

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	nAPP2310735838
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Hilcorp Energy Company	OGRID 372171
Contact Name Mitch Killough	Contact Telephone 713-757-5247
Contact email mkillough@hilcorp.com	Incident # nAPP2310735838
Contact mailing address 1111 Travis Street, Houston, Texas 77002	

Location of Release Source

Latitude 36.7891159 Longitude -108.177948
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Federal A 2E	Site Type Well
Date Release Discovered: 4/2/2023 @ 15:30 (MT)	API# 30-045-23865

Unit Letter	Section	Township	Range	County
C	26	30N	13W	San Juan

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (Name: MCLIVERTY WILLIAM B AND KRISTEN B)

Nature and Volume of Release

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

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Condensate	Volume Released (bbls) 23.5 bbls	Volume Recovered (bbls) 3 bbls
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A release of approximately 23.5 bbls condensate overflowed from an open-top below-grade tank (BGT) due to a failed check valve on an oil dump line. The operator showed up on location in response to a high-level pit alarm and immediately shut-in the well. Approximately 3 bbls of fluid could be recovered from within the cribbing surrounding the BGT, but 20.5 bbls of condensate soaked into the ground surface immediately below the BGT. OCD will be notified 48 hours prior to sampling.

The spill amount was determined by operator's monthly tank gauging data.


State of New Mexico
Oil Conservation Division

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Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? The spill amount did not exceed 25 bbls.
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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> been undertaken, explain why: In the case of this release, approximately 20.5 bbls condensate soaked vertically into the ground surface beneath the BGT. Only 3 bbls of spilled fluid could be recovered.	
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: <u>Mitch Killough</u> Title: <u>Environmental Specialist</u>	
Signature: <u></u> Date: <u>04/17/2023</u>	
email: <u>mkillough@hilcorp.com</u> Telephone: <u>713-757-5247</u>	
<u>OCD Only</u> Received by: _____ Date: _____	

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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?	<u>>100</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

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

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


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

State of New Mexico
Oil Conservation Division

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

Printed Name: Mitch Killough Title: Environmental SpecialistSignature:  Date: 9/14/2023email: mkillough@hilcorp.com Telephone: 713-757-5247**OCD Only**Received by: Shelly Wells Date: 10/6/2023

Incident ID	nAPP2310735838
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Closure


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

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

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities

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

Printed Name: Mitch Killough Title: Environmental Specialist

Signature:  Date: 9/14/2023

email: mkillough@hilcorp.com Telephone: 713-757-5247

OCD Only

Received by: Shelly Wells Date: 10/6/2023

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____



September 14, 2023

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: **Site Characterization Report and Closure Request with Variance**

Federal A 2E
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NAPP2310735838

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Site Characterization Report and Closure Request with Variance* associated with a release discovered at the Federal A 2E natural gas production well pad (Site). The Site is located on private land in Unit C, Section 26, Township 30 North, Range 13 West in San Juan County, New Mexico (Figure 1).

SITE BACKGROUND

On April 2, 2023, Hilcorp personnel responded to a high-level alarm and discovered a release of condensate from an open-top below grade tank (BGT). The BGT overflowed due to a failed check valve on an oil dump line. The well was immediately shut in and initial response activities recovered approximately 3 barrels (bbls) of condensate from within the cribbing surrounding the BGT. However, at the time of the release, it was estimated that approximately 20.5 bbls of condensate were not recovered and infiltrated into the soil immediately below the BGT. The release did not impact surface soil outside of the BGT cribbing. The release was reported to the New Mexico Oil Conservation Division (NMOCD) on April 17, 2023 on a Form C-141, *Release Notification*. The release was assigned NMOCD Incident Number NAPP2310735838.

SITE CHARACTERIZATION AND CLOSURE CRITERIA

As part of the Site investigation, local geology/hydrogeology and nearby sensitive receptors were assessed in accordance with Title 19, Chapter 15, Part 29, Sections 11 and 12 (19.15.29.11 and 12) of the New Mexico Administrative Code (NMAC).

The Site is located within the Nacimiento Geologic Formation. In the report titled "*Hydrogeology and Water Resources of San Juan Basin, New Mexico*" (Stone, et. al., 1983), the Nacimiento Formation is characterized by interbedded black carbonaceous mudstones and white, coarse-grained sandstones, which ranges in thickness from 418 feet to 2,232 feet. The hydrogeologic properties of the Nacimiento Formation display variable properties dependent on location. Where sufficient yield is present, the primary use of water from this formation is for domestic and/or livestock supply. The Nacimiento Formation is underlain by the Ojo Alamo sandstone (Stone et. al, 1983).

The closest significant watercourse is an unnamed dry wash that is approximately 250 feet southwest of the Site. This wash has a defined bed and bank and is a first order tributary to a dry wash identified by a dashed blue line on a United States Geological Survey (USGS) 7.5-minute quadrangle map. The Site is greater than 200 feet from any lakebed, sinkhole, or playa lake (Figure 1). The nearest fresh-water well is New Mexico Office of the State Engineer (NMOSE) permitted well SJ-01736 (Appendix A), located approximately 1,450 feet south of the Site. The recorded depth to water on the NMOSE database is 300 feet below ground surface (bgs). No wellhead protection areas, springs, or domestic/stock wells are located within a ½-mile from the Site. The Site is not within a 100-year floodplain, overlying a subsurface mine, or located within an area underlain by unstable geology (area designated as low potential karst by the Bureau of Land Management (BLM)). Schools, hospitals, institutions, churches, and/or other occupied permanent residence or structures are not located within 300 feet of the Site.

Based on the information presented above and in accordance with the *Table I, Closure Criteria for Soils Impacted by a Release* (19.15.29.12 NMAC), the following Closure Criteria was applied to the Site constituents of concern (COCs):

- Benzene: 10 milligrams per kilogram (mg/kg)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX): 50 mg/kg
- Total petroleum hydrocarbons (TPH) as a combination of gasoline range organics (GRO), diesel range organics (DRO), and motor oil range organics (MRO): 100 mg/kg
- Chloride: 600 mg/kg

SITE INVESTIGATION ACTIVITIES

In response to the discovery of the release and because of the limited access at the Site due to infrastructure, utilities, and topography, vertical and horizontal delineation activities were performed using a drill rig. Ensolum submitted notice of sampling to the NMOCD and BLM at least 48 hours in advance of sampling activities (Appendix B). Drilling activities occurred on July 19 and 20, 2023 utilizing a Central Mining Equipment (CME) 75 hollow-stem auger drill rig operated by Enviro-Drill, Inc. with split-spoon sampling to advance a total of five borings (BH01 to BH05) to depths ranging from 15 feet to 34 feet bgs (locations shown on Figure 2). Photographs taken during delineation activities are included in Appendix C. Of note, placement of soil borings was limited by on-pad infrastructure, several utility/pipeline corridors, and significant topographical relief outside of the well pad, which prevented the drill rig from accessing optimal locations; however, Ensolum was able to place boring BH01 directly adjacent to the BGT location to assess potential soil impacts proximal to the release source.

During drilling, an Ensolum geologist logged lithology, inspected the soil for petroleum hydrocarbon staining and odors, and field screened for volatile organic compounds (VOCs) using a photoionization detector (PID), with results noted on field logs (attached as Appendix D). In general, soil samples were collected at depth intervals indicating the greatest impacts based on field screening results and from the terminal depth of the boring. Soil samples were collected directly into laboratory-provided jars and immediately placed on ice. Samples were submitted to Hall Environmental Analysis Laboratory (Hall) for analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021B, TPH by EPA Method 8015M/D, and chloride by EPA Method 300.0.

Soil composition at the Site was variable, consisting of fine- to medium-grained sand and silty sand interbedded with occasional silty clay. Formation sandstone (consolidated) was encountered in all borings at depths ranging from 5 feet to 20 feet bgs. Sandstone density appeared to increase with depth resulting in drilling refusal in all borings advanced at the Site. No groundwater or saturated soil was observed in any of the borings during drilling.

Laboratory analysis of the soil sample collected from boring BH01 at a depth of 29 to 31 feet bgs identified elevated concentrations of TPH exceeding the Table I Closure Criteria. All other soil samples

analyzed during this delineation effort, including the sample at the terminus of BH01, were in compliance with the applicable Closure Criteria for TPH, BTEX, and chloride. Laboratory analytical results from the initial drilling effort are summarized in Table 1 and Figure 2, with the complete laboratory analytical report attached in Appendix E.

SVE Well Construction and Installation

Based on field screening during drilling and for potential future use for pilot testing, borings BH01 through BH04 were completed as soil vapor extraction (SVE) wells for potential future use. Two nested SVE wells, as indicated on the well construction diagram, were installed in boring BH01, located in the source area of the release. Screened casings in boring BH01 were installed across the subsurface intervals with the highest petroleum hydrocarbon impacts based on PID results in order to direct the applied vacuum to these depth intervals. In addition, SVE wells installed in borings BH02 through BH04 were completed for potential future use as observation wells during an SVE "pilot test". SVE wells were constructed with 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to 2 feet above the screened interval, then hydrated bentonite seal to the ground surface.

SITE FINDINGS

Based on field screening and analytical data gathered during the Site delineation events, impacted soil was identified near the source of the release in BH01. No significant VOCs were detected by field screening in shallow soils (ground surface to approximately 9 feet bgs). Laboratory analytical results from deeper subsurface soil samples collected from BH01 detected the presence of BTEX and TPH, but only one sample, collected at 29 feet bgs and containing 209 mg/kg TPH, exceeded NMOCD Table I Closure Criteria. The detected TPH constituents are primarily GRO and DRO, and when evaluated with elevated field screening data, are representative of volatile condensate.

Soil analytical results from BH01 and the other lateral boreholes indicate that impacts resulting from the release do not appear to be widespread, either vertically or laterally. Site access restrictions prevented optimal placement of borings, particularly for a more precise investigation of the area immediately beneath and downgradient (south-southeast) of the source. The areas directly under adjacent infrastructure could not be accessed. However, boring BH01 was positioned proximal to the release and as close as possible to the BGT according to Hilcorp safety policies regarding drilling near active infrastructure. Boring BH02 was positioned in the downgradient direction, shifted outward to avoid subsurface utilities (Figure 2), and BH05 was positioned slightly cross-gradient as high up the approaching hill as the drill rig could safely access. Similarly, BH03 and BH04 were installed as close to the location as possible to delineate the impacts observed in field screening results from BH01. Impacts from an extensive release, if present, would be identified in those surrounding borings. Soil impacts do not appear to be widespread either vertically or laterally, and given the low-level concentrations of TPH detected in BH01 and limited depth range of occurrence, there does not appear to be evidence of significant migration.

CONCLUSIONS

Based on the findings of this limited soil investigation, condensate from the BGT overflowed and infiltrated into soil beneath the BGT, belling out slightly as evidenced by elevated field screening results beginning at 9 feet bgs in BH01. The resulting condensate impacts to soil exceed regulatory thresholds are only at an interval greater than 25 feet in depth and less than 5 feet wide approximately 15 feet away from the BGT. While it is likely that impacts exist directly under the BGT and/or compressor, the volume of condensate and/or the type of material released (i.e., condensate versus produced water) may also have been overestimated. Assuming a bell or pyramid shape of impacted soil below the BGT resulting from vertical migration and mechanical dispersion of fluids, a conservative estimate of the volume of

regulated impacted soil containing TPH concentrations greater than 100 mg/kg is approximately 255 cubic yards of soil (base of the pyramid is assumed to be approximately 900 square feet).

The Site characterization presented above indicates that potential nearby receptors are not located within the radii presented in 19.15.29.11 and 12 NMAC, with the exception of a significant watercourse located within 300 feet of the Site. This significant watercourse is a dry wash located 250 feet away from the Site and, based on regional depth to water data, is a losing stream. Due to depth of impacts, surface water runoff and potential sheet flow into nearby significant watercourses would not be impacted by TPH concentrations present in soil at depth. Additionally, since the water course is a losing stream, the potential for petroleum hydrocarbons to enter the water course from depth is low.

Site lithology indicates that formation sandstone was encountered in all borings at depths ranging from 5 feet to 20 feet bgs. The vertical transport of the petroleum hydrocarbons through the sandstone would be dependent on applying enough head or flowing pressure to overcome the existing adsorption of the petroleum hydrocarbons to the soil. As the release is no longer occurring, the only driving mechanism that could increase vertical transport would be water infiltration. With little rainfall historically recorded in San Juan County (approximately 10 inches per year) and depth to groundwater greater than 100 feet bgs at the Site, the potential of surface water infiltrating and transporting the petroleum hydrocarbon impacts to groundwater is unlikely.

Lastly, petroleum hydrocarbons are organic matter and conducive for natural attenuation through adsorption, biodegradation, and volatilization in the unsaturated zone of the soil column. Over time, microbes will consume adsorbed hydrocarbons, thereby reducing TPH concentrations. Considering the limited volume and low TPH concentrations present at the Site, natural attenuation is likely to reduce concentrations to below NMOCD Table I Closure Criteria in a reasonable timeframe.

VARIANCE REQUEST

The site characterization and findings described above identify that there are no complete pathways for human or environmental exposure to COCs at the Site. COC concentrations remaining at the Site, if left in place, do not pose a risk to fresh water, human health, or the environment and leaving them in place is equally protective of public health and environment. Natural attenuation through adsorption, biodegradation, and volatilization will reduce TPH concentrations over time and still achieve the objectives identified in 19.15.29 NMAC. As such, Hilcorp and Ensolum recommend leaving the impacted soil at the Site in place to naturally attenuate. This approach, although protective, would result in leaving impacted media in place exceeding NMOCD remediation action levels and, as such, require a variance in accordance with 19.15.29.14 NMAC.

The variance requirements also require a discussion of a need for a variance and a demonstration of how the variance will provide better or equal protection of public health, safety, and the environment. Equal or better protection of public health and the environment through natural attenuation is documented in the evaluation of potential exposure pathways and nearby sensitive receptors presented above that concludes there is no complete pathway for human or environmental exposure to the COCs. Conversely, those exposure pathways are significantly altered and effectually opened if alternative remediation techniques are applied at the Site (i.e., excavation or SVE remediation alternatives). These alternatives would bring the subsurface impacts to the surface as impacted soil and/or vapors that can expose humans and the environment to harmful chemicals. If left in place, contaminants will be degraded *in situ* by biological processes that will reduce the petroleum hydrocarbons to carbon dioxide and water.

CLOSURE REQUEST

Based on delineation and characterization of vadose zone impacts at the Site and no complete pathways to human or environmental exposures to the identified COCs, Hilcorp requests approval to leave the limited impacted soil in place and close Incident Number NAPP2310735838 with no further action required. Upon approval of this closure request, Hilcorp will properly plug and abandon the SVE wells that were constructed at the Site.

REFERENCES

Stone, W.; Lyford, F.; Frenzel, P.; Mizell, N.; and Padgett, E. (1983). *Hydrogeology and Water Resources of San Juan Basin, New Mexico*. Socorro: New Mexico Bureau of Mines and Mineral Resources.


United States Environmental Protection Agency (EPA). (2015). *Technical Guide For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites*. Washington, D.C.: United States Environmental Protection Agency.

We appreciate the opportunity to provide this document to the NMOCD. If you should have any questions or comments regarding this document, please contact the undersigned.

