25:08 AM	G59658
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.38		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Toluene	0.89	0.76		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Ethylbenzene	0.81	0.76		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Xylenes, Total	11	1.5		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	20	5/6/2019 11:25:08 AM	R59658

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: GR02@29'
Project: Lambe 2C
Collection Date: 5/3/2019 2:20:00 PM
Lab ID: 1905231-003
Matrix: MEOH (SOIL)
Received Date: 5/4/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/7/2019 2:39:16 PM	44736
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/7/2019 2:39:16 PM	44736
Surr: DNOP	93.9	70-130		%Rec	1	5/7/2019 2:39:16 PM	44736
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.5		mg/Kg	1	5/6/2019 11:47:50 AM	G59658
Surr: BFB	95.9	73.8-119		%Rec	1	5/6/2019 11:47:50 AM	G59658
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.023		mg/Kg	1	5/6/2019 11:47:50 AM	R59658
Toluene	ND	0.045		mg/Kg	1	5/6/2019 11:47:50 AM	R59658
Ethylbenzene	ND	0.045		mg/Kg	1	5/6/2019 11:47:50 AM	R59658
Xylenes, Total	ND	0.090		mg/Kg	1	5/6/2019 11:47:50 AM	R59658
Surr: 4-Bromofluorobenzene	92.7	80-120		%Rec	1	5/6/2019 11:47:50 AM	R59658

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#: **1905231**

15-May-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **LCS-44736**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **44736**	RunNo: **59674**
Prep Date: **5/6/2019**	Analysis Date: **5/7/2019**	SeqNo: **2012068** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	96.9	63.9	124			
Surr: DNOP	4.0		5.000		79.8	70	130			

Sample ID: **MB-44736**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **44736**	RunNo: **59674**
Prep Date: **5/6/2019**	Analysis Date: **5/7/2019**	SeqNo: **2012069** 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	9.7		10.00		97.0	70	130			

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#: **1905231**

15-May-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **G59658**	RunNo: **59658**
Prep Date:	Analysis Date: **5/6/2019**	SeqNo: **2011127** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.5	80.1	123			
Surr: BFB	1000		1000		104	73.8	119			

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **G59658**	RunNo: **59658**
Prep Date:	Analysis Date: **5/6/2019**	SeqNo: **2011128** 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	900		1000		89.9	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#: **1905231**

15-May-19

Client: Hilcorp Energy

Project: Lambe 2C

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

Client ID: **LCSS** Batch ID: **R59658** RunNo: **59658**

Prep Date: Analysis Date: **5/6/2019** SeqNo: **2011130** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	109	80	120			
Toluene	0.93	0.050	1.000	0	93.1	80	120			
Ethylbenzene	0.91	0.050	1.000	0	91.2	80	120			
Xylenes, Total	2.7	0.10	3.000	0	89.7	80	120			
Surr: 4-Bromofluorobenzene	0.94		1.000		93.6	80	120			

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

Client ID: **PBS** Batch ID: **R59658** RunNo: **59658**

Prep Date: Analysis Date: **5/6/2019** SeqNo: **2011140** 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	0.89		1.000		88.5	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1905231**

15-May-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R59702**	RunNo: **59702**
Prep Date:	Analysis Date: **5/7/2019**	SeqNo: **2012832** 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	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.6	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.1	70	130			
Surr: Toluene-d8	9.4		10.00		94.3	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R59702**	RunNo: **59702**
Prep Date:	Analysis Date: **5/7/2019**	SeqNo: **2012843** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	18	1.0	20.00	0	88.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.5	70	130			
Surr: 4-Bromofluorobenzene	9.0		10.00		90.2	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.4	70	130			
Surr: Toluene-d8	9.2		10.00		91.7	70	130			

Sample ID: **1905231-001a ms**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **GW01**	Batch ID: **R59702**	RunNo: **59702**
Prep Date:	Analysis Date: **5/7/2019**	SeqNo: **2012908** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3400	50	1000	2324	106	70	130			
Toluene	5300	50	1000	4507	80.8	70	130			E
Surr: 1,2-Dichloroethane-d4	540		500.0		108	70	130			
Surr: 4-Bromofluorobenzene	470		500.0		94.6	70	130			
Surr: Dibromofluoromethane	510		500.0		103	70	130			
Surr: Toluene-d8	500		500.0		99.2	70	130			

Sample ID: **1905231-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **GW01**	Batch ID: **R59702**	RunNo: **59702**
Prep Date:	Analysis Date: **5/7/2019**	SeqNo: **2012909** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3400	50	1000	2324	107	70	130	0.207	20	
Toluene	5200	50	1000	4507	67.4	70	130	2.56	20	ES

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#: **1905231**

15-May-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **1905231-001a msd** SampType: **MSD** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **GW01** Batch ID: **R59702** RunNo: **59702**

Prep Date: Analysis Date: **5/7/2019** SeqNo: **2012909** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	540		500.0		108	70	130	0	0	
Surr: 4-Bromofluorobenzene	460		500.0		91.7	70	130	0	0	
Surr: Dibromofluoromethane	510		500.0		102	70	130	0	0	
Surr: Toluene-d8	470		500.0		94.9	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

