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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Accepted - 11/14/2022 NV

Responsible Party Hilcorp Energy	OGRID 372171
Contact Name Kate Kaufman	Contact Telephone 346-237-2275
Contact email kkaufman@hilcorp.com	Incident # *(assigned by OCD):* NRM2022755502
Contact mailing address 382 CR 3100, Aztec NM 87410	

Location of Release Source

Latitude 36.7776375 Longitude -107.7176285
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Howell M 1	Site Type Well Site
Date Release Discovered Historic	API# *(if applicable)* 30-045-09101

Unit Letter	Section	Township	Range	County
N	30	30N	8W	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) Unknown	Volume Recovered (bbls) 0
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release
During cleanup of a release a Midstream operator had on the Hilcorp Howell M 1 well site a historic impact was encountered. Because of the location and what appeared to be a liner they notified Hilcorp of their findings.

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?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

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: Clara Cardoza Title: Environmental Specialist

Signature: Clara Cardoza Date: 08/14/2020

email: ccardoza@hilcorp.com Telephone: 505.564.0733

OCD Only

Received by: Date:

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	
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?	>55 (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.

June 29, 2021

District III
New Mexico Oil Conservation Division
1000 Rio Brazos
Aztec, New Mexico 87410

Subject: **Interim Report - Delineation Activities Update**
Howell M#1
NMOCD Incident Number: NRM2022755502
San Juan County, New Mexico

To Whom It May Concern:

On behalf of Hilcorp Energy Company (Hilcorp), WSP USA Inc. (WSP) has prepared this *Delineation Activities Update* for the Howell M#1 production well site (Site) located on Bureau of Land Management (BLM) surface in San Juan County, New Mexico (Figure 1). WSP has conducted soil-delineation activities to investigate historical petroleum-hydrocarbon impact discovered by a midstream operator at the Site. Specifically, while performing a remedial excavation to address a separate release, the midstream operator encountered what appeared to be an old pit liner and a historical release of petroleum hydrocarbons. Currently, the source and volume of the release is unknown. After discovery of the release, Hilcorp submitted a *Release Notification Form C-141* to the New Mexico Oil Conservation Division (NMOCD) on August 14, 2020. NMOCD has assigned Incident Number NRM2022755502 to the Site.

SITE CHARACTERIZATION

The Howell M#1 natural gas production well is located on Bureau of Land Management (BLM) surface in Unit N of Section 30, Township 30 North, Range 8 West, San Juan County, New Mexico (Figure 1). The Site is approximately 17 miles east of Aztec, New Mexico, south of New Mexico State Route 511. As part of the site investigation, local geology/hydrogeology and nearby sensitive receptors were accessed in accordance with 19.15.29.11 of the New Mexico Administrative Code (NMAC). This information is further discussed below.

GEOLOGY AND HYDROGEOLOGY

Based on United States Geological Survey (USGS) geologic mapping, the Site is located within the Tertiary Nacimiento Formation. In the report titled “Hydrogeology and Water Resources of San Juan Basin, New Mexico” (Stone, et. al., 1983), the Nacimiento Formation as characterized by interbedded black carbonaceous mudstones and white, coarse-grained sandstones. This formation ranges in thickness from 418 to 2,232 feet. The Nacimiento Formation overlies the Ojo Alamo sandstone formation, which is the shallowest water-bearing unit beneath the Site (Stone et. al., 1983).

SITE RECEPTORS

Assessment of potential nearby receptors was conducted through desktop reviews of topographic maps, Federal Emergency Management Administration (FEMA) Geographic Information System (GIS) maps, United States Geological Survey (USGS) GIS maps, New Mexico Office of the State Engineer database, and aerial photographs, as well as site-specific observations.

Borings at the Site indicate groundwater is not present at depths up to 55 feet below ground surface (bgs). However, an unnamed dry wash is located 60 feet to the west of the Site that is considered a “significant watercourse” as defined in 19.15.17.7 NMAC. Additionally, the San Juan River is located approximately 1,660 feet to the northwest

WSP USA
848 EAST 2ND AVENUE
DURANGO CO 81301

Tel.: 970-385-1096
wsp.com

of the Site. There are no known springs or fresh-water wells located within 500 feet of the Site. The nearest groundwater well (SJ 04066) is located approximately 1,300 feet southeast of the Site (Figure 2). Depth to water information from this well indicates that groundwater is approximately 200 feet below ground surface (bgs). In addition, the data sheet for a cathodic protection well submitted for the Howell M#1 well site in 1991 indicated that water was encountered at depths of 36, 80, and 120 feet; however, water and/or saturated soils have not been encountered during drilling at the Site up to depths of 55 feet bgs.

The Site is greater than 200 feet from any lakebed, sinkhole, or playa lake, and greater than 300 feet from any wetland (Figure 2). Surface land use surrounding the Site consists primarily of oil and gas development and livestock grazing. No occupied permanent residence or structures, including schools, hospitals, institutions, and/or churches, are located within 300 feet of the Site. The Site is not within the area of a subsurface mine or unstable area and is not within the 100-year floodplain.

SITE CLOSURE CRITERIA

WSP has characterized the Site according to Table 1, Closure Criteria for Soils Impacted by a Release of 19.15.29.12 NMAC. Due to the Site's proximity to a significant watercourse, the following NMOCD Table 1 closure criteria apply: 10 milligrams per kilogram (mg/kg) benzene; 50 mg/kg total benzene, toluene, ethylbenzene, and total xylenes (BTEX); 100 mg/kg total petroleum hydrocarbons (TPH); and 600 mg/kg chloride.

SITE INVESTIGATION ACTIVITIES AND RESULTS

To date, there have been two separate mobilization events to delineate subsurface impacts: September 16, 2020 to September 22, 2020 and May 14, 2021 to May 14, 2021. During each site delineation attempt, WSP personnel advanced boreholes via hollow-stem auger to confirm the presence or absence of petroleum hydrocarbon impacts to soil. Groundwater was not encountered in any of the boreholes during drilling up to depths of 55 feet bgs.

During drilling, silty sand and sand with occasional gravel and cobbles were generally encountered to depths up to 40 feet bgs. Gravel and cobbles increased with depth and were present in most wells from 35 feet bgs to the terminus of the boring. Several wells encountered clay and silt/siltstone around 40 feet bgs to the terminus of the boring. All borings were advanced until the auger met refusal on the cobbles and/or bedrock.

SOIL ASSESSMENT

To date, 13 boreholes have been advanced at the Site (shown on Figure 3). Soil samples were collected from boreholes and submitted for laboratory analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021, TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-motor oil range organics (MRO) by EPA Method 8015, and chloride by EPA method 300.0. A summary of soil analytical results is presented in Table 1, with laboratory analytical reports attached as Enclosure A.

Borings BH01 through BH10 were initially advanced during the September 2020 sampling event. Soil samples collected from borings BH01, BH02, BH03, BH08, and BH09 contained concentrations of TPH and/or BTEX above the NMOCD Table 1 Closure Criteria. Based on these results, these five borings were completed as soil-vapor extraction (SVE) wells during the September 2020 drilling event for potential future use to remediate the Site. Additionally, analytical results from borings BH02, BH08, and BH09 indicated that soil impacts had migrated off of the well pad to the west/northwest. At that time, Hilcorp proposed additional soil sampling locations in off-pad locations to the BLM. The BLM indicated that a cultural survey would be required for the off-pad locations; however, the cultural survey had to be postponed due to snow cover at the Site. The cultural survey was subsequently performed by La Plata Archaeological Consults in February 2021 and approved by the BLM in May 2021.

Once BLM access approval was obtained, Hilcorp advanced three additional borings at the site in May 2021: BH11, BH12, and BH13. These borings encountered similar lithologies as the previous borings and also met refusal on cobbles and/or bedrock. Borings BH11 and BH12 did not encounter any field indications of petroleum hydrocarbons and soil sample results indicated that no BTEX or TPH was detected above laboratory reporting limits. Petroleum hydrocarbon staining/odors and organic vapors measured on a photoionization detector (PID) indicated that petroleum impacts were increasing at depths below approximately 42 feet bgs in boring BH13. Sample

BH13@40-45' contained a TPH concentration of 21 milligrams per kilogram (mg/kg), below the NMOCD Table 1 Closure Criteria, however, deeper soil samples were not able to be collected from this boring due to auger refusal.

CONCLUSIONS AND RECOMMENDATIONS:

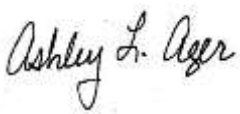
Based on the delineation activities performed to date, petroleum-impacted soil appears to be present on and to the west/northwest of the Howell M#1 well pad. Soil impacts on the well pad have been successfully delineated at this time. However, due to Site lithology and presence of cobbles and bedrock at depths of approximately 40 feet bgs, vertical delineation has not yet been achieved in locations near borings BH08 and, potentially, BH13.

Because of the shallow refusal using the hollow-stem auger drill rig, additional borings were not advanced during the May 2021 drilling event. As such, a sonic drill rig (Environmental Works, Boulder, Colorado) has been scheduled to complete the delineation the week of August 23, 2021. Sonic drilling will likely be able to obtain continuous core samples at the Site to the required depths. The proposed drilling locations are presented on Figure 3. For the additional work, Hilcorp will complete the Site delineation and prepare a remediation work plan within 90 days of submittal of this document. The remediation work plan will include details regarding SVE well construction and proposed remediation via SVE or other methods based on final delineation findings.

If you have any questions or comments, please do not hesitate to contact Mr. Stuart Hyde at stuart.hyde@wsp.com, or at (970) 385-1096.

