



ENSOLUM

July 12, 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: Second Quarter 2023 – SVE System Update

OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NVF1602039091
Ensolum Project No. 07A1988025

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Second Quarter 2023 – SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site), located in Unit D of Section 10, Township 26 North, and Range 11 West in San Juan County, New Mexico (Figure 1). Specifically, this report summarizes Site activities performed in April, May, and June of 2023 to the New Mexico Oil Conservation Division (NMOCD).

SVE SYSTEM SPECIFICATIONS

The current operation at the Site consists of two SVE systems, each with a dedicated blower, knockout tank, and control panel. The original SVE system (“SVE Skid 1”) was installed at the Site in 2016 by XTO Energy (the previous owner and operator of the Site) and subsequently upgraded by Hilcorp in 2019. This SVE system consists of a 2 horsepower Atlantic Blower AB-301 blower capable of producing 110 standard cubic feet per minute (scfm) of flow and 72 inches of water column (IWC) vacuum. A second SVE system (“SVE Skid 2”) was installed at the Site and became operational on March 11, 2022 in order to more efficiently address residual soil impacts at the Site. Specifically, the new system was built with a 3.4 horsepower Republic Manufacturing HRC501 blower capable of producing 221 scfm of flow and 72 IWC vacuum. When operated concurrently, the two SVE systems are able to induce the necessary flow and vacuum on all SVE wells at the Site simultaneously with no need to rotate operating wells.

SVE wells are located and screened in the “Secondary” and “Tertiary” Source Zones, as identified in the WSP USA Inc. *Site Summary Report*, dated October 1, 2021. Once the new SVE Skid 2 was installed at the Site, new manifolds were constructed so SVE Skid 1 operated wells located in the Secondary Source Zone (SVE-5, SVE-8, and SVE-9) and SVE Skid 2 operated wells located in the Tertiary Source Zone (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). The SVE well locations are shown on Figure 2.

SECOND QUARTER 2023 ACTIVITIES

During the second quarter of 2023, Ensolum and Hilcorp personnel performed bi-weekly operation and maintenance (O&M) visits to verify the system was operating as designed and to perform any required maintenance. Field notes taken during O&M visits are presented in Appendix A. During the second quarter of 2023, all SVE wells, except SVE-6 and SVE-11, were operated in order to induce flow in areas with remaining soil impacts. SVE wells SVE-6 and SVE-11 are screened at depths shallower than the remaining soil impacts at the Site and have been turned off in order for the SVE system to induce a higher flow and vacuum on the remaining open wells. Between March 10 and June 23, 2023, SVE Skid 1 operated for 2,241 hours with a runtime efficiency of 89 percent (%) and Skid 2 operated for 1,833 hours with a runtime efficiency of 73%. Table 1 presents the SVE system operational hours and percent runtime. Appendix B presents photographs of the runtime meter for calculating the second quarter runtime efficiency.

Reduced runtime during the second quarter of 2023 was caused by a lightning strike that occurred at the Site in late May of 2023. The lightning strike caused both SVE skids to trip an overload switch and shut the systems down. Ensolum personnel conducted a Site visit on June 1, 2023 and was able to turn SVE Skid 1 on and bring it back into operation. However, one of the electrical capacitors on the blower for SVE Skid 2 was damaged and was inoperable until repairs could be made. A notification regarding the damaged equipment was sent to the NMOCD and acknowledged on June 7, 2023, and is attached as Appendix C. Once replacement parts were received, a Hilcorp electrician repaired the damaged blower and returned Skid 2 to service on June 12, 2023.

Emissions samples were collected from sample ports located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. Prior to collection, the emission samples were field screened with a photoionization detector (PID) for organic vapor monitoring (OVM). Second quarter 2023 emissions samples were collected from both SVE skids on June 23, 2023. The emission samples were collected directly into two 1-Liter Tedlar® bags and submitted to Hall Environmental Analysis Laboratory (Hall) in Albuquerque, New Mexico for analysis of total volatile petroleum hydrocarbons (TVPH – also known as total petroleum hydrocarbons – gasoline range organics (TPH-GRO)) following United States Environmental Protection Agency (EPA) Method 8015D, volatile organic compounds (VOCs) following EPA Method 8260B, and fixed gas analysis of oxygen and carbon dioxide following Gas Processors Association (GPA) Method 2261.

Table 2 presents a summary of analytical data collected during the sampling events and from historical sampling events, with the full laboratory analytical report included in Appendix D. Emission sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE systems (Tables 3 and 4). Based on these estimates, a total of 728,877 pounds (364 tons) of TVPH have been removed by the systems to date.

