NV

October 1, 2021

New Mexico Energy, Minerals and Natural Resources Department
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

Subject: **Site Summary Report**
Hilcorp Energy Company
OH Randel #5
San Juan County, New Mexico
API # 30-045-05964
Incident # NVF1602039091

To Whom it May Concern:

WSP USA Inc. (WSP), previously LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Site Summary Report* discussing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site). This report is being submitted in response to the "Notice of Violation" prepared by the New Mexico Oil Conservation Division (NMOCD) and dated September 1, 2021.

SITE BACKGROUND

An SVE system was originally installed at the Site by XTO Energy, the former operator, in 2016 to treat soil impacted by a release from a production tank ("Primary" source) and an underlying historical release ("Secondary" source). Based on additional sampling conducted by LTE in 2017 and 2018, a third source area of unknown historical origin was discovered and labeled the "Tertiary" source. Additional SVE wells were installed in 2017, 2018, and 2019 and a pilot test was conducted on June 28, 2019 to confirm the feasibility of SVE technology to remediate the deeper Tertiary source soil impacts.

Stack volatile organic compound (VOC) measurements and observed vacuum recorded during the pilot test indicated that SVE is an applicable technology to remediate the Tertiary source. Applied vacuum at the SVE wells ranged from 70 inches water column (IWC) to 76 IWC. Responses observed in the observation wells ranged from 0.0 IWC to 53.4 IWC. Vacuum responses were observed as far away as 35 feet from existing SVE test wells. A conservative radius of influence of 30 feet was subsequently utilized in the final design. At this time, the SVE system was upgraded to a 2 horsepower blower capable of producing 80 SCFM at 70 IWC.

Additional details regarding the site history and SVE pilot test results are presented in the following LTE reports:

- *Delineation Report and Remedial Evaluation*, dated January 31, 2019
- *Remediation Work Plan*, dated April 1, 2019
- *Pilot Test Results*, dated August 6, 2019

CURRENT SVE SYSTEM DESIGN AND OPERATION

The current SVE well configuration and screen intervals are presented on Figure 1. The SVE system consists of a two-horsepower Atlantic AB-301 regenerative blower capable of producing 80 standard cubic feet per minute (SCFM) at 70 IWC vacuum. The blower is connected to an adjustable manifold that allows control over which SVE wells are active. Since August 2019, the manifold has been adjusted on a biweekly basis to alternate wells inducing vacuum at the Site and focus remediation across the lateral and vertical extent of the Site. By doing this, the appropriate vacuum and airflow is applied to the operating SVE wells. Based on the second quarter sampling during 2021 (completed on June 11, 2021), the total operational time of the system was 25,892 hours with an estimated

WSP USA
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DURANGO CO 81301

Tel.: 970-385-1096
wsp.com

mass source removal via the SVE system of 620,705 pounds of total volatile petroleum hydrocarbons (TVPH). Based on air analytical results collected from the SVE system and the estimated mass removed from the Site, a significant volume of petroleum hydrocarbons have been removed from the subsurface.

CONCLUSIONS AND RECOMMENDATIONS

Originally, the Site consisted of 22 installed SVE wells (15 SVE wells treating the Tertiary source and 7 SVE wells treating the Primary and Secondary impact as shown on Figure 1). The SVE wells installed in the shallow primary impact no longer produce hydrocarbon vapors and have likely remediated the shallow soil impacts in this area. As such, the current SVE system rotates operation between 17 total SVE wells, with 15 treating the Tertiary impact and 2 wells treating the Secondary impact.

Due to age and mechanical issues with the current SVE system, WSP and Hilcorp plan to reconfigure the existing SVE system and install an additional SVE system at the Site. Specifically, the existing SVE system will be reconfigured to address only the Secondary source area at the Site. The current 2 horsepower SVE system has a capacity of 80 SCFM at 70 IWC, sufficient to address the two active SVE wells in the Secondary source zone (wells SVE-5 and SVE-8), with capacity to operate additional wells treating Tertiary source area, if needed.

An additional system will then be added to the Site to operate the 15 SVE wells locate within the Tertiary source area (wells SVE-6, SVE-7, SVE-10, SVE-11, SVE-12, SVE-13, SVE-14, SVE-15, SVE-16, SVE-17, SVE-18, SVE-19, SVE-20, SVE-21, and SVE-22). With the addition of a new SVE system, the combined systems will have the ability to meet the vacuum and flow requirements in order to achieve NMOCD Table 1 Closure Criteria in a more timely manner. The additional system is being designed to maximize the existing electrical service onsite, which is a single phase 100 ampere, 240-volt service. The SVE system will be engineered to operate with the current electrical service while also maximizing the flow and necessary vacuum on all SVE wells concurrently, negating the need to rotate the SVE system between wells on a biweekly basis. By doing this, overall remediation timeframe will be reduced.

SVE SYSTEM UPGRADES

Based on the 2019 pilot test results, a vacuum of 70 IWC induced sufficient radius-of-influence to address the impacted volume of soil with the current SVE well layout. Ideal system specifications to ensure sufficient vacuum across the Site would be 70 IWC and a flow rate of 10 to 15 standard cubic feet per minute (SCFM) per well.

In order to strengthen remediation efforts in the Tertiary source area of the Site, two additional SVE blowers will be installed that are capable of producing a combined total flowrate of 140 SCFM to 210 SCFM at 70 IWC. WSP and Hilcorp have been coordinating with Farmington Electric Utility in order to size the new SVE system for the Site. With the sites single phase electrical service, blowers for the new system are limited to a size of 3 to 5 horsepower, as motor sizes larger than 5 horsepower are all 3-phase with most manufacturers limiting single phase blowers to a 3 horsepower motor. WSP electrical engineers have explored the option of a phase convertor to provide 3-phase service for the system; however, the wire size and transformers do not support this large electrical load. To overcome the electrical service limitations, WSP recommends two blowers/systems to meet the flow requirements while being able to operate on the existing electrical drop. Based on this, WSP and Hilcorp are currently sourcing two regenerative blowers that are capable of producing 70 SCFM to 105 SCFM each at 70 IWC for a total of 140 SCFM to 210 SCFM at 70 IWC.

Monthly operation and maintenance visits will continue to be conducted at the Site to ensure the system is running and operating to meet runtime requirements. Additionally, the upgraded system will be connected to the facility's production telemetry with alarms for any system downtime.

Air samples will continue to be collected on a quarterly basis to assess gas sample concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) and TVPH, as well as to document hydrocarbon mass recovery. Additionally, air samples will be analyzed for Environmental Protection Agency (EPA) Method 8260B and fixed-gas parameters on an annual basis.

UPDATED REMEDIATION TIMELINE

The following timeline is proposed following submittal of this report;

- 1st Quarter 2022 – Complete installation of additional SVE system(s) and begin operation;
- 1st Quarter 2023 – Once air concentrations of TVPH collected from the system become asymptotic and/or are below 1.0 milligrams per liter (mg/L), soil samples will be collected from the Primary, Secondary, and Tertiary source areas to collect soil performance samples and assess soil concentrations. Performance sampling locations shown on Figure 2. Request for site closure if soil sample results are below NMOCD Table 1 Closure Criteria;
- 1st Quarter 2024 – Additional confirmation soil sampling (if necessary) and site closure.

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact me at (970) 385-1096 or via email at stuart.hyde@wsp.com or Kate Kaufman at (346) 237-2275 or via email at kkaufman@hilcorp.com.