Kind regards,

Stuart Hyde, L.G.
Senior Geologist



Ashley Ager, M.S., P.G.
Senior Geologist, Managing Director

cc: Kate Kaufman, Hilcorp Energy Company

Enclosures:

Figure 1	Site Location Map
Figure 2	Receptor Map
Figure 3	Site Map
Table 1	Soil Analytical Results
Enclosure A	Laboratory Analytical Reports

FIGURES

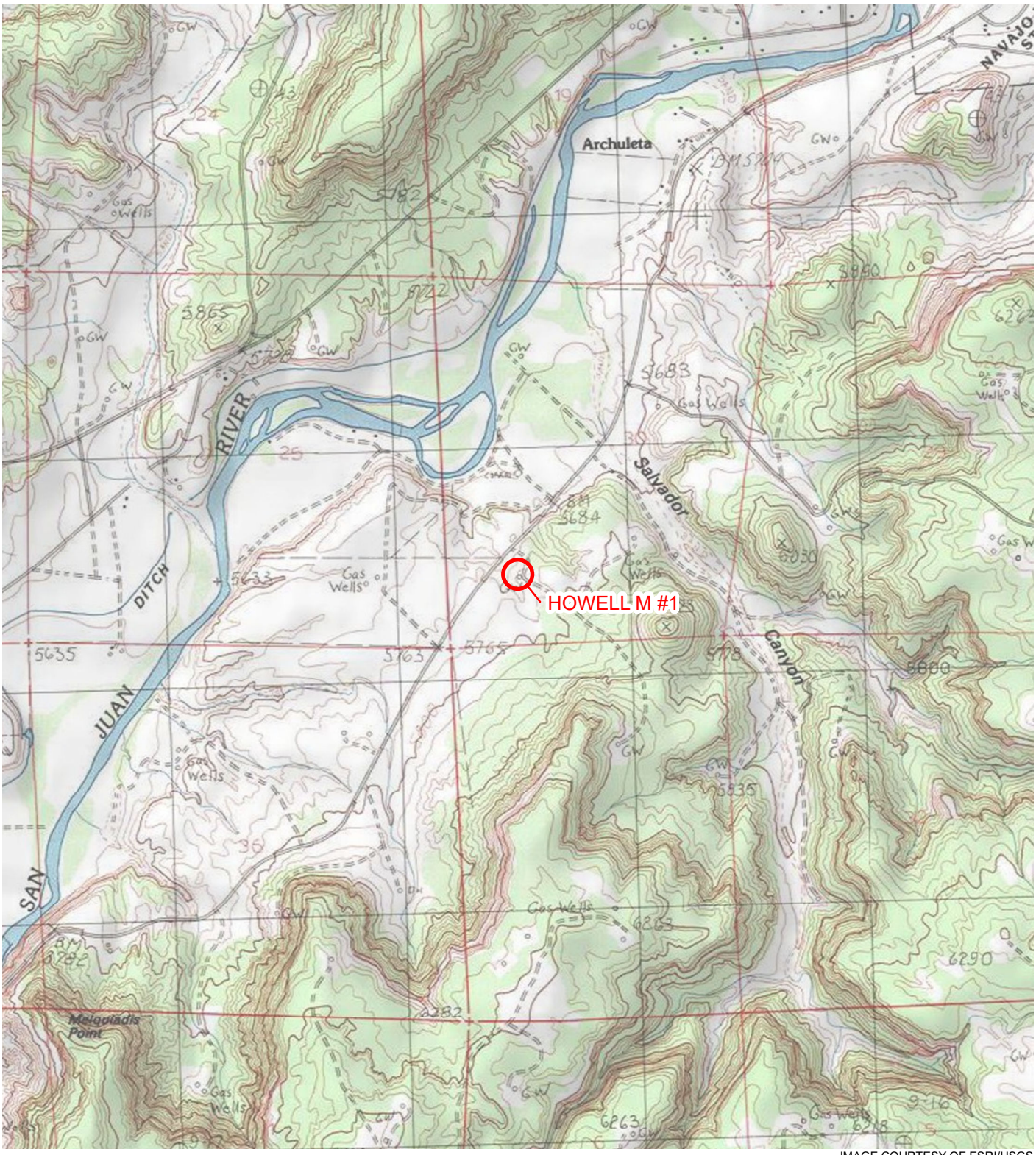


IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

NEW MEXICO

FIGURE 1
SITE LOCATION MAP
HOWELL M #1
LOT 11 SEC 30-T30N-R8W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017821013_HOWELL_M #1\017821013_FIG01_HOWELL_M #1_SL_2021.mxd

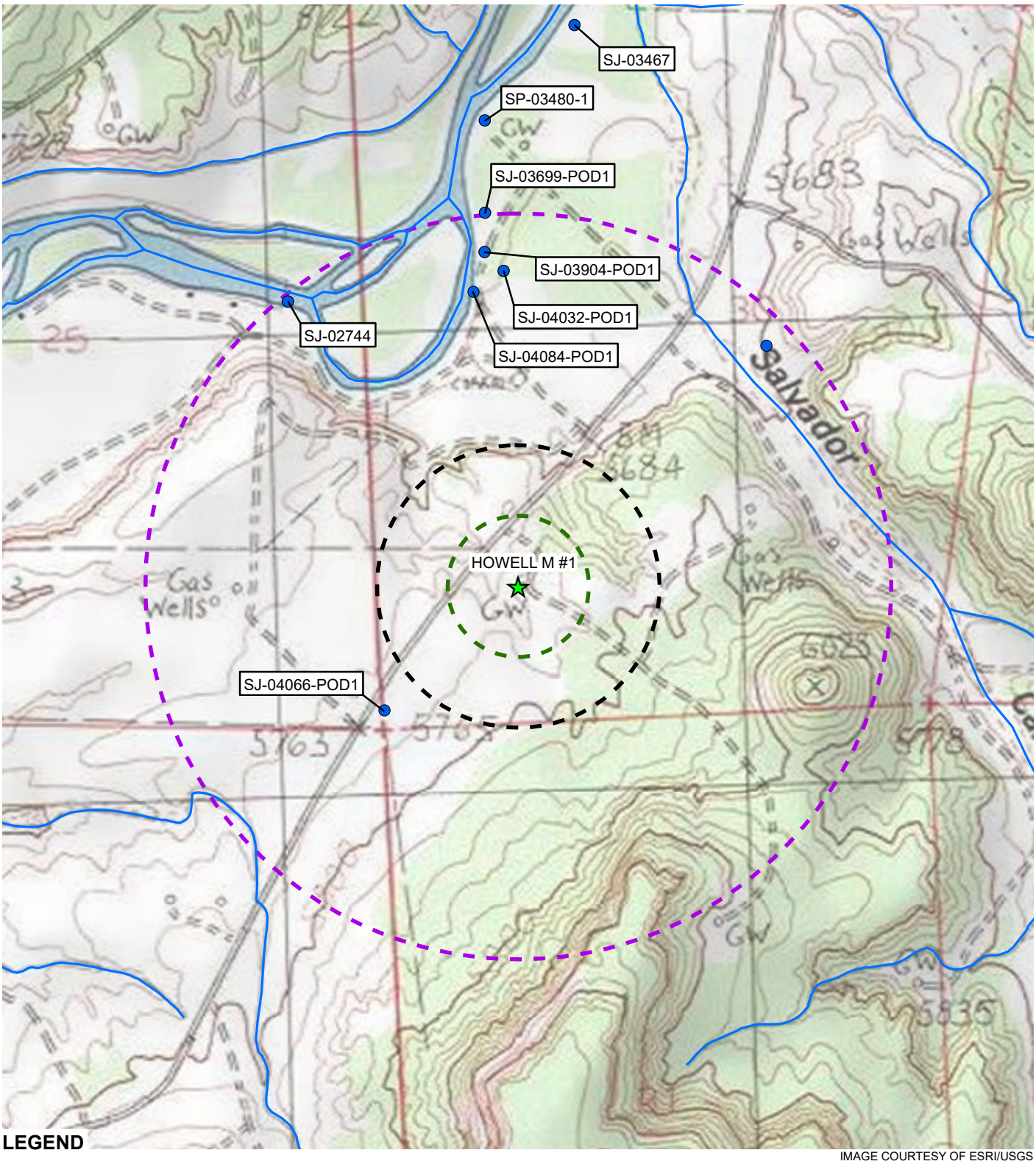


IMAGE COURTESY OF ESRI/USGS

LEGEND

- WATER WELL
- SITE LOCATION
- NATIONAL HYDROGRAPHY DATASET SURFACE WATER FEATURE
- 500-FOOT RADIUS
- 1,000-FOOT RADIUS
- HALF-MILE RADIUS

0 1,000 2,000
Feet

N

FIGURE 2
RECEPTOR MAP
HOWELL M #1
LOT 11 SEC 30-T30N-R8W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

wsp

P:\Hilcorp\GIS\MXD\017821013_HOWELL_M #1\017821013_FIG02_HOWELL_M #1_RECEPTOR.mxd

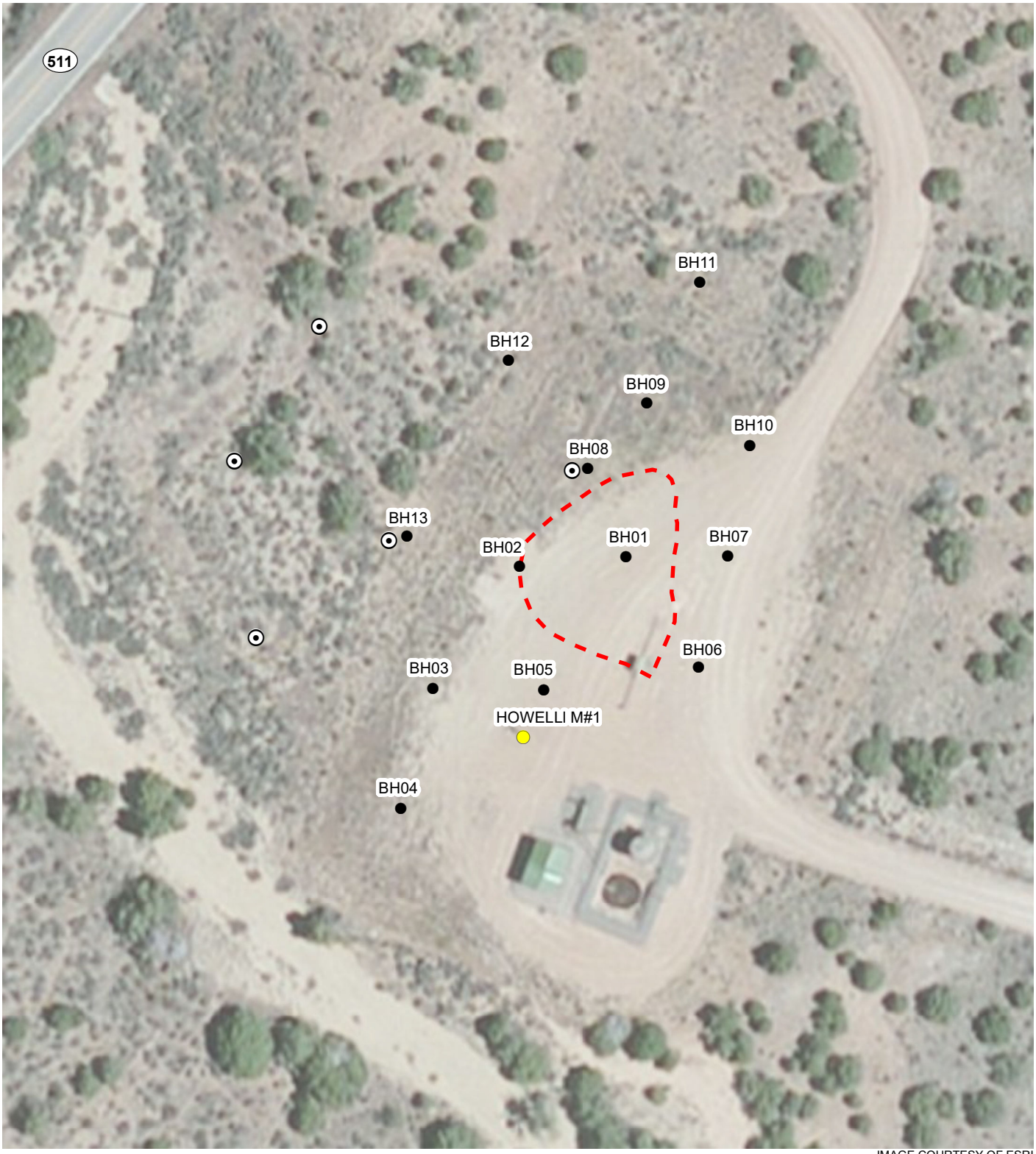


IMAGE COURTESY OF ESRI

LEGEND

- SOIL BORING
- PROPOSED SOIL BORING
- WELLHEAD
- EXCAVATION EXTENT

0 60 120

Feet

N

FIGURE 3
SITE MAP
HOWELL M #1
LOT 11 SEC 30-T30N-R8W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017821013_HOWELL_M #1\017821013_FIG03_HOWELL_M #1_SITE.mxd