Sincerely,
Ensolum, LLC



Stuart Hyde, LG
Senior Geologist
(970) 903-1607
shyde@ensolum.com



Daniel R. Moir, PG
Senior Managing Geologist
(303) 887-2946
dmoir@ensolum.com

Attachments:

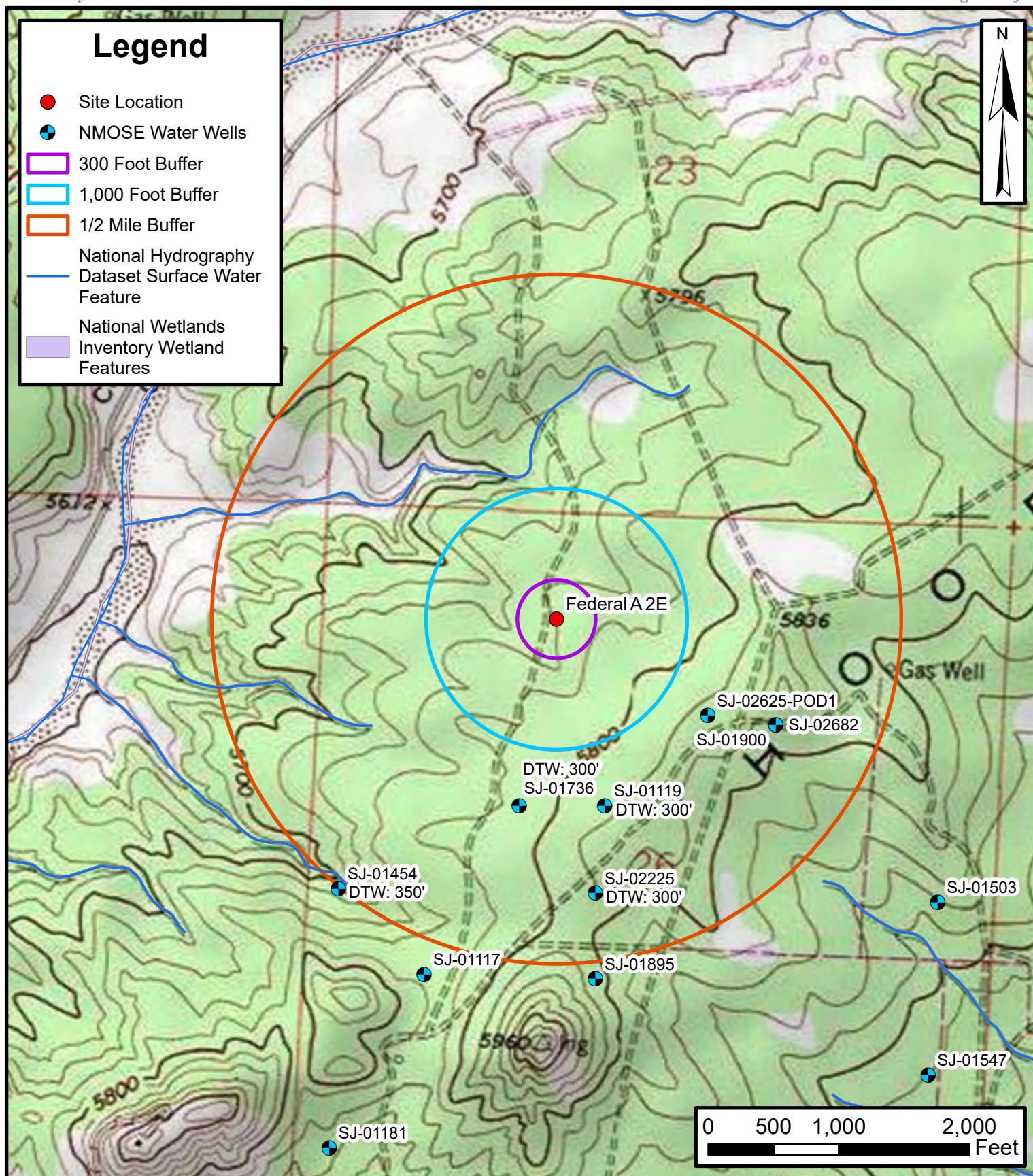
- Figure 1: Site Receptor Map
- Figure 2: Soil Sample Analytical Results

- Table 1: Delineation Soil Sample Analytical Results

- Appendix A: NMOSE Point of Diversion Summary
- Appendix B: Agency Sampling Notifications
- Appendix C: Photographic Log
- Appendix D: Boring Logs
- Appendix E: Laboratory Analytical Reports



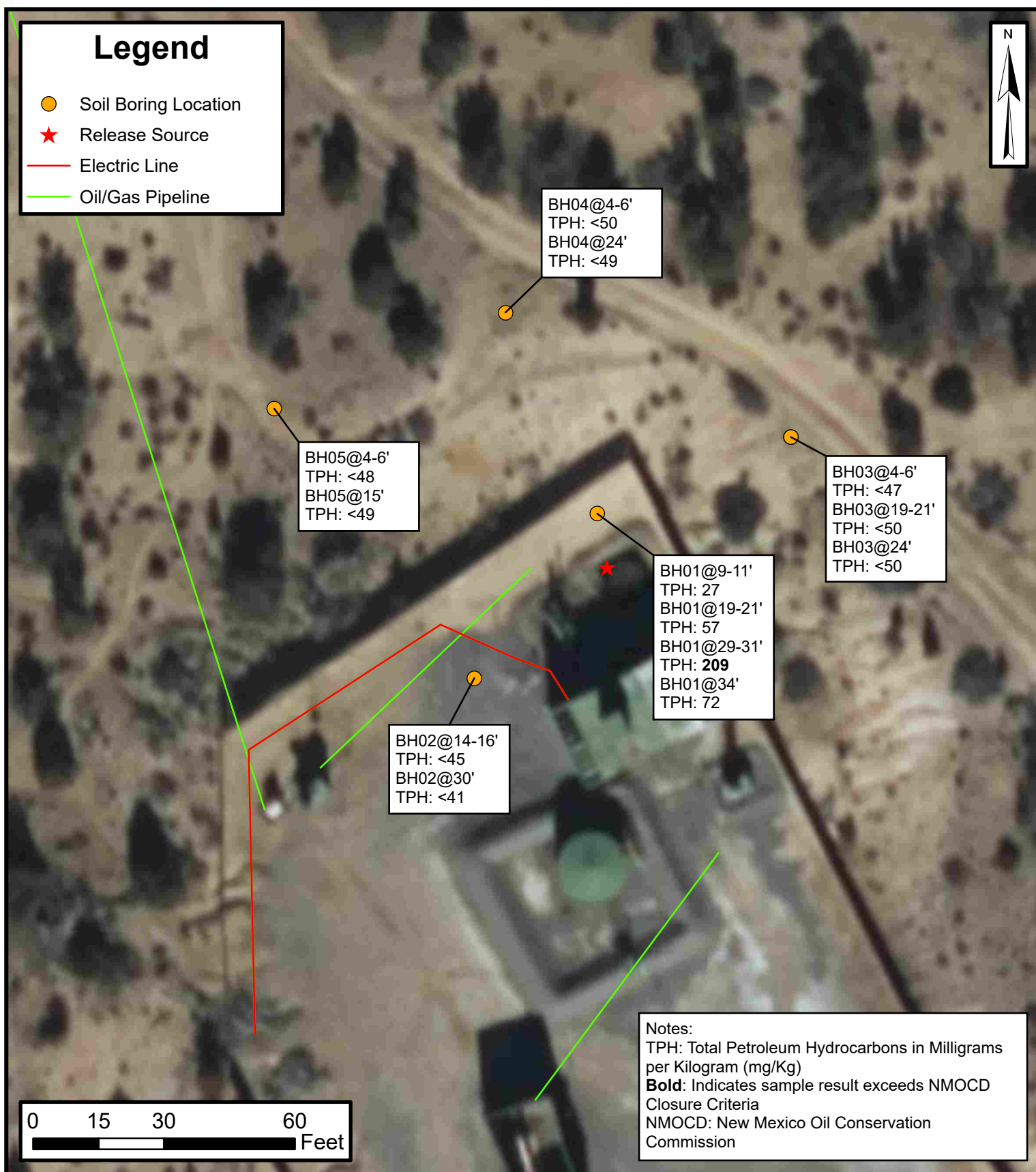
FIGURES



Site Receptor Map

Federal A 2E
 Hilcorp Energy Company
 Incident Number: napp2310735838
 36.7891159, -108.177948
 San Juan County, New Mexico

FIGURE
 1



Soil Analytical Results

Federal A 2E

Hilcorp Energy Company

Incident Number: napp2310735838

36.7891159, -108.177948

San Juan County, New Mexico

FIGURE

2



TABLES



TABLE 1
DELINEATION SOIL SAMPLE ANALYTICAL RESULTS
 Federal A 2E
 Hilcorp Energy Company
 San Juan County, New Mexico

Sample ID	Date	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH MRO (mg/kg)	Total TPH (mg/kg)	Chloride (mg/kg)
NMOCD Closure Criteria for Soils Impacted by a Release			10	NE	NE	NE	50	NE	NE	NE	100	600
BH01 @ 9-11'	7/19/2023	9-11	<0.024	<0.048	<0.048	0.35	0.35	11	16	<48	27	<60
BH01 @ 19-21'	7/19/2023	19-21	<0.025	0.14	0.099	0.94	1.179	45	12	<41	57	<60
BH01 @ 29-31'	7/19/2023	29-31	0.027	0.11	0.16	0.33	0.627	59	150	<48	209	<60
BH01 @ 34'	7/19/2023	34	<0.025	<0.050	<0.050	<0.10	<0.10	11	61	<45	72	<60
BH02 @ 14-16'	7/19/2023	14-16	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<8.9	<45	<45	210
BH02 @ 30'	7/19/2023	30	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<8.3	<41	<41	66
BH03 @ 4-6'	7/20/2023	4-6	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.4	<47	<47	<60
BH03 @ 19-21'	7/20/2023	19-21	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.9	<50	<50	<61
BH03 @ 24'	7/20/2023	24	<0.024	<0.048	<0.048	<0.095	<0.095	<4.8	<9.9	<50	<50	<60
BH04 @ 4-6'	7/20/2023	4-6	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<50	<50	110
BH04 @ 24'	7/20/2023	24	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.8	<49	<49	<61
BH05 @ 4-6'	7/20/2023	4-6	<0.023	<0.047	<0.047	<0.094	<0.094	<4.7	<9.6	<48	<48	71
BH05 @ 15'	7/20/2023	15	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.7	<49	<49	<60

Notes:

bgs: below ground surface

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes

mg/kg: milligrams per kilogram

NE: Not Established

NMOCD: New Mexico Oil Conservation Division

': feet

GRO: Gasoline Range Organics

DRO: Diesel Range Organics

MRO: Motor Oil/Lube Oil Range Organics

TPH: Total Petroleum Hydrocarbon

<: indicates result less than the stated laboratory reporting limit (RL)

Concentrations in **bold** and shaded exceed the New Mexico Oil Conservation Division Table I Closure Criteria for Soils Impacted by a Release



APPENDIX A

NMOSE Point of Diversion Summary



New Mexico Office of the State Engineer

Point of Diversion Summary

(quarters are 1=NW 2=NE 3=SW 4=SE)
 (quarters are smallest to largest) (NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	SJ 01736	3	4	1	26	30N	13W	216360	4075758*

Driller License:	717	Driller Company:	WESTERN WATER WELLS	
Driller Name:	TERRY HOOD			
Drill Start Date:	06/11/1983	Drill Finish Date:	06/15/1983	Plug Date:
Log File Date:	06/16/1983	PCW Rev Date:		Source: Shallow
Pump Type:		Pipe Discharge Size:		Estimated Yield: 8 GPM
Casing Size:	5.00	Depth Well:	332 feet	Depth Water: 300 feet

Water Bearing Stratifications:	Top	Bottom	Description
	300	332	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	292	332

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/TSC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

8/14/23 3:04 PM

POINT OF DIVERSION SUMMARY



APPENDIX B

Agency Sampling Notifications

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#); [Adeloye, Abiodun A](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#); [Reece Hanson](#)
Subject: Re: [EXTERNAL] Federal A 2E - Drilling and Sampling Notification
Date: Tuesday, July 18, 2023 10:17:59 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-tldnt2k2.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Thank you for the notice. If an OCD representative is not on-site on the date &/or time given, please sample per 19.15.29 NMAC or from an OCD pre-approved sampling plan. For whatever reason, if the sampling timeframe is altered, please notify the OCD as soon as possible so we may adjust our schedule(s). Failure to notify the OCD of this change may result in the closure sample(s) not being accepted.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrn.nm.gov
<http://www.emnrn.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Tuesday, July 18, 2023 9:58 AM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrn.nm.gov>; Adeloye, Abiodun A <aadeloye@blm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>; Reece Hanson <rhanson@ensolum.com>
Subject: [EXTERNAL] Federal A 2E - Drilling and Sampling Notification

CAUTION: This email originated outside of our organization. Exercise caution prior to

clicking on links or opening attachments.

Emmanuel and Nelson,

On behalf of Hilcorp Energy Company, we are submitting this updated drilling and sampling notification for the Federal A 2E site located in San Juan County at coordinates 36.78903, -108.17735. Drilling work was originally scheduled to begin on July 17, 2023, but will now commence on Wednesday July 19, 2023 at 10 AM. Please reach out with any questions or comments regarding the scheduled work. Thanks.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Extension Request
Date: Wednesday, September 13, 2023 2:35:32 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-cw0va3qq.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Your 30-day time extension request is approved. Remediation Due date has been updated to October 16, 2023 within the incident page.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Wednesday, September 13, 2023 2:19 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Extension Request

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, we are requesting an additional 30-day extension for the report submittal for the Federal A 2E site located in San Juan County, NM. We have completed

delineation and prepared the report for submittal, however, we are waiting on the landowner (private surface) and BLM approval of the final report prior to submitting to the NMOCD. If approved, the new reporting deadline would be Monday October 16, 2023. Please reach out with any questions or concerns regarding this request. Thanks and have a good afternoon.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Deadline Extension Request
Date: Wednesday, June 28, 2023 2:56:59 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-qn5oiv03.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Thank you for the correspondence. Your time extension request is approved. Remediation Due date has been updated to September 15, 2023.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

The OCD requires a copy of all correspondence relative to remedial activities be included in all proposals and/or final closure reports. Correspondence required to be included in reports may include, but not limited to, notifications for liner inspections, sample events, spill/release/fire, and request for time extensions or variances.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Wednesday, June 28, 2023 12:31 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Deadline Extension Request

CAUTION: This email originated outside of our organization. Exercise caution prior to

clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, we are submitting this deadline extension request for the Federal A 2E site located at coordinates 36.78911, -108.17795. Based on discussions with the BLM, because the well is producing from federal minerals and delineation activities are proposed in off-pad areas, the BLM has required Hilcorp to conduct a cultural survey of the area north and east of the well pad. At this time, the cultural survey has been performed by a third-party consultant and is being finalized for submittal to the BLM. Drilling activities are currently scheduled to begin on July 17th, pending BLM approval of the cultural survey. As such, Hilcorp is requesting a 60-day extension from the date of drilling and requests a new reporting deadline of Friday, September 15, 2023.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 



APPENDIX C

Photographic Log



Photographic Log
Hilcorp Energy Company
Federal A 2E
San Juan County, New Mexico



Photograph: 1 Date: 5/9/2023
Description: View of release location and BH01 (left)
View: Southeast



Photograph: 2 Date: 5/9/2023
Description: View of steep topography near BH03
View: West



Photograph: 3 Date: 7/20/2023
Description: View of on-pad infrastructure/equipment
View: Southwest



Photograph: 4 Date: 7/20/2023
Description: View of boring location BH01
View: Northwest



APPENDIX D

Boring Logs



FEDERAL A 2E BH01

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 34 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Reece Hanson/Zach Myers	

CASING DEEP - 0-32', SHALLOW - 0-17'