Kind regards,

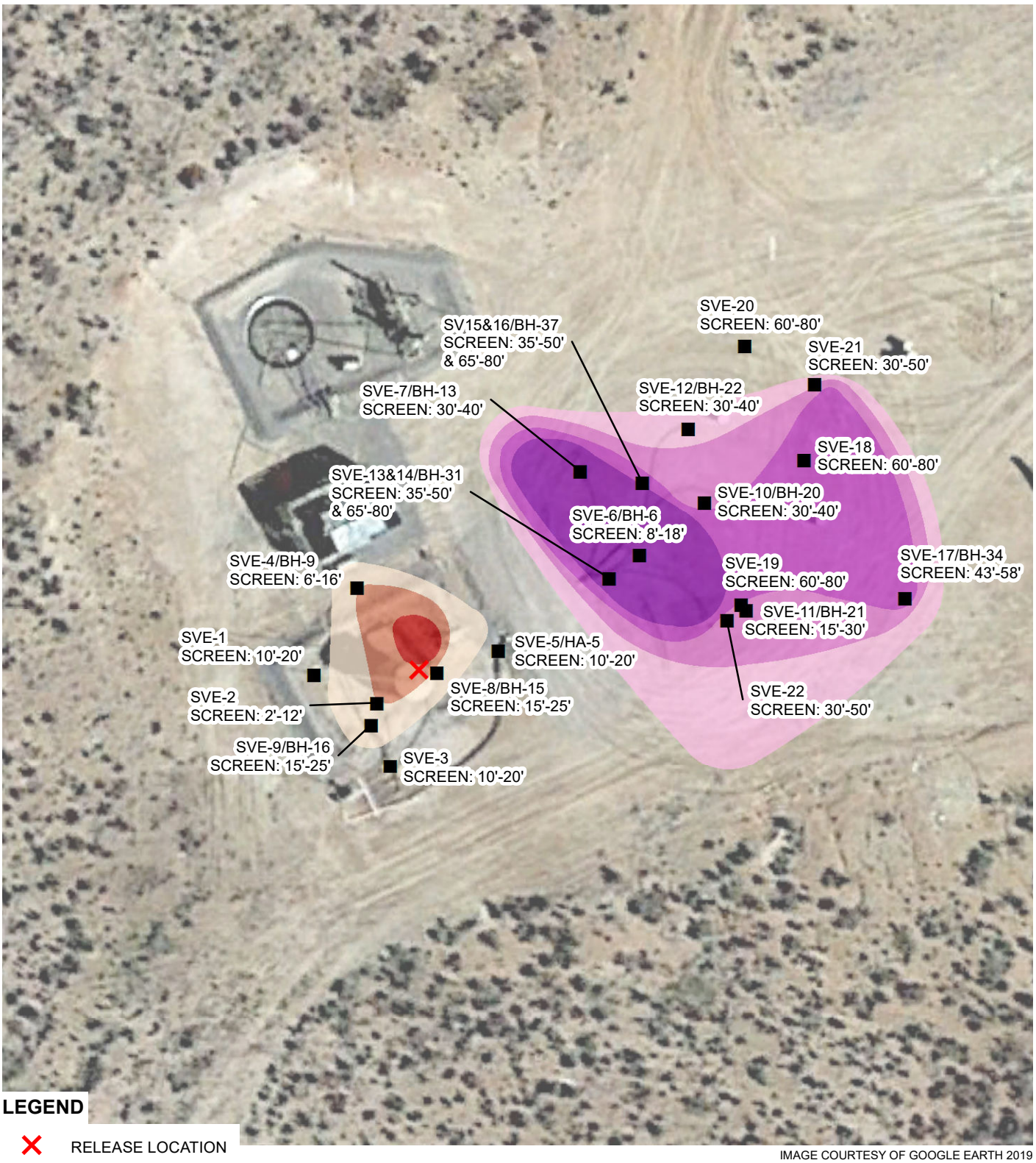
Stuart Hyde, L.G.
Senior Geologist

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

Enclosures:

Figure 1 – SVE System Layout
Figure 2 – Performance Soil Sampling Locations

FIGURES



LEGEND

RELEASE LOCATION

SOIL VAPOR EXTRACTION (SVE) WELL

INFERRED BTEX ISOCONCENTRATION (PARTS PER MILLION)

- 50.00 - 200.00
- 50.00 - 100.00
- 200.01 - 400.00
- 100.01 - 200.00
- 400.01 - 600.00
- 200.01 - 300.00
- > 600.00

IMAGE COURTESY OF GOOGLE EARTH 2019

0 30 60

Feet

N

FIGURE 1
SVE SYSTEM LAYOUT
OH RANDEL #5
NWNW SEC 10 T26N R11W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017818016_OH RANDEL #5\017818016_OH RANDEL #5_FIG01_SVE_LAYOUT_2020.mxd

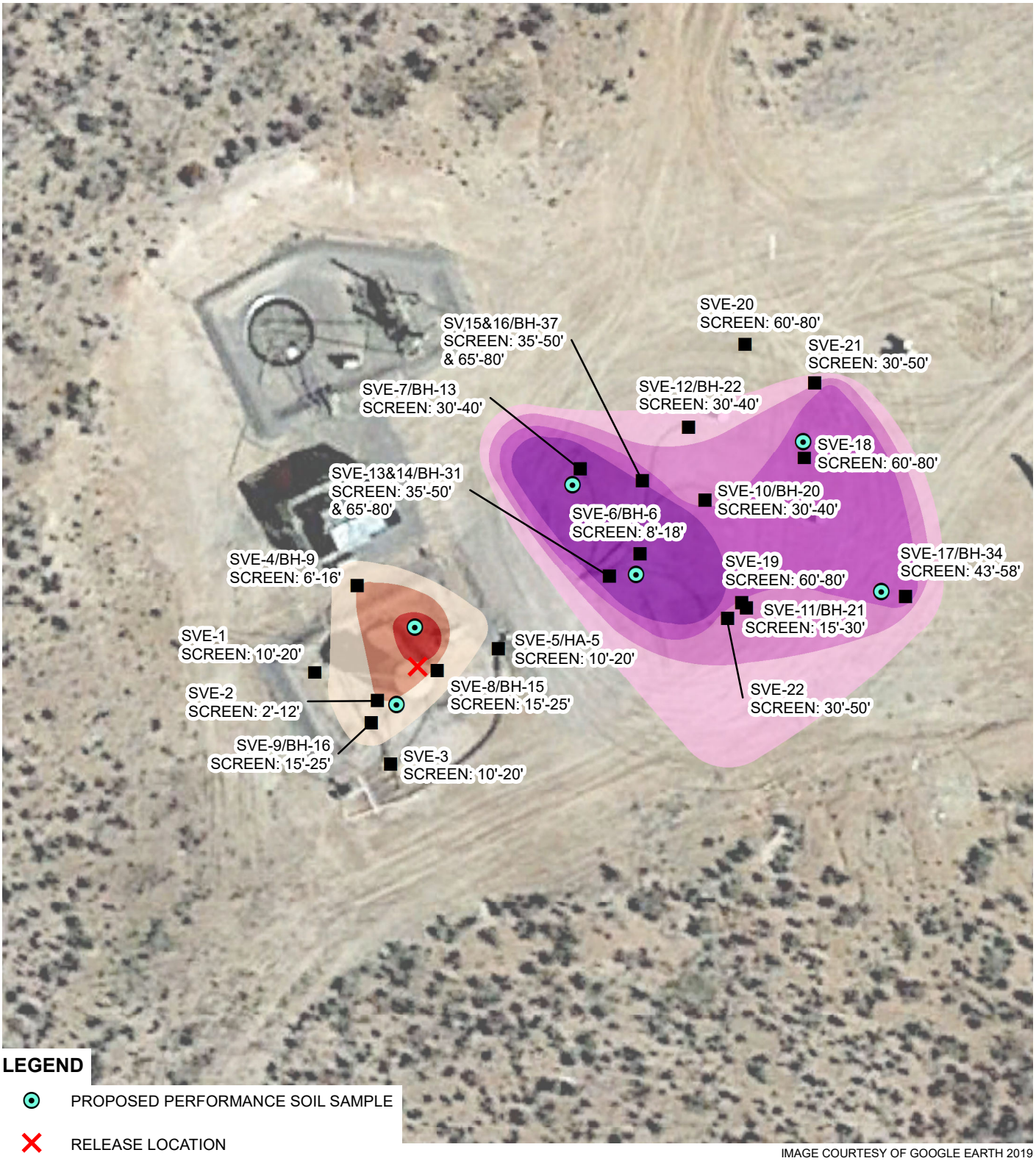


FIGURE 2
PERFORMANCE SOIL SAMPLING LOCATIONS
OH RANDEL #5
NWNW SEC 10 T26N R11W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017818016_OH RANDEL #5\017818016_OH RANDEL #5_FIG01_PERF_SS_LOC_2021.mxd

NV

October 10, 2020

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

Subject: **Quarter 3 2020 - Quarterly SVE System Update**
Hilcorp Energy Company
OH Randel #5
San Juan County, New Mexico
API # 30-045-05964
Incident # NVF1602039091

Dear Mr. Smith:

WSP USA Inc. (WSP, formerly LT Environmental, Inc.), on behalf of Hilcorp Energy Company (Hilcorp), presents the following third quarter summary report discussing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site). This report is being submitted as part of the proposed timeline of remediation events in the Pilot Test Results submitted to the New Mexico Oil Conservation Division (NMOCD) on August 6, 2019.