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: **1905231** RcptNo: **1**

Received By: **Isaiah Ortiz** **5/4/2019 8:50:00 AM** I-OK

Completed By: **Yazmine Garduno** **5/4/2019 10:08:42 AM** Yazmine Garduno

Reviewed By: YG 5/4/19

LB: JJC 5-6-19

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 ☐	

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

Adjusted? _____

Checked by: JJC 5-6-19

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	2.4	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp

Mailing Address:

Attn: Jennifer Deal

Phone #:

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: 48 hr TAT

☐ Standard ☒ Rush

Project Name: Lambe 2C

Project #:

Project Manager: LTE - Danny Burns

Sampler: D. Burns

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.4°

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. 1905231	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) B-TEX only	8270 (Semi-VOA)	Total Coliform (Present/Absent)
5-3-19	1400	AQ	GW01	3 VOAs	NONE	-001								X		
5-3-19	1415	SOIL	GR01@28'	1-4oz	↓	-002	X	X								
5-3-19	1420	SOIL	GR02@29'	1-4oz	↓	-003	X	X								

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
5-3-19	15:34				5/3/19	1534
5/3/19	1826			courier	5/4/19	0850

Remarks: cc: dburns@ltenv.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.

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 10, 2019

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

RE: Lambe 2C OrderNo.: 1905E09

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 9 sample(s) on 5/30/2019 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: GR03@28'
Project: Lambe 2C
Collection Date: 5/29/2019 10:30:00 AM
Lab ID: 1905E09-001 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 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	6/4/2019 12:31:15 PM	45307
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/4/2019 12:31:15 PM	45307
Surr: DNOP	120	70-130		%Rec	1	6/4/2019 12:31:15 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/3/2019 5:13:10 PM	45298
Surr: BFB	91.0	73.8-119		%Rec	1	6/3/2019 5:13:10 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/3/2019 5:13:10 PM	45298
Toluene	ND	0.048		mg/Kg	1	6/3/2019 5:13:10 PM	45298
Ethylbenzene	ND	0.048		mg/Kg	1	6/3/2019 5:13:10 PM	45298
Xylenes, Total	ND	0.096		mg/Kg	1	6/3/2019 5:13:10 PM	45298
Surr: 4-Bromofluorobenzene	94.7	80-120		%Rec	1	6/3/2019 5:13:10 PM	45298

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: GR04@28'
Project: Lambe 2C
Collection Date: 5/29/2019 10:35:00 AM
Lab ID: 1905E09-002 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	1000	95		mg/Kg	10	6/4/2019 12:55:30 PM	45307
Motor Oil Range Organics (MRO)	ND	480		mg/Kg	10	6/4/2019 12:55:30 PM	45307
Surr: DNOP	0	70-130	S	%Rec	10	6/4/2019 12:55:30 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	550	47		mg/Kg	10	6/4/2019 4:13:09 PM	45298
Surr: BFB	522	73.8-119	S	%Rec	10	6/4/2019 4:13:09 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.045	0.024		mg/Kg	1	6/3/2019 6:21:17 PM	45298
Toluene	2.5	0.047		mg/Kg	1	6/3/2019 6:21:17 PM	45298
Ethylbenzene	2.5	0.047		mg/Kg	1	6/3/2019 6:21:17 PM	45298
Xylenes, Total	37	0.94		mg/Kg	10	6/4/2019 4:13:09 PM	45298
Surr: 4-Bromofluorobenzene	386	80-120	S	%Rec	1	6/3/2019 6:21:17 PM	45298

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: GR05@28'
Project: Lambe 2C
Collection Date: 5/29/2019 10:40:00 AM
Lab ID: 1905E09-003 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	420	9.2		mg/Kg	1	6/4/2019 1:20:04 PM	45307
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/4/2019 1:20:04 PM	45307
Surr: DNOP	119	70-130		%Rec	1	6/4/2019 1:20:04 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	50	4.8		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Surr: BFB	540	73.8-119	S	%Rec	1	6/3/2019 7:51:49 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Toluene	ND	0.048		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Ethylbenzene	ND	0.048		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Xylenes, Total	1.4	0.097		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Surr: 4-Bromofluorobenzene	128	80-120	S	%Rec	1	6/3/2019 7:51:49 PM	45298

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: GR06@28'
Project: Lambe 2C
Collection Date: 5/29/2019 10:45:00 AM
Lab ID: 1905E09-004 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	2200	98		mg/Kg	10	6/4/2019 1:44:27 PM	45307
Motor Oil Range Organics (MRO)	ND	490		mg/Kg	10	6/4/2019 1:44:27 PM	45307
Surr: DNOP	0	70-130	S	%Rec	10	6/4/2019 1:44:27 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	2600	98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Surr: BFB	824	73.8-119	S	%Rec	20	6/3/2019 8:37:13 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.49		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Toluene	35	0.98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Ethylbenzene	21	0.98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Xylenes, Total	220	20		mg/Kg	200	6/4/2019 4:36:26 PM	45298
Surr: 4-Bromofluorobenzene	158	80-120	S	%Rec	20	6/3/2019 8:37:13 PM	45298