SCREEN DEEP - 22-32', SHALLOW - 7-17'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
2			15.2	Slt moist	SILTY SAND: Soft, gray to brown-reddish silty sandstone or compacted silty sand. Fine to medium grained, no staining or odor. Hard drilling from ~3.5' bgs, difficulty getting split spoon down	Deep	2
4						Shallow	4
6							6
8			1,717	Dry	SILTY CLAY: Gray, compacted silty clay with orange rust layers. Moderate odor. Moderate to strong odor in auger cuttings from ~7'bgs		8
10	BH01 9-11						10
12			1,985	Slt moist	SILTY SANDY CLAY: Softer, compacted silty clay with fine to medium grained sand and orange inclusions/layers. Hard drilling encountered at ~14' bgs, poor recovery with split spoon		12
14							14
16							16
18			2,355	Slt moist	SAND/SANDSTONE: Top 2" - SAA, bottom 2" - Light gray, medium to coarse broken up sand/sandstone, with some consolidated pieces. Moderate to strong odor. 60 blows for split spoon sampling		18
20	BH01 19-21						20
22			2,055	Slt moist	SAND/SANDSTONE: Top 2" - Same as 14-16' interval, bottom 2" - SAA. Moderate to strong odor		22
24							24
26							26
28			2,179	Slt moist	SAND/SANDSTONE: Tan-brown, mostly unconsolidated, fine to medium sand with some coarse grains. Occasional consolidated sandstone pieces. Moderate to strong odor		28
30	BH01 29-31						30
32			2,355	Slt moist	SAND/SANDSTONE: SAA with more coarse grains. Moderate to strong odor		32
34	BH01 @ 34						34
					Termination Depth at: 34' bgs due to refusal		



FEDERAL A 2E BH02

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 30 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Reece Hanson/Zach Myers	

CASING 0-30'

SCREEN 20-30'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
2							2
4			7.5	Dry	SILTY SAND: Tan to reddish brown, fine to medium grained sand No staining or odor Hard drilling, difficulty getting split spoon sampler down		4
6							6
8			3.4	Dry	SAND: Gray and rusty red/brown medium to coarse sand No staining or odor Hard drilling, difficulty getting split spoon sampler down	concrete cement grout	8
10							10
12							12
14	BH02 14-16		16.5	Dry to Slt moist	Top 0.5' of interval - Soft, black to dark gray, moist sand with swampy odor SILTY SANDY CLAY: Tan to gray, fine to medium grained sand with silt and clay No staining or odor Hard drilling, difficulty getting split spoon sampler down		14
16						bentonite	16
18			8.6	Dry	SAND/SANDSTONE: Tan/gray and rusty brown, medium to coarse sand No staining or odor 2" layer of black, silt and clay with swampy odor Hard drilling, difficulty getting split spoon sampler down		18
20							20
22							22
24			7.2	Dry	SAND/SANDSTONE: Tan to gray, medium to coarse sand/soft sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down	filter pack	24
26							26
28							28
30	BH02 @ 30		5.8	Slt moist	SAND/SANDSTONE: Tan to brown with black flecks/inclusions. Medium to coarse sand/soft sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down		30
					Termination Depth at: 30' bgs due to refusal		



FEDERAL A 2E BH03

ENSOLUM

PROJECT NAME Federal A 2E CLIENT Hilcorp Energy Company LOCATION 36.789154°, -108.177607° DRILLING DATE 7/19/2023 LOGGED BY Zach Myers	DRILLING COMPANY Enviro-Drill DRILLING METHOD Hollow Stem Auger TOTAL DEPTH 24 feet BOREHOLE DIAMETER 8 inches
---	---

CASING 0-24'

SCREEN 14-24'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
1							1
2							2
3							3
4	BH03 @ 4-6		7.2	Dry	SILTY SAND: Tan to rusty brown, fine to medium sand with silt No staining or odor Difficulty getting split spoon sampler down	concrete cement grout	4
5							5
6							6
7							7
8							8
9			5.1	Dry	SILTY SAND: Tan to rusty brown, fine to medium with rare coarse sand with silt No staining or odor Hard drilling, difficulty getting split spoon sampler down	bentonite	9
10							10
11							11
12							12
13							13
14			3.8	Dry	SILTY SAND/SANDSTONE: Tan, fine sand and silt with consolidated pieces of sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down	filter pack	14
15							15
16							16
17							17
18			7.9	Dry	@ 20' - SILTY SAND/SANDSTONE: Tan, fine sand with silt and consolidated sandstone pieces @ 20.5' - SILTY CLAY: Brown, gray silt with clay, very hard No staining or odor Hard drilling, difficulty getting split spoon sampler down		18
19	BH03 @ 19-21						19
20							20
21							21
22			50.8	Dry	SILTY SANDY CLAY: Tan, fine sand with silt and clay, some consolidated pieces of sandstone No staining, slight odor Hard drilling, difficulty getting split spoon sampler down		22
23	BH03 @ 24						23
24					Termination Depth at: 24' bgs due to refusal		24



FEDERAL A 2E BH04

ENSOLUM

PROJECT NAME Federal A 2E

CLIENT Hilcorp Energy Company

LOCATION 36.789154°, -108.177607°

DRILLING DATE 7/19/2023

LOGGED BY Zach Myers

DRILLING COMPANY Enviro-Drill

DRILLING METHOD Hollow Stem Auger

TOTAL DEPTH 24 feet

BOREHOLE DIAMETER 8 inches

CASING 0-24'

SCREEN 14-24'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
1							1
2							2
3							3
4	BH04 4-6		15.1	Dry	SAND/SANDSTONE: Reddish brown, fine to medium sand/sandstone. Large, consolidated pieces of soft Formation sandstone present. No staining or odor. Hard drilling from 2' bgs, difficulty getting split spoon sampler down		4
5						concrete cement grout	5
6							6
7							7
8							8
9			6.7	Dry	SILTY SAND: Gray, silty sand with rare clay. Hard, large consolidated Formation pieces present. No staining or odor. Hard drilling, difficulty getting split spoon sampler down		9
10						bentonite	10
11							11
12							12
13							13
14			5.2	Dry	SILT/SILTSTONE: Dark gray siltstone/shale, large, consolidated Formation material in sampler, difficult to break up. No staining or odor. Hard drilling, difficulty getting split spoon sampler down		14
15							15
16							16
17							17
18						filter pack	18
19			6.3	Dry	SAND/SANDSTONE: Gray, medium to coarse sand/sandstone, large consolidated Formation pieces present in sampler. No staining or odor. Hard drilling, difficulty getting split spoon sampler down		19
20							20
21							21
22							22
23	BH04 @ 24		8.9	Dry	SAND/SANDSTONE: Gray, medium to coarse sand/sandstone, large consolidated Formation pieces present in sampler. No staining or odor. Hard drilling, difficulty getting split spoon sampler down		23
24					Termination Depth at: 24' bgs due to refusal		24



FEDERAL A 2E BH05

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 15 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Zach Myers	

CASING NA, BACKFILLED

SCREEN NA, BACKFILLED

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
1							1
2							2
3							3
4	BH05 4-6		8.2	Dry	SAND/SANDSTONE: Gray to tan, fine to medium sand/sandstone. Some consolidated pieces of Formation sandstone present. No staining or odor Hard drilling from 2' bgs, difficulty getting split spoon sampler down		4
5							5
6							6
7							7
8							8
9							9
10			3.9	Dry	SILTY SAND: White to tan, fine sand with silt. Some consolidated pieces of sandstone present. No staining or odor Hard drilling, difficulty getting split spoon sampler down		10
11							11
12							12
13							13
14	BH05 @ 24			Dry	SAND/SANDSTONE: Tan to yellow, fine to medium sand. Some consolidated pieces of Formation sandstone present. No staining or odor Hard drilling, difficulty getting split spoon sampler down		14
15			5.8		Termination Depth at: 15' bgs due to refusal		15

Backfill



APPENDIX E

Laboratory Analytical Reports



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

July 31, 2023

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

RE: Federal A2E

OrderNo.: 2307A00

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 6 sample(s) on 7/21/2023 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a white background.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 9-11'

Project: Federal A2E

Collection Date: 7/19/2023 10:53:00 AM

Lab ID: 2307A00-001

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	16	9.6		mg/Kg	1	7/23/2023 6:32:20 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/23/2023 6:32:20 PM
Surr: DNOP	93.3	69-147		%Rec	1	7/23/2023 6:32:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	11	4.8		mg/Kg	1	7/24/2023 7:17:34 PM
Surr: BFB	134	15-244		%Rec	1	7/24/2023 7:17:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	7/24/2023 7:17:34 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 7:17:34 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 7:17:34 PM
Xylenes, Total	0.35	0.096		mg/Kg	1	7/24/2023 7:17:34 PM
Surr: 4-Bromofluorobenzene	122	39.1-146		%Rec	1	7/24/2023 7:17:34 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:35:16 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 1 of 10

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 19-21'

Project: Federal A2E

Collection Date: 7/19/2023 10:55:00 AM

Lab ID: 2307A00-002

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	12	8.1		mg/Kg	1	7/23/2023 6:56:47 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/23/2023 6:56:47 PM
Surr: DNOP	102	69-147		%Rec	1	7/23/2023 6:56:47 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	45	4.9		mg/Kg	1	7/24/2023 7:41:12 PM
Surr: BFB	267	15-244	S	%Rec	1	7/24/2023 7:41:12 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 7:41:12 PM
Toluene	0.14	0.049		mg/Kg	1	7/24/2023 7:41:12 PM
Ethylbenzene	0.099	0.049		mg/Kg	1	7/24/2023 7:41:12 PM
Xylenes, Total	0.94	0.099		mg/Kg	1	7/24/2023 7:41:12 PM
Surr: 4-Bromofluorobenzene	128	39.1-146		%Rec	1	7/24/2023 7:41:12 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:47:40 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 2 of 10

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 29-31'

Project: Federal A2E

Collection Date: 7/19/2023 10:58:00 AM

Lab ID: 2307A00-003

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	150	9.5		mg/Kg	1	7/23/2023 7:21:17 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/23/2023 7:21:17 PM
Surr: DNOP	98.4	69-147		%Rec	1	7/23/2023 7:21:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	59	4.8		mg/Kg	1	7/24/2023 8:04:46 PM
Surr: BFB	457	15-244	S	%Rec	1	7/24/2023 8:04:46 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	0.027	0.024		mg/Kg	1	7/24/2023 8:04:46 PM
Toluene	0.11	0.048		mg/Kg	1	7/24/2023 8:04:46 PM
Ethylbenzene	0.16	0.048		mg/Kg	1	7/24/2023 8:04:46 PM
Xylenes, Total	0.33	0.097		mg/Kg	1	7/24/2023 8:04:46 PM
Surr: 4-Bromofluorobenzene	130	39.1-146		%Rec	1	7/24/2023 8:04:46 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:00:05 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 34'

Project: Federal A2E

Collection Date: 7/19/2023 11:00:00 AM

Lab ID: 2307A00-004

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	61	9.1		mg/Kg	1	7/23/2023 7:45:44 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	7/23/2023 7:45:44 PM
Surr: DNOP	90.6	69-147		%Rec	1	7/23/2023 7:45:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	11	5.0		mg/Kg	1	7/24/2023 8:28:21 PM
Surr: BFB	144	15-244		%Rec	1	7/24/2023 8:28:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 8:28:21 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 8:28:21 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 8:28:21 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/24/2023 8:28:21 PM
Surr: 4-Bromofluorobenzene	120	39.1-146		%Rec	1	7/24/2023 8:28:21 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:37:18 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH02@ 14-16'

Project: Federal A2E

Collection Date: 7/19/2023 1:50:00 PM

Lab ID: 2307A00-005

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	7/23/2023 8:10:14 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	7/23/2023 8:10:14 PM
Surr: DNOP	88.9	69-147		%Rec	1	7/23/2023 8:10:14 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/24/2023 3:19:33 PM
Surr: BFB	96.0	15-244		%Rec	1	7/24/2023 3:19:33 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	7/24/2023 3:19:33 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 3:19:33 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 3:19:33 PM
Xylenes, Total	ND	0.096		mg/Kg	1	7/24/2023 3:19:33 PM
Surr: 4-Bromofluorobenzene	118	39.1-146		%Rec	1	7/24/2023 3:19:33 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	210	60		mg/Kg	20	7/26/2023 2:14:31 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH02@ 30'

Project: Federal A2E

Collection Date: 7/19/2023 1:55:00 PM

Lab ID: 2307A00-006

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	8.3		mg/Kg	1	7/23/2023 8:34:49 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/23/2023 8:34:49 PM
Surr: DNOP	97.6	69-147		%Rec	1	7/23/2023 8:34:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 3:43:22 PM
Surr: BFB	98.0	15-244		%Rec	1	7/24/2023 3:43:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 3:43:22 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 3:43:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 3:43:22 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/24/2023 3:43:22 PM
Surr: 4-Bromofluorobenzene	121	39.1-146		%Rec	1	7/24/2023 3:43:22 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	66	60		mg/Kg	20	7/26/2023 2:51:45 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00
31-Jul-23

Client: HILCORP ENERGY
Project: Federal A2E

Sample ID: MB-76477	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 76477	RunNo: 98503								
Prep Date: 7/26/2023	Analysis Date: 7/26/2023	SeqNo: 3587770	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-76477	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 76477	RunNo: 98503								
Prep Date: 7/26/2023	Analysis Date: 7/26/2023	SeqNo: 3587771	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.9	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 Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307A00

31-Jul-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: LCS-76387	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583070	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.3	61.9	130			
Surr: DNOP	4.6		5.000		91.4	69	147			

Sample ID: 2307A00-006AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BH02@ 30'	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583093	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	8.3	41.39	0	98.3	54.2	135			
Surr: DNOP	4.2		4.139		101	69	147			

Sample ID: 2307A00-006AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BH02@ 30'	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583094	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	35	8.5	42.30	0	82.0	54.2	135	15.9	29.2	
Surr: DNOP	3.5		4.230		83.1	69	147	0	0	

Sample ID: MB-76387	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 76387	RunNo: 98451								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583918	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		107	69	147			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00

31-Jul-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: lcs-76381	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583843		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	94.4	70	130			
Surr: BFB	2000		1000		197	15	244			

Sample ID: mb-76381	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583844		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	950		1000		95.2	15	244			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00

31-Jul-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: LCS-76381	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583856		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	114	70	130			
Toluene	1.1	0.050	1.000	0	115	70	130			
Ethylbenzene	1.2	0.050	1.000	0	117	70	130			
Xylenes, Total	3.5	0.10	3.000	0	118	70	130			
Surr: 4-Bromofluorobenzene	1.2		1.000		120	39.1	146			

Sample ID: mb-76381	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583857		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	1.2		1.000		119	39.1	146			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
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 Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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**HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY**

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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2307A00

RcptNo: 1

Received By: Tracy Casarrubias 7/21/2023 6:40:00 AM

Completed By: Tracy Casarrubias 7/21/2023 7:37:47 AM

Reviewed By: *Tracy 7/21/23*

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: *SEM 07/21/23*

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: Mailing address, phone number and Email/Fax are missing on COC - TMC 7/21/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.7	Good	Yes	Morty		



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

August 01, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Federal A2E

OrderNo.: 2307999

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 7 sample(s) on 7/21/2023 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 10:30:00 AM

Lab ID: 2307999-001

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: SB
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	7/28/2023 1:31:02 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/28/2023 1:31:02 PM
Surr: DNOP	93.1	69-147		%Rec	1	7/28/2023 1:31:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 6:37:00 PM
Surr: BFB	79.2	15-244		%Rec	1	7/24/2023 6:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 6:37:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 6:37:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 6:37:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 6:37:00 PM
Surr: 4-Bromofluorobenzene	78.0	39.1-146		%Rec	1	7/24/2023 6:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/25/2023 11:36:45 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 19-21'