An SVE system was originally installed by XTO Energy in 2016. Based on prior delineation events and the pilot test, an additional five SVE wells were installed on August 23, 2019 by Hilcorp. SVE well configuration and screen intervals are presented in Figure 1. In total, The SVE system consists of a two horsepower Atlantic AB-301 regenerative blower capable of producing 110 cubic feet per minute (cfm) at 72 inches of water column vacuum. The blower is connected to an adjustable manifold that allows control over which SVE wells are currently active.

Between July 8, 2019 and October 3, 2019, the SVE system was inoperable due to a malfunctioning SVE blower. The SVE blower was replaced on October 3, 2019 and the SVE system was operational until May of 2020, at which time WSP discovered (during a site visit conducted on May 15, 2020) that the new SVE blower was not on and had become inoperable sometime since the previous site visit on April 30, 2020. A replacement blower has been purchased and Hilcorp is awaiting arrival in order to install and restart the SVE system. Once the system is operational, site visits will resume on a bi-weekly basis by Hilcorp personnel to continue rotating the active SVE wells, maximize runtime efficiency, and conduct any required system maintenance. Due to no runtime during the third quarter of 2020, no contaminant mass removal estimates were calculated.

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact me at (970) 385-1096 or via email at stuart.hyde@wsp.com or Clara Cardoza at (505) 793-2784 or at ccardoza@hilcorp.com.

Kind regards,

Stuart Hyde, L.G.
Environmental Geologist

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

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NV

January 10, 2021

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

Subject: **Quarter 4 2020 - Quarterly SVE System Update**
Hilcorp Energy Company
OH Randel #5
San Juan County, New Mexico
API # 30-045-05964
Incident # NVF1602039091

Dear Mr. Smith:

WSP USA Inc. (WSP, formerly LT Environmental, Inc.), on behalf of Hilcorp Energy Company (Hilcorp), presents the following fourth quarter summary report discussing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site). This report is being submitted as part of the proposed timeline of remediation events in the Pilot Test Results submitted to the New Mexico Oil Conservation Division (NMOCD) on August 6, 2019.

An SVE system was originally installed by XTO Energy in 2016. Based on prior delineation events and the pilot test, an additional five SVE wells were installed on August 23, 2019 by Hilcorp. SVE well configuration and screen intervals are presented in Figure 1. In total, The SVE system consists of a two horsepower Atlantic AB-301 regenerative blower capable of producing 110 cubic feet per minute (cfm) at 72 inches of water column vacuum. The blower is connected to an adjustable manifold that allows control over which SVE wells are currently active.

Between July 8, 2019 and October 3, 2019, the SVE system was inoperable due to a malfunctioning SVE blower. The SVE blower was replaced on October 3, 2019 and the SVE system was operational until May of 2020, at which time WSP discovered (during a site visit conducted on May 15, 2020) that the new SVE blower was not on and had become inoperable sometime since the previous site visit on April 30, 2020. A replacement blower was again installed at the site in November 2020 and the system was put back into service. Once the system was running at full capacity, an air sample was collected on November 10, 2020 (because of the broken blower, air samples were not collected during the second and third quarters of 2020). The fourth quarter air sample was analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8021, and total volatile petroleum hydrocarbons (TVPH) via EPA Method 8015. Laboratory analytical results are summarized in Table 1, with analytical laboratory report included as Attachment 1.

Once the system was operational, site visits resumed on a bi-weekly basis by Hilcorp personnel to continue rotating the active SVE wells, maximize runtime efficiency, and conduct any required system maintenance. Due to the lack of runtime between May and October, no contaminant mass removal estimates were calculated for the fourth quarter of 2020. Run time hours and an air sample will be collected in the first quarter of 2021 to estimate mass removal since the system was restarted in November 2020. The air sample data collected to date and measured stack flow rate were utilized to calculate total emissions for the system up to May 2020 (Table 2). As of May 2020, the total operational time of the system was 20,806 hours with an estimated mass source removal via the SVE system of 584,580 pounds of TVPH.

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CONCLUSIONS AND RECOMMENDATIONS

Mechanical issues have greatly reduced the operational runtime of the current SVE system since it was updated in 2019. Because of the low runtime, it is unlikely that the site can meet the original estimated remediation timeline set forth in the *Remediation Work Plan* prepared by LT Environmental Inc. (dated April 1, 2019). Additionally, due to the mechanical issues of the current system, WSP and Hilcorp plan to remove the current SVE system and install a larger system in the spring of 2021 that is capable of meeting the vacuum requirements of the site and achieve NMOCD Table 1 Closure Criteria in a timely manner. At this time, the replacement system is anticipated to be able to induce the necessary vacuum on all SVE wells at the site without the need to rotate the SVE system on a bi-weekly basis. The planned system will consist of a 20 horsepower blower cable of producing a maximum flow of 1,100 cfm at 90 inches of water column vacuum.

Hilcorp will continue to maintain, monitor, and sample the current SVE system until the new system is installed. After installation, a report will be prepared that outlines the specifications of the system and proposes a new remediation timeline for the site.

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact me at (970) 385-1096 or via email at stuart.hyde@wsp.com or Clara Cardoza at (505) 793-2784 or at ccardoza@hilcorp.com.

Kind regards,

Stuart Hyde, L.G.
Environmental Geologist

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

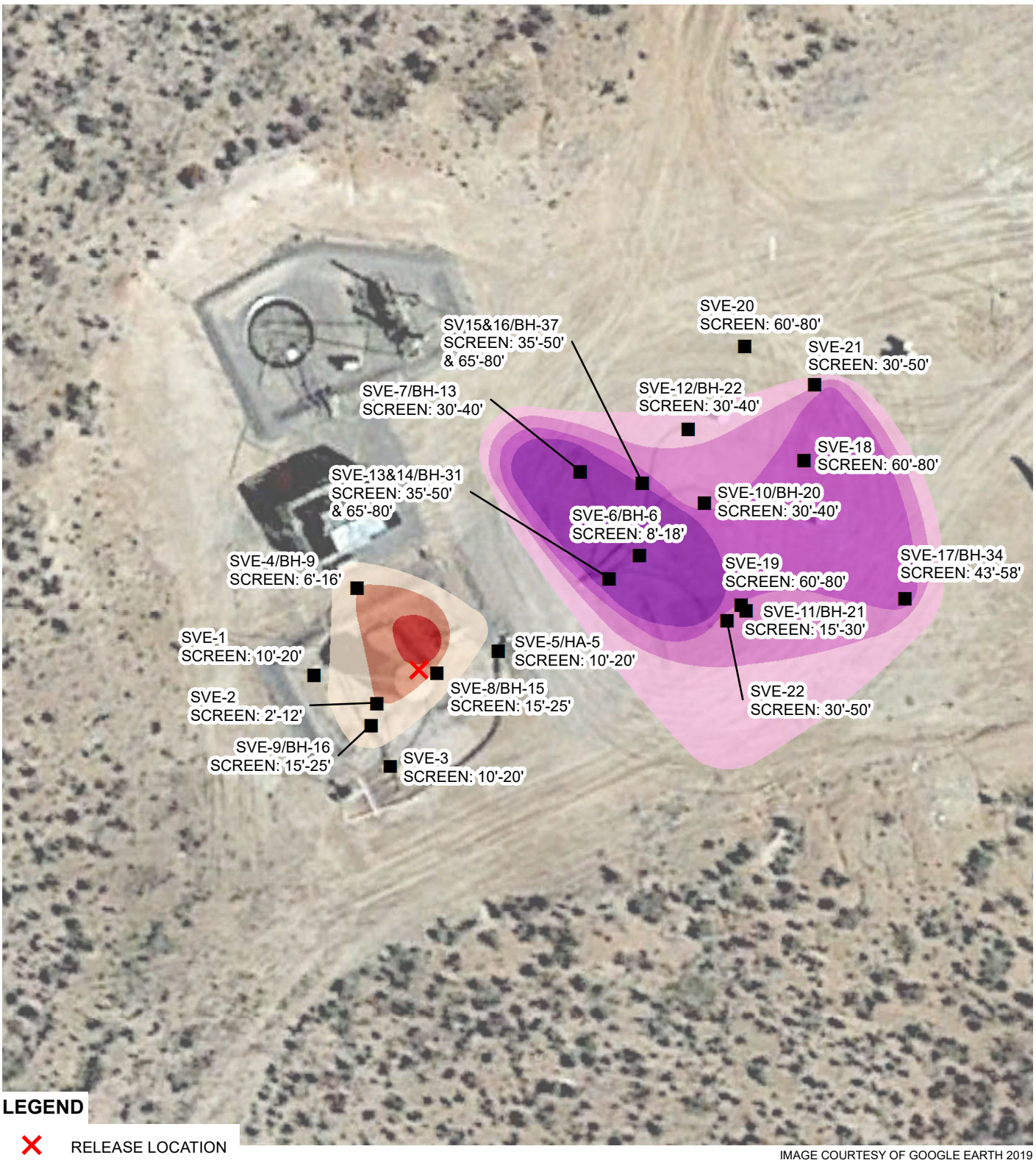
Enclosures:

Figure 1 – Site Location Map

Table 1 – Air Sample Results Summary
Table 2 – Soil Vapor Extraction System Recovery & Emissions Summary

Attachment 1 – Analytical Laboratory Report

FIGURES



LEGEND

RELEASE LOCATION

SOIL VAPOR EXTRACTION (SVE) WELL

INFERRED BTEX ISOCONCENTRATION (PARTS PER MILLION)

- 50.00 - 200.00
- 50.00 - 100.00
- 200.01 - 400.00
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- 400.01 - 600.00
- 200.01 - 300.00
- > 600.00

IMAGE COURTESY OF GOOGLE EARTH 2019

0 30 60

Feet

N

FIGURE 1
SVE SYSTEM LAYOUT
OH RANDEL #5
NWNW SEC 10 T26N R11W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017818016_OH RANDEL #5\017818016_OH RANDEL #5_FIG01_SVE_LAYOUT_2020.mxd

TABLES

TABLE 1
SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL RESULTS

OH RANDEL #5
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TVPH (µg/L)	PID (ppm)
8/11/2016	160	1,700	61	500	46,000	4,072
8/17/2018	130	230	10	110	8,900	719
6/28/2019	7,200	15,000	360	3,000	460,000	1,257
12/16/2019	1,800	4,400	83	660	170,000	1,685
3/10/2020	1,700	3,300	89	700	130,000	897
4/30/2020 (1)	2,440	4,737	128	1,005	186,592	1,853
6/24/2020 (1)	NT	NT	NT	NT	NT	NT
11/10/2020	320	1,100	43	380	43,000	NT

Notes:
(1) - blower not operational for sampling from May to October 2020
µg/L - micrograms per Liter
PID - photoionization detector
ppm - parts per million
TVPH - total volatile petroleum hydrocarbons
NT - not tested

TABLE 2
SOIL VAPOR EXTRACTION SYSTEM RECOVERY & EMISSIONS SUMMARY

OH RANDEL #5
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Information and Lab Analysis

Date	Total Flow (cf)	Delta Flow (cf)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TVPH (µg/L)	PID (ppm)
8/11/2016	31,185	31,185	160	1,700	61	500	46,000	4,072
8/17/2018	59,647,485	59,616,300	130	230	10	110	8,900	719
12/16/2019	59,647,485	59,616,300	1,800	4,400	83	660	170,000	1,902
3/10/2020	71,718,885	12,071,400	1,700	3,300	89	700	130,000	897
4/30/2020 (1)	68,858,085	9,210,600	2,440	4,737	128	1,005	186,592	1,853
6/24/2020	Blower Not Operational (2)							
11/10/2021	68,858,085		320	1,100	43	380	43,000	NT
		Average	1,092	2,578	69	559	97,415	1,889

Vapor Extraction Calculations

Date	Flow Rate (cfm)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Xylenes (lb/hr)	TVPH (lb/hr)
8/11/2016	105	0.1	0.7	0.02	0.2	18.1
8/17/2018	100	0.1	0.4	0.01	0.1	10.3
12/16/2019	110	0.4	1.0	0.02	0.2	36.8
3/10/2020	110	0.7	1.6	0.04	0.3	61.7
4/30/2020 (1)	105	0.8	1.6	0.04	0.3	62.2
6/24/2020	Blower Not Operational (2)					
Average	106	0.4	1.0	0.03	0.2	37.8

Pounds Extracted Over Operating Time

Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethylbenzene (lbs)	Xylenes (lbs)	TVPH (lbs)	TVPH (tons)
8/11/2016	Startup							
8/11/2016	5.0	5.0	0.3	3.3	0.1	1.0	89.4	0.0
8/17/2018	9,941	9,936	539	3,586	132	1,133	102,009	51
12/16/2019	17,515	7,574	3,007	7,214	145	1,200	278,728	139
3/10/2020	19,344	1,829	1,317	2,897	65	512	112,870	56
4/30/2020 (1)	20,806	1,462	1,188	2,307	62	489	90,884	45
6/24/2020	Blower Not Operational (2)							
		Total Extracted to Date	6,051	16,007	404	3,335	584,580	292

NOTES:

(1) - data extrapolated from PID measurements
(2) - blower not operational for sampling in May and June 2020
cf - cubic feet
cfm - cubic feet per minute
µg/l - micrograms per liter
lb/hr - pounds per hour
System startup occurred on 8/11/16 at 10 AM with 0 hours on the blower engine.
Blower replaced on 10/3/2019 with 16,038 hours on the blower engine
lbs - pounds
PID - photo-ionization detector
ppm - part per million
TVPH - total volatile petroleum hydrocarbons

ATTACHMENT 1 – ANALYTICAL LABORATORY REPORT

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

December 08, 2020

Clara Cardoza

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

RE: OH Randel 5 OrderNo.: 2011573

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 1 sample(s) on 11/11/2020 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2011573**
Date Reported: **12/8/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: OH Randel 5
Lab ID: 2011573-001 **Matrix:** AIR

Client Sample ID: Influent 11-10-20
Collection Date: 11/10/2020 1:30:00 PM
Received Date: 11/11/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	43000	500		µg/L	100	11/16/2020 12:40:11 PM	R73408
Surr: BFB	95.9	70-130		%Rec	100	11/16/2020 12:40:11 PM	R73408
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	320	5.0		µg/L	50	11/15/2020 3:03:52 PM	SL73373
Toluene	1100	10	E	µg/L	100	11/16/2020 12:40:11 PM	A73408
Ethylbenzene	43	5.0		µg/L	50	11/15/2020 3:03:52 PM	SL73373
Xylenes, Total	380	7.5		µg/L	50	11/15/2020 3:03:52 PM	SL73373
Surr: 1,2-Dichloroethane-d4	64.3	70-130	S	%Rec	50	11/15/2020 3:03:52 PM	SL73373
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	50	11/15/2020 3:03:52 PM	SL73373
Surr: Dibromofluoromethane	71.9	70-130		%Rec	50	11/15/2020 3:03:52 PM	SL73373
Surr: Toluene-d8	106	70-130		%Rec	50	11/15/2020 3:03:52 PM	SL73373

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

Qualifiers:

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

ENERGY LABORATORIES
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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

ANALYTICAL SUMMARY REPORT

November 18, 2020

Hall Environmental
4901 Hawkins St NE Ste D
Albuquerque, NM 87109-4372

Work Order: G20110267

Project Name: Not Indicated

Energy Laboratories Inc. Gillette WY received the following 1 sample for Hall Environmental on 11/12/2020 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G20110267-001	2011573-001B; Influent 11-10-20	11/10/20 13:30	11/12/20	Gas	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo-Critical Pressure Natural Gas Analysis - Psuedo-Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these tests results, please contact your Project Manager.