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: GR07@23'
Project: Lambe 2C
Collection Date: 5/29/2019 11:10:00 AM
Lab ID: 1905E09-005 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 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	6/4/2019 2:08:55 PM	45307
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/4/2019 2:08:55 PM	45307
Surr: DNOP	126	70-130		%Rec	1	6/4/2019 2:08:55 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/3/2019 8:59:52 PM	45298
Surr: BFB	98.7	73.8-119		%Rec	1	6/3/2019 8:59:52 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	6/4/2019 4:59:44 PM	45298
Toluene	ND	0.048		mg/Kg	1	6/4/2019 4:59:44 PM	45298
Ethylbenzene	ND	0.048		mg/Kg	1	6/4/2019 4:59:44 PM	45298
Xylenes, Total	ND	0.097		mg/Kg	1	6/4/2019 4:59:44 PM	45298
Surr: 4-Bromofluorobenzene	92.8	80-120		%Rec	1	6/4/2019 4:59:44 PM	45298

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: GR08@25'
Project: Lambe 2C
Collection Date: 5/29/2019 11:15:00 AM
Lab ID: 1905E09-006
Matrix: SOIL
Received Date: 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	6/4/2019 2:33:11 PM	45307
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/4/2019 2:33:11 PM	45307
Surr: DNOP	117	70-130		%Rec	1	6/4/2019 2:33:11 PM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/3/2019 9:22:58 PM	45298
Surr: BFB	97.2	73.8-119		%Rec	1	6/3/2019 9:22:58 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/3/2019 9:22:58 PM	45298
Toluene	ND	0.048		mg/Kg	1	6/3/2019 9:22:58 PM	45298
Ethylbenzene	ND	0.048		mg/Kg	1	6/3/2019 9:22:58 PM	45298
Xylenes, Total	ND	0.096		mg/Kg	1	6/3/2019 9:22:58 PM	45298
Surr: 4-Bromofluorobenzene	91.0	80-120		%Rec	1	6/3/2019 9:22:58 PM	45298

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: GR09@25'
Project: Lambe 2C
Collection Date: 5/29/2019 11:20:00 AM
Lab ID: 1905E09-007 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	6/5/2019 8:27:34 AM	45307
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/5/2019 8:27:34 AM	45307
Surr: DNOP	100	70-130		%Rec	1	6/5/2019 8:27:34 AM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/3/2019 9:45:59 PM	45298
Surr: BFB	94.7	73.8-119		%Rec	1	6/3/2019 9:45:59 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	6/3/2019 9:45:59 PM	45298
Toluene	ND	0.047		mg/Kg	1	6/3/2019 9:45:59 PM	45298
Ethylbenzene	ND	0.047		mg/Kg	1	6/3/2019 9:45:59 PM	45298
Xylenes, Total	ND	0.093		mg/Kg	1	6/3/2019 9:45:59 PM	45298
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	6/3/2019 9:45:59 PM	45298

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: GR10@23'
Project: Lambe 2C
Collection Date: 5/29/2019 11:25:00 AM
Lab ID: 1905E09-008 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	6/5/2019 8:52:56 AM	45307
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2019 8:52:56 AM	45307
Surr: DNOP	95.3	70-130		%Rec	1	6/5/2019 8:52:56 AM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/3/2019 10:08:56 PM	45298
Surr: BFB	95.5	73.8-119		%Rec	1	6/3/2019 10:08:56 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	6/3/2019 10:08:56 PM	45298
Toluene	ND	0.046		mg/Kg	1	6/3/2019 10:08:56 PM	45298
Ethylbenzene	ND	0.046		mg/Kg	1	6/3/2019 10:08:56 PM	45298
Xylenes, Total	ND	0.093		mg/Kg	1	6/3/2019 10:08:56 PM	45298
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	6/3/2019 10:08:56 PM	45298

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: FS01@29'
Project: Lambe 2C
Collection Date: 5/29/2019 11:30:00 AM
Lab ID: 1905E09-009 **Matrix:** SOIL **Received Date:** 5/30/2019 8:00:00 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	6/5/2019 9:16:47 AM	45307
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/5/2019 9:16:47 AM	45307
Surr: DNOP	90.2	70-130		%Rec	1	6/5/2019 9:16:47 AM	45307
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/3/2019 10:31:51 PM	45298
Surr: BFB	94.3	73.8-119		%Rec	1	6/3/2019 10:31:51 PM	45298
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/3/2019 10:31:51 PM	45298
Toluene	ND	0.049		mg/Kg	1	6/3/2019 10:31:51 PM	45298
Ethylbenzene	ND	0.049		mg/Kg	1	6/3/2019 10:31:51 PM	45298
Xylenes, Total	ND	0.097		mg/Kg	1	6/3/2019 10:31:51 PM	45298
Surr: 4-Bromofluorobenzene	95.7	80-120		%Rec	1	6/3/2019 10:31:51 PM	45298