RECOMMENDATIONS

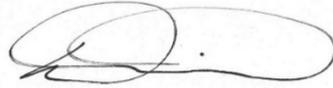
Bi-weekly O&M visits will continue to be performed by Ensolum and/or Hilcorp personnel to verify the SVE systems are operating within normal working ranges (i.e., temperature, pressure, and vacuum). Deviations from regular operations will be noted on field logs and included in the following quarterly report. Hilcorp will continue operating the SVE systems until asymptotic emissions are observed. At that time, an evaluation of residual petroleum hydrocarbons will be assessed and further recommendations for remedial actions, if any, will be provided to NMOCD.

We appreciate the opportunity to provide this report to the New Mexico Oil Conservation Division. If you should have any questions or comments regarding this report, please contact the undersigned.

Sincerely,
Ensolum, LLC



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Attachments:

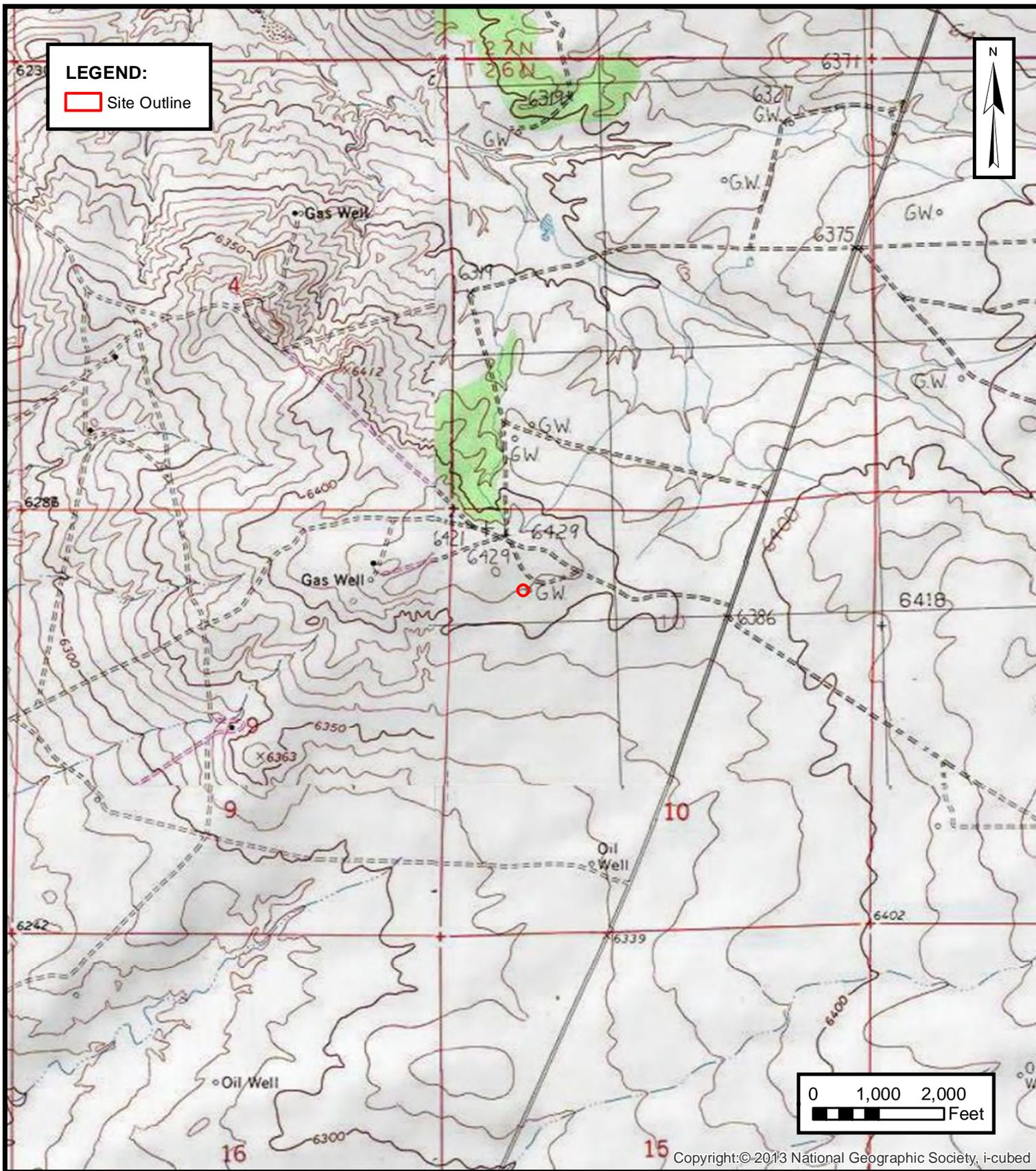
Figure 1 Site Location Map
Figure 2 SVE System Layout

Table 1 Soil Vapor Extraction System Runtime Calculations
Table 2 Soil Vapor Extraction System Emissions Analytical Results
Table 3 Soil Vapor Extraction System Mass Removal and Emissions – Skid 1
Table 4 Soil Vapor Extraction System Mass Removal and Emissions – Skid 2

Appendix A Field Notes
Appendix B Project Photographs
Appendix C NMOCD Correspondence