Report Approved By:

ENERGY LABORATORIES
Trust our People. Trust our Data.
www.energylab.com
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: Not Indicated
Client Sample ID: 2011573-001B; Influent 11-10-20
Location:
Lab ID: G20110267-001

Report Date: 11/18/20
Collection Date: 11/10/20 13:30
Date Received: 11/12/20
Sampled By: Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT					
Oxygen	21.447	Mol %		GPA 2261	11/18/20 09:12 / djb
Nitrogen	77.542	Mol %		GPA 2261	11/18/20 09:12 / djb
Carbon Dioxide	0.353	Mol %		GPA 2261	11/18/20 09:12 / djb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	11/18/20 09:12 / djb
Methane	< 0.001	Mol %		GPA 2261	11/18/20 09:12 / djb
Ethane	0.001	Mol %		GPA 2261	11/18/20 09:12 / djb
Propane	0.012	Mol %		GPA 2261	11/18/20 09:12 / djb
Isobutane	0.021	Mol %		GPA 2261	11/18/20 09:12 / djb
n-Butane	0.068	Mol %		GPA 2261	11/18/20 09:12 / djb
Isopentane	0.085	Mol %		GPA 2261	11/18/20 09:12 / djb
n-Pentane	0.083	Mol %		GPA 2261	11/18/20 09:12 / djb
Hexanes plus	0.388	Mol %		GPA 2261	11/18/20 09:12 / djb
GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS					
GPM Ethane	< 0.0003	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Propane	0.0030	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Isobutane	0.0070	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM n-Butane	0.0210	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Isopentane	0.0310	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM n-Pentane	0.0300	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Hexanes plus	0.1690	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Pentanes plus	0.2290	gal/MCF		GPA 2261	11/18/20 09:12 / djb
GPM Total	0.2610	gal/MCF		GPA 2261	11/18/20 09:12 / djb
CALCULATED PROPERTIES					
Calculation Pressure Base	14.730	psia		GPA 2261	11/18/20 09:12 / djb
Calculation Temperature Base	60	°F		GPA 2261	11/18/20 09:12 / djb
Compressibility Factor, Z	1.0000	unitless		GPA 2261	11/18/20 09:12 / djb
Molecular Weight	29.27	unitless		GPA 2261	11/18/20 09:12 / djb
Pseudo-critical Pressure, psia	547	psia		GPA 2261	11/18/20 09:12 / djb
Pseudo-critical Temperature, deg R	244	deg R		GPA 2261	11/18/20 09:12 / djb
Specific Gravity (air=1.000)	1.014	unitless		GPA 2261	11/18/20 09:12 / djb
Gross BTU per cu ft @ std cond, dry	29.87	BTU/cu ft		GPA 2261	11/18/20 09:12 / djb
Gross BTU per cu ft @ std cond, wet	29.35	BTU/cu ft		GPA 2261	11/18/20 09:12 / djb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental **Work Order:** G20110267 **Report Date:** 11/18/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261										Analytical Run: R261245
Lab ID: ICV-2011180843	12	Initial Calibration Verification Standard								11/18/20 08:44
Oxygen		0.394	Mol %	0.001	98	75	110			
Nitrogen		5.149	Mol %	0.001	103	90	110			
Carbon Dioxide		4.905	Mol %	0.001	99	90	110			
Hydrogen Sulfide		0.128	Mol %	0.001	129	100	136			
Methane		73.169	Mol %	0.001	100	90	110			
Ethane		5.002	Mol %	0.001	101	90	110			
Propane		5.009	Mol %	0.001	100	90	110			
Isobutane		1.987	Mol %	0.001	99	90	110			
n-Butane		1.969	Mol %	0.001	98	90	110			
Isopentane		0.985	Mol %	0.001	99	90	110			
n-Pentane		0.996	Mol %	0.001	100	90	110			
Hexanes plus		0.307	Mol %	0.001	102	90	110			
Lab ID: CCV-2011180848	12	Continuing Calibration Verification Standard								11/18/20 08:49
Oxygen		0.616	Mol %	0.001	103	90	110			
Nitrogen		1.317	Mol %	0.001	94	85	110			
Carbon Dioxide		0.958	Mol %	0.001	96	90	110			
Hydrogen Sulfide		0.031	Mol %	0.001	124	70	130			
Methane		93.502	Mol %	0.001	100	90	110			
Ethane		1.017	Mol %	0.001	102	90	110			
Propane		1.014	Mol %	0.001	101	90	110			
Isobutane		0.494	Mol %	0.001	99	90	110			
n-Butane		0.495	Mol %	0.001	99	90	110			
Isopentane		0.200	Mol %	0.001	100	90	110			
n-Pentane		0.201	Mol %	0.001	100	90	110			
Hexanes plus		0.155	Mol %	0.001	103	90	110			
Lab ID: CCV-2011180925	12	Continuing Calibration Verification Standard								11/18/20 09:25
Oxygen		0.640	Mol %	0.001	107	90	110			
Nitrogen		1.397	Mol %	0.001	100	85	110			
Carbon Dioxide		0.956	Mol %	0.001	96	90	110			
Hydrogen Sulfide		0.032	Mol %	0.001	128	70	130			
Methane		93.410	Mol %	0.001	100	90	110			
Ethane		1.015	Mol %	0.001	101	90	110			
Propane		1.012	Mol %	0.001	101	90	110			
Isobutane		0.493	Mol %	0.001	98	90	110			
n-Butane		0.493	Mol %	0.001	98	90	110			
Isopentane		0.199	Mol %	0.001	100	90	110			
n-Pentane		0.199	Mol %	0.001	100	90	110			
Hexanes plus		0.154	Mol %	0.001	103	90	110			
Method: GPA 2261										Batch: R261245
Lab ID: G20110267-001ADUP	12	Sample Duplicate				Run: Varian GC_201118A				11/18/20 09:16
Oxygen		21.445	Mol %	0.001				0.0	20	
Nitrogen		77.540	Mol %	0.001				0.0	10	
Carbon Dioxide		0.353	Mol %	0.001				0.0	10	

Qualifiers:

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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental **Work Order:** G20110267 **Report Date:** 11/18/20

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261										Batch: R261245
Lab ID: G20110267-001ADUP	12	Sample Duplicate				Run: Varian GC_201118A			11/18/20 09:16	
Hydrogen Sulfide		< 0.001	Mol %	0.001					10	
Methane		< 0.001	Mol %	0.001					10	
Ethane		0.001	Mol %	0.001				0.0	10	
Propane		0.013	Mol %	0.001				8.0	10	
Isobutane		0.021	Mol %	0.001				0.0	10	
n-Butane		0.068	Mol %	0.001				0.0	10	
Isopentane		0.085	Mol %	0.001				0.0	10	
n-Pentane		0.083	Mol %	0.001				0.0	10	
Hexanes plus		0.391	Mol %	0.001				0.8	10	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

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Work Order Receipt Checklist

Hall Environmental

G20110267

Login completed by: Chantel S. Johnson
Date Received: 11/12/2020
Reviewed by: Misty Stephens
Received by: csj
Reviewed Date: 11/13/2020
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

CHAIN OF CUSTODY RECORD

SUB CONTRATOR:	Energy Labs-Gillette	COMPANY: Energy Laboratories	PHONE: (866) 686-7175 FAX:
ADDRESS:	400 W Boxelder Rd		ACCOUNT #: EMAIL:
CITY, STATE, ZIP:	Gillette, WY 82718		

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2011573-001B	Influent 11-10-20	TEDLAR	Air	11/10/2020 1:30:00 PM	1	Fixed gases

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By: EM	Date: 11/11/2020	Time: 8:29 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: Chantel Johnson 1050	Date: 11/12/2020	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples ____ °C Attempt to Cool ? ____
Comments: G2011002L07

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Hilcorp Energy** Work Order Number: **2011573** RcptNo: 1

Received By: **Desiree Dominguez** 11/11/2020 8:00:00 AM DD

Completed By: **Emily Mocho** 11/11/2020 8:23:46 AM

Reviewed By: ENM 11/11/20

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☐	NA ☑
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☑	No ☐	NA ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

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

Adjusted? _____

Checked by: JR 11/11/20

Special Handling (if applicable)

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

Person Notified: _____ Date: _____

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

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Chain-of-Custody Record

Client: Hilcorp Energy Company
Attn: Clara Cardoza
Mailing Address:

Phone #:
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☑ EDD (Type) PDF

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OH Randel #5
Project #:
Project Manager: LTE/WSP- Danny Burns
Sampler: D.B.
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): NA (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2011573	BTEX / ~~MTBE~~ / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Fixed Gas
11-10-20	1330	Air	Influent 11-10-20	2-Tedlar	NONE	001	X	X									X

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
11-10-20	1442				11/10/2020	1442
11/10/2020	1930			Courier	11-11-20	8:00

Remarks: cc: danny.burns@wsp.com

NV

July 12, 2021

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

Subject: **Second Quarter 2021 - Quarterly SVE System Update**
Hilcorp Energy Company
OH Randel #5
San Juan County, New Mexico
API # 30-045-05964
Incident # NVF1602039091

Dear Mr. Smith:

WSP USA Inc. (WSP), on behalf of Hilcorp Energy Company (Hilcorp), presents the following second quarter 2021 summary report discussing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site). This report is being submitted as part of the proposed timeline of remediation events in the Pilot Test Results submitted to the New Mexico Oil Conservation Division (NMOCD) on August 6, 2019.