Project: Federal A2E

Collection Date: 7/20/2023 10:35:00 AM

Lab ID: 2307999-002

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/25/2023 3:01:12 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:01:12 PM
Surr: DNOP	92.1	69-147		%Rec	1	7/25/2023 3:01:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 8:05:00 PM
Surr: BFB	78.6	15-244		%Rec	1	7/24/2023 8:05:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 8:05:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 8:05:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 8:05:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 8:05:00 PM
Surr: 4-Bromofluorobenzene	77.7	39.1-146		%Rec	1	7/24/2023 8:05:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	61		mg/Kg	20	7/25/2023 11:49:10 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 24'

Project: Federal A2E

Collection Date: 7/20/2023 10:40:00 AM

Lab ID: 2307999-003

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/25/2023 3:12:10 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:12:10 PM
Surr: DNOP	102	69-147		%Rec	1	7/25/2023 3:12:10 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/24/2023 9:10:00 PM
Surr: BFB	79.5	15-244		%Rec	1	7/24/2023 9:10:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.024		mg/Kg	1	7/24/2023 9:10:00 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 9:10:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 9:10:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	7/24/2023 9:10:00 PM
Surr: 4-Bromofluorobenzene	75.9	39.1-146		%Rec	1	7/24/2023 9:10:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:01:35 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH04@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 11:35:00 AM

Lab ID: 2307999-004

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/25/2023 3:23:09 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:23:09 PM
Surr: DNOP	103	69-147		%Rec	1	7/25/2023 3:23:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 9:32:00 PM
Surr: BFB	81.1	15-244		%Rec	1	7/24/2023 9:32:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 9:32:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 9:32:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 9:32:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 9:32:00 PM
Surr: 4-Bromofluorobenzene	75.3	39.1-146		%Rec	1	7/24/2023 9:32:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	110	60		mg/Kg	20	7/26/2023 12:38:49 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH04@ 24'

Project: Federal A2E

Collection Date: 7/20/2023 11:38:00 AM

Lab ID: 2307999-005

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/25/2023 3:34:08 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/25/2023 3:34:08 PM
Surr: DNOP	141	69-147		%Rec	1	7/25/2023 3:34:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/24/2023 9:54:00 PM
Surr: BFB	79.3	15-244		%Rec	1	7/24/2023 9:54:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 9:54:00 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 9:54:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 9:54:00 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/24/2023 9:54:00 PM
Surr: 4-Bromofluorobenzene	76.6	39.1-146		%Rec	1	7/24/2023 9:54:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	61		mg/Kg	20	7/26/2023 12:51:14 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH05@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 1:25:00 PM

Lab ID: 2307999-006

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/25/2023 3:45:05 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/25/2023 3:45:05 PM
Surr: DNOP	113	69-147		%Rec	1	7/25/2023 3:45:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/24/2023 10:15:00 PM
Surr: BFB	78.8	15-244		%Rec	1	7/24/2023 10:15:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.023		mg/Kg	1	7/24/2023 10:15:00 PM
Toluene	ND	0.047		mg/Kg	1	7/24/2023 10:15:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	7/24/2023 10:15:00 PM
Xylenes, Total	ND	0.094		mg/Kg	1	7/24/2023 10:15:00 PM
Surr: 4-Bromofluorobenzene	76.8	39.1-146		%Rec	1	7/24/2023 10:15:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	71	60		mg/Kg	20	7/26/2023 1:03:38 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH05@ 15'

Project: Federal A2E

Collection Date: 7/20/2023 1:28:00 PM

Lab ID: 2307999-007

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/25/2023 3:56:01 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/25/2023 3:56:01 PM
Surr: DNOP	116	69-147		%Rec	1	7/25/2023 3:56:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/24/2023 10:37:00 PM
Surr: BFB	78.2	15-244		%Rec	1	7/24/2023 10:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 10:37:00 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 10:37:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 10:37:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 10:37:00 PM
Surr: 4-Bromofluorobenzene	76.8	39.1-146		%Rec	1	7/24/2023 10:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:16:02 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: 2307999
01-Aug-23

Client: HILCORP ENERGY
Project: Federal A2E

Sample ID: MB-76448	SampType: MBLK	TestCode: EPA Method 300.0: Anions
Client ID: PBS	Batch ID: 76448	RunNo: 98504
Prep Date: 7/25/2023	Analysis Date: 7/25/2023	SeqNo: 3586471 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	ND	1.5

Sample ID: LCS-76448	SampType: LCS	TestCode: EPA Method 300.0: Anions
Client ID: LCSS	Batch ID: 76448	RunNo: 98504
Prep Date: 7/25/2023	Analysis Date: 7/25/2023	SeqNo: 3586472 Units: mg/Kg
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Chloride	14	1.5 15.00 0 93.2 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 Quantitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: LCS-76408	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 76408		RunNo: 98469							
Prep Date: 7/24/2023	Analysis Date: 7/25/2023		SeqNo: 3586100		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	61.9	130			
Surr: DNOP	4.4		5.000		88.2	69	147			

Sample ID: MB-76408	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 76408		RunNo: 98469							
Prep Date: 7/24/2023	Analysis Date: 7/25/2023		SeqNo: 3586104		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	8.2		10.00		82.4	69	147			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: lcs-76388	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583936 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	99.4	70	130			
Surr: BFB	2000		1000		200	15	244			

Sample ID: mb-76388	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583937 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	820		1000		81.7	15	244			

Sample ID: 2307999-001amsd	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BH03@ 4-6'	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583940 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.65	0	88.9	70	130	0.189	20	
Surr: BFB	1900		986.2		191	15	244	0	0	

Sample ID: 2307999-001ams	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BH03@ 4-6'	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3584071 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.56	0	88.5	70	130			
Surr: BFB	1900		982.3		193	15	244			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: lcs-76388	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583974		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.87	0.025	1.000	0	87.1	70	130			
Toluene	0.87	0.050	1.000	0	87.5	70	130			
Ethylbenzene	0.90	0.050	1.000	0	90.2	70	130			
Xylenes, Total	2.7	0.10	3.000	0	90.8	70	130			
Surr: 4-Bromofluorobenzene	0.81		1.000		80.9	39.1	146			

Sample ID: mb-76388	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583975		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	0.79		1.000		78.8	39.1	146			

Sample ID: 2307999-002ams	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: BH03@ 19-21'	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583978		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.025	0.9833	0	87.4	70	130			
Toluene	0.88	0.049	0.9833	0	89.0	70	130			
Ethylbenzene	0.90	0.049	0.9833	0	91.1	70	130			
Xylenes, Total	2.7	0.098	2.950	0.03172	91.4	70	130			
Surr: 4-Bromofluorobenzene	0.77		0.9833		77.9	39.1	146			

Sample ID: 2307999-002amsd	SampType: MSD		TestCode: EPA Method 8021B: Volatiles							
Client ID: BH03@ 19-21'	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583979		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.025	0.9862	0	83.5	70	130	4.34	20	
Toluene	0.85	0.049	0.9862	0	86.4	70	130	2.67	20	
Ethylbenzene	0.87	0.049	0.9862	0	88.3	70	130	2.90	20	
Xylenes, Total	2.6	0.099	2.959	0.03172	88.4	70	130	2.93	20	
Surr: 4-Bromofluorobenzene	0.78		0.9862		78.7	39.1	146	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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2307999

RcptNo: 1

Received By: Tracy Casarrubias 7/21/2023 6:40:00 AM

Completed By: Tracy Casarrubias 7/21/2023 7:27:57 AM

Reviewed By: *ju 7/21/23*

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: *SCM 07/21/23*

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: Mailing address, phone number and Email/Fax are missing on COC - TMC 7/21/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.7	Good	Yes	Morty		

Well Name: FEDERAL A	Well Location: T30N / R13W / SEC 26 / NENW / 36.78903 / -108.17735	County or Parish/State: SAN JUAN / NM
Well Number: 2E	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078213	Unit or CA Name:	Unit or CA Number:
US Well Number: 300452386500S1	Well Status: Producing Gas Well	Operator: HILCORP ENERGY COMPANY

Subsequent Report

Sundry ID: 2753532

Type of Submission: Subsequent Report

Type of Action: Other

Date Sundry Submitted: 09/27/2023

Time Sundry Submitted: 07:01

Date Operation Actually Began: 09/27/2023

Actual Procedure: Hilcorp is requesting BLM approval/concurrence of the proposed variance request prior to submitting the attached Site Characterization Report and Closure Request with Variance to the NMOCD. Refer to the attachment for additional info.

SR Attachments

Actual Procedure

Federal_A_2E__Subsequent_Rpt__09272023_20230927070057.pdf

Well Name: FEDERAL A	Well Location: T30N / R13W / SEC 26 / NENW / 36.78903 / -108.17735	County or Parish/State: SAN JUAN / NM
Well Number: 2E	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078213	Unit or CA Name:	Unit or CA Number:
US Well Number: 300452386500S1	Well Status: Producing Gas Well	Operator: HILCORP ENERGY COMPANY

Operator

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: MITCH KILLOUGH

Signed on: SEP 27, 2023 07:01 AM

Name: HILCORP ENERGY COMPANY

Title: Environmental Specialist - Sr

Street Address: 1111 TRAVIS ST

City: HOUSTONState: TX

Phone: (713) 757-5247

Email address: MKILLOUGH@HILCORP.COM

Field

Representative Name:

Street Address:

City:State:Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: DAVE J MANKIEWICZ

BLM POC Title: AFM-Minerals

BLM POC Phone: 5055647761

BLM POC Email Address: DMANKIEW@BLM.GOV

Disposition: Approved

Disposition Date: 10/05/2023

Signature: Dave J Mankiewicz

Mitch Killough

From: Ben Mitchell
Sent: Thursday, September 21, 2023 10:04 AM
To: Mitch Killough
Subject: FW: [EXTERNAL] RE: Fed A 2E Closure Report/Variance Request

FYI from Elizabeth.

From: Elizabeth McNally <emcnally@animasenvironmental.com>
Sent: Thursday, September 21, 2023 9:00 AM
To: Ben Mitchell <bemitchell@hilcorp.com>
Subject: [EXTERNAL] RE: Fed A 2E Closure Report/Variance Request

CAUTION: External sender. DO NOT open links or attachments from UNKNOWN senders.

Hello Ben,

Thanks for sending the Site Characterization Report and Closure Request with Variance for the Federal A 2E for me to review. Based on our observations as next door residents and the private surface owner (Lot 7), along with the information provided in the report, the site investigation and subsequent site findings appear reasonable.

While I disagree with the conclusion that there is a "bell or pyramid shape of impacted soil below the BGT" (because the site is situated on and adjacent to sandstone outcropping, and homogeneous subsurface soils are unlikely), it is clear that the single exceedance of TPH (209 mg/kg) at BH-01 29-31' is vertically defined at 34', with TPH concentrations (72 mg/kg) below the NMOCD action level. Lateral extents appear defined.

We are in concurrence with the request for variance at this time. An excavation of contaminated soils would disrupt the neighborhood by creating a noise disturbance, traffic disturbance and unmitigated petroleum hydrocarbon vapors. Natural attenuation is a reasonable approach to treatment of slightly elevated concentrations at depth.

We request that the two soil vapor extraction (SVE) wells that were installed outside the fenced well location be removed immediately; they currently represent an attractive nuisance/hazard. There are two SVE wells remaining on the location, and we request that they are NOT to be utilized as part of a mechanical SVE system, since vapors are not typically reliably treated and would migrate off location and downgradient to our house, which is at a lower elevation. We also request that Hilcorp continue to maintain the well site with appropriate berms so that nothing can inadvertently be discharged from the location in the event of a future release.

If you have any questions, please don't hesitate to contact me. I am also happy to meet at the site with you and/or representatives from BLM and NMOCD to discuss this further.

Thanks,
Beth McNally

Elizabeth McNally, PE
Animas Environmental Services
Farmington NM
505.564.2281
emcnally@animasenvironmental.com

From: Ben Mitchell <bemitchell@hilcorp.com>
Sent: Sunday, September 17, 2023 11:25 AM
To: Elizabeth McNally <emcnally@animasenvironmental.com>
Subject: Fed A 2E Closure Report/Variance Request

Attached is the Closure Report/Variance Request for the Fed A 2E. If you have recommendations please provide them and we will include your comments in the report to the BLM/FFO.

Ben Mitchell
Landman – San Juan North
Hilcorp Energy
505-324-5179
bemitchell@hilcorp.com

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United States Department of the Interior
Bureau of Land Management
New Mexico Farmington Field Office
Report of Undesirable Event



1. Operator: Hilcorp Energy Company				Field Name: Basin Dakota; Basin Fruitland Coal			
2. IID NO (Lease, ROW, Unit/PA, CA): USA NMSF078213							
3. Date of Occurrence: 4/2/2023				Time of Occurrence: 15:30 (MT)			
4. Date Reported to BLM: 4/17/2023			Time Reported to BLM: 11:30 MT		Reported to: NMOCD (also reportable to BLM-FFO since on fed minerals)		
5. Reported By: Mitch Killough		Phone Number: 713-757-5247					
6. Person in Charge: Chris Bramwell		Phone Number: 505-326-9749					
7. Location: Count San Juan	State: NM	T. 30N	R. 13W	Sec.26	Qtr/Qtr:NENW	or Unit C	
8. Surface Ownership (BLM, other Federal, Fee, State, Indian): Fee				Nearest Town or Landmark: Farmington, NM			
9. Well or Facility ID: 30-045-23865							
10. Type of Event (See instructions): Condensate release							
11. Cause of, and Extent of Event: A release of approximately 23.5 bbls condensate was released from a below-grade tank (BGT) due to a failed check valve on an oil dump line.							
12. Volume Discharged or Consumed:		Oil 23.5	Water 0	Gas	Other		
Volume Recovered:		Oil 3	Water 0	Gas	Other		
Volume Lost:		Oil 20.5	Water 0	Gas	Other		
13. Time required to Control Event: 1 hour (upon discovery)							
14. Action Taken to Control Event: The operator showed up on location in response to a high-level pit alarm and immediately shut-in the well. Approximately 3 bbls of fluid could be recovered from within the cribbing surrounding the BGT, but 20.5 bbls of condensate soaked into the ground surface immediately below the BGT.							
15. Description of Potential/Resultant Damage and Cause/Extents of Personal Injuries: No released fluids migrated outside of secondary containment or the BGT's cribbing. However, only three bbls of the released product could be recovered since it had soaked vertically into the ground surface. The visibly-impacted soil footprint has been assessed to cover an area of 9'8" x 9'8".							
16. Clean up Procedures and Dates: On the day of the release, all immediate response actions, including the recovery of fluid, took place.							
17. Action Taken to Prevent Recurrence/Initiate or Update Contingency Planning: The failed check valve has been replaced.							
18. General Remarks: Per NMOCD 19.15.29 guidelines, Hilcorp will work towards the 90-day deadline of 7/1/2023 for completing all site characterization requirements. By this date, Hilcorp will provide a either a summary of delineation activities (with a plan of action for remediation) or a final closure report. BLM-FFO will be kept in the loop as we progress on this project.							
19. Other Federal, State, & Local Agencies Notified: NMOCD, EPA, ACE, Tribe, FIMO, Landowner (list names, phone numbers), Other (List name and phone): NMOCD - Initial C-141 - 4/17/2023 (also attached for NMOCD's reference)							
20. Signature: Mitch Killough						Date: 4/17/2023	

.....