TABLES

TABLE 1
SOIL ANALYTICAL RESULTS

HOWELL M#1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID Reading (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
BH01@25'-30'	9/16/2020	1,757	<0.024	12	7.5	85	**104.5**	<60	1,600	190	<45	**1,790**
BH01@38'-40'	9/16/2020	24.6	0.026	<0.048	<0.048	<0.096	0.026	<60	<4.8	<9.5	<48	<48
BH02@25'-30'	9/16/2020	1,658	<0.082	0.22	<0.16	3.8	4.02	<60	140	370	<46	**510**
BH02@46'	9/16/2020	413.0	0.027	0.32	<0.031	1.2	1.52	<60	56	21	<48	77
BH03@30'-35'	9/17/2020	2,403	<0.12	0.80	0.80	13	14.6	<60	430	140	89	**659**
BH03@47'	9/17/2020	328.0	<0.086	<0.17	<0.17	<0.35	<0.35	84	<17	<9.1	<45	<45
BH04@15'-20'	9/17/2020	3.7	<0.025	<0.049	<0.049	<0.098	<0.098	100	<4.9	<9.6	<48	<48
BH04@43'-45'	9/17/2020	2.5	<0.024	<0.049	<0.049	<0.097	<0.097	<60	<4.9	<9.1	<45	<45
BH05@35'-40'	9/17/2020	14.9	<0.025	<0.050	<0.050	<0.099	<0.099	<60	<5.0	<9.7	<48	<48
BH05@40'-45'	9/17/2020	0.7	<0.024	<0.049	<0.049	<0.097	<0.097	<60	<4.9	<10	<50	<50
BH06@35'-40'	9/18/2020	10.7	0.054	<0.048	<0.048	0.13	0.18	<60	<4.8	<8.8	<44	<44
BH06@40'-45'	9/18/2020	2.9	<0.024	<0.048	<0.048	<0.097	<0.097	<60	<4.8	<9.1	<45	<45
BH07@35'-40'	9/18/2020	9.4	<0.024	<0.049	<0.049	<0.098	<0.098	<60	<4.9	<10	<50	<50
BH07@40'-45'	9/18/2020	0.9	<0.024	<0.048	<0.048	<0.096	<0.096	<60	<4.8	<9.7	<49	<49
BH08@30'-35'	9/21/2020	2,376	<0.12	0.65	0.54	6.7	7.89	<60	140	31	<46	**171**
BH08@40'-45'	9/21/2020	2,194	0.66	26	12	150	**188.7**	<60	3,100	510	<490	**3,610**
BH09@35'-38'	9/21/2020	1,494	2.9	96	16	260	**374.9**	<60	6,600	390	<470	**6,990**
BH09@40'-43'	9/21/2020	54.6	<0.023	<0.047	<0.047	<0.094	<0.094	<60	<4.7	16	<44	16
BH10@30'-35'	9/22/2020	17.5	<0.025	0.077	<0.050	0.37	0.447	<60	13	<9.5	<48	13
BH10@38'-40'	9/22/2020	7.1	<0.025	<0.050	<0.050	<0.10	<0.10	<60	<5.0	<9.8	<49	<49
BH11@0-5' (1)	5/14/2021	15.4	<0.023	<0.047	<0.047	<0.094	<0.094	<60	<4.7	<8.5	<43	<43
BH11@40-45' (1)	5/14/2021	11.6	<0.025	<0.049	<0.049	<0.099	<0.099	68	<4.9	<10	<50	<50
BH12@10-15' (1)	5/20/2021	40.5	<0.023	<0.047	<0.047	<0.093	<0.093	110	<4.7	<9.6	<48	<48
BH12@50-55' (1)	5/20/2021	6.7	<0.024	<0.048	<0.048	<0.097	<0.097	<60	<4.8	<9.6	<48	<48
BH13@30-35' (1)	5/20/2021	12.9	<0.024	<0.048	<0.048	<0.096	<0.096	<60	<4.8	<9.8	<49	<49
BH13@40-45' (1)	5/20/2021	371	<0.024	<0.047	<0.047	<0.095	<0.095	<61	21	<9.6	<48	21
NMOCD Closure Criteria		NE	**10**	NE	NE	NE	**50**	**600**	NE	NE	NE	**100**

NOTES:

(1) - samples collected on 5/14/2021 and 5/20/2021 were mislabeled on the laboratory analytical reports
BTEX - benzene, toluene, ethylbenzene, and total xylenes analyzed by US EPA Method 8021B
DRO - diesel range organics analyzed by US EPA Method 8015D
GRO - gasoline range organics analyzed by US EPA Method 8015D
mg/kg - milligrams per kilogram
MRO - motor oil range organics analyzed by US EPA method 8015D
NA - not analyzed
NE - not established
NMOCD - New Mexico Oil Conservation Division
PID - photo-ionization detector
TPH - total petroleum hydrocarbon (sum of GRO, DRO, and MRO)
< - indicates result is less than the stated laboratory reporting limit
Bold - indicates value exceeds stated NMOCD Closure Criteria
ppm - parts per million

ENCLOSURE A – LABORATORY ANALYTICAL REPORTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

September 21, 2020

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

RE: Howell M1 OrderNo.: 2009976

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 4 sample(s) on 9/17/2020 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 **2009976**
Date Reported: **9/21/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH01@25'-30'
Project: Howell M1
Collection Date: 9/16/2020 9:45:00 AM
Lab ID: 2009976-001 **Matrix:** SOIL
Received Date: 9/17/2020 8:03:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	190	9.0		mg/Kg	1	9/17/2020 11:15:10 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/17/2020 11:15:10 AM
Surr: DNOP	94.9	30.4-154		%Rec	1	9/17/2020 11:15:10 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1600	480		mg/Kg	100	9/20/2020 12:41:08 PM
Surr: BFB	134	75.3-105	S	%Rec	100	9/20/2020 12:41:08 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	9/19/2020 1:56:46 PM
Toluene	12	4.8		mg/Kg	100	9/20/2020 12:41:08 PM
Ethylbenzene	7.5	4.8		mg/Kg	100	9/20/2020 12:41:08 PM
Xylenes, Total	85	9.6		mg/Kg	100	9/20/2020 12:41:08 PM
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	100	9/20/2020 12:41:08 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/17/2020 5:15:28 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009976**
Date Reported: **9/21/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH01@38'-40'
Project: Howell M1
Collection Date: 9/16/2020 10:30:00 AM
Lab ID: 2009976-002 **Matrix:** SOIL
Received Date: 9/17/2020 8:03:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/17/2020 11:39:16 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/17/2020 11:39:16 AM
Surr: DNOP	93.6	30.4-154		%Rec	1	9/17/2020 11:39:16 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/20/2020 1:04:37 PM
Surr: BFB	90.5	75.3-105		%Rec	1	9/20/2020 1:04:37 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.026	0.024		mg/Kg	1	9/20/2020 1:04:37 PM
Toluene	ND	0.048		mg/Kg	1	9/20/2020 1:04:37 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/20/2020 1:04:37 PM
Xylenes, Total	ND	0.096		mg/Kg	1	9/20/2020 1:04:37 PM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	9/20/2020 1:04:37 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/17/2020 5:27:48 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009976**
Date Reported: **9/21/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH02@25'-30'
Project: Howell M1
Collection Date: 9/16/2020 1:00:00 PM
Lab ID: 2009976-003 **Matrix:** SOIL **Received Date:** 9/17/2020 8:03:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**
Diesel Range Organics (DRO)	370	9.1		mg/Kg	1	9/17/2020 10:47:00 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/17/2020 10:47:00 AM
Surr: DNOP	94.9	30.4-154		%Rec	1	9/17/2020 10:47:00 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	140	16		mg/Kg	5	9/17/2020 12:19:40 PM
Surr: BFB	224	75.3-105	S	%Rec	5	9/17/2020 12:19:40 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.082		mg/Kg	5	9/17/2020 12:19:40 PM
Toluene	0.22	0.16		mg/Kg	5	9/17/2020 12:19:40 PM
Ethylbenzene	ND	0.16		mg/Kg	5	9/17/2020 12:19:40 PM
Xylenes, Total	3.8	0.33		mg/Kg	5	9/17/2020 12:19:40 PM
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	5	9/17/2020 12:19:40 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/17/2020 12:31:37 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009976**
Date Reported: **9/21/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH02@46'
Project: Howell M1
Collection Date: 9/16/2020 1:30:00 PM
Lab ID: 2009976-004 **Matrix:** SOIL **Received Date:** 9/17/2020 8:03:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**
Diesel Range Organics (DRO)	21	9.5		mg/Kg	1	9/17/2020 11:10:47 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/17/2020 11:10:47 AM
Surr: DNOP	95.1	30.4-154		%Rec	1	9/17/2020 11:10:47 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	56	3.1		mg/Kg	1	9/17/2020 12:43:09 PM
Surr: BFB	311	75.3-105	S	%Rec	1	9/17/2020 12:43:09 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.027	0.015		mg/Kg	1	9/17/2020 12:43:09 PM
Toluene	0.32	0.031		mg/Kg	1	9/17/2020 12:43:09 PM
Ethylbenzene	ND	0.031		mg/Kg	1	9/17/2020 12:43:09 PM
Xylenes, Total	1.2	0.061		mg/Kg	1	9/17/2020 12:43:09 PM
Surr: 4-Bromofluorobenzene	109	80-120		%Rec	1	9/17/2020 12:43:09 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/17/2020 1:08:40 PM

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2009976**

21-Sep-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **MB-55233**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **55233**	RunNo: **71928**							
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2518797**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55233**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **55233**	RunNo: **71928**							
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2518798**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.7	90	110			

Sample ID: **MB-55238**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **55238**	RunNo: **71928**							
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2518827**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55238**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **55238**	RunNo: **71928**							
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2518828**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.0	90	110			

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#: **2009976**

21-Sep-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **LCS-55231**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **55231**	RunNo: **71918**
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2517325** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	89.8	70	130			
Surr: DNOP	4.4		5.000		89.0	30.4	154			

Sample ID: **MB-55231**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **55231**	RunNo: **71918**
Prep Date: **9/17/2020**	Analysis Date: **9/17/2020**	SeqNo: **2517326** 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	9.5		10.00		95.3	30.4	154			

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#: **2009976**

21-Sep-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **GS71929**	RunNo: **71929**
Prep Date:	Analysis Date: **9/17/2020**	SeqNo: **2518375** 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	72.5	106			
Surr: BFB	1100		1000		109	75.3	105			S

Sample ID: **mb1**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **GS71929**	RunNo: **71929**
Prep Date:	Analysis Date: **9/17/2020**	SeqNo: **2518399** 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	960		1000		95.9	75.3	105			