An SVE system was originally installed by XTO Energy in 2016. Based on prior delineation events and the pilot test, an additional five SVE wells were installed on August 23, 2019 by Hilcorp. SVE well configuration and screen intervals are presented in Figure 1. In total, the SVE system consists of a two-horsepower Atlantic AB-301 regenerative blower capable of producing 110 cubic feet per minute (cfm) at 72 inches of water column vacuum. The blower is connected to an adjustable manifold that allows control over which SVE wells are currently active.

The second quarter 2021 sample was collected on June 10, 2021. The air samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8021, and total volatile petroleum hydrocarbons (TVPH) via EPA Method 8015. Laboratory analytical results for these analytes are summarized in Table 1. In addition, annual sampling for the full list of volatile organic compounds by EPA Method 8260B and fixed-gasses (including carbon monoxide, carbon dioxide, and oxygen) were analyzed for this sampling event and are included in the laboratory analytical report attached in Enclosure A.

Hilcorp personnel conducted bi-weekly operation and maintenance visits to ensure the system was operating, maximize runtime efficiency, and conduct any required system maintenance. The air sample data collected to date and measured stack flow rate were utilized to calculate total emissions for the system up to June 11, 2021 (Table 2). As of June 2021, the total operational time of the system was 25,892 hours with an estimated mass source removal via the SVE system of 620,705 pounds of TVPH.

CONCLUSIONS AND RECOMMENDATIONS

Due to past mechanical issues with the current SVE system, WSP and Hilcorp plan to reconfigure the current system and install an additional larger SVE system to meet the vacuum requirements for the Site and achieve NMOCD Table 1 Closure Criteria in a timely manner. The additional system is being designed to maximize the existing electrical service onsite, which is a single phase 100 ampere, 240-volt service. The system will be engineered to be able to operate with the current electrical service while also maximizing the flow and necessary vacuum on all SVE wells concurrently at the Site negate the need to rotate the SVE system between wells on a biweekly basis. By doing this, overall remediation timeframe will be reduced.

Hilcorp will continue to maintain, monitor, and sample the current SVE system until the new system is installed. After installation, a report will be prepared that outlines the specifications of the system and proposes a new remediation timeline for the Site.

WSP USA
848 EAST 2ND AVENUE
DURANGO CO 81301

Tel.: 970-385-1096
wsp.com

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact me at (970) 385-1096 or via email at stuart.hyde@wsp.com or Kate Kaufman at (346) 237-2275 or via email at kkaufman@hilcorp.com.

Kind regards,

Stuart Hyde, L.G.
Environmental Geologist

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

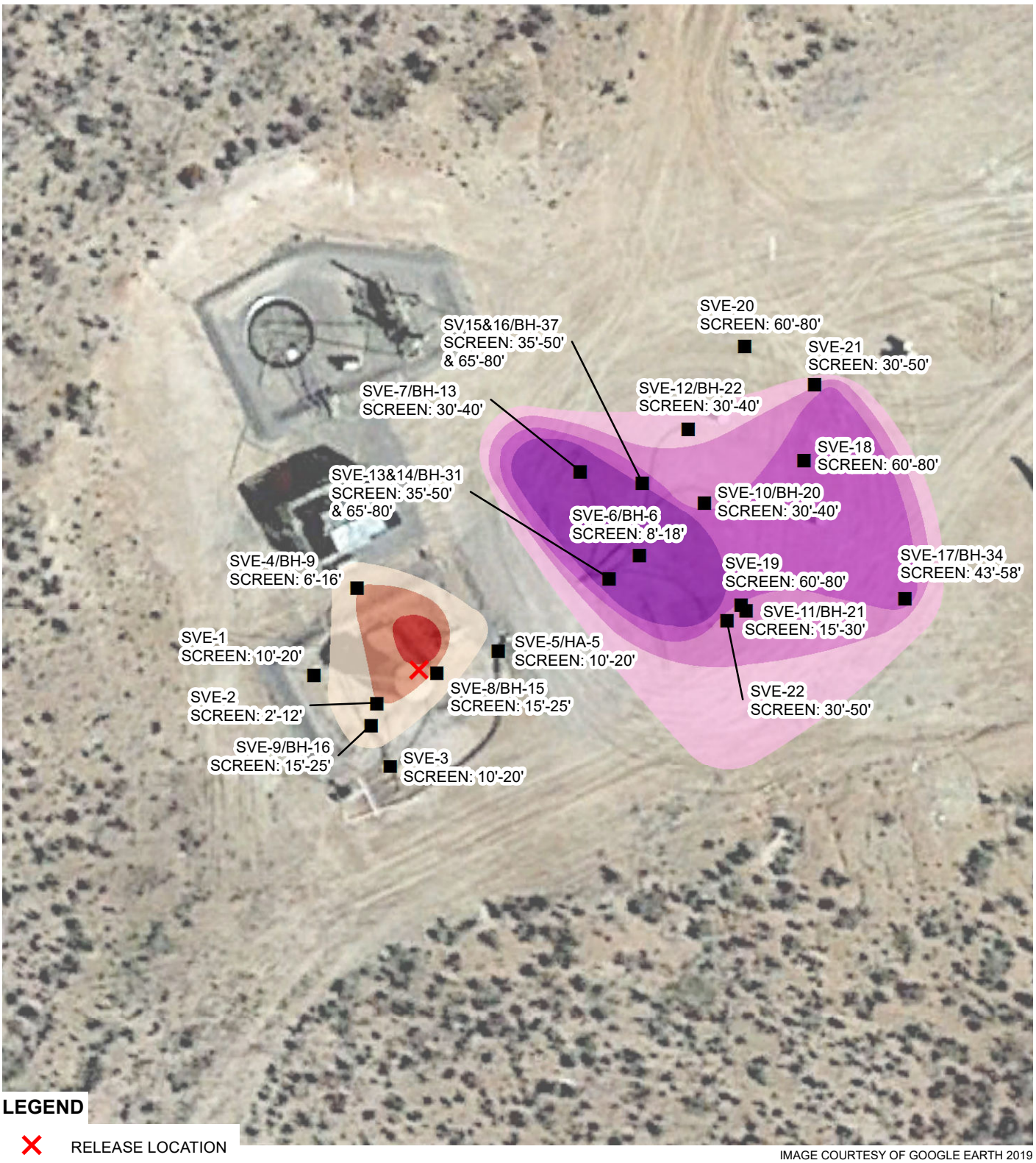
Enclosures:

Figure 1 – Site Location Map

Table 1 – Air Sample Results Summary
Table 2 – Soil Vapor Extraction System Recovery & Emissions Summary

Enclosure A – Analytical Laboratory Reports

FIGURES



LEGEND

RELEASE LOCATION

SOIL VAPOR EXTRACTION (SVE) WELL

INFERRED BTEX ISOCONCENTRATION (PARTS PER MILLION)

- 50.00 - 200.00
- 50.00 - 100.00
- 200.01 - 400.00
- 100.01 - 200.00
- 400.01 - 600.00
- 200.01 - 300.00
- > 600.00

IMAGE COURTESY OF GOOGLE EARTH 2019

0 30 60

Feet

N

FIGURE 1
SVE SYSTEM LAYOUT
OH RANDEL #5
NWNW SEC 10 T26N R11W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017818016_OH RANDEL #5\017818016_OH RANDEL #5_FIG01_SVE_LAYOUT_2020.mxd

TABLES

TABLE 1
SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL RESULTS

OH RANDEL #5
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TVPH (µg/L)	PID (ppm)
8/11/2016	160	1,700	61	500	46,000	4,072
8/17/2018	130	230	10	110	8,900	719
6/28/2019	7,200	15,000	360	3,000	460,000	1,257
12/16/2019	1,800	4,400	83	660	170,000	1,685
3/10/2020	1,700	3,300	89	700	130,000	897
4/30/2020 (1)	2,440	4,737	128	1,005	186,592	1,853
6/24/2020 (1)	NT	NT	NT	NT	NT	NT
11/10/2020	320	1,100	43	380	43,000	1,385
2/10/2021	360	950	35	250	32,000	865
6/11/2021	170	390	11	110	18,000	400