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#: **1905E09**

10-Jun-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID: **LCS-45307**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **45307**	RunNo: **60359**
Prep Date: **5/31/2019**	Analysis Date: **6/4/2019**	SeqNo: **2041753** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	104	63.9	124			
Surr: DNOP	5.3		5.000		105	70	130			

Sample ID: **MB-45307**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **45307**	RunNo: **60359**
Prep Date: **5/31/2019**	Analysis Date: **6/4/2019**	SeqNo: **2041754** 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	11		10.00		114	70	130			

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#: **1905E09**

10-Jun-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID: **1905E09-001AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **GR03@28'** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041015** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.8	23.76	0	85.1	69.1	142			
Surr: BFB	980		950.6		103	73.8	119			

Sample ID: **1905E09-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **GR03@28'** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041016** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.7	23.65	0	86.9	69.1	142	1.67	20	
Surr: BFB	980		946.1		103	73.8	119	0	0	

Sample ID: **LCS-45298** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041036** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.1	80.1	123			
Surr: BFB	1000		1000		102	73.8	119			

Sample ID: **MB-45298** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041037** 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	890		1000		89.3	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#: **1905E09**

10-Jun-19

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID: **1905E09-002AMS** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **GR04@28'** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041048** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.023	0.9363	0.04481	82.5	63.9	127			
Toluene	3.1	0.047	0.9363	2.450	69.2	69.9	131			S
Ethylbenzene	3.3	0.047	0.9363	2.481	87.3	71	132			
Xylenes, Total	35	0.094	2.809	35.25	5.72	71.8	131			ES
Surr: 4-Bromofluorobenzene	3.6		0.9363		386	80	120			S

Sample ID: **1905E09-002AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **GR04@28'** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041049** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.78	0.024	0.9699	0.04481	76.2	63.9	127	4.24	20	
Toluene	3.6	0.048	0.9699	2.450	120	69.9	131	15.4	20	
Ethylbenzene	3.8	0.048	0.9699	2.481	136	71	132	14.1	20	S
Xylenes, Total	41	0.097	2.910	35.25	182	71.8	131	13.5	20	ES
Surr: 4-Bromofluorobenzene	4.0		0.9699		412	80	120	0	0	S

Sample ID: **LCS-45298** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041067** 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	100	80	120			
Toluene	1.1	0.050	1.000	0	105	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		106	80	120			

Sample ID: **MB-45298** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **45298** RunNo: **60348**

Prep Date: **5/31/2019** Analysis Date: **6/3/2019** SeqNo: **2041068** 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	0.97		1.000		96.5	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 FAR Work Order Number: 1905E09 RcptNo: 1

Received By: **Anne Thorne** 5/30/2019 8:00:00 AM

Completed By: **Erin Melendrez** 5/30/2019 11:21:34 AM

Reviewed By: YG 5/30/19

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 preserved 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 5-30-19

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	3.6	Good	Yes			
2	2.6	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy Company

Mailing Address:

Phone #: 505-324-5128

email or Fax#: jdeal@hilcorp.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validatio

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other____
☐ EDD (Type) ____ PDF

Turn-Around Time:
☒ Standard ☐ Rush____

Project Name:
Lambe 2C

Project #:

Project Manager:
Hilcorp - Jennifer Deal
LTE - Danny Burns

Sampler: D. Burns
On Ice: ☒ Yes ☐ No
# of Coolers: 2
Cooler Temp(including CF): 3.1+0.2CF = 3.4°C 2.4+0.2CF = 2.6°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. 1905E09	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)
5/29/2019	10:30	Soil	GR03@28'	1-4 oz jar	cool	-001	X	X								
5/29/2019	10:35	Soil	GR04@28'	1-4 oz jar	cool	-002	X	X								
5/29/2019	10:40	Soil	GR05@28'	1-4 oz jar	cool	-003	X	X								
5/29/2019	10:45	Soil	GR06@28'	1-4 oz jar	cool	-004	X	X								
5/29/2019	11:10	Soil	GR07@23'	1-4 oz jar	cool	-005	X	X								
5/29/2019	11:15	Soil	GR08@25'	1-4 oz jar	cool	-006	X	X								
5/29/2019	11:20	Soil	GR09@25'	1-4 oz jar	cool	-007	X	X								
5/29/2019	11:25	Soil	GR10@23'	1-4 oz jar	cool	-008	X	X								
5/29/2019	11:30	Soil	FS01@29'	1-4 oz jar	cool	-009	X	X								

Date:	Time:	Relinquished by	Received by:	Via:	Date	Time
5-29-19	18:00				5/29/19	1800
5/29/19	1819				05/30/19	0800

Remarks: cc: dburns@ltenv.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.