Sample ID: **lcs-55219**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **55219**	RunNo: **71963**
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519548** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		104	75.3	105			

Sample ID: **mb-55219**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **55219**	RunNo: **71963**
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519549** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	950		1000		95.4	75.3	105			

Sample ID: **mb-55234**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **55234**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520089** 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	75.3	105			

Sample ID: **lcs-55234**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **55234**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520113** 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	100	72.5	106			
Surr: BFB	1000		1000		105	75.3	105			

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#: **2009976**

21-Sep-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **mb-55251**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **55251**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/20/2020**	SeqNo: **2520138** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	880		1000		88.0	75.3	105			

Sample ID: **lcs-55251**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **55251**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/20/2020**	SeqNo: **2520139** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	990		1000		99.0	75.3	105			

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#: **2009976**

21-Sep-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **100ng btex lcs**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **BS71929**	RunNo: **71929**
Prep Date:	Analysis Date: **9/17/2020**	SeqNo: **2518417** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	87.7	80	120			
Toluene	0.90	0.050	1.000	0	89.6	80	120			
Ethylbenzene	0.90	0.050	1.000	0	89.9	80	120			
Xylenes, Total	2.7	0.10	3.000	0	90.0	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	80	120			

Sample ID: **mb1**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **BS71929**	RunNo: **71929**
Prep Date:	Analysis Date: **9/17/2020**	SeqNo: **2518443** 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		99.7	80	120			

Sample ID: **mb-55234**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **55234**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520171** 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		100	80	120			

Sample ID: **LCS-55234**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **55234**	RunNo: **71993**
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520172** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	97.0	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	103	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	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#: **2009976**
21-Sep-20

Client: HILCORP ENERGY
Project: Howell M1

Sample ID: **2009976-002ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **BH01@38'-40'**	Batch ID: **55234**	RunNo: **71993**							
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520177**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.024	0.9416	0.02586	92.1	76.3	120			
Toluene	0.94	0.047	0.9416	0.01820	98.2	78.5	120			
Ethylbenzene	0.97	0.047	0.9416	0.01791	101	78.1	124			
Xylenes, Total	2.9	0.094	2.825	0.04655	103	79.3	125			
Surr: 4-Bromofluorobenzene	0.96		0.9416		102	80	120			

Sample ID: **2009976-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **BH01@38'-40'**	Batch ID: **55234**	RunNo: **71993**							
Prep Date: **9/17/2020**	Analysis Date: **9/19/2020**	SeqNo: **2520178**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.024	0.9588	0.02586	96.9	76.3	120	6.63	20	
Toluene	1.0	0.048	0.9588	0.01820	103	78.5	120	6.58	20	
Ethylbenzene	1.0	0.048	0.9588	0.01791	107	78.1	124	7.46	20	
Xylenes, Total	3.1	0.096	2.876	0.04655	107	79.3	125	6.26	20	
Surr: 4-Bromofluorobenzene	0.98		0.9588		102	80	120	0	0	

Sample ID: **mb-55251**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **PBS**	Batch ID: **55251**	RunNo: **71993**							
Prep Date: **9/17/2020**	Analysis Date: **9/20/2020**	SeqNo: **2520197**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.98		1.000		97.6	80	120			

Sample ID: **LCS-55251**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **LCSS**	Batch ID: **55251**	RunNo: **71993**							
Prep Date: **9/17/2020**	Analysis Date: **9/20/2020**	SeqNo: **2520198**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.0		1.000		99.7	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: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 2009976 RcptNo: 1

Received By: **Scott Anderson** 9/17/2020 8:03:00 AM

Completed By: **Juan Rojas** 9/17/2020 8:06:28 AM

Reviewed By: JR 9/17/20

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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
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 9/17/20

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	5.0	Good				

Chain-of-Custody Record

Client: Hilcorp Energy Company
Attn: Clara Cardoza
Mailing Address:
Phone #:
email or Fax#: ccardoza@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) EDF

Turn-Around Time:
☒ Standard ☒ Rush BH01 Same day results for BH02
Project Name: Howell M#1
Project #:
Project Manager: LTE-Danny Burns 701-570-4727
Sampler: D. Burns
On Ice: ☑ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 4.8+0.2=5.0 (°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. 2000976	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)
9-16-20	09:45	Soil	BH01@25'-30'	1-4oz.	cool	-001	X	X					X			
	10:30		BH01@38'-40'			-002										
	13:00		BH02@25'-30'			-003										
	13:30		BH02@46'			-004										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-16-20	17:00		SPA Courier		9-17-20	8:03
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks:
cc: dhencmann@ltenv.com
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: clients.hallenvironmental.com

September 22, 2020

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

RE: Howell M 1 OrderNo.: 2009A88

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/18/2020 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 **2009A88**
Date Reported: **9/22/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH03 @ 30'-35'
Project: Howell M 1
Collection Date: 9/17/2020 11:45:00 AM
Lab ID: 2009A88-001 **Matrix:** SOIL
Received Date: 9/18/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	9/21/2020 2:16:39 PM	55323
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	430	25		mg/Kg	5	9/20/2020 1:58:49 PM	55273
Surr: BFB	112	70-130		%Rec	5	9/20/2020 1:58:49 PM	55273
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**	
Diesel Range Organics (DRO)	140	8.9		mg/Kg	1	9/21/2020 12:14:38 PM	55283
Motor Oil Range Organics (MRO)	89	44		mg/Kg	1	9/21/2020 12:14:38 PM	55283
Surr: DNOP	117	30.4-154		%Rec	1	9/21/2020 12:14:38 PM	55283
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.12		mg/Kg	5	9/20/2020 1:58:49 PM	55273
Toluene	0.80	0.25		mg/Kg	5	9/20/2020 1:58:49 PM	55273
Ethylbenzene	0.80	0.25		mg/Kg	5	9/20/2020 1:58:49 PM	55273
Xylenes, Total	13	0.49		mg/Kg	5	9/20/2020 1:58:49 PM	55273
Surr: 1,2-Dichloroethane-d4	96.3	70-130		%Rec	5	9/20/2020 1:58:49 PM	55273
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	5	9/20/2020 1:58:49 PM	55273
Surr: Dibromofluoromethane	107	70-130		%Rec	5	9/20/2020 1:58:49 PM	55273
Surr: Toluene-d8	98.3	70-130		%Rec	5	9/20/2020 1:58:49 PM	55273

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

Qualifiers:

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

Analytical Report
Lab Order **2009A88**
Date Reported: **9/22/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH03 @ 47'
Project: Howell M 1
Collection Date: 9/17/2020 12:15:00 PM
Lab ID: 2009A88-002 **Matrix:** SOIL **Received Date:** 9/18/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	84	60		mg/Kg	20	9/18/2020 12:58:43 PM	55265
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/18/2020 10:01:11 AM	55261
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/18/2020 10:01:11 AM	55261
Surr: DNOP	94.7	30.4-154		%Rec	1	9/18/2020 10:01:11 AM	55261
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	17		mg/Kg	5	9/18/2020 12:58:34 PM	55217
Surr: BFB	96.6	75.3-105		%Rec	5	9/18/2020 12:58:34 PM	55217
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.086		mg/Kg	5	9/18/2020 12:58:34 PM	55217
Toluene	ND	0.17		mg/Kg	5	9/18/2020 12:58:34 PM	55217
Ethylbenzene	ND	0.17		mg/Kg	5	9/18/2020 12:58:34 PM	55217
Xylenes, Total	ND	0.35		mg/Kg	5	9/18/2020 12:58:34 PM	55217
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	5	9/18/2020 12:58:34 PM	55217

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

Qualifiers:

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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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **MB-55265** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55265** RunNo: **71998**
Prep Date: **9/18/2020** Analysis Date: **9/18/2020** SeqNo: **2520645** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55265** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55265** RunNo: **71998**
Prep Date: **9/18/2020** Analysis Date: **9/18/2020** SeqNo: **2520646** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	90	110			

Sample ID: **MB-55323** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55323** RunNo: **72032**
Prep Date: **9/21/2020** Analysis Date: **9/21/2020** SeqNo: **2522893** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55323** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55323** RunNo: **72032**
Prep Date: **9/21/2020** Analysis Date: **9/21/2020** SeqNo: **2522895** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.1	90	110			

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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **MB-55261**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **55261**	RunNo: **71952**
Prep Date: **9/18/2020**	Analysis Date: **9/18/2020**	SeqNo: **2518515** 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		99.9	30.4	154			

Sample ID: **LCS-55261**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **55261**	RunNo: **71952**
Prep Date: **9/18/2020**	Analysis Date: **9/18/2020**	SeqNo: **2518516** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	93.4	70	130			
Surr: DNOP	4.8		5.000		96.6	30.4	154			

Sample ID: **LCS-55283**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **55283**	RunNo: **72031**
Prep Date: **9/19/2020**	Analysis Date: **9/21/2020**	SeqNo: **2522561** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	102	70	130			
Surr: DNOP	5.4		5.000		108	30.4	154			

Sample ID: **MB-55283**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **55283**	RunNo: **72031**
Prep Date: **9/19/2020**	Analysis Date: **9/21/2020**	SeqNo: **2522562** 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	13		10.00		127	30.4	154			

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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **lcs-55217**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **55217**	RunNo: **71963**							
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519202**	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	101	72.5	106			
Surr: BFB	1100		1000		108	75.3	105			S

Sample ID: **mb-55217**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **55217**	RunNo: **71963**							
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519203**	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	970		1000		96.6	75.3	105			

Sample ID: **lcs-55219**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **55219**	RunNo: **71963**							
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519548**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		104	75.3	105			

Sample ID: **mb-55219**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **55219**	RunNo: **71963**							
Prep Date: **9/16/2020**	Analysis Date: **9/18/2020**	SeqNo: **2519549**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	950		1000		95.4	75.3	105			

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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **LCS-55217** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **55217** RunNo: **71963**
Prep Date: **9/16/2020** Analysis Date: **9/18/2020** SeqNo: **2519215** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.025	1.000	0	89.6	80	120			
Toluene	0.94	0.050	1.000	0	93.6	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.2	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.4	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		103	80	120			

Sample ID: **mb-55217** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **55217** RunNo: **71963**
Prep Date: **9/16/2020** Analysis Date: **9/18/2020** SeqNo: **2519216** 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		101	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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **mb-55273** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **55273** RunNo: **71984**
Prep Date: **9/18/2020** Analysis Date: **9/19/2020** SeqNo: **2519815** 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: 1,2-Dichloroethane-d4	0.45		0.5000		90.7	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		104	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.49		0.5000		98.4	70	130			

Sample ID: **lcs-55273** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **55273** RunNo: **71984**
Prep Date: **9/18/2020** Analysis Date: **9/19/2020** SeqNo: **2519816** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	97.8	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		92.2	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		107	70	130			
Surr: Toluene-d8	0.49		0.5000		97.4	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#: **2009A88**
22-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **mb-55273**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **55273**	RunNo: **71984**
Prep Date: **9/18/2020**	Analysis Date: **9/19/2020**	SeqNo: **2519845** 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	510		500.0		103	70	130			