Notes:
(1) - blower not operational for sampling from May to October 2020
µg/L - micrograms per Liter
PID - photoionization detector
ppm - parts per million
TVPH - total volatile petroleum hydrocarbons
NT - not tested

TABLE 2
SOIL VAPOR EXTRACTION SYSTEM RECOVERY & EMISSIONS SUMMARY

OH RANDEL #5
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Information and Lab Analysis

Date	Total Flow (cf)	Delta Flow (cf)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TVPH (µg/L)	PID (ppm)
8/11/2016	31,185	31,185	160	1,700	61	500	46,000	4,072
8/17/2018	59,647,485	59,616,300	130	230	10	110	8,900	719
12/16/2019	109,635,885	49,988,400	1,800	4,400	83	660	170,000	1,902
3/10/2020	121,707,285	12,071,400	1,700	3,300	89	700	130,000	897
4/30/2020 (1)	130,917,885	9,210,600	2,440	4,737	128	1,005	186,592	1,853
6/24/2020	Blower Not Operational (2)							
11/10/2021	130,917,885	0	320	1,100	43	380	43,000	1,385
2/10/2021	143,580,765	12,662,880	360	950	35	250	32,000	865
6/11/2021	158,657,565	15,076,800	170	390	11	110	18,000	400
		Average	885	2,101	57	464	79,311	1,889

Vapor Extraction Calculations

Date	Flow Rate (cfm)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Xylenes (lb/hr)	TVPH (lb/hr)
8/11/2016	105	0.1	0.7	0.02	0.2	18.1
8/17/2018	100	0.1	0.4	0.01	0.1	10.3
12/16/2019	110	0.4	1.0	0.02	0.2	36.8
3/10/2020	110	0.7	1.6	0.04	0.3	61.7
4/30/2020 (1)	105	0.8	1.6	0.04	0.3	62.2
6/24/2020	Blower Not Operational (2)					
11/10/2021	105	0.0	0.0	0.00	0.0	0.0
2/10/2021	92	0.1	0.2	0.01	0.0	5.5
6/11/2021	90	0.1	0.2	0.01	0.1	8.4
Average	106	0.3	0.8	0.02	0.2	29.0

Pounds Extracted Over Operating Time

Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethylbenzene (lbs)	Xylenes (lbs)	TVPH (lbs)	TVPH (tons)
8/11/2016	Startup							
8/11/2016	5.0	5.0	0.3	3.3	0.1	1.0	89.4	0.0
8/17/2018	9,941	9,936	539	3,586	132	1,133	102,009	51
12/16/2019	17,515	7,574	3,007	7,214	145	1,200	278,728	139
3/10/2020	19,344	1,829	1,317	2,897	65	512	112,870	56
4/30/2020 (1)	20,806	1,462	1,188	2,307	62	489	90,884	45
6/24/2020	Blower Not Operational (2)							
11/10/2021	20,806	0	0	0	0	0	0	0
2/10/2021	23,100	2,294	142	375	14	99	12,629	6
6/11/2021	25,892	2,792	249	630	22	169	23,495	12
		Total Extracted to Date	6,443	17,012	439	3,603	620,705	310

NOTES:

(1) - data extrapolated from PID measurements
(2) - blower not operational for sampling in May and June 2020
cf - cubic feet
cfm - cubic feet per minute
µg/l - micrograms per liter
lbs - pounds
lb/hr - pounds per hour
PID - photo-ionization detector
ppm - part per million
TVPH - total volatile petroleum hydrocarbons

ENCLOSURE A –ANALYTICAL LABORATORY REPORTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

June 22, 2021

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

RE: OH Randel 5 OrderNo.: 2106717

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/12/2021 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2106717**
Date Reported: **6/22/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent 6-10-21
Project: OH Randel 5
Collection Date: 6/10/2021 11:15:00 AM
Lab ID: 2106717-001 **Matrix:** AIR
Received Date: 6/12/2021 7:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	18000	250		µg/L	50	6/17/2021 11:53:28 AM
Surr: BFB	152	37.3-213		%Rec	50	6/17/2021 11:53:28 AM
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**
Benzene	170	5.0		µg/L	50	6/17/2021 3:36:08 PM
Toluene	390	5.0		µg/L	50	6/17/2021 3:36:08 PM
Ethylbenzene	11	5.0		µg/L	50	6/17/2021 3:36:08 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2,4-Trimethylbenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,3,5-Trimethylbenzene	5.5	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Naphthalene	ND	10		µg/L	50	6/17/2021 3:36:08 PM
1-Methylnaphthalene	ND	20		µg/L	50	6/17/2021 3:36:08 PM
2-Methylnaphthalene	ND	20		µg/L	50	6/17/2021 3:36:08 PM
Acetone	ND	50		µg/L	50	6/17/2021 3:36:08 PM
Bromobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Bromodichloromethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Bromoform	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Bromomethane	ND	10		µg/L	50	6/17/2021 3:36:08 PM
2-Butanone	ND	50		µg/L	50	6/17/2021 3:36:08 PM
Carbon disulfide	ND	50		µg/L	50	6/17/2021 3:36:08 PM
Carbon tetrachloride	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Chlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Chloroethane	ND	10		µg/L	50	6/17/2021 3:36:08 PM
Chloroform	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Chloromethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
2-Chlorotoluene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
4-Chlorotoluene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
cis-1,2-DCE	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	6/17/2021 3:36:08 PM
Dibromochloromethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Dibromomethane	ND	10		µg/L	50	6/17/2021 3:36:08 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM

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

Qualifiers:

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

Analytical Report
Lab Order **2106717**
Date Reported: **6/22/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent 6-10-21
Project: OH Randel 5
Collection Date: 6/10/2021 11:15:00 AM
Lab ID: 2106717-001 **Matrix:** AIR **Received Date:** 6/12/2021 7:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**
1,2-Dichloropropane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1-Dichloropropene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
2-Hexanone	ND	50		µg/L	50	6/17/2021 3:36:08 PM
Isopropylbenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	6/17/2021 3:36:08 PM
Methylene chloride	ND	15		µg/L	50	6/17/2021 3:36:08 PM
n-Butylbenzene	ND	15		µg/L	50	6/17/2021 3:36:08 PM
n-Propylbenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
sec-Butylbenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Styrene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
tert-Butylbenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
trans-1,2-DCE	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	6/17/2021 3:36:08 PM
Vinyl chloride	ND	5.0		µg/L	50	6/17/2021 3:36:08 PM
Xylenes, Total	110	7.5		µg/L	50	6/17/2021 3:36:08 PM
Surr: Dibromofluoromethane	95.7	70-130		%Rec	50	6/17/2021 3:36:08 PM
Surr: 1,2-Dichloroethane-d4	114	70-130		%Rec	50	6/17/2021 3:36:08 PM
Surr: Toluene-d8	106	70-130		%Rec	50	6/17/2021 3:36:08 PM
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	50	6/17/2021 3:36:08 PM

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

Qualifiers:

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

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ANALYTICAL SUMMARY REPORT

June 18, 2021

Hall Environmental
4901 Hawkins St NE Ste D
Albuquerque, NM 87109-4372

Work Order: G21060288

Project Name: Not Indicated

Energy Laboratories Inc. Gillette WY received the following 1 sample for Hall Environmental on 6/15/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G21060288-001	2106717-001B; Influent 6-10-2021	06/10/21 11:15	06/15/21	Gas	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo-Critical Pressure Natural Gas Analysis - Psuedo-Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these tests results, please contact your Project Manager.