BLM USE ONLY

A. Field Office:	B. Date Reported to NMSO:
------------------	---------------------------



Memorandum

To: Abiodun Adeloye (Emmanuel), Bureau of Land Management (BLM) - Farmington Field Office

From: Mitch Killough, Hilcorp Energy Company (Hilcorp)

Date: 9/27/2023

Subject: Subsequent Report – Federal A 2E (API No. 30-045-23865)

Background: On 4/2/2023 at approximately 3:30 pm (MT), Hilcorp Energy Company (Hilcorp) discovered a 23.5-bbl release of condensate at the Federal A 2E (API: 30-045-23865 / Lease No: NMSF078213) in San Juan County, NM (36.789115, -108.177948). The surface owner is private while BLM owns the minerals. Based on initial assessments conducted by Hilcorp personnel, the cause of the release was determined to be related to an equipment failure. A release of condensate overflowed from an open-top below-grade tank (BGT) due to a failed check valve on an oil dump line. The operator showed up on location in response to a high-level pit alarm and immediately shut-in the well. Approximately 3 bbls of fluid could be recovered from within the cribbing surrounding the BGT, but 20.5 bbls of condensate soaked into the ground surface immediately below the BGT. Hilcorp submitted the initial Form C-141 to the New Mexico Oil Conservation Division (NMOCD) on 4/17/2023 and the Site was assigned NMOCD incident number nAPP2310735838. Hilcorp also submitted a Report of Undesirable Event to the BLM via sundry on 4/17/2023.

Scope: Hilcorp is requesting BLM approval/concurrence of the proposed variance request prior to submitting the attached Site Characterization Report and Closure Request with Variance to the NMOCD. The site characterization and findings identify that there are no complete pathways for human or environmental exposure to constituents of concern (COC) at the Site. COC concentrations remaining at the Site, if left in place, do not pose a risk to fresh water, human health, or the environment and leaving them in place is equally protective of public health and environment. Natural attenuation through adsorption, biodegradation, and volatilization will reduce TPH concentrations over time and still achieve the objectives identified in 19.15.29 NMAC. As such, Hilcorp and Ensolum recommend leaving the impacted soil at the Site in place to naturally attenuate. Note: The surface owner is in agreement with the attached variance request. The surface owner's email correspondence has been attached for BLM review.

Attachments: Site Characterization Report and Closure Request with Variance
Surface Owner – Approval of Variance Request (dated 9/21/2023)

Hilcorp Energy Company
1111 Travis Street, Houston, Texas 77002
T 713.209.2400 F 713.289.2750



September 14, 2023

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: **Site Characterization Report and Closure Request with Variance**

Federal A 2E
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NAPP2310735838

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Site Characterization Report and Closure Request with Variance* associated with a release discovered at the Federal A 2E natural gas production well pad (Site). The Site is located on private land in Unit C, Section 26, Township 30 North, Range 13 West in San Juan County, New Mexico (Figure 1).

SITE BACKGROUND

On April 2, 2023, Hilcorp personnel responded to a high-level alarm and discovered a release of condensate from an open-top below grade tank (BGT). The BGT overflowed due to a failed check valve on an oil dump line. The well was immediately shut in and initial response activities recovered approximately 3 barrels (bbls) of condensate from within the cribbing surrounding the BGT. However, at the time of the release, it was estimated that approximately 20.5 bbls of condensate were not recovered and infiltrated into the soil immediately below the BGT. The release did not impact surface soil outside of the BGT cribbing. The release was reported to the New Mexico Oil Conservation Division (NMOCD) on April 17, 2023 on a Form C-141, *Release Notification*. The release was assigned NMOCD Incident Number NAPP2310735838.

SITE CHARACTERIZATION AND CLOSURE CRITERIA

As part of the Site investigation, local geology/hydrogeology and nearby sensitive receptors were assessed in accordance with Title 19, Chapter 15, Part 29, Sections 11 and 12 (19.15.29.11 and 12) of the New Mexico Administrative Code (NMAC).

The Site is located within the Nacimiento Geologic Formation. In the report titled "*Hydrogeology and Water Resources of San Juan Basin, New Mexico*" (Stone, et. al., 1983), the Nacimiento Formation is characterized by interbedded black carbonaceous mudstones and white, coarse-grained sandstones, which ranges in thickness from 418 feet to 2,232 feet. The hydrogeologic properties of the Nacimiento Formation display variable properties dependent on location. Where sufficient yield is present, the primary use of water from this formation is for domestic and/or livestock supply. The Nacimiento Formation is underlain by the Ojo Alamo sandstone (Stone et. al, 1983).

The closest significant watercourse is an unnamed dry wash that is approximately 250 feet southwest of the Site. This wash has a defined bed and bank and is a first order tributary to a dry wash identified by a dashed blue line on a United States Geological Survey (USGS) 7.5-minute quadrangle map. The Site is greater than 200 feet from any lakebed, sinkhole, or playa lake (Figure 1). The nearest fresh-water well is New Mexico Office of the State Engineer (NMOSE) permitted well SJ-01736 (Appendix A), located approximately 1,450 feet south of the Site. The recorded depth to water on the NMOSE database is 300 feet below ground surface (bgs). No wellhead protection areas, springs, or domestic/stock wells are located within a ½-mile from the Site. The Site is not within a 100-year floodplain, overlying a subsurface mine, or located within an area underlain by unstable geology (area designated as low potential karst by the Bureau of Land Management (BLM)). Schools, hospitals, institutions, churches, and/or other occupied permanent residence or structures are not located within 300 feet of the Site.

Based on the information presented above and in accordance with the *Table I, Closure Criteria for Soils Impacted by a Release* (19.15.29.12 NMAC), the following Closure Criteria was applied to the Site constituents of concern (COCs):

- Benzene: 10 milligrams per kilogram (mg/kg)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX): 50 mg/kg
- Total petroleum hydrocarbons (TPH) as a combination of gasoline range organics (GRO), diesel range organics (DRO), and motor oil range organics (MRO): 100 mg/kg
- Chloride: 600 mg/kg

SITE INVESTIGATION ACTIVITIES

In response to the discovery of the release and because of the limited access at the Site due to infrastructure, utilities, and topography, vertical and horizontal delineation activities were performed using a drill rig. Ensolum submitted notice of sampling to the NMOCD and BLM at least 48 hours in advance of sampling activities (Appendix B). Drilling activities occurred on July 19 and 20, 2023 utilizing a Central Mining Equipment (CME) 75 hollow-stem auger drill rig operated by Enviro-Drill, Inc. with split-spoon sampling to advance a total of five borings (BH01 to BH05) to depths ranging from 15 feet to 34 feet bgs (locations shown on Figure 2). Photographs taken during delineation activities are included in Appendix C. Of note, placement of soil borings was limited by on-pad infrastructure, several utility/pipeline corridors, and significant topographical relief outside of the well pad, which prevented the drill rig from accessing optimal locations; however, Ensolum was able to place boring BH01 directly adjacent to the BGT location to assess potential soil impacts proximal to the release source.

During drilling, an Ensolum geologist logged lithology, inspected the soil for petroleum hydrocarbon staining and odors, and field screened for volatile organic compounds (VOCs) using a photoionization detector (PID), with results noted on field logs (attached as Appendix D). In general, soil samples were collected at depth intervals indicating the greatest impacts based on field screening results and from the terminal depth of the boring. Soil samples were collected directly into laboratory-provided jars and immediately placed on ice. Samples were submitted to Hall Environmental Analysis Laboratory (Hall) for analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021B, TPH by EPA Method 8015M/D, and chloride by EPA Method 300.0.

Soil composition at the Site was variable, consisting of fine- to medium-grained sand and silty sand interbedded with occasional silty clay. Formation sandstone (consolidated) was encountered in all borings at depths ranging from 5 feet to 20 feet bgs. Sandstone density appeared to increase with depth resulting in drilling refusal in all borings advanced at the Site. No groundwater or saturated soil was observed in any of the borings during drilling.

Laboratory analysis of the soil sample collected from boring BH01 at a depth of 29 to 31 feet bgs identified elevated concentrations of TPH exceeding the Table I Closure Criteria. All other soil samples

analyzed during this delineation effort, including the sample at the terminus of BH01, were in compliance with the applicable Closure Criteria for TPH, BTEX, and chloride. Laboratory analytical results from the initial drilling effort are summarized in Table 1 and Figure 2, with the complete laboratory analytical report attached in Appendix E.

SVE Well Construction and Installation

Based on field screening during drilling and for potential future use for pilot testing, borings BH01 through BH04 were completed as soil vapor extraction (SVE) wells for potential future use. Two nested SVE wells, as indicated on the well construction diagram, were installed in boring BH01, located in the source area of the release. Screened casings in boring BH01 were installed across the subsurface intervals with the highest petroleum hydrocarbon impacts based on PID results in order to direct the applied vacuum to these depth intervals. In addition, SVE wells installed in borings BH02 through BH04 were completed for potential future use as observation wells during an SVE "pilot test". SVE wells were constructed with 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to 2 feet above the screened interval, then hydrated bentonite seal to the ground surface.

SITE FINDINGS

Based on field screening and analytical data gathered during the Site delineation events, impacted soil was identified near the source of the release in BH01. No significant VOCs were detected by field screening in shallow soils (ground surface to approximately 9 feet bgs). Laboratory analytical results from deeper subsurface soil samples collected from BH01 detected the presence of BTEX and TPH, but only one sample, collected at 29 feet bgs and containing 209 mg/kg TPH, exceeded NMOCD Table I Closure Criteria. The detected TPH constituents are primarily GRO and DRO, and when evaluated with elevated field screening data, are representative of volatile condensate.

Soil analytical results from BH01 and the other lateral boreholes indicate that impacts resulting from the release do not appear to be widespread, either vertically or laterally. Site access restrictions prevented optimal placement of borings, particularly for a more precise investigation of the area immediately beneath and downgradient (south-southeast) of the source. The areas directly under adjacent infrastructure could not be accessed. However, boring BH01 was positioned proximal to the release and as close as possible to the BGT according to Hilcorp safety policies regarding drilling near active infrastructure. Boring BH02 was positioned in the downgradient direction, shifted outward to avoid subsurface utilities (Figure 2), and BH05 was positioned slightly cross-gradient as high up the approaching hill as the drill rig could safely access. Similarly, BH03 and BH04 were installed as close to the location as possible to delineate the impacts observed in field screening results from BH01. Impacts from an extensive release, if present, would be identified in those surrounding borings. Soil impacts do not appear to be widespread either vertically or laterally, and given the low-level concentrations of TPH detected in BH01 and limited depth range of occurrence, there does not appear to be evidence of significant migration.

CONCLUSIONS

Based on the findings of this limited soil investigation, condensate from the BGT overflowed and infiltrated into soil beneath the BGT, belling out slightly as evidenced by elevated field screening results beginning at 9 feet bgs in BH01. The resulting condensate impacts to soil exceed regulatory thresholds are only at an interval greater than 25 feet in depth and less than 5 feet wide approximately 15 feet away from the BGT. While it is likely that impacts exist directly under the BGT and/or compressor, the volume of condensate and/or the type of material released (i.e., condensate versus produced water) may also have been overestimated. Assuming a bell or pyramid shape of impacted soil below the BGT resulting from vertical migration and mechanical dispersion of fluids, a conservative estimate of the volume of

regulated impacted soil containing TPH concentrations greater than 100 mg/kg is approximately 255 cubic yards of soil (base of the pyramid is assumed to be approximately 900 square feet).

The Site characterization presented above indicates that potential nearby receptors are not located within the radii presented in 19.15.29.11 and 12 NMAC, with the exception of a significant watercourse located within 300 feet of the Site. This significant watercourse is a dry wash located 250 feet away from the Site and, based on regional depth to water data, is a losing stream. Due to depth of impacts, surface water runoff and potential sheet flow into nearby significant watercourses would not be impacted by TPH concentrations present in soil at depth. Additionally, since the water course is a losing stream, the potential for petroleum hydrocarbons to enter the water course from depth is low.

Site lithology indicates that formation sandstone was encountered in all borings at depths ranging from 5 feet to 20 feet bgs. The vertical transport of the petroleum hydrocarbons through the sandstone would be dependent on applying enough head or flowing pressure to overcome the existing adsorption of the petroleum hydrocarbons to the soil. As the release is no longer occurring, the only driving mechanism that could increase vertical transport would be water infiltration. With little rainfall historically recorded in San Juan County (approximately 10 inches per year) and depth to groundwater greater than 100 feet bgs at the Site, the potential of surface water infiltrating and transporting the petroleum hydrocarbon impacts to groundwater is unlikely.

Lastly, petroleum hydrocarbons are organic matter and conducive for natural attenuation through adsorption, biodegradation, and volatilization in the unsaturated zone of the soil column. Over time, microbes will consume adsorbed hydrocarbons, thereby reducing TPH concentrations. Considering the limited volume and low TPH concentrations present at the Site, natural attenuation is likely to reduce concentrations to below NMOCD Table I Closure Criteria in a reasonable timeframe.

VARIANCE REQUEST

The site characterization and findings described above identify that there are no complete pathways for human or environmental exposure to COCs at the Site. COC concentrations remaining at the Site, if left in place, do not pose a risk to fresh water, human health, or the environment and leaving them in place is equally protective of public health and environment. Natural attenuation through adsorption, biodegradation, and volatilization will reduce TPH concentrations over time and still achieve the objectives identified in 19.15.29 NMAC. As such, Hilcorp and Ensolum recommend leaving the impacted soil at the Site in place to naturally attenuate. This approach, although protective, would result in leaving impacted media in place exceeding NMOCD remediation action levels and, as such, require a variance in accordance with 19.15.29.14 NMAC.

The variance requirements also require a discussion of a need for a variance and a demonstration of how the variance will provide better or equal protection of public health, safety, and the environment. Equal or better protection of public health and the environment through natural attenuation is documented in the evaluation of potential exposure pathways and nearby sensitive receptors presented above that concludes there is no complete pathway for human or environmental exposure to the COCs. Conversely, those exposure pathways are significantly altered and effectually opened if alternative remediation techniques are applied at the Site (i.e., excavation or SVE remediation alternatives). These alternatives would bring the subsurface impacts to the surface as impacted soil and/or vapors that can expose humans and the environment to harmful chemicals. If left in place, contaminants will be degraded *in situ* by biological processes that will reduce the petroleum hydrocarbons to carbon dioxide and water.

CLOSURE REQUEST

Based on delineation and characterization of vadose zone impacts at the Site and no complete pathways to human or environmental exposures to the identified COCs, Hilcorp requests approval to leave the limited impacted soil in place and close Incident Number NAPP2310735838 with no further action required. Upon approval of this closure request, Hilcorp will properly plug and abandon the SVE wells that were constructed at the Site.

REFERENCES

Stone, W.; Lyford, F.; Frenzel, P.; Mizell, N.; and Padgett, E. (1983). *Hydrogeology and Water Resources of San Juan Basin, New Mexico*. Socorro: New Mexico Bureau of Mines and Mineral Resources.

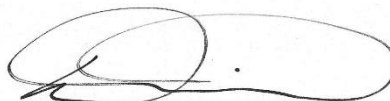
United States Environmental Protection Agency (EPA). (2015). *Technical Guide For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites*. Washington, D.C.: United States Environmental Protection Agency.

We appreciate the opportunity to provide this document to the NMOCD. If you should have any questions or comments regarding this document, please contact the undersigned.