Sample ID: **lcs-55273**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **55273**	RunNo: **71984**
Prep Date: **9/18/2020**	Analysis Date: **9/19/2020**	SeqNo: **2519846** 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	88.6	70	130			
Surr: BFB	520		500.0		103	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2009A88** RcptNo: **1**

Received By: **Emily Mocho** **9/18/2020 8:00:00 AM**

Completed By: **Emily Mocho** **9/18/2020 8:11:35 AM**

Reviewed By: CMC 9/18/20

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. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
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: EM 9/18/20

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	0.6	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy

Clara Cardoza

Mailing Address:

Phone #:

email or Fax#: ccardoza@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☒ EDD (Type) PDF

Turn-Around Time:

☐ Standard ☒ Rush Same Day 47' Sample

Project Name: Howell M #1

Project #:

Project Manager: Danny Burns (LTE) 701-570-4727

Sampler: D. Burns

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 0.5+0.1=0.6(°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. 2009A88	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)						
9/17	1145	soil	BH03 @ 30'-35'			001	X	X					X									
9/17	1215	soil	BH03 @ 47'			002	X	X					X									

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9/17	1500	[signature]	[signature]	courier	9/18/20	8:00
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: Same day for ~~the~~ BH03 @ 47'

cc: dhenrin@itenr.com ecarroll@itenr.com

Seal intact [signature] 9/18/20

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: clients.hallenvironmental.com

September 30, 2020

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

RE: Howell M 1 OrderNo.: 2009B86

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 8 sample(s) on 9/19/2020 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 **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH04@ 15'-20'
Project: Howell M 1
Collection Date: 9/17/2020 1:45:00 PM
Lab ID: 2009B86-001 **Matrix:** SOIL
Received Date: 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/23/2020 1:55:13 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 1:55:13 PM
Surr: DNOP	78.9	30.4-154		%Rec	1	9/23/2020 1:55:13 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	100	61		mg/Kg	20	9/28/2020 7:01:48 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.025		mg/Kg	1	9/23/2020 7:52:07 AM
Toluene	ND	0.049		mg/Kg	1	9/23/2020 7:52:07 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 7:52:07 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/23/2020 7:52:07 AM
Surr: 1,2-Dichloroethane-d4	90.3	70-130		%Rec	1	9/23/2020 7:52:07 AM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/23/2020 7:52:07 AM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	9/23/2020 7:52:07 AM
Surr: Toluene-d8	99.5	70-130		%Rec	1	9/23/2020 7:52:07 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 7:52:07 AM
Surr: BFB	105	70-130		%Rec	1	9/23/2020 7:52:07 AM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH04@ 43'-45'
Project: Howell M 1
Collection Date: 9/17/2020 2:20:00 PM
Lab ID: 2009B86-002 **Matrix:** SOIL **Received Date:** 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/23/2020 2:05:07 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/23/2020 2:05:07 PM
Surr: DNOP	93.2	30.4-154		%Rec	1	9/23/2020 2:05:07 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 8:03:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	9/23/2020 6:27:55 PM
Toluene	ND	0.049		mg/Kg	1	9/23/2020 6:27:55 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 6:27:55 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/23/2020 6:27:55 PM
Surr: 1,2-Dichloroethane-d4	85.8	70-130		%Rec	1	9/23/2020 6:27:55 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/23/2020 6:27:55 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/23/2020 6:27:55 PM
Surr: Toluene-d8	97.1	70-130		%Rec	1	9/23/2020 6:27:55 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 6:27:55 PM
Surr: BFB	105	70-130		%Rec	1	9/23/2020 6:27:55 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH05@ 35'-40'
Project: Howell M 1
Collection Date: 9/17/2020 4:20:00 PM
Lab ID: 2009B86-003 **Matrix:** SOIL **Received Date:** 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 2:14:59 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 2:14:59 PM
Surr: DNOP	89.5	30.4-154		%Rec	1	9/23/2020 2:14:59 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 8:16:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.025		mg/Kg	1	9/23/2020 7:53:25 PM
Toluene	ND	0.050		mg/Kg	1	9/23/2020 7:53:25 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/23/2020 7:53:25 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/23/2020 7:53:25 PM
Surr: 1,2-Dichloroethane-d4	90.0	70-130		%Rec	1	9/23/2020 7:53:25 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	9/23/2020 7:53:25 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	9/23/2020 7:53:25 PM
Surr: Toluene-d8	92.5	70-130		%Rec	1	9/23/2020 7:53:25 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/23/2020 7:53:25 PM
Surr: BFB	102	70-130		%Rec	1	9/23/2020 7:53:25 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH05@ 40'-45'
Project: Howell M 1
Collection Date: 9/17/2020 4:30:00 PM
Lab ID: 2009B86-004 **Matrix:** SOIL
Received Date: 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/23/2020 2:24:52 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/23/2020 2:24:52 PM
Surr: DNOP	80.3	30.4-154		%Rec	1	9/23/2020 2:24:52 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 6:16:13 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	9/23/2020 8:21:52 PM
Toluene	ND	0.049		mg/Kg	1	9/23/2020 8:21:52 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 8:21:52 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/23/2020 8:21:52 PM
Surr: 1,2-Dichloroethane-d4	94.2	70-130		%Rec	1	9/23/2020 8:21:52 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/23/2020 8:21:52 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/23/2020 8:21:52 PM
Surr: Toluene-d8	98.7	70-130		%Rec	1	9/23/2020 8:21:52 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 8:21:52 PM
Surr: BFB	106	70-130		%Rec	1	9/23/2020 8:21:52 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH06@ 35'-40'
Project: Howell M 1
Collection Date: 9/18/2020 11:20:00 AM
Lab ID: 2009B86-005 **Matrix:** SOIL
Received Date: 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	9/23/2020 2:34:44 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/23/2020 2:34:44 PM
Surr: DNOP	87.0	30.4-154		%Rec	1	9/23/2020 2:34:44 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 6:53:26 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	0.054	0.024		mg/Kg	1	9/23/2020 8:50:27 PM
Toluene	ND	0.048		mg/Kg	1	9/23/2020 8:50:27 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 8:50:27 PM
Xylenes, Total	0.13	0.097		mg/Kg	1	9/23/2020 8:50:27 PM
Surr: 1,2-Dichloroethane-d4	87.9	70-130		%Rec	1	9/23/2020 8:50:27 PM
Surr: 4-Bromofluorobenzene	97.0	70-130		%Rec	1	9/23/2020 8:50:27 PM
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/23/2020 8:50:27 PM
Surr: Toluene-d8	94.9	70-130		%Rec	1	9/23/2020 8:50:27 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 8:50:27 PM
Surr: BFB	104	70-130		%Rec	1	9/23/2020 8:50:27 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH06@ 40'-45'
Project: Howell M 1
Collection Date: 9/18/2020 11:30:00 AM
Lab ID: 2009B86-006 **Matrix:** SOIL
Received Date: 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/23/2020 2:44:36 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/23/2020 2:44:36 PM
Surr: DNOP	82.9	30.4-154		%Rec	1	9/23/2020 2:44:36 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 7:05:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	9/23/2020 9:19:02 PM
Toluene	ND	0.048		mg/Kg	1	9/23/2020 9:19:02 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 9:19:02 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/23/2020 9:19:02 PM
Surr: 1,2-Dichloroethane-d4	86.6	70-130		%Rec	1	9/23/2020 9:19:02 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	9/23/2020 9:19:02 PM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	9/23/2020 9:19:02 PM
Surr: Toluene-d8	93.2	70-130		%Rec	1	9/23/2020 9:19:02 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 9:19:02 PM
Surr: BFB	103	70-130		%Rec	1	9/23/2020 9:19:02 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH07@ 35'40'
Project: Howell M 1
Collection Date: 9/18/2020 1:45:00 PM
Lab ID: 2009B86-007 **Matrix:** SOIL **Received Date:** 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/23/2020 2:54:29 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/23/2020 2:54:29 PM
Surr: DNOP	79.4	30.4-154		%Rec	1	9/23/2020 2:54:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 7:18:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	9/23/2020 9:47:36 PM
Toluene	ND	0.049		mg/Kg	1	9/23/2020 9:47:36 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 9:47:36 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/23/2020 9:47:36 PM
Surr: 1,2-Dichloroethane-d4	91.4	70-130		%Rec	1	9/23/2020 9:47:36 PM
Surr: 4-Bromofluorobenzene	99.7	70-130		%Rec	1	9/23/2020 9:47:36 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	9/23/2020 9:47:36 PM
Surr: Toluene-d8	97.8	70-130		%Rec	1	9/23/2020 9:47:36 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 9:47:36 PM
Surr: BFB	103	70-130		%Rec	1	9/23/2020 9:47:36 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2009B86**
Date Reported: **9/30/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH07@ 40'-45'
Project: Howell M 1
Collection Date: 9/18/2020 2:00:00 PM
Lab ID: 2009B86-008 **Matrix:** SOIL **Received Date:** 9/19/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 3:04:22 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/23/2020 3:04:22 PM
Surr: DNOP	96.4	30.4-154		%Rec	1	9/23/2020 3:04:22 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	9/28/2020 7:30:39 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	9/23/2020 10:16:09 PM
Toluene	ND	0.048		mg/Kg	1	9/23/2020 10:16:09 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 10:16:09 PM
Xylenes, Total	ND	0.096		mg/Kg	1	9/23/2020 10:16:09 PM
Surr: 1,2-Dichloroethane-d4	91.1	70-130		%Rec	1	9/23/2020 10:16:09 PM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	9/23/2020 10:16:09 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	9/23/2020 10:16:09 PM
Surr: Toluene-d8	96.3	70-130		%Rec	1	9/23/2020 10:16:09 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 10:16:09 PM
Surr: BFB	105	70-130		%Rec	1	9/23/2020 10:16:09 PM

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

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B86**
30-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **MB-55495**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **55495**	RunNo: **72217**							
Prep Date: **9/28/2020**	Analysis Date: **9/28/2020**	SeqNo: **2532335**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55495**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **55495**	RunNo: **72217**							
Prep Date: **9/28/2020**	Analysis Date: **9/28/2020**	SeqNo: **2532336**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.0	90	110			

Sample ID: **MB-55496**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **55496**	RunNo: **72226**							
Prep Date: **9/28/2020**	Analysis Date: **9/28/2020**	SeqNo: **2532664**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55496**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **55496**	RunNo: **72226**							
Prep Date: **9/28/2020**	Analysis Date: **9/28/2020**	SeqNo: **2532665**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.6	90	110			

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#: **2009B86**
30-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **LCS-55347**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **55347**	RunNo: **72066**
Prep Date: **9/22/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527106** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	10	50.00	0	106	70	130			
Surr: DNOP	5.3		5.000		106	30.4	154			

Sample ID: **MB-55347**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **55347**	RunNo: **72066**
Prep Date: **9/22/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527109** 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		113	30.4	154			

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#: **2009B86**
30-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **lcs-55331** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524709** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	96.9	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	104	80	120			
Surr: 1,2-Dichloroethane-d4	0.42		0.5000		85.0	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.5	70	130			
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			

Sample ID: **mb-55331** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524710** 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: 1,2-Dichloroethane-d4	0.43		0.5000		86.1	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.7	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.50		0.5000		99.6	70	130			