Report Approved By:

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LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: Not Indicated
Client Sample ID: 2106717-001B; Influent 6-10-2021
Location:
Lab ID: G21060288-001

Report Date: 06/18/21
Collection Date: 06/10/21 11:15
Date Received: 06/15/21
Sampled By: Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT					
Oxygen	22.047	Mol %		GPA 2261	06/18/21 10:27 / djb
Nitrogen	77.635	Mol %		GPA 2261	06/18/21 10:27 / djb
Carbon Monoxide	< 0.001	Mol %		GPA 2261	06/18/21 10:27 / djb
Carbon Dioxide	0.151	Mol %		GPA 2261	06/18/21 10:27 / djb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	06/18/21 10:27 / djb
Methane	< 0.001	Mol %		GPA 2261	06/18/21 10:27 / djb
Ethane	< 0.001	Mol %		GPA 2261	06/18/21 10:27 / djb
Propane	< 0.001	Mol %		GPA 2261	06/18/21 10:27 / djb
Isobutane	0.003	Mol %		GPA 2261	06/18/21 10:27 / djb
n-Butane	0.011	Mol %		GPA 2261	06/18/21 10:27 / djb
Isopentane	0.019	Mol %		GPA 2261	06/18/21 10:27 / djb
n-Pentane	0.020	Mol %		GPA 2261	06/18/21 10:27 / djb
Hexanes plus	0.114	Mol %		GPA 2261	06/18/21 10:27 / djb
GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS					
GPM Ethane	< 0.0003	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Isobutane	0.0010	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM n-Butane	0.0040	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Isopentane	0.0070	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM n-Pentane	0.0070	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Hexanes plus	0.0500	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Pentanes plus	0.0640	gal/MCF		GPA 2261	06/18/21 10:27 / djb
GPM Total	0.0690	gal/MCF		GPA 2261	06/18/21 10:27 / djb
CALCULATED PROPERTIES					
Calculation Pressure Base	14.730	psia		GPA 2261	06/18/21 10:27 / djb
Calculation Temperature Base	60	°F		GPA 2261	06/18/21 10:27 / djb
Compressibility Factor, Z	1.0000	unitless		GPA 2261	06/18/21 10:27 / djb
Molecular Weight	29.01	unitless		GPA 2261	06/18/21 10:27 / djb
Pseudo-critical Pressure, psia	547	psia		GPA 2261	06/18/21 10:27 / djb
Pseudo-critical Temperature, deg R	241	deg R		GPA 2261	06/18/21 10:27 / djb
Specific Gravity (air=1.000)	1.005	unitless		GPA 2261	06/18/21 10:27 / djb
Gross BTU per cu ft @ std cond, dry	7.92	BTU/cu ft		GPA 2261	06/18/21 10:27 / djb
Gross BTU per cu ft @ std cond, wet	7.79	BTU/cu ft		GPA 2261	06/18/21 10:27 / djb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental **Work Order:** G21060288 **Report Date:** 06/18/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261										Analytical Run: R265001
Lab ID: ICV-2106180818	12	Initial Calibration Verification Standard								06/18/21 08:19
Oxygen		0.385	Mol %	0.001	96	75	110			
Nitrogen		5.091	Mol %	0.001	101	90	110			
Carbon Dioxide		4.899	Mol %	0.001	99	90	110			
Hydrogen Sulfide		0.124	Mol %	0.001	125	100	136			
Methane		73.279	Mol %	0.001	100	90	110			
Ethane		4.996	Mol %	0.001	101	90	110			
Propane		5.001	Mol %	0.001	100	90	110			
Isobutane		1.981	Mol %	0.001	99	90	110			
n-Butane		1.962	Mol %	0.001	98	90	110			
Isopentane		0.983	Mol %	0.001	98	90	110			
n-Pentane		0.993	Mol %	0.001	99	90	110			
Hexanes plus		0.306	Mol %	0.001	101	90	110			
Lab ID: CCV-2106180838	12	Continuing Calibration Verification Standard								06/18/21 08:38
Oxygen		0.604	Mol %	0.001	101	90	110			
Nitrogen		1.293	Mol %	0.001	92	85	110			
Carbon Dioxide		0.955	Mol %	0.001	96	90	110			
Hydrogen Sulfide		0.030	Mol %	0.001	120	70	130			
Methane		93.558	Mol %	0.001	100	90	110			
Ethane		1.012	Mol %	0.001	101	90	110			
Propane		1.008	Mol %	0.001	101	90	110			
Isobutane		0.494	Mol %	0.001	99	90	110			
n-Butane		0.493	Mol %	0.001	98	90	110			
Isopentane		0.199	Mol %	0.001	100	90	110			
n-Pentane		0.200	Mol %	0.001	100	90	110			
Hexanes plus		0.154	Mol %	0.001	103	90	110			
Lab ID: ICV1-2106180853	2	Initial Calibration Verification Standard								06/18/21 08:54
Nitrogen		98.961	Mol %	0.001	100	90	110			
Carbon Monoxide		1.038	Mol %	0.001	102	90	110			
Lab ID: CCV1-2106180934	2	Continuing Calibration Verification Standard								06/18/21 09:34
Nitrogen		99.907	Mol %	0.001	100	85	110			
Carbon Monoxide		0.093	Mol %	0.001	92	90	110			
Lab ID: CCV-2106181109	12	Continuing Calibration Verification Standard								06/18/21 11:09
Oxygen		0.606	Mol %	0.001	101	90	110			
Nitrogen		1.324	Mol %	0.001	95	85	110			
Carbon Dioxide		0.954	Mol %	0.001	95	90	110			
Hydrogen Sulfide		0.030	Mol %	0.001	120	70	130			
Methane		93.535	Mol %	0.001	100	90	110			
Ethane		1.010	Mol %	0.001	101	90	110			
Propane		1.006	Mol %	0.001	101	90	110			
Isobutane		0.492	Mol %	0.001	98	90	110			
n-Butane		0.492	Mol %	0.001	98	90	110			
Isopentane		0.199	Mol %	0.001	100	90	110			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental **Work Order:** G21060288 **Report Date:** 06/18/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261										Analytical Run: R265001
Lab ID: CCV-2106181109	12	Continuing Calibration Verification Standard								06/18/21 11:09
n-Pentane		0.199	Mol %	0.001	100	90	110			
Hexanes plus		0.153	Mol %	0.001	102	90	110			
Method: GPA 2261										Batch: R265001
Lab ID: G21060288-001ADUP	13	Sample Duplicate				Run: Varian GC_210618A				06/18/21 10:32
Oxygen		22.047	Mol %	0.001				0.0	10	
Nitrogen		77.632	Mol %	0.001				0.0	10	
Carbon Monoxide		< 0.001	Mol %	0.001					10	
Carbon Dioxide		0.151	Mol %	0.001				0.0	10	
Hydrogen Sulfide		< 0.001	Mol %	0.001					10	
Methane		< 0.001	Mol %	0.001					10	
Ethane		< 0.001	Mol %	0.001					10	
Propane		< 0.001	Mol %	0.001					10	
Isobutane		0.003	Mol %	0.001				0.0	10	
n-Butane		0.011	Mol %	0.001				0.0	10	
Isopentane		0.019	Mol %	0.001				0.0	10	
n-Pentane		0.020	Mol %	0.001				0.0	10	
Hexanes plus		0.117	Mol %	0.001				2.6	10	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

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Work Order Receipt Checklist

Hall Environmental

G21060288

Login completed by: Chantel S. Johnson
Date Received: 6/15/2021
Reviewed by: Misty Stephens
Received by: mas
Reviewed Date: 6/16/2021
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

CHAIN OF CUSTODY RECORD

SUB CONTRATOR: **Energy Labs-Gillette**	COMPANY: **Energy Laboratories**	PHONE: **(866) 686-7175**	FAX:
ADDRESS: **400 W Boxelder Rd**		ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: **Gillette, WY 82718**			

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2106717-001B	Influent 6-10-21	TEDLAR	Air	6/10/2021 11:15:00 AM	1	Fixed Gasses CO, CO2, 02

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By:	Date: 6/14/2021	Time: 8:29 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of samples ____ °C Attempt to Cool ? ____
Comments: G2106008S9

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Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2106717** RcptNo: 1

Received By: **Isaiah Ortiz** 6/12/2021 7:56:00 AM I-OK

Completed By: **Cheyenne Cason** 6/14/2021 8:28:30 AM

Reviewed By: DAD 6.14.21

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	IO 6.14.21
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	Checked by:

Special Handling (if applicable)

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

Person Notified: Date:

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

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

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

Chain-of-Custody Record

Client: Hilcorp

Clara Cardoza

Mailing Address:

Phone #:

email or Fax#: CCardoza@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☒ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name: OH Randel H 5

Project #:

Project Manager: Stewart Hyde

Sampler: Eric Carroll

On Ice: ☐ Yes ☒ No

# of Coolers: 1

Cooler Temp(including CF): (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2106717	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Co, CO_2, O_2
6-10-21	11:15	Air	Influent 6-10-21	3 Tedlar		0001		X						X			X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6-11-21	1500	Eric Carroll			6/11/21	1506
6/11/21	1747				6/12/21	0756

Remarks:

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

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

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

CONDITIONS

Action 54554

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 54554
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record that includes 3Q & 4Q 2020, 2Q 2021. See App ID 125248 for most updated status.	9/22/2022