Sincerely,
Ensolum, LLC



Stuart Hyde, LG
Senior Geologist
(970) 903-1607
shyde@ensolum.com



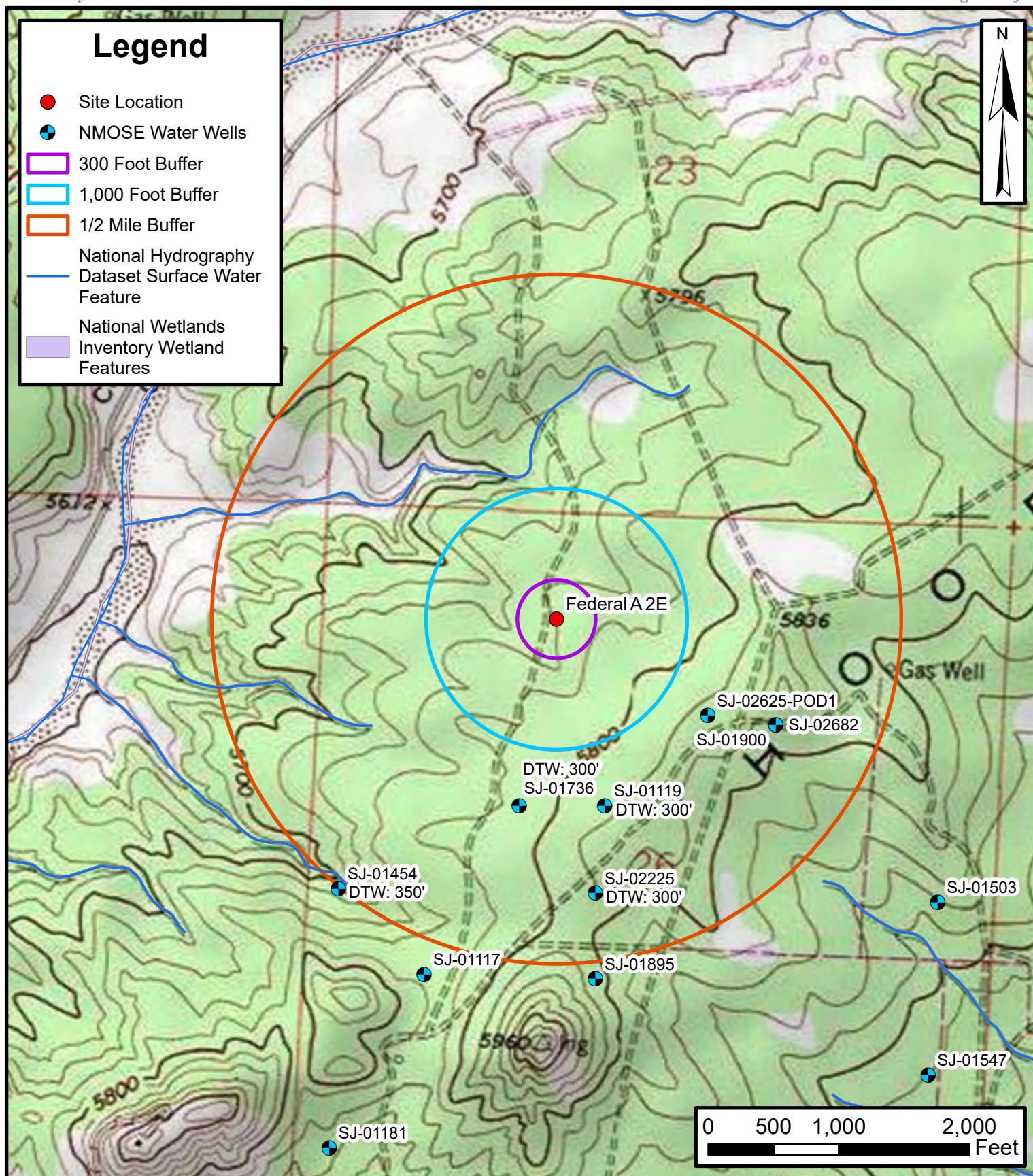
Daniel R. Moir, PG
Senior Managing Geologist
(303) 887-2946
dmoir@ensolum.com

Attachments:

- Figure 1: Site Receptor Map
- Figure 2: Soil Sample Analytical Results
- Table 1: Delineation Soil Sample Analytical Results
- Appendix A: NMOSE Point of Diversion Summary
- Appendix B: Agency Sampling Notifications
- Appendix C: Photographic Log
- Appendix D: Boring Logs
- Appendix E: Laboratory Analytical Reports



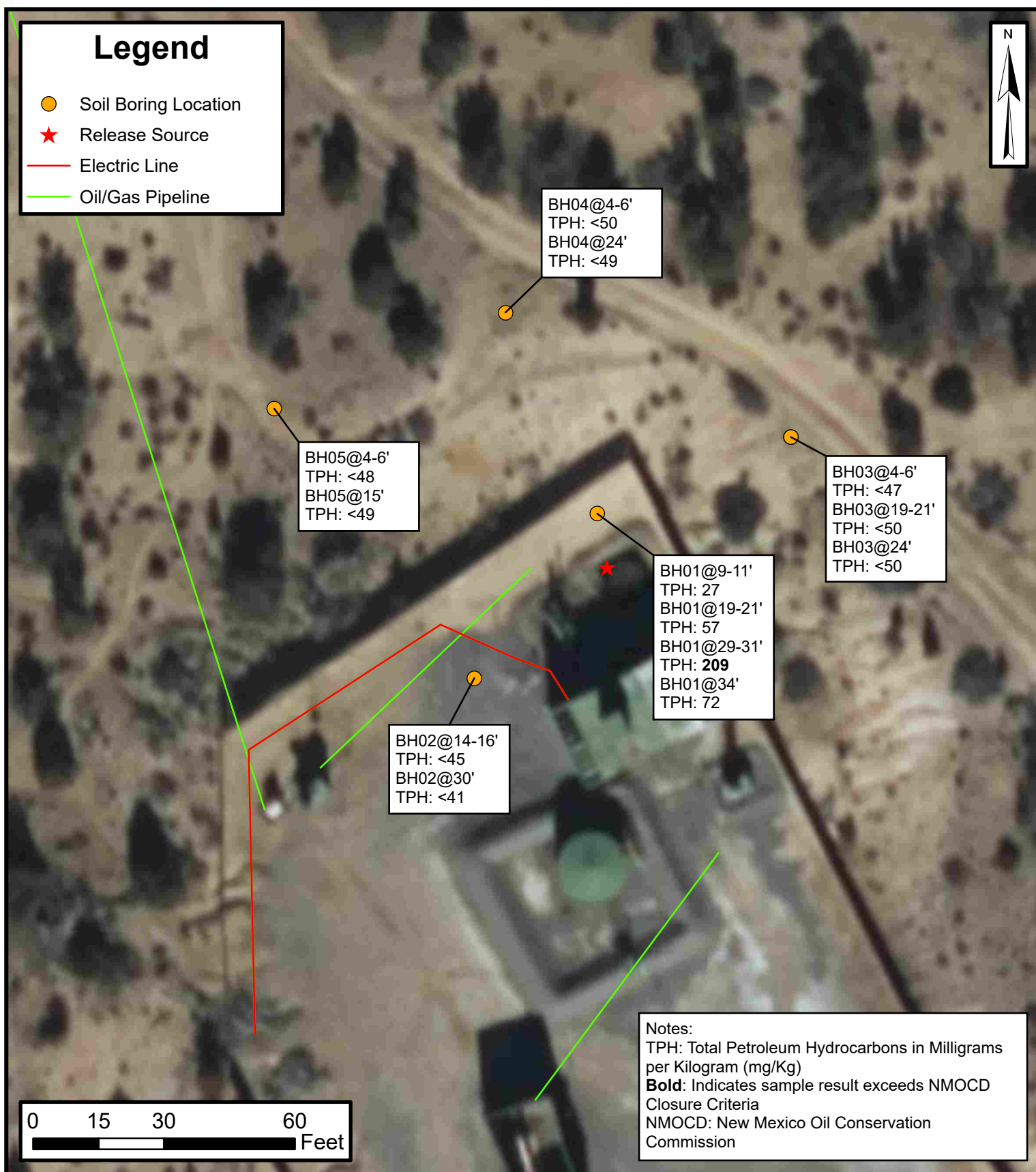
FIGURES



Site Receptor Map

Federal A 2E
 Hilcorp Energy Company
 Incident Number: napp2310735838
 36.7891159, -108.177948
 San Juan County, New Mexico

FIGURE
 1



Soil Analytical Results

Federal A 2E

Hilcorp Energy Company

Incident Number: napp2310735838

36.7891159, -108.177948

San Juan County, New Mexico

FIGURE

2



TABLES



TABLE 1
DELINEATION SOIL SAMPLE ANALYTICAL RESULTS
 Federal A 2E
 Hilcorp Energy Company
 San Juan County, New Mexico

Sample ID	Date	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH MRO (mg/kg)	Total TPH (mg/kg)	Chloride (mg/kg)
NMOCD Closure Criteria for Soils Impacted by a Release			10	NE	NE	NE	50	NE	NE	NE	100	600
BH01 @ 9-11'	7/19/2023	9-11	<0.024	<0.048	<0.048	0.35	0.35	11	16	<48	27	<60
BH01 @ 19-21'	7/19/2023	19-21	<0.025	0.14	0.099	0.94	1.179	45	12	<41	57	<60
BH01 @ 29-31'	7/19/2023	29-31	0.027	0.11	0.16	0.33	0.627	59	150	<48	209	<60
BH01 @ 34'	7/19/2023	34	<0.025	<0.050	<0.050	<0.10	<0.10	11	61	<45	72	<60
BH02 @ 14-16'	7/19/2023	14-16	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<8.9	<45	<45	210
BH02 @ 30'	7/19/2023	30	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<8.3	<41	<41	66
BH03 @ 4-6'	7/20/2023	4-6	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.4	<47	<47	<60
BH03 @ 19-21'	7/20/2023	19-21	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.9	<50	<50	<61
BH03 @ 24'	7/20/2023	24	<0.024	<0.048	<0.048	<0.095	<0.095	<4.8	<9.9	<50	<50	<60
BH04 @ 4-6'	7/20/2023	4-6	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<50	<50	110
BH04 @ 24'	7/20/2023	24	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.8	<49	<49	<61
BH05 @ 4-6'	7/20/2023	4-6	<0.023	<0.047	<0.047	<0.094	<0.094	<4.7	<9.6	<48	<48	71
BH05 @ 15'	7/20/2023	15	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.7	<49	<49	<60

Notes:

bgs: below ground surface

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes

mg/kg: milligrams per kilogram

NE: Not Established

NMOCD: New Mexico Oil Conservation Division

': feet

GRO: Gasoline Range Organics

DRO: Diesel Range Organics

MRO: Motor Oil/Lube Oil Range Organics

TPH: Total Petroleum Hydrocarbon

<: indicates result less than the stated laboratory reporting limit (RL)

Concentrations in **bold** and shaded exceed the New Mexico Oil Conservation Division Table I Closure Criteria for Soils Impacted by a Release




APPENDIX A

NMOSE Point of Diversion Summary



New Mexico Office of the State Engineer

Point of Diversion Summary

		(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)	
Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	SJ 01736	3	4	1	26	30N	13W	216360	4075758* 
Driller License:	717	Driller Company:				WESTERN WATER WELLS			
Driller Name:	TERRY HOOD								
Drill Start Date:	06/11/1983	Drill Finish Date:				06/15/1983		Plug Date:	
Log File Date:	06/16/1983	PCW Rev Date:						Source:	Shallow
Pump Type:		Pipe Discharge Size:						Estimated Yield:	8 GPM
Casing Size:	5.00	Depth Well:				332 feet		Depth Water:	300 feet
x									
Water Bearing Stratifications:				Top	Bottom	Description			
				300	332	Sandstone/Gravel/Conglomerate			
x									
Casing Perforations:				Top	Bottom				
				292	332				

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/TSC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

8/14/23 3:04 PM

POINT OF DIVERSION SUMMARY



APPENDIX B

Agency Sampling Notifications

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#); [Adeloye, Abiodun A](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#); [Reece Hanson](#)
Subject: Re: [EXTERNAL] Federal A 2E - Drilling and Sampling Notification
Date: Tuesday, July 18, 2023 10:17:59 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-tldnt2k2.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Thank you for the notice. If an OCD representative is not on-site on the date &/or time given, please sample per 19.15.29 NMAC or from an OCD pre-approved sampling plan. For whatever reason, if the sampling timeframe is altered, please notify the OCD as soon as possible so we may adjust our schedule(s). Failure to notify the OCD of this change may result in the closure sample(s) not being accepted.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrn.nm.gov
<http://www.emnrn.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Tuesday, July 18, 2023 9:58 AM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrn.nm.gov>; Adeloye, Abiodun A <aadeloye@blm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>; Reece Hanson <rhanson@ensolum.com>
Subject: [EXTERNAL] Federal A 2E - Drilling and Sampling Notification

CAUTION: This email originated outside of our organization. Exercise caution prior to

clicking on links or opening attachments.

Emmanuel and Nelson,

On behalf of Hilcorp Energy Company, we are submitting this updated drilling and sampling notification for the Federal A 2E site located in San Juan County at coordinates 36.78903, -108.17735. Drilling work was originally scheduled to begin on July 17, 2023, but will now commence on Wednesday July 19, 2023 at 10 AM. Please reach out with any questions or comments regarding the scheduled work. Thanks.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Extension Request
Date: Wednesday, September 13, 2023 2:35:32 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-cw0va3qq.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Your 30-day time extension request is approved. Remediation Due date has been updated to October 16, 2023 within the incident page.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Wednesday, September 13, 2023 2:19 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Extension Request

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, we are requesting an additional 30-day extension for the report submittal for the Federal A 2E site located in San Juan County, NM. We have completed

delineation and prepared the report for submittal, however, we are waiting on the landowner (private surface) and BLM approval of the final report prior to submitting to the NMOCD. If approved, the new reporting deadline would be Monday October 16, 2023. Please reach out with any questions or concerns regarding this request. Thanks and have a good afternoon.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Deadline Extension Request
Date: Wednesday, June 28, 2023 2:56:59 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-qn5oiv03.png](#)

[**EXTERNAL EMAIL**]

Stuart,

Thank you for the correspondence. Your time extension request is approved. Remediation Due date has been updated to September 15, 2023.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

The OCD requires a copy of all correspondence relative to remedial activities be included in all proposals and/or final closure reports. Correspondence required to be included in reports may include, but not limited to, notifications for liner inspections, sample events, spill/release/fire, and request for time extensions or variances.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Wednesday, June 28, 2023 12:31 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] napp2310735838 - Federal A 2E Reporting Deadline Extension Request

CAUTION: This email originated outside of our organization. Exercise caution prior to

clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, we are submitting this deadline extension request for the Federal A 2E site located at coordinates 36.78911, -108.17795. Based on discussions with the BLM, because the well is producing from federal minerals and delineation activities are proposed in off-pad areas, the BLM has required Hilcorp to conduct a cultural survey of the area north and east of the well pad. At this time, the cultural survey has been performed by a third-party consultant and is being finalized for submittal to the BLM. Drilling activities are currently scheduled to begin on July 17th, pending BLM approval of the cultural survey. As such, Hilcorp is requesting a 60-day extension from the date of drilling and requests a new reporting deadline of Friday, September 15, 2023.