Sample ID: **2009b86-001ams** SampType: **MS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BH04@ 15'-20'** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524715** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9901	0	107	71.1	115			
Toluene	1.1	0.050	0.9901	0	112	79.6	132			
Ethylbenzene	1.1	0.050	0.9901	0	113	83.8	134			
Xylenes, Total	3.4	0.099	2.970	0	116	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.45		0.4950		90.7	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.4950		100	70	130			
Surr: Dibromofluoromethane	0.53		0.4950		107	70	130			
Surr: Toluene-d8	0.48		0.4950		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#: **2009B86**
30-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **2009b86-001amsd** SampType: **MSD4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BH04@ 15'-20'** Batch ID: **55331** RunNo: **72064**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524716** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9852	0	110	71.1	115	2.29	20	
Toluene	1.1	0.049	0.9852	0	114	79.6	132	1.15	20	
Ethylbenzene	1.2	0.049	0.9852	0	118	83.8	134	4.15	20	
Xylenes, Total	3.5	0.099	2.956	0	119	82.4	132	2.71	20	
Surr: 1,2-Dichloroethane-d4	0.45		0.4926		91.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.46		0.4926		93.3	70	130	0	0	
Surr: Dibromofluoromethane	0.53		0.4926		107	70	130	0	0	
Surr: Toluene-d8	0.47		0.4926		96.2	70	130	0	0	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B86**
30-Sep-20

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: **lcs-55331**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **55331**	RunNo: **72064**
Prep Date: **9/21/2020**	Analysis Date: **9/23/2020**	SeqNo: **2524727** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	79.6	70	130			
Surr: BFB	510		500.0		102	70	130			

Sample ID: **mb-55331**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **55331**	RunNo: **72064**
Prep Date: **9/21/2020**	Analysis Date: **9/23/2020**	SeqNo: **2524728** 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	520		500.0		105	70	130			

Sample ID: **2009b86-002ams**	SampType: **MS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BH04@ 43'-45'**	Batch ID: **55331**	RunNo: **72117**
Prep Date: **9/21/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527430** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.70	0	85.4	49.2	122			
Surr: BFB	520		494.1		105	70	130			

Sample ID: **2009b86-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BH04@ 43'-45'**	Batch ID: **55331**	RunNo: **72117**
Prep Date: **9/21/2020**	Analysis Date: **9/23/2020**	SeqNo: **2527431** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.8	23.99	0	84.2	49.2	122	4.34	20	
Surr: BFB	490		479.8		102	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: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 2009B86 RcptNo: 1

Received By: **Emily Mocho** 9/18/2020 8:30:00 AM

Completed By: **Juan Rojas** 9/21/2020 9:24:54 AM

Reviewed By: JR 9/21/20

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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
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: CM 9/21/20

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	2.7	Good				

Chain-of-Custody Record

Client: Hilcorp Energy Company
Attn: Clara Cardoza
Mailing Address:
Phone #:
email or Fax#: ccardoza@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: Howell M #1
Project #:
Project Manager: LTE - Danny Burns 701-570-4727
Sampler: D Burns
On Ice: ☑ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 2.8-0.1=2.7 (°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. 2009886	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)
9-17-20	1345	SOIL	BH04@15'-20'	1-4oz	COOL	-001	X	X					X			
	1420		BH04@43'-45'			-002										
	1620		BH05@35'-40'			-003										
	1630		BH05@40'-45'			-004										
9-18-20	1120		BH06@35'-40'			-005										
	1130		BH06@40'-45'			-006										
	1345		BH07@35'-40'			-007										
	1400		BH07@40'-45'			-008										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-18-20	16:00		EM	courier	9/19/20 EM	
					9/18/20	8:30
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks: cc: dhencmann@ltenv.com
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: clients.hallenvironmental.com

October 02, 2020

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

RE: Howell M1 OrderNo.: 2009D45

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 6 sample(s) on 9/23/2020 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 **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH08@30'-35'
Project: Howell M1
Collection Date: 9/21/2020 9:00:00 AM
Lab ID: 2009D45-001 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	60		mg/Kg	20	9/29/2020 2:22:03 PM	55518
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	31	9.1		mg/Kg	1	9/24/2020 3:34:09 PM	55398
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/24/2020 3:34:09 PM	55398
Surr: DNOP	118	30.4-154		%Rec	1	9/24/2020 3:34:09 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	140	24		mg/Kg	5	9/26/2020 11:09:25 PM	55383
Surr: BFB	178	75.3-105	S	%Rec	5	9/26/2020 11:09:25 PM	55383
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.12		mg/Kg	5	9/26/2020 11:09:25 PM	55383
Toluene	0.65	0.24		mg/Kg	5	9/26/2020 11:09:25 PM	55383
Ethylbenzene	0.54	0.24		mg/Kg	5	9/26/2020 11:09:25 PM	55383
Xylenes, Total	6.7	0.49		mg/Kg	5	9/26/2020 11:09:25 PM	55383
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	5	9/26/2020 11:09:25 PM	55383

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

Qualifiers:

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

Analytical Report
Lab Order **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH08@40'-45'
Project: Howell M1
Collection Date: 9/21/2020 9:30:00 AM
Lab ID: 2009D45-002 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	60		mg/Kg	20	9/29/2020 5:50:52 PM	55541
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	510	97		mg/Kg	10	9/24/2020 5:36:08 PM	55398
Motor Oil Range Organics (MRO)	ND	490	D	mg/Kg	10	9/24/2020 5:36:08 PM	55398
Surr: DNOP	0	30.4-154	S	%Rec	10	9/24/2020 5:36:08 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	3100	490		mg/Kg	100	9/28/2020 12:50:23 PM	55383
Surr: BFB	181	75.3-105	S	%Rec	100	9/28/2020 12:50:23 PM	55383
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	0.66	0.12		mg/Kg	5	9/26/2020 11:32:53 PM	55383
Toluene	26	4.9		mg/Kg	100	9/28/2020 12:50:23 PM	55383
Ethylbenzene	12	0.25		mg/Kg	5	9/26/2020 11:32:53 PM	55383
Xylenes, Total	150	9.9		mg/Kg	100	9/28/2020 12:50:23 PM	55383
Surr: 4-Bromofluorobenzene	191	80-120	S	%Rec	5	9/26/2020 11:32:53 PM	55383

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

Qualifiers:

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

Analytical Report
Lab Order **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH09@35'-38'
Project: Howell M1
Collection Date: 9/21/2020 12:00:00 PM
Lab ID: 2009D45-003 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	60		mg/Kg	20	9/29/2020 6:28:06 PM	55541
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	390	94		mg/Kg	10	9/24/2020 5:46:06 PM	55398
Motor Oil Range Organics (MRO)	ND	470	D	mg/Kg	10	9/24/2020 5:46:06 PM	55398
Surr: DNOP	0	30.4-154	S	%Rec	10	9/24/2020 5:46:06 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	6600	990		mg/Kg	200	9/28/2020 1:13:49 PM	55383
Surr: BFB	155	75.3-105	S	%Rec	200	9/28/2020 1:13:49 PM	55383
EPA METHOD 8021B: VOLATILES						Analyst:	**RAA**
Benzene	2.9	0.12		mg/Kg	5	9/27/2020 1:06:32 AM	55383
Toluene	96	9.9		mg/Kg	200	9/28/2020 1:13:49 PM	55383
Ethylbenzene	16	0.25		mg/Kg	5	9/27/2020 1:06:32 AM	55383
Xylenes, Total	260	20		mg/Kg	200	9/28/2020 1:13:49 PM	55383
Surr: 4-Bromofluorobenzene	213	80-120	S	%Rec	5	9/27/2020 1:06:32 AM	55383

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		

Analytical Report
Lab Order **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH09@40'-43'
Project: Howell M1
Collection Date: 9/21/2020 12:20:00 PM
Lab ID: 2009D45-004 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	60		mg/Kg	20	9/29/2020 7:05:20 PM	55541
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	16	8.7		mg/Kg	1	9/24/2020 4:03:27 PM	55398
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/24/2020 4:03:27 PM	55398
Surr: DNOP	106	30.4-154		%Rec	1	9/24/2020 4:03:27 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/27/2020 1:29:53 AM	55383
Surr: BFB	92.3	75.3-105		%Rec	1	9/27/2020 1:29:53 AM	55383
EPA METHOD 8021B: VOLATILES						Analyst:	**RAA**
Benzene	ND	0.023		mg/Kg	1	9/27/2020 1:29:53 AM	55383
Toluene	ND	0.047		mg/Kg	1	9/27/2020 1:29:53 AM	55383
Ethylbenzene	ND	0.047		mg/Kg	1	9/27/2020 1:29:53 AM	55383
Xylenes, Total	ND	0.094		mg/Kg	1	9/27/2020 1:29:53 AM	55383
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	9/27/2020 1:29:53 AM	55383

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		

Analytical Report
Lab Order **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH010@30'-35'
Project: Howell M1
Collection Date: 9/22/2020 8:30:00 AM
Lab ID: 2009D45-005 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	60		mg/Kg	20	9/29/2020 7:17:44 PM	55541
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/24/2020 4:13:12 PM	55398
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/24/2020 4:13:12 PM	55398
Surr: DNOP	91.4	30.4-154		%Rec	1	9/24/2020 4:13:12 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	13	5.0		mg/Kg	1	9/27/2020 1:53:21 AM	55383
Surr: BFB	146	75.3-105	S	%Rec	1	9/27/2020 1:53:21 AM	55383
EPA METHOD 8021B: VOLATILES						Analyst:	**RAA**
Benzene	ND	0.025		mg/Kg	1	9/27/2020 1:53:21 AM	55383
Toluene	0.077	0.050		mg/Kg	1	9/27/2020 1:53:21 AM	55383
Ethylbenzene	ND	0.050		mg/Kg	1	9/27/2020 1:53:21 AM	55383
Xylenes, Total	0.37	0.099		mg/Kg	1	9/27/2020 1:53:21 AM	55383
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	9/27/2020 1:53:21 AM	55383

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

Qualifiers:

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

Analytical Report
Lab Order **2009D45**
Date Reported: **10/2/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH010@38'-40'
Project: Howell M1
Collection Date: 9/22/2020 10:00:00 AM
Lab ID: 2009D45-006 **Matrix:** SOIL **Received Date:** 9/23/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	60		mg/Kg	20	9/29/2020 7:30:08 PM	55541
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/24/2020 4:22:57 PM	55398
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/24/2020 4:22:57 PM	55398
Surr: DNOP	96.0	30.4-154		%Rec	1	9/24/2020 4:22:57 PM	55398
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/27/2020 2:16:51 AM	55383
Surr: BFB	89.5	75.3-105		%Rec	1	9/27/2020 2:16:51 AM	55383
EPA METHOD 8021B: VOLATILES						Analyst:	**RAA**
Benzene	ND	0.025		mg/Kg	1	9/27/2020 2:16:51 AM	55383
Toluene	ND	0.050		mg/Kg	1	9/27/2020 2:16:51 AM	55383
Ethylbenzene	ND	0.050		mg/Kg	1	9/27/2020 2:16:51 AM	55383
Xylenes, Total	ND	0.10		mg/Kg	1	9/27/2020 2:16:51 AM	55383
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	9/27/2020 2:16:51 AM	55383