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

August 07, 2019

Jennifer Deal

Hilcorp Energy
PO Box PO Box 4700
Farmington, NM 84701
TEL:
FAX

RE: Lambe 2C OrderNo.: 1907D51

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 16 sample(s) on 7/26/2019 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: MW08 0'-5'
Project: Lambe 2C
Collection Date: 7/22/2019 12:00:00 PM
Lab ID: 1907D51-001 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/1/2019 9:11:49 AM	46522
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/1/2019 9:11:49 AM	46522
Surr: DNOP	88.2	70-130		%Rec	1	8/1/2019 9:11:49 AM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 6:27:52 PM	46521
Surr: BFB	97.4	73.8-119		%Rec	1	8/1/2019 6:27:52 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 6:27:52 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 6:27:52 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 6:27:52 PM	46521
Xylenes, Total	ND	0.099		mg/Kg	1	8/1/2019 6:27:52 PM	46521
Surr: 4-Bromofluorobenzene	96.6	80-120		%Rec	1	8/1/2019 6:27:52 PM	46521

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: MW08 30'-35'
Project: Lambe 2C
Collection Date: 7/22/2019 1:00:00 PM
Lab ID: 1907D51-002 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/1/2019 3:50:56 PM	46522
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/1/2019 3:50:56 PM	46522
Surr: DNOP	81.6	70-130		%Rec	1	8/1/2019 3:50:56 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/1/2019 7:39:01 PM	46521
Surr: BFB	97.5	73.8-119		%Rec	1	8/1/2019 7:39:01 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/1/2019 7:39:01 PM	46521
Toluene	ND	0.049		mg/Kg	1	8/1/2019 7:39:01 PM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/1/2019 7:39:01 PM	46521
Xylenes, Total	ND	0.097		mg/Kg	1	8/1/2019 7:39:01 PM	46521
Surr: 4-Bromofluorobenzene	97.1	80-120		%Rec	1	8/1/2019 7:39:01 PM	46521

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: MW06 30'-35'
Project: Lambe 2C
Collection Date: 7/23/2019 9:00:00 AM
Lab ID: 1907D51-003 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/5/2019 9:25:24 AM	46522
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/5/2019 9:25:24 AM	46522
Surr: DNOP	95.1	70-130		%Rec	1	8/5/2019 9:25:24 AM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/1/2019 8:50:14 PM	46521
Surr: BFB	95.6	73.8-119		%Rec	1	8/1/2019 8:50:14 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 8:50:14 PM	46521
Toluene	ND	0.049		mg/Kg	1	8/1/2019 8:50:14 PM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/1/2019 8:50:14 PM	46521
Xylenes, Total	ND	0.099		mg/Kg	1	8/1/2019 8:50:14 PM	46521
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	8/1/2019 8:50:14 PM	46521

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: MW06 20'-25'
Project: Lambe 2C
Collection Date: 7/23/2019 8:15:00 AM
Lab ID: 1907D51-004 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 4:35:29 PM	46522
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/1/2019 4:35:29 PM	46522
Surr: DNOP	74.0	70-130		%Rec	1	8/1/2019 4:35:29 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/1/2019 9:13:51 PM	46521
Surr: BFB	97.8	73.8-119		%Rec	1	8/1/2019 9:13:51 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 9:13:51 PM	46521
Toluene	ND	0.049		mg/Kg	1	8/1/2019 9:13:51 PM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/1/2019 9:13:51 PM	46521
Xylenes, Total	ND	0.098		mg/Kg	1	8/1/2019 9:13:51 PM	46521
Surr: 4-Bromofluorobenzene	97.4	80-120		%Rec	1	8/1/2019 9:13:51 PM	46521

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: MW02 20'-25'
Project: Lambe 2C
Collection Date: 7/23/2019 2:00:00 PM
Lab ID: 1907D51-005 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 4:57:52 PM	46522
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/1/2019 4:57:52 PM	46522
Surr: DNOP	84.9	70-130		%Rec	1	8/1/2019 4:57:52 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 9:37:27 PM	46521
Surr: BFB	94.6	73.8-119		%Rec	1	8/1/2019 9:37:27 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 9:37:27 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 9:37:27 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 9:37:27 PM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/1/2019 9:37:27 PM	46521
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	8/1/2019 9:37:27 PM	46521

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: MW02 30'-35'
Project: Lambe 2C
Collection Date: 7/23/2019 3:00:00 PM
Lab ID: 1907D51-006 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 5:20:12 PM	46522
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/1/2019 5:20:12 PM	46522
Surr: DNOP	77.0	70-130		%Rec	1	8/1/2019 5:20:12 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/1/2019 10:01:01 PM	46521
Surr: BFB	97.0	73.8-119		%Rec	1	8/1/2019 10:01:01 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 10:01:01 PM	46521
Toluene	ND	0.049		mg/Kg	1	8/1/2019 10:01:01 PM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/1/2019 10:01:01 PM	46521
Xylenes, Total	ND	0.098		mg/Kg	1	8/1/2019 10:01:01 PM	46521
Surr: 4-Bromofluorobenzene	97.0	80-120		%Rec	1	8/1/2019 10:01:01 PM	46521

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: MW03 20'-25'
Project: Lambe 2C
Collection Date: 7/23/2019 4:20:00 PM
Lab ID: 1907D51-007 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/1/2019 5:43:01 PM	46522
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/1/2019 5:43:01 PM	46522
Surr: DNOP	73.5	70-130		%Rec	1	8/1/2019 5:43:01 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 10:24:41 PM	46521
Surr: BFB	94.7	73.8-119		%Rec	1	8/1/2019 10:24:41 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 10:24:41 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 10:24:41 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 10:24:41 PM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/1/2019 10:24:41 PM	46521
Surr: 4-Bromofluorobenzene	95.4	80-120		%Rec	1	8/1/2019 10:24:41 PM	46521

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: MW03 30'-35'
Project: Lambe 2C
Collection Date: 7/23/2019 5:00:00 PM
Lab ID: 1907D51-008 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 6:05:32 PM	46522
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	8/1/2019 6:05:32 PM	46522
Surr: DNOP	80.2	70-130		%Rec	1	8/1/2019 6:05:32 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 10:48:14 PM	46521
Surr: BFB	94.4	73.8-119		%Rec	1	8/1/2019 10:48:14 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 10:48:14 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 10:48:14 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 10:48:14 PM	46521
Xylenes, Total	ND	0.099		mg/Kg	1	8/1/2019 10:48:14 PM	46521
Surr: 4-Bromofluorobenzene	94.9	80-120		%Rec	1	8/1/2019 10:48:14 PM	46521

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: MW04 20'-25'
Project: Lambe 2C
Collection Date: 7/24/2019 3:50:00 PM
Lab ID: 1907D51-009 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 6:28:12 PM	46522
Motor Oil Range Organics (MRO)	ND	52		mg/Kg	1	8/1/2019 6:28:12 PM	46522
Surr: DNOP	80.6	70-130		%Rec	1	8/1/2019 6:28:12 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 11:11:46 PM	46521
Surr: BFB	97.9	73.8-119		%Rec	1	8/1/2019 11:11:46 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 11:11:46 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 11:11:46 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 11:11:46 PM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/1/2019 11:11:46 PM	46521
Surr: 4-Bromofluorobenzene	98.6	80-120		%Rec	1	8/1/2019 11:11:46 PM	46521

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: MW04 30'-35'
Project: Lambe 2C
Collection Date: 7/24/2019 4:30:00 PM
Lab ID: 1907D51-010 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 6:50:42 PM	46522
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/1/2019 6:50:42 PM	46522
Surr: DNOP	87.5	70-130		%Rec	1	8/1/2019 6:50:42 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/2019 11:35:22 PM	46521
Surr: BFB	95.6	73.8-119		%Rec	1	8/1/2019 11:35:22 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/1/2019 11:35:22 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/1/2019 11:35:22 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/1/2019 11:35:22 PM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/1/2019 11:35:22 PM	46521
Surr: 4-Bromofluorobenzene	95.1	80-120		%Rec	1	8/1/2019 11:35:22 PM	46521

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: MW05 15'-20'
Project: Lambe 2C
Collection Date: 7/24/2019 9:40:00 AM
Lab ID: 1907D51-011 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 7:13:23 PM	46522
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	8/1/2019 7:13:23 PM	46522
Surr: DNOP	80.1	70-130		%Rec	1	8/1/2019 7:13:23 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/2/2019 10:38:48 AM	46521
Surr: BFB	103	73.8-119		%Rec	1	8/2/2019 10:38:48 AM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	8/2/2019 10:38:48 AM	46521
Toluene	ND	0.049		mg/Kg	1	8/2/2019 10:38:48 AM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/2/2019 10:38:48 AM	46521
Xylenes, Total	ND	0.098		mg/Kg	1	8/2/2019 10:38:48 AM	46521
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	8/2/2019 10:38:48 AM	46521

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: MW05 30'-35'
Project: Lambe 2C
Collection Date: 7/24/2019 11:00:00 AM
Lab ID: 1907D51-012 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 7:35:47 PM	46522
Motor Oil Range Organics (MRO)	ND	52		mg/Kg	1	8/1/2019 7:35:47 PM	46522
Surr: DNOP	76.8	70-130		%Rec	1	8/1/2019 7:35:47 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/2/2019 11:02:19 AM	46521
Surr: BFB	102	73.8-119		%Rec	1	8/2/2019 11:02:19 AM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/2/2019 11:02:19 AM	46521
Toluene	ND	0.049		mg/Kg	1	8/2/2019 11:02:19 AM	46521
Ethylbenzene	ND	0.049		mg/Kg	1	8/2/2019 11:02:19 AM	46521
Xylenes, Total	ND	0.099		mg/Kg	1	8/2/2019 11:02:19 AM	46521
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	8/2/2019 11:02:19 AM	46521

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: MW01 25'-30'
Project: Lambe 2C
Collection Date: 7/24/2019 1:30:00 PM
Lab ID: 1907D51-013 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	60	10		mg/Kg	1	8/3/2019 10:57:45 AM	46522
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/2019 10:57:45 AM	46522
Surr: DNOP	91.2	70-130		%Rec	1	8/3/2019 10:57:45 AM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	120	25		mg/Kg	5	8/2/2019 3:45:32 PM	46521
Surr: BFB	263	73.8-119	S	%Rec	5	8/2/2019 3:45:32 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.12		mg/Kg	5	8/2/2019 3:45:32 PM	46521
Toluene	0.36	0.25		mg/Kg	5	8/2/2019 3:45:32 PM	46521
Ethylbenzene	0.56	0.25		mg/Kg	5	8/2/2019 3:45:32 PM	46521
Xylenes, Total	6.2	0.50		mg/Kg	5	8/2/2019 3:45:32 PM	46521
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	5	8/2/2019 3:45:32 PM	46521

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: MW01 30'-35'
Project: Lambe 2C
Collection Date: 7/24/2019 2:00:00 PM
Lab ID: 1907D51-014 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/1/2019 8:20:28 PM	46522
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/1/2019 8:20:28 PM	46522
Surr: DNOP	77.4	70-130		%Rec	1	8/1/2019 8:20:28 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/2/2019 11:49:24 AM	46521
Surr: BFB	92.0	73.8-119		%Rec	1	8/2/2019 11:49:24 AM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/2/2019 11:49:24 AM	46521
Toluene	ND	0.050		mg/Kg	1	8/2/2019 11:49:24 AM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/2/2019 11:49:24 AM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/2/2019 11:49:24 AM	46521
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	8/2/2019 11:49:24 AM	46521

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: MW07 25'-30'
Project: Lambe 2C
Collection Date: 7/23/2019 10:30:00 AM
Lab ID: 1907D51-015 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 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	8/3/2019 11:22:17 AM	46522
Motor Oil Range Organics (MRO)	ND	52		mg/Kg	1	8/3/2019 11:22:17 AM	46522
Surr: DNOP	93.4	70-130		%Rec	1	8/3/2019 11:22:17 AM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/2/2019 12:12:55 PM	46521
Surr: BFB	99.2	73.8-119		%Rec	1	8/2/2019 12:12:55 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/2/2019 12:12:55 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/2/2019 12:12:55 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/2/2019 12:12:55 PM	46521
Xylenes, Total	ND	0.099		mg/Kg	1	8/2/2019 12:12:55 PM	46521
Surr: 4-Bromofluorobenzene	94.5	80-120		%Rec	1	8/2/2019 12:12:55 PM	46521

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: MW07 30'-35'
Project: Lambe 2C
Collection Date: 7/23/2019 11:00:00 AM
Lab ID: 1907D51-016 **Matrix:** SOIL **Received Date:** 7/26/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/1/2019 9:05:11 PM	46522
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/1/2019 9:05:11 PM	46522
Surr: DNOP	83.0	70-130		%Rec	1	8/1/2019 9:05:11 PM	46522
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/2/2019 12:36:27 PM	46521
Surr: BFB	93.1	73.8-119		%Rec	1	8/2/2019 12:36:27 PM	46521
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	8/2/2019 12:36:27 PM	46521
Toluene	ND	0.050		mg/Kg	1	8/2/2019 12:36:27 PM	46521
Ethylbenzene	ND	0.050		mg/Kg	1	8/2/2019 12:36:27 PM	46521
Xylenes, Total	ND	0.10		mg/Kg	1	8/2/2019 12:36:27 PM	46521
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	8/2/2019 12:36:27 PM	46521

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#: **1907D51**
07-Aug-19

Client: Hilcorp Energy
Project: Lambe 2C

Sample ID: **LCS-46522** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **46522** RunNo: **61831**
Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096112** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	100	63.9	124			
Surr: DNOP	4.9		5.000		97.3	70	130			

Sample ID: **MB-46522** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **46522** RunNo: **61831**
Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096114** 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	10		10.00		102	70	130			

Sample ID: **1907D51-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW08 0'-5'** Batch ID: **46522** RunNo: **61831**
Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096438** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	11	53.30	0	85.0	57	142			
Surr: DNOP	3.9		5.330		73.0	70	130			

Sample ID: **1907D51-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW08 0'-5'** Batch ID: **46522** RunNo: **61831**
Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096556** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	52.19	0	91.3	57	142	5.00	20	
Surr: DNOP	4.0		5.219		76.4	70	130	0	0	

Sample ID: **LCS-46535** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **46535** RunNo: **61831**
Prep Date: **8/1/2019** Analysis Date: **8/2/2019** SeqNo: **2097809** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.7		5.000		94.9	70	130			

Sample ID: **MB-46535** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **46535** RunNo: **61831**
Prep Date: **8/1/2019** Analysis Date: **8/2/2019** SeqNo: **2097811** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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#: **1907D51**
07-Aug-19

Client: Hilcorp Energy
Project: Lambe 2C

Sample ID: **MB-46535**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **46535**	RunNo: **61831**
Prep Date: **8/1/2019**	Analysis Date: **8/2/2019**	SeqNo: **2097811** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	13		10.00		135	70	130			S

Sample ID: **LCS-46571**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **46571**	RunNo: **61865**
Prep Date: **8/2/2019**	Analysis Date: **8/5/2019**	SeqNo: **2098678** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		89.1	70	130			

Sample ID: **MB-46571**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **46571**	RunNo: **61865**
Prep Date: **8/2/2019**	Analysis Date: **8/5/2019**	SeqNo: **2098679** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.4		10.00		94.3	70	130			

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#: **1907D51**

07-Aug-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **1907D51-002AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **MW08 30'-35'** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096980** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	69.1	142			
Surr: BFB	1100		1000		108	73.8	119			

Sample ID: **1907D51-002AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **MW08 30'-35'** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096981** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	4.9	24.73	0	102	69.1	142	1.13	20	
Surr: BFB	1100		989.1		109	73.8	119	0	0	

Sample ID: **LCS-46521** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096990** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.0	80.1	123			
Surr: BFB	1100		1000		110	73.8	119			

Sample ID: **MB-46521** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2096991** 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	990		1000		99.0	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#: **1907D51**

07-Aug-19

Client: Hilcorp Energy

Project: Lambe 2C

Sample ID: **1907D51-001AMS** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW08 0'-5'** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2097157** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	0.9872	0	100	63.9	127			
Toluene	1.1	0.049	0.9872	0	107	69.9	131			
Ethylbenzene	1.1	0.049	0.9872	0	110	71	132			
Xylenes, Total	3.2	0.099	2.962	0	109	71.8	131			
Surr: 4-Bromofluorobenzene	0.98		0.9872		99.5	80	120			

Sample ID: **1907D51-001AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW08 0'-5'** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2097158** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9843	0	102	63.9	127	1.60	20	
Toluene	1.1	0.049	0.9843	0	109	69.9	131	2.01	20	
Ethylbenzene	1.1	0.049	0.9843	0	112	71	132	1.93	20	
Xylenes, Total	3.3	0.098	2.953	0	112	71.8	131	2.09	20	
Surr: 4-Bromofluorobenzene	0.97		0.9843		98.6	80	120	0	0	

Sample ID: **LCS-46521** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2097168** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	95.5	80	120			
Toluene	1.0	0.050	1.000	0	101	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		99.6	80	120			

Sample ID: **MB-46521** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **46521** RunNo: **61828**

Prep Date: **7/31/2019** Analysis Date: **8/1/2019** SeqNo: **2097169** 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		98.5	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: 1907D51 RcptNo: 1

Received By: **Anne Thorne** 7/26/2019 8:00:00 AM

Completed By: **Erin Melendrez** 7/26/2019 8:47:32 AM

Reviewed By: DAD 7/30/19

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: MJ 07/30/19

Special Handling (if applicable)

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

Person Notified: Danny Burns Date: 7/30/19

By Whom: Leah Baca Via: ☒ eMail ☒ Phone ☐ Fax ☐ In Person

Regarding: Extra samples

Client Instructions: Add them

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp

Jennifer Deal

Mailing Address:

Phone #: 505-324-5128

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~~ cc Lambe 2C

Project #:

Project Manager: Danny Burns-LTE

Sampler: Eric Carroll

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 1.5 + 0.1 CF = 1.6°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. 1907D51	BTEX / ~~MTBE~~ / ~~TMBs~~ (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)
7/22	1200	Soil	MW08 0'-5'	1 4oz	cc ~~HOA~~ Cool	-001	X	X					X			
7/22	1300		MW08 30'-35'			-002	X	X					X			
7/23	0900		MW06 30'-35'			-003	X	X					X			
	0815		MW06 20'-25'			-004	X	X					X			
	1400		MW02 20'-25'			-005	X	X					X			
	1500		MW02 30'-35'			-006	X	X					X			
	1620		MW03 20'-25'			-007	X	X					X			
	1700		MW03 30'-35			-008	X	X					X			
7/24	1550		MW04 20'-25			-009	X	X					X			
	1630		MW04 30'-35'			-010	X	X					X			
	0940		MW05 15'-20'			-011	X	X					X			
	1100		MW05 30'-35'			-012	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
7/25	1115	Eric Carroll	Christin Walker		7/25/19	1115
7/25/19	1820	Christin Walker			07/26/19	0800

Remarks:

Please CC: dburns@ltenv.com

ecarroll@ltenv.com

NO Chloride

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.

Chain-of-Custody Record

Client: Hilcorp

Jennifer Deal

Mailing Address:

Phone #: 505-324-5128

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: Lambe 2C

Project #:

Project Manager: Danny Burns - LTE

Sampler: Eric Carroll

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CF): 1.5+0.1 = 1.6°

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. 1907D51	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, NO3, NO2, PO4, SO4~~	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
7/24	1330	Soil	MW01 ~~1330~~ 25'-30'	1 4oz	Cool	-013	X	X					X			
7/24	1400	Soil	MW01 1400 30'-35'	1 4oz	Cool	-014	X	X					X			
7/23	~~1030~~ ~~1100~~	Soil	MW07 ~~1023~~ 25'-30'	1 4oz	Cool	-015										
7/23	1100	Soil	MW07 30'-35'	1 4oz	Cool	-016										
			LB per Danny Burns													

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
7/25	1115	Eric Carroll	Christian Walls		7/25/19	1115
7/25/19	1820	Christian Walls			07/26/19	0820

Remarks:

Please CC: dburns@ltenv.com
ecarroll@ltenv.com

No chlorde

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.