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 



APPENDIX C

Photographic Log



Photographic Log
Hilcorp Energy Company
Federal A 2E
San Juan County, New Mexico



Photograph: 1 Date: 5/9/2023
Description: View of release location and BH01 (left)
View: Southeast



Photograph: 2 Date: 5/9/2023
Description: View of steep topography near BH03
View: West



Photograph: 3 Date: 7/20/2023
Description: View of on-pad infrastructure/equipment
View: Southwest



Photograph: 4 Date: 7/20/2023
Description: View of boring location BH01
View: Northwest



APPENDIX D

Boring Logs



FEDERAL A 2E BH01

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 34 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Reece Hanson/Zach Myers	

CASING DEEP - 0-32', SHALLOW - 0-17'

SCREEN DEEP - 22-32', SHALLOW - 7-17'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
2			15.2	Slt moist	SILTY SAND: Soft, gray to brown-reddish silty sandstone or compacted silty sand. Fine to medium grained, no staining or odor. Hard drilling from ~3.5' bgs, difficulty getting split spoon down	Deep	2
4						Shallow	4
6							6
8			1,717	Dry	SILTY CLAY: Gray, compacted silty clay with orange rust layers. Moderate odor. Moderate to strong odor in auger cuttings from ~7'bgs		8
10	BH01 9-11						10
12			1,985	Slt moist	SILTY SANDY CLAY: Softer, compacted silty clay with fine to medium grained sand and orange inclusions/layers. Hard drilling encountered at ~14' bgs, poor recovery with split spoon		12
14							14
16							16
18			2,355	Slt moist	SAND/SANDSTONE: Top 2" - SAA, bottom 2" - Light gray, medium to coarse broken up sand/sandstone, with some consolidated pieces. Moderate to strong odor. 60 blows for split spoon sampling		18
20	BH01 19-21						20
22			2,055	Slt moist	SAND/SANDSTONE: Top 2" - Same as 14-16' interval, bottom 2" - SAA. Moderate to strong odor		22
24							24
26							26
28			2,179	Slt moist	SAND/SANDSTONE: Tan-brown, mostly unconsolidated, fine to medium sand with some coarse grains. Occasional consolidated sandstone pieces. Moderate to strong odor		28
30	BH01 29-31						30
32			2,355	Slt moist	SAND/SANDSTONE: SAA with more coarse grains. Moderate to strong odor		32
34	BH01 @ 34						34
					Termination Depth at: 34' bgs due to refusal		



FEDERAL A 2E BH02

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 30 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Reece Hanson/Zach Myers	

CASING 0-30'

SCREEN 20-30'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
2							2
4			7.5	Dry	SILTY SAND: Tan to reddish brown, fine to medium grained sand No staining or odor Hard drilling, difficulty getting split spoon sampler down		4
6							6
8			3.4	Dry	SAND: Gray and rusty red/brown medium to coarse sand No staining or odor Hard drilling, difficulty getting split spoon sampler down	concrete cement grout	8
10							10
12							12
14	BH02 14-16		16.5	Dry to Slt moist	Top 0.5' of interval - Soft, black to dark gray, moist sand with swampy odor SILTY SANDY CLAY: Tan to gray, fine to medium grained sand with silt and clay No staining or odor Hard drilling, difficulty getting split spoon sampler down		14
16						bentonite	16
18			8.6	Dry	SAND/SANDSTONE: Tan/gray and rusty brown, medium to coarse sand No staining or odor 2" layer of black, silt and clay with swampy odor Hard drilling, difficulty getting split spoon sampler down		18
20							20
22							22
24			7.2	Dry	SAND/SANDSTONE: Tan to gray, medium to coarse sand/soft sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down	filter pack	24
26							26
28							28
30	BH02 @ 30		5.8	Slt moist	SAND/SANDSTONE: Tan to brown with black flecks/inclusions. Medium to coarse sand/soft sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down		30
					Termination Depth at: 30' bgs due to refusal		



FEDERAL A 2E BH03

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 24 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Zach Myers	

CASING 0-24'					SCREEN 14-24'				
Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram			Depth (ft)
1			7.2					concrete cement grout	1
2									2
3									3
4	BH03 @ 4-6	<div></div>		Dry	SILTY SAND: Tan to rusty brown, fine to medium sand with silt No staining or odor Difficulty getting split spoon sampler down				4
5								bentonite	5
6					6				
7					7				
8					8				
9		<div></div>	5.1	Dry	SILTY SAND: Tan to rusty brown, fine to medium with rare coarse sand with silt No staining or odor Hard drilling, difficulty getting split spoon sampler down				9
10									10
11		<div></div>							11
12									12
13			3.8						13
14		<div></div>		Dry	SILTY SAND/SANDSTONE: Tan, fine sand and silt with consolidated pieces of sandstone No staining or odor Hard drilling, difficulty getting split spoon sampler down				14
15									15
16		<div></div>							16
17			7.9						17
18					@ 20' - SILTY SAND/SANDSTONE: Tan, fine sand with silt and consolidated sandstone pieces				18
19	BH03 @ 19-21	<div></div>		Dry	@ 20.5' - SILTY CLAY: Brown, gray silt with clay, very hard No staining or odor Hard drilling, difficulty getting split spoon sampler down				19
20									20
21			50.8						21
22					SILTY SANDY CLAY: Tan, fine sand with silt and clay, some consolidated pieces of sandstone				22
23	BH03 @ 24	<div></div>		Dry	No staining, slight odor Hard drilling, difficulty getting split spoon sampler down				23
24					Termination Depth at: 24' bgs due to refusal				24



FEDERAL A 2E BH04

ENSOLUM

PROJECT NAME Federal A 2E	DRILLING COMPANY Enviro-Drill
CLIENT Hilcorp Energy Company	DRILLING METHOD Hollow Stem Auger
LOCATION 36.789154°, -108.177607°	TOTAL DEPTH 24 feet
DRILLING DATE 7/19/2023	BOREHOLE DIAMETER 8 inches
LOGGED BY Zach Myers	

CASING 0-24'

SCREEN 14-24'

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
1							1
2							2
3							3
4	BH04 4-6		15.1	Dry	SAND/SANDSTONE: Reddish brown, fine to medium sand/sandstone. Large, consolidated pieces of soft Formation sandstone present. No staining or odor Hard drilling from 2' bgs, difficulty getting split spoon sampler down		4
5						concrete cement grout	5
6							6
7							7
8							8
9			6.7	Dry	SILTY SAND: Gray, silty sand with rare clay. Hard, large consolidated Formation pieces present No staining or odor Hard drilling, difficulty getting split spoon sampler down		9
10						bentonite	10
11							11
12							12
13							13
14			5.2	Dry	SILT/SILTSTONE: Dark gray siltstone/shale, large, consolidated Formation material in sampler, difficult to break up. No staining or odor Hard drilling, difficulty getting split spoon sampler down		14
15							15
16							16
17							17
18						filter pack	18
19			6.3	Dry	SAND/SANDSTONE: Gray, medium to coarse sand/sandstone, large consolidated Formation pieces present in sampler. No staining or odor Hard drilling, difficulty getting split spoon sampler down		19
20							20
21							21
22							22
23	BH04 @ 24		8.9	Dry	SAND/SANDSTONE: Gray, medium to coarse sand/sandstone, large consolidated Formation pieces present in sampler No staining or odor Hard drilling, difficulty getting split spoon sampler down		23
24					Termination Depth at: 24' bgs due to refusal		24



FEDERAL A 2E BH05

ENSOLUM

PROJECT NAME Federal A 2E CLIENT Hilcorp Energy Company LOCATION 36.789154°, -108.177607° DRILLING DATE 7/19/2023 LOGGED BY Zach Myers	DRILLING COMPANY Enviro-Drill DRILLING METHOD Hollow Stem Auger TOTAL DEPTH 15 feet BOREHOLE DIAMETER 8 inches
---	---

CASING NA, BACKFILLED

SCREEN NA, BACKFILLED

Depth (ft)	Samples	% Recovery	PID	Moisture	Material Description	Well Diagram	Depth (ft)
1							1
2							2
3							3
4	BH05 4-6		8.2	Dry	SAND/SANDSTONE: Gray to tan, fine to medium sand/sandstone. Some consolidated pieces of Formation sandstone present. No staining or odor Hard drilling from 2' bgs, difficulty getting split spoon sampler down		4
5							5
6							6
7							7
8							8
9							9
10			3.9	Dry	SILTY SAND: White to tan, fine sand with silt. Some consolidated pieces of sandstone present. No staining or odor Hard drilling, difficulty getting split spoon sampler down		10
11							11
12							12
13							13
14	BH05 @ 24			Dry	SAND/SANDSTONE: Tan to yellow, fine to medium sand. Some consolidated pieces of Formation sandstone present. No staining or odor Hard drilling, difficulty getting split spoon sampler down		14
15			5.8		Termination Depth at: 15' bgs due to refusal		15



APPENDIX E

Laboratory Analytical Reports



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

July 31, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Federal A2E

OrderNo.: 2307A00

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 6 sample(s) on 7/21/2023 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 9-11'

Project: Federal A2E

Collection Date: 7/19/2023 10:53:00 AM

Lab ID: 2307A00-001

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	16	9.6		mg/Kg	1	7/23/2023 6:32:20 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/23/2023 6:32:20 PM
Surr: DNOP	93.3	69-147		%Rec	1	7/23/2023 6:32:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	11	4.8		mg/Kg	1	7/24/2023 7:17:34 PM
Surr: BFB	134	15-244		%Rec	1	7/24/2023 7:17:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	7/24/2023 7:17:34 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 7:17:34 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 7:17:34 PM
Xylenes, Total	0.35	0.096		mg/Kg	1	7/24/2023 7:17:34 PM
Surr: 4-Bromofluorobenzene	122	39.1-146		%Rec	1	7/24/2023 7:17:34 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:35:16 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 1 of 10

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 19-21'

Project: Federal A2E

Collection Date: 7/19/2023 10:55:00 AM

Lab ID: 2307A00-002

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	12	8.1		mg/Kg	1	7/23/2023 6:56:47 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/23/2023 6:56:47 PM
Surr: DNOP	102	69-147		%Rec	1	7/23/2023 6:56:47 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	45	4.9		mg/Kg	1	7/24/2023 7:41:12 PM
Surr: BFB	267	15-244	S	%Rec	1	7/24/2023 7:41:12 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 7:41:12 PM
Toluene	0.14	0.049		mg/Kg	1	7/24/2023 7:41:12 PM
Ethylbenzene	0.099	0.049		mg/Kg	1	7/24/2023 7:41:12 PM
Xylenes, Total	0.94	0.099		mg/Kg	1	7/24/2023 7:41:12 PM
Surr: 4-Bromofluorobenzene	128	39.1-146		%Rec	1	7/24/2023 7:41:12 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:47:40 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 2 of 10

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 29-31'

Project: Federal A2E

Collection Date: 7/19/2023 10:58:00 AM

Lab ID: 2307A00-003

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	150	9.5		mg/Kg	1	7/23/2023 7:21:17 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/23/2023 7:21:17 PM
Surr: DNOP	98.4	69-147		%Rec	1	7/23/2023 7:21:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	59	4.8		mg/Kg	1	7/24/2023 8:04:46 PM
Surr: BFB	457	15-244	S	%Rec	1	7/24/2023 8:04:46 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	0.027	0.024		mg/Kg	1	7/24/2023 8:04:46 PM
Toluene	0.11	0.048		mg/Kg	1	7/24/2023 8:04:46 PM
Ethylbenzene	0.16	0.048		mg/Kg	1	7/24/2023 8:04:46 PM
Xylenes, Total	0.33	0.097		mg/Kg	1	7/24/2023 8:04:46 PM
Surr: 4-Bromofluorobenzene	130	39.1-146		%Rec	1	7/24/2023 8:04:46 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:00:05 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 3 of 10

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH01 @ 34'

Project: Federal A2E

Collection Date: 7/19/2023 11:00:00 AM

Lab ID: 2307A00-004

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	61	9.1		mg/Kg	1	7/23/2023 7:45:44 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	7/23/2023 7:45:44 PM
Surr: DNOP	90.6	69-147		%Rec	1	7/23/2023 7:45:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	11	5.0		mg/Kg	1	7/24/2023 8:28:21 PM
Surr: BFB	144	15-244		%Rec	1	7/24/2023 8:28:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 8:28:21 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 8:28:21 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 8:28:21 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/24/2023 8:28:21 PM
Surr: 4-Bromofluorobenzene	120	39.1-146		%Rec	1	7/24/2023 8:28:21 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:37:18 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH02@ 14-16'

Project: Federal A2E

Collection Date: 7/19/2023 1:50:00 PM

Lab ID: 2307A00-005

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	7/23/2023 8:10:14 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	7/23/2023 8:10:14 PM
Surr: DNOP	88.9	69-147		%Rec	1	7/23/2023 8:10:14 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/24/2023 3:19:33 PM
Surr: BFB	96.0	15-244		%Rec	1	7/24/2023 3:19:33 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	7/24/2023 3:19:33 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 3:19:33 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 3:19:33 PM
Xylenes, Total	ND	0.096		mg/Kg	1	7/24/2023 3:19:33 PM
Surr: 4-Bromofluorobenzene	118	39.1-146		%Rec	1	7/24/2023 3:19:33 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	210	60		mg/Kg	20	7/26/2023 2:14:31 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report

Lab Order 2307A00

Date Reported: 7/31/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH02@ 30'

Project: Federal A2E

Collection Date: 7/19/2023 1:55:00 PM

Lab ID: 2307A00-006

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	8.3		mg/Kg	1	7/23/2023 8:34:49 PM
Motor Oil Range Organics (MRO)	ND	41		mg/Kg	1	7/23/2023 8:34:49 PM
Surr: DNOP	97.6	69-147		%Rec	1	7/23/2023 8:34:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 3:43:22 PM
Surr: BFB	98.0	15-244		%Rec	1	7/24/2023 3:43:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	7/24/2023 3:43:22 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 3:43:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 3:43:22 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/24/2023 3:43:22 PM
Surr: 4-Bromofluorobenzene	121	39.1-146		%Rec	1	7/24/2023 3:43:22 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	66	60		mg/Kg	20	7/26/2023 2:51:45 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00
31-Jul-23

Client: HILCORP ENERGY
Project: Federal A2E

Sample ID: MB-76477		SampType: MBLK		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 76477		RunNo: 98503						
Prep Date: 7/26/2023		Analysis Date: 7/26/2023		SeqNo: 3587770			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-76477		SampType: LCS		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 76477		RunNo: 98503						
Prep Date: 7/26/2023		Analysis Date: 7/26/2023		SeqNo: 3587771			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.9	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 Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307A00

31-Jul-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: LCS-76387	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583070 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.3	61.9	130			
Surr: DNOP	4.6		5.000		91.4	69	147			

Sample ID: 2307A00-006AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BH02@ 30'	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583093 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	8.3	41.39	0	98.3	54.2	135			
Surr: DNOP	4.2		4.139		101	69	147			

Sample ID: 2307A00-006AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BH02@ 30'	Batch ID: 76387	RunNo: 98368								
Prep Date: 7/21/2023	Analysis Date: 7/23/2023	SeqNo: 3583094 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	35	8.5	42.30	0	82.0	54.2	135	15.9	29.2	
Surr: DNOP	3.5		4.230		83.1	69	147	0	0	

Sample ID: MB-76387	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 76387	RunNo: 98451								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583918 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		107	69	147			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00
31-Jul-23

Client: HILCORP ENERGY
Project: Federal A2E

Sample ID: lcs-76381	SampType: LCS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS	Batch ID: 76381			RunNo: 98452						
Prep Date: 7/21/2023	Analysis Date: 7/24/2023			SeqNo: 3583843		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	94.4	70	130			
Surr: BFB	2000		1000		197	15	244			

Sample ID: mb-76381	SampType: MBLK			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS	Batch ID: 76381			RunNo: 98452						
Prep Date: 7/21/2023	Analysis Date: 7/24/2023			SeqNo: 3583844		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	950		1000		95.2	15	244			

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 Quantitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307A00