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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **MB-55518** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55518** RunNo: **72231**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534523** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55518** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55518** RunNo: **72231**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534524** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.3	90	110			

Sample ID: **MB-55518** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55518** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534647** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55518** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55518** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534648** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.0	90	110			

Sample ID: **MB-55541** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55541** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534669** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55541** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55541** RunNo: **72232**
Prep Date: **9/29/2020** Analysis Date: **9/29/2020** SeqNo: **2534670** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.7	90	110			

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#: **2009D45**
02-Oct-20

Client: HILCORP ENERGY
Project: Howell M1

Sample ID: **2009D05-001AMS**	SampType: **ms**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **55541**	RunNo: **72232**
Prep Date: **9/29/2020**	Analysis Date: **9/29/2020**	SeqNo: **2534672** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24	7.5	15.00	11.08	83.0	47.2	156			

Sample ID: **2009D05-001AMSD**	SampType: **msd**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **55541**	RunNo: **72232**
Prep Date: **9/29/2020**	Analysis Date: **9/29/2020**	SeqNo: **2534673** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	23	7.5	15.00	11.08	81.2	47.2	156	1.16	20	

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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **2009C39-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BatchQC** Batch ID: **55398** RunNo: **72109**

Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527693** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	9.5	47.39	0	86.5	15	184			
Surr: DNOP	4.0		4.739		84.0	30.4	154			

Sample ID: **2009C39-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BatchQC** Batch ID: **55398** RunNo: **72109**

Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527694** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	40	9.7	48.64	0	82.1	15	184	2.65	23.9	
Surr: DNOP	3.7		4.864		75.2	30.4	154	0	0	

Sample ID: **LCS-55398** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **55398** RunNo: **72109**

Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527717** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	57	10	50.00	0	114	70	130			
Surr: DNOP	5.3		5.000		106	30.4	154			

Sample ID: **MB-55398** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **55398** RunNo: **72109**

Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527718** 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		111	30.4	154			

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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **lcs-55362**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2529247**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		103	75.3	105			

Sample ID: **mb-55362**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2529249**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	880		1000		87.8	75.3	105			

Sample ID: **2009c45-013ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2530042**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	9500		4726		202	75.3	105			S

Sample ID: **2009c45-013amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2530043**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	9600		4836		198	75.3	105	0	0	S

Sample ID: **mb-55383**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530060**	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	910		1000		91.2	75.3	105			

Sample ID: **lcs-55383**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530061**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	85.3	72.5	106			
Surr: BFB	1000		1000		102	75.3	105			

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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **2009d42-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530063**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.9	24.51	0	93.6	61.3	114			
Surr: BFB	990		980.4		101	75.3	105			

Sample ID: **2009d42-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530064**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.9	24.27	0	84.4	61.3	114	11.3	20	
Surr: BFB	920		970.9		94.4	75.3	105	0	0	

Sample ID: **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **G72180**	RunNo: **72180**							
Prep Date:	Analysis Date: **9/26/2020**	SeqNo: **2530540**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		101	75.3	105			

Sample ID: **2009g46-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **G72180**	RunNo: **72180**							
Prep Date:	Analysis Date: **9/26/2020**	SeqNo: **2530559**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	770		796.8		96.9	75.3	105			

Sample ID: **2009g46-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **BatchQC**	Batch ID: **G72180**	RunNo: **72180**							
Prep Date:	Analysis Date: **9/26/2020**	SeqNo: **2530560**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	810		796.8		102	75.3	105	0	0	

Sample ID: **mb1**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **G72180**	RunNo: **72180**							
Prep Date:	Analysis Date: **9/26/2020**	SeqNo: **2530568**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	950		1000		95.4	75.3	105			

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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **LCS-55362**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **LCSS**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2529256**	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-55362**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **PBS**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2529258**	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: **2009c45-014ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **BatchQC**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2530072**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.0		0.9551		107	80	120			

Sample ID: **2009c45-014amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **BatchQC**	Batch ID: **55362**	RunNo: **72151**							
Prep Date: **9/22/2020**	Analysis Date: **9/25/2020**	SeqNo: **2530073**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.0		0.9921		104	80	120	0	0	

Sample ID: **mb-55383**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **PBS**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530090**	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		103	80	120			

Sample ID: **LCS-55383**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **LCSS**	Batch ID: **55383**	RunNo: **72151**							
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530091**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	96.9	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#: **2009D45**

02-Oct-20

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **LCS-55383**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **55383**	RunNo: **72151**
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530091** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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	1.1		1.000		106	80	120			

Sample ID: **2009d42-002ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BatchQC**	Batch ID: **55383**	RunNo: **72151**
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530094** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.024	0.9542	0	89.6	76.3	120			
Toluene	0.93	0.048	0.9542	0.01215	95.9	78.5	120			
Ethylbenzene	0.95	0.048	0.9542	0	99.9	78.1	124			
Xylenes, Total	2.9	0.095	2.863	0	99.8	79.3	125			
Surr: 4-Bromofluorobenzene	0.95		0.9542		99.8	80	120			

Sample ID: **2009d42-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BatchQC**	Batch ID: **55383**	RunNo: **72151**
Prep Date: **9/23/2020**	Analysis Date: **9/26/2020**	SeqNo: **2530095** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.023	0.9302	0	92.1	76.3	120	0.209	20	
Toluene	0.92	0.047	0.9302	0.01215	97.3	78.5	120	1.13	20	
Ethylbenzene	0.94	0.047	0.9302	0	101	78.1	124	1.86	20	
Xylenes, Total	2.8	0.093	2.791	0	101	79.3	125	1.35	20	
Surr: 4-Bromofluorobenzene	0.94		0.9302		101	80	120	0	0	

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2009D45** RcptNo: **1**

Received By: **Cheyenne Cason** **9/23/2020 8:00:00 AM**

Completed By: **Isaiah Ortiz** **9/23/2020 9:08:49 AM** I-OK

Reviewed By: CM 9/23/20

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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
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: SPA 9.23.20

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	5.2	Good	Not Present			

Chain-of-Custody Record

Client: Hilcorp Energy Company
Attn: Clara Cardoza
Mailing Address:
Phone #:
email or Fax#: ccardoza@hilcorp.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: Howell M#1
Project #:
Project Manager: LTE - Danny Burns
Sampler: D. Burns
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 5.3 - 0.1 = 5.2 (°C)

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

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2009D45	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)
9-21	0900	Soil	BH08 @ 30'-35'	1-4oz	cool	001	X	X					X			
	0930		BH08 @ 40'-45'			002										
	1200		BH09 @ 35'-38'			003										
	1220		BH09 @ 40'-43'			004										
9-22	0830		BH10 @ 30'-35'			005										
	1000		BH10 @ 38'-40'			006										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9-22-20	14:30				9/22/2020	1430
9/22/2020	1810				9/23/20	0800

Remarks: cc: dhencmann@ltenv.com
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: clients.hallenvironmental.com

May 28, 2021

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

RE: Howell M1 OrderNo.: 2105A14

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 4 sample(s) on 5/22/2021 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 **2105A14**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH11 10-15'
Project: Howell M1
Collection Date: 5/20/2021 1:30:00 PM
Lab ID: 2105A14-001 **Matrix:** SOIL **Received Date:** 5/22/2021 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/24/2021 2:42:02 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/24/2021 2:42:02 PM
Surr: DNOP	91.8	70-130		%Rec	1	5/24/2021 2:42:02 PM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	110	60		mg/Kg	20	5/25/2021 12:30:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.023		mg/Kg	1	5/25/2021 2:29:19 AM
Toluene	ND	0.047		mg/Kg	1	5/25/2021 2:29:19 AM
Ethylbenzene	ND	0.047		mg/Kg	1	5/25/2021 2:29:19 AM
Xylenes, Total	ND	0.093		mg/Kg	1	5/25/2021 2:29:19 AM
Surr: 1,2-Dichloroethane-d4	94.0	70-130		%Rec	1	5/25/2021 2:29:19 AM
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	5/25/2021 2:29:19 AM
Surr: Dibromofluoromethane	112	70-130		%Rec	1	5/25/2021 2:29:19 AM
Surr: Toluene-d8	102	70-130		%Rec	1	5/25/2021 2:29:19 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/25/2021 2:29:19 AM
Surr: BFB	105	70-130		%Rec	1	5/25/2021 2:29:19 AM

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

Qualifiers:

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

Analytical Report
Lab Order **2105A14**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH11 50-55'
Project: Howell M1
Collection Date: 5/20/2021 3:30:00 PM
Lab ID: 2105A14-002 **Matrix:** SOIL **Received Date:** 5/22/2021 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/24/2021 2:51:50 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/24/2021 2:51:50 PM
Surr: DNOP	123	70-130		%Rec	1	5/24/2021 2:51:50 PM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	ND	60		mg/Kg	20	5/25/2021 1:32:52 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	5/25/2021 5:43:15 PM
Toluene	ND	0.048		mg/Kg	1	5/25/2021 5:43:15 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/25/2021 5:43:15 PM
Xylenes, Total	ND	0.097		mg/Kg	1	5/25/2021 5:43:15 PM
Surr: 1,2-Dichloroethane-d4	88.5	70-130		%Rec	1	5/25/2021 5:43:15 PM
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	5/25/2021 5:43:15 PM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	5/25/2021 5:43:15 PM
Surr: Toluene-d8	101	70-130		%Rec	1	5/25/2021 5:43:15 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/25/2021 5:43:15 PM
Surr: BFB	106	70-130		%Rec	1	5/25/2021 5:43:15 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2105A14**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH12 30-35'
Project: Howell M1
Collection Date: 5/21/2021 10:00:00 AM
Lab ID: 2105A14-003 **Matrix:** SOIL **Received Date:** 5/22/2021 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	5/24/2021 3:01:38 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/24/2021 3:01:38 PM
Surr: DNOP	95.4	70-130		%Rec	1	5/24/2021 3:01:38 PM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	ND	60		mg/Kg	20	5/25/2021 1:45:16 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	5/25/2021 3:26:18 AM
Toluene	ND	0.048		mg/Kg	1	5/25/2021 3:26:18 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/25/2021 3:26:18 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/25/2021 3:26:18 AM
Surr: 1,2-Dichloroethane-d4	90.6	70-130		%Rec	1	5/25/2021 3:26:18 AM
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	5/25/2021 3:26:18 AM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	5/25/2021 3:26:18 AM
Surr: Toluene-d8	100	70-130		%Rec	1	5/25/2021 3:26:18 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/25/2021 3:26:18 AM
Surr: BFB	103	70-130		%Rec	1	5/25/2021 3:26:18 AM

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

Qualifiers:

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

Analytical Report
Lab Order **2105A14**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH12 40-45'
Project: Howell M1
Collection Date: 5/21/2021 11:00:00 AM
Lab ID: 2105A14-004 **Matrix:** SOIL **Received Date:** 5/22/2021 8:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/24/2021 3:11:28 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/24/2021 3:11:28 PM
Surr: DNOP	104	70-130		%Rec	1	5/24/2021 3:11:28 PM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	ND	61		mg/Kg	20	5/25/2021 1:57:41 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	5/25/2021 6:11:51 PM
Toluene	ND	0.047		mg/Kg	1	5/25/2021 6:11:51 PM
Ethylbenzene	ND	0.047		mg/Kg	1	5/25/2021 6:11:51 PM
Xylenes, Total	ND	0.095		mg/Kg	1	5/25/2021 6:11:51 PM
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	5/25/2021 6:11:51 PM
Surr: 4-Bromofluorobenzene	96.6	70-130		%Rec	1	5/25/2021 6:11:51 PM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	5/25/2021 6:11:51 PM
Surr: Toluene-d8	98.1	70-130		%Rec	1	5/25/2021 6:11:51 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	21	4.7		mg/Kg	1	5/25/2021 6:11:51 PM
Surr: BFB	109	70-130		%Rec	1	5/25/2021 6:11:51 PM

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

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2105A14**
28-May-21

Client: HILCORP ENERGY
Project: Howell M1

Sample ID: **MB-60237**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **60237**	RunNo: **77623**							
Prep Date: **5/25/2021**	Analysis Date: **5/25/2021**	SeqNo: **2756623**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-60237**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **60237**	RunNo: **77623**							
Prep Date: **5/25/2021**	Analysis Date: **5/25/2021**	SeqNo: **2756624**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.6	90	110			

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#: **2105A14**
28-May-21

Client: HILCORP ENERGY
Project: Howell M1

Sample ID: **MB-60204**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **60204**	RunNo: **77605**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2754540** 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		108	70	130			

Sample ID: **LCS-60204**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **60204**	RunNo: **77600**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2754936** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	40	10	50.00	0	80.2	68.9	141			
Surr: DNOP	5.1		5.000		102	70	130			

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#: **2105A14**
28-May-21

Client: HILCORP ENERGY
Project: Howell M1

Sample ID: **lcs-60202**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **LCSS**	Batch ID: **60202**	RunNo: **77632**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755757** 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	108	70	130			
Toluene	1.0	0.050	1.000	0	104	70	130			
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.8	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.2	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.51		0.5000		103	70	130			

Sample ID: **mb-60202**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS**	Batch ID: **60202**	RunNo: **77632**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755758** 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: 1,2-Dichloroethane-d4	0.48		0.5000		96.2	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		107	70	130			
Surr: Toluene-d8	0.49		0.5000		98.0	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#: **2105A14**

28-May-21

Client: HILCORP ENERGY

Project: Howell M1

Sample ID: **lcs-60202**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **60202**	RunNo: **77632**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755770** 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	97.4	70	130			
Surr: BFB	520		500.0		104	70	130			

Sample ID: **mb-60202**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **60202**	RunNo: **77632**
Prep Date: **5/22/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755771** 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	520		500.0		103	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2105A14** RcptNo: 1

Received By: **Desiree Dominguez** **5/22/2021 8:45:00 AM** DD

Completed By: **Desiree Dominguez** **5/22/2021 10:08:08 AM** DD

Reviewed By: DAD 5/22/21

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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
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 5/22/21

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	3.4	Good	Yes			

Chain-of-Custody Record

Client: HilCorp Energy
Clara Cardoza
Mailing Address:
Phone #:
email or Fax#: CCardoza@hilcorp.com
QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: Howell M1
Project #:
Project Manager: Stuart Hyde - WSP
Sampler: Eric Carroll
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 3.3+0.1=3.4 (°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. 2105A14	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)	Chloride
5/20	1330	Soil	BH11 10-15'	1 4oz	Cool	-001	X	X									X
5/20	1530	↓	BH11 50-55'	↓	↓	-002	X	X									X
5/20	1000	↓	BH12 30-35'	↓	↓	-003	X	X									X
5/21	1100	↓	BH12 40-45'	↓	↓	-004	X	X									X

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
5/21	1250	Eric Carroll	Christine Walker		5/21/20	1250
5/21/20	1810	Christine Walker		Courier	5.22.21	8:45

Remarks:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

May 28, 2021

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

RE: Howell 1M OrderNo.: 2105888

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 2 sample(s) on 5/20/2021 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 **2105888**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH10 0-5'
Project: Howell 1M
Collection Date: 5/14/2021 11:00:00 AM
Lab ID: 2105888-001 **Matrix:** SOIL **Received Date:** 5/20/2021 7:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	8.5		mg/Kg	1	5/22/2021 6:59:05 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	5/22/2021 6:59:05 PM
Surr: DNOP	103	70-130		%Rec	1	5/22/2021 6:59:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/22/2021 11:59:15 AM
Surr: BFB	90.2	70-130		%Rec	1	5/22/2021 11:59:15 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	5/22/2021 11:59:15 AM
Toluene	ND	0.047		mg/Kg	1	5/22/2021 11:59:15 AM
Ethylbenzene	ND	0.047		mg/Kg	1	5/22/2021 11:59:15 AM
Xylenes, Total	ND	0.094		mg/Kg	1	5/22/2021 11:59:15 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	5/22/2021 11:59:15 AM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	ND	60		mg/Kg	20	5/24/2021 4:16:53 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 Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2105888**
Date Reported: **5/28/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: BH10 40-45'
Project: Howell 1M
Collection Date: 5/14/2021 12:30:00 PM
Lab ID: 2105888-002 **Matrix:** SOIL **Received Date:** 5/20/2021 7:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	5/22/2021 11:15:07 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/22/2021 11:15:07 AM
Surr: DNOP	140	70-130	S	%Rec	1	5/22/2021 11:15:07 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	5/22/2021 12:22:39 PM
Surr: BFB	89.7	70-130		%Rec	1	5/22/2021 12:22:39 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	5/22/2021 12:22:39 PM
Toluene	ND	0.049		mg/Kg	1	5/22/2021 12:22:39 PM
Ethylbenzene	ND	0.049		mg/Kg	1	5/22/2021 12:22:39 PM
Xylenes, Total	ND	0.099		mg/Kg	1	5/22/2021 12:22:39 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	5/22/2021 12:22:39 PM
EPA METHOD 300.0: ANIONS						Analyst: **VP**
Chloride	68	60		mg/Kg	20	5/24/2021 4:29:17 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 Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2105888**

28-May-21

Client: HILCORP ENERGY

Project: Howell 1M

Sample ID: **MB-60211**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **60211**	RunNo: **77619**							
Prep Date: **5/24/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755203**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-60211**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **60211**	RunNo: **77619**							
Prep Date: **5/24/2021**	Analysis Date: **5/24/2021**	SeqNo: **2755204**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.7	90	110			

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#: **2105888**

28-May-21

Client: HILCORP ENERGY

Project: Howell 1M

Sample ID: **MB-60165** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **60165** RunNo: **77563**

Prep Date: **5/20/2021** Analysis Date: **5/21/2021** SeqNo: **2753501** Units: **mg/Kg**

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

Sample ID: **MB-60191** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **60191** RunNo: **77590**

Prep Date: **5/21/2021** Analysis Date: **5/22/2021** SeqNo: **2753997** 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	13		10.00		128	70	130			

Sample ID: **LCS-60191** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **60191** RunNo: **77590**

Prep Date: **5/21/2021** Analysis Date: **5/22/2021** SeqNo: **2754004** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	64	10	50.00	0	127	68.9	141			
Surr: DNOP	7.2		5.000		145	70	130			S

Sample ID: **2105888-002AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BH10 40-45'** Batch ID: **60191** RunNo: **77590**

Prep Date: **5/21/2021** Analysis Date: **5/22/2021** SeqNo: **2754008** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.4	47.13	0	107	15	184			
Surr: DNOP	5.2		4.713		111	70	130			

Sample ID: **2105888-002AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BH10 40-45'** Batch ID: **60191** RunNo: **77590**

Prep Date: **5/21/2021** Analysis Date: **5/22/2021** SeqNo: **2754011** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	63	10	50.15	0	126	15	184	23.1	23.9	
Surr: DNOP	6.5		5.015		129	70	130	0	0	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2105888**
28-May-21

Client: HILCORP ENERGY
Project: Howell 1M

Sample ID: **LCS-60165** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **60165** RunNo: **77604**
Prep Date: **5/20/2021** Analysis Date: **5/22/2021** SeqNo: **2754505** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	59	10	50.00	0	118	68.9	141			
Surr: DNOP	5.9		5.000		118	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#: **2105888**

28-May-21

Client: HILCORP ENERGY

Project: Howell 1M

Sample ID: **mb-60161** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **60161** RunNo: **77587**

Prep Date: **5/20/2021** Analysis Date: **5/22/2021** SeqNo: **2753650** 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		88.7	70	130			

Sample ID: **lcs-60161** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **60161** RunNo: **77587**

Prep Date: **5/20/2021** Analysis Date: **5/22/2021** SeqNo: **2753651** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.4	78.6	131			
Surr: BFB	970		1000		97.3	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#: **2105888**

28-May-21

Client: HILCORP ENERGY

Project: Howell 1M

Sample ID: **mb-60161**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **60161**	RunNo: **77587**
Prep Date: **5/20/2021**	Analysis Date: **5/22/2021**	SeqNo: **2753713** 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		99.5	70	130			

Sample ID: **LCS-60161**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **60161**	RunNo: **77587**
Prep Date: **5/20/2021**	Analysis Date: **5/22/2021**	SeqNo: **2753714** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	94.1	80	120			
Toluene	0.98	0.050	1.000	0	98.2	80	120			
Ethylbenzene	0.97	0.050	1.000	0	97.3	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		100	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2105888** RcptNo: **1**

Received By: **Juan Rojas** **5/20/2021 7:20:00 AM** Juan Rojas

Completed By: **Sean Livingston** **5/20/2021 9:29:51 AM** Sean Livingston

Reviewed By: JR 5/20/21

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. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
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 ☐	

10. NO

# of preserved bottles checked for pH: 5.20.21 (<2 or >12 unless noted)

Adjusted?

Checked by:

Special Handling (if applicable)

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

Person Notified: Date:

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

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.5	Good				

Chain-of-Custody Record

Client: Hilcorp Energy
Clara Cardoza
Mailing Address:
Phone #:
email or Fax#: CCardoza@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: Howell 1M
Project #:
Project Manager: Stuart Hyde - WSP
Sampler: Eric Carroll
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 0.4+0.1=0.5 (°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. 2105888	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)	Chloride
5/14	1100	Soil	BH10 0-5'	1 4oz	Cool	001	X	X									X
5/14	1230	Soil	BH10 40-45'	1 4oz	Cool	002	X	✓									✓

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
5/19	1710	Eric Carroll	Chris Ward		5/19/21	1718
5/19/21	1830	Chris Walters		courier	5/20/21	7:20

Remarks:
Please cc: Stuart.Hyde@wsp.com
Eric.Carroll@wsp.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.

Form C-141
Page 4

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: Kathryn H Kaufman Title: Environmental Specialist

Signature: Kathryn Kaufman Date: 7/26/2021

email: kkaufman@hilcorp.com Telephone: 346-237-2275

OCD Only

Received by: Date:

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 37317
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 63058 for most updated status.	11/14/2022