31-Jul-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: LCS-76381	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583856		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	114	70	130			
Toluene	1.1	0.050	1.000	0	115	70	130			
Ethylbenzene	1.2	0.050	1.000	0	117	70	130			
Xylenes, Total	3.5	0.10	3.000	0	118	70	130			
Surr: 4-Bromofluorobenzene	1.2		1.000		120	39.1	146			

Sample ID: mb-76381	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 76381		RunNo: 98452							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583857		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	1.2		1.000		119	39.1	146			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2307A00

RcptNo: 1

Received By: Tracy Casarrubias 7/21/2023 6:40:00 AM

Completed By: Tracy Casarrubias 7/21/2023 7:37:47 AM

Reviewed By: *Tracy 7/21/23*

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: *SCM 07/21/23*
(<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: Mailing address, phone number and Email/Fax are missing on COC - TMC 7/21/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.7	Good	Yes	Morty		

Chain-of-Custody Record

Client: Hilcorp/Mitch Killough

~~aka~~ mKillough@hilcorp.com

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

- ☐ Standard
- ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

□ EDD (Type)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	Cooler Temp (including CF): 37-42.3.7 (°C)
7/19/23	1053	soil	BH01 @ 9-11'	4oz jar	cool	001	
	1055		BH01 @ 19-21'			002	
	1058		BH01 @ 29-31'			003	
	1100		BH01 @ 34'			004	
7/19/23	1350		BH02 @ 14-16'			005	
	1355		BH02 @ 30'			006	

Date:	Time:	Relinquished by:
-------	-------	------------------

7/20/14

Date:	Time:	Relinquished by:
-------	-------	------------------

Date:	Time:
-------	-------

Received by: Via:

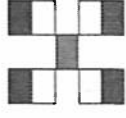
Date _____ Time _____

Received by: Via:

Date / Time

Remarks:

Remarks: cc: Zmyers@ensolom.com



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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



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

August 01, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Federal A2E

OrderNo.: 2307999

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 7 sample(s) on 7/21/2023 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 10:30:00 AM

Lab ID: 2307999-001

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: SB
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	7/28/2023 1:31:02 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/28/2023 1:31:02 PM
Surr: DNOP	93.1	69-147		%Rec	1	7/28/2023 1:31:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 6:37:00 PM
Surr: BFB	79.2	15-244		%Rec	1	7/24/2023 6:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 6:37:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 6:37:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 6:37:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 6:37:00 PM
Surr: 4-Bromofluorobenzene	78.0	39.1-146		%Rec	1	7/24/2023 6:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/25/2023 11:36:45 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 19-21'

Project: Federal A2E

Collection Date: 7/20/2023 10:35:00 AM

Lab ID: 2307999-002

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/25/2023 3:01:12 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:01:12 PM
Surr: DNOP	92.1	69-147		%Rec	1	7/25/2023 3:01:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 8:05:00 PM
Surr: BFB	78.6	15-244		%Rec	1	7/24/2023 8:05:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 8:05:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 8:05:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 8:05:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 8:05:00 PM
Surr: 4-Bromofluorobenzene	77.7	39.1-146		%Rec	1	7/24/2023 8:05:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	61		mg/Kg	20	7/25/2023 11:49:10 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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH03@ 24'

Project: Federal A2E

Collection Date: 7/20/2023 10:40:00 AM

Lab ID: 2307999-003

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/25/2023 3:12:10 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:12:10 PM
Surr: DNOP	102	69-147		%Rec	1	7/25/2023 3:12:10 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/24/2023 9:10:00 PM
Surr: BFB	79.5	15-244		%Rec	1	7/24/2023 9:10:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.024		mg/Kg	1	7/24/2023 9:10:00 PM
Toluene	ND	0.048		mg/Kg	1	7/24/2023 9:10:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	7/24/2023 9:10:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	7/24/2023 9:10:00 PM
Surr: 4-Bromofluorobenzene	75.9	39.1-146		%Rec	1	7/24/2023 9:10:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 12:01:35 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH04@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 11:35:00 AM

Lab ID: 2307999-004

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/25/2023 3:23:09 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/25/2023 3:23:09 PM
Surr: DNOP	103	69-147		%Rec	1	7/25/2023 3:23:09 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/24/2023 9:32:00 PM
Surr: BFB	81.1	15-244		%Rec	1	7/24/2023 9:32:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 9:32:00 PM
Toluene	ND	0.049		mg/Kg	1	7/24/2023 9:32:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/24/2023 9:32:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 9:32:00 PM
Surr: 4-Bromofluorobenzene	75.3	39.1-146		%Rec	1	7/24/2023 9:32:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	110	60		mg/Kg	20	7/26/2023 12:38:49 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH04@ 24'

Project: Federal A2E

Collection Date: 7/20/2023 11:38:00 AM

Lab ID: 2307999-005

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/25/2023 3:34:08 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/25/2023 3:34:08 PM
Surr: DNOP	141	69-147		%Rec	1	7/25/2023 3:34:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/24/2023 9:54:00 PM
Surr: BFB	79.3	15-244		%Rec	1	7/24/2023 9:54:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 9:54:00 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 9:54:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 9:54:00 PM
Xylenes, Total	ND	0.10		mg/Kg	1	7/24/2023 9:54:00 PM
Surr: 4-Bromofluorobenzene	76.6	39.1-146		%Rec	1	7/24/2023 9:54:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	61		mg/Kg	20	7/26/2023 12:51:14 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH05@ 4-6'

Project: Federal A2E

Collection Date: 7/20/2023 1:25:00 PM

Lab ID: 2307999-006

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/25/2023 3:45:05 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/25/2023 3:45:05 PM
Surr: DNOP	113	69-147		%Rec	1	7/25/2023 3:45:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/24/2023 10:15:00 PM
Surr: BFB	78.8	15-244		%Rec	1	7/24/2023 10:15:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.023		mg/Kg	1	7/24/2023 10:15:00 PM
Toluene	ND	0.047		mg/Kg	1	7/24/2023 10:15:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	7/24/2023 10:15:00 PM
Xylenes, Total	ND	0.094		mg/Kg	1	7/24/2023 10:15:00 PM
Surr: 4-Bromofluorobenzene	76.8	39.1-146		%Rec	1	7/24/2023 10:15:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	71	60		mg/Kg	20	7/26/2023 1:03:38 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report

Lab Order 2307999

Date Reported: 8/1/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH05@ 15'

Project: Federal A2E

Collection Date: 7/20/2023 1:28:00 PM

Lab ID: 2307999-007

Matrix: SOIL

Received Date: 7/21/2023 6:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/25/2023 3:56:01 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/25/2023 3:56:01 PM
Surr: DNOP	116	69-147		%Rec	1	7/25/2023 3:56:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/24/2023 10:37:00 PM
Surr: BFB	78.2	15-244		%Rec	1	7/24/2023 10:37:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: KMN
Benzene	ND	0.025		mg/Kg	1	7/24/2023 10:37:00 PM
Toluene	ND	0.050		mg/Kg	1	7/24/2023 10:37:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	7/24/2023 10:37:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/24/2023 10:37:00 PM
Surr: 4-Bromofluorobenzene	76.8	39.1-146		%Rec	1	7/24/2023 10:37:00 PM
EPA METHOD 300.0: ANIONS						Analyst: RBC
Chloride	ND	60		mg/Kg	20	7/26/2023 1:16:02 AM

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	Above Quantitation Range/Estimated Value
	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: MB-76448	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 76448	RunNo: 98504								
Prep Date: 7/25/2023	Analysis Date: 7/25/2023	SeqNo: 3586471	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-76448	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 76448	RunNo: 98504								
Prep Date: 7/25/2023	Analysis Date: 7/25/2023	SeqNo: 3586472	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.2	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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY

Project: Federal A2E

Sample ID: LCS-76408	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 76408		RunNo: 98469							
Prep Date: 7/24/2023	Analysis Date: 7/25/2023		SeqNo: 3586100		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	61.9	130			
Surr: DNOP	4.4		5.000		88.2	69	147			

Sample ID: MB-76408	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 76408		RunNo: 98469							
Prep Date: 7/24/2023	Analysis Date: 7/25/2023		SeqNo: 3586104		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	8.2		10.00		82.4	69	147			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: lcs-76388	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583936			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	99.4	70	130			
Surr: BFB	2000		1000		200	15	244			

Sample ID: mb-76388	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583937			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	820		1000		81.7	15	244			

Sample ID: 2307999-001amsd	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BH03@ 4-6'	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3583940			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.65	0	88.9	70	130	0.189	20	
Surr: BFB	1900		986.2		191	15	244	0	0	

Sample ID: 2307999-001ams	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BH03@ 4-6'	Batch ID: 76388	RunNo: 98439								
Prep Date: 7/21/2023	Analysis Date: 7/24/2023	SeqNo: 3584071			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.56	0	88.5	70	130			
Surr: BFB	1900		982.3		193	15	244			

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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2307999

01-Aug-23

Client: HILCORP ENERGY**Project:** Federal A2E

Sample ID: ics-76388	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583974		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.87	0.025	1.000	0	87.1	70	130			
Toluene	0.87	0.050	1.000	0	87.5	70	130			
Ethylbenzene	0.90	0.050	1.000	0	90.2	70	130			
Xylenes, Total	2.7	0.10	3.000	0	90.8	70	130			
Surr: 4-Bromofluorobenzene	0.81		1.000		80.9	39.1	146			

Sample ID: mb-76388	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583975		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	0.79		1.000		78.8	39.1	146			

Sample ID: 2307999-002ams	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: BH03@ 19-21'	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583978		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.025	0.9833	0	87.4	70	130			
Toluene	0.88	0.049	0.9833	0	89.0	70	130			
Ethylbenzene	0.90	0.049	0.9833	0	91.1	70	130			
Xylenes, Total	2.7	0.098	2.950	0.03172	91.4	70	130			
Surr: 4-Bromofluorobenzene	0.77		0.9833		77.9	39.1	146			

Sample ID: 2307999-002amsd	SampType: MSD		TestCode: EPA Method 8021B: Volatiles							
Client ID: BH03@ 19-21'	Batch ID: 76388		RunNo: 98439							
Prep Date: 7/21/2023	Analysis Date: 7/24/2023		SeqNo: 3583979		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.025	0.9862	0	83.5	70	130	4.34	20	
Toluene	0.85	0.049	0.9862	0	86.4	70	130	2.67	20	
Ethylbenzene	0.87	0.049	0.9862	0	88.3	70	130	2.90	20	
Xylenes, Total	2.6	0.099	2.959	0.03172	88.4	70	130	2.93	20	
Surr: 4-Bromofluorobenzene	0.78		0.9862		78.7	39.1	146	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 Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2307999

RcptNo: 1

Received By: Tracy Casarrubias 7/21/2023 6:40:00 AM

Completed By: Tracy Casarrubias 7/21/2023 7:27:57 AM

Reviewed By: *ju 7/21/23*

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: *SCM 07/21/23*

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: Mailing address, phone number and Email/Fax are missing on COC - TMC 7/21/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.7	Good	Yes	Morty		

Chain-of-Custody Record

Client: Hi corp / Mitch Killough
mkillough@hcorp.com
Mailing Address:

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Project Name: Federal A2E

Project #:

Phone #:

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

□ EDD (Type)

Sampler:

On Ice: ☒ Yes[illegible]

Cooler Temp (including CE):	33 - 0 = 33	(°C)
-----------------------------	-------------	------

Date	Time	Matrix	Sample Name
------	------	--------	-------------

7/24/23	1030	501	BH03 @4-6'
7/24/23	1030	501	BH03 @4-6'

1035	1	BH03 @ 19-21'
------	---	---------------

✓	1040	BHO3 @ 24'
---	------	------------

3/20/23	1135	1	B+0424-6
---------	------	---	----------

120/23	11386	1	KH04 @ 24
7/24	11385	1	011-0111

2/7/2019	✓	CS132/1
2/7/2019	✓	CS132/1

Date:	Time:
-------	-------

 $\frac{14}{2}$

Relinquished by:

4

Date:	Time:
-------	-------

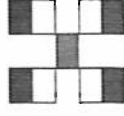
71	1591
----	------

Relinquished by:

2

Remarks:

cc: Zmyerse@ensolum.com



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

BTEX / MTBE / TMB's (8021)	<	
TPH:8015D(GRO / DRO / MRO)	<	
8081 Pesticides/8082 PCB's		
EDB (Method 504.1)		
PAHs by 8310 or 8270SIMS		
RCRA 8 Metals		
Cl ₂ , F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	<	
8260 (VOA)		
8270 (Semi-VOA)		
Total Coliform (Present/Absent)		

Remarks:	cc: Zmyerse@ensolum.com
----------	-------------------------

Mitch Killough

From: Ben Mitchell
Sent: Thursday, September 21, 2023 10:04 AM
To: Mitch Killough
Subject: FW: [EXTERNAL] RE: Fed A 2E Closure Report/Variance Request

FYI from Elizabeth.

From: Elizabeth McNally <emcnally@animasenvironmental.com>
Sent: Thursday, September 21, 2023 9:00 AM
To: Ben Mitchell <bemitchell@hilcorp.com>
Subject: [EXTERNAL] RE: Fed A 2E Closure Report/Variance Request

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Hello Ben,

Thanks for sending the Site Characterization Report and Closure Request with Variance for the Federal A 2E for me to review. Based on our observations as next door residents and the private surface owner (Lot 7), along with the information provided in the report, the site investigation and subsequent site findings appear reasonable.

While I disagree with the conclusion that there is a "bell or pyramid shape of impacted soil below the BGT" (because the site is situated on and adjacent to sandstone outcropping, and homogeneous subsurface soils are unlikely), it is clear that the single exceedance of TPH (209 mg/kg) at BH-01 29-31' is vertically defined at 34', with TPH concentrations (72 mg/kg) below the NMOCD action level. Lateral extents appear defined.

We are in concurrence with the request for variance at this time. An excavation of contaminated soils would disrupt the neighborhood by creating a noise disturbance, traffic disturbance and unmitigated petroleum hydrocarbon vapors. Natural attenuation is a reasonable approach to treatment of slightly elevated concentrations at depth.

We request that the two soil vapor extraction (SVE) wells that were installed outside the fenced well location be removed immediately; they currently represent an attractive nuisance/hazard. There are two SVE wells remaining on the location, and we request that they are NOT to be utilized as part of a mechanical SVE system, since vapors are not typically reliably treated and would migrate off location and downgradient to our house, which is at a lower elevation. We also request that Hilcorp continue to maintain the well site with appropriate berms so that nothing can inadvertently be discharged from the location in the event of a future release.

If you have any questions, please don't hesitate to contact me. I am also happy to meet at the site with you and/or representatives from BLM and NMOCD to discuss this further.

Thanks,
Beth McNally

Elizabeth McNally, PE
Animas Environmental Services
Farmington NM
505.564.2281
emcnally@animasenvironmental.com

From: Ben Mitchell <bemitchell@hilcorp.com>
Sent: Sunday, September 17, 2023 11:25 AM
To: Elizabeth McNally <emcnally@animasenvironmental.com>
Subject: Fed A 2E Closure Report/Variance Request

Attached is the Closure Report/Variance Request for the Fed A 2E. If you have recommendations please provide them and we will include your comments in the report to the BLM/FFO.

Ben Mitchell
Landman – San Juan North
Hilcorp Energy
505-324-5179
bemitchell@hilcorp.com

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Oil Conservation Division
1220 S. St Francis Dr.
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CONDITIONS

Action 273156

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 273156
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
scwells	Remediation closure is approved. Per landowner's request and BLM approval, a variance to leave BH01's TPH exceedance in place at 29-31 bgs is approved. Landowner has requested BH01 through BH04 be plugged. OCD would like to be notified when this has occurred.	2/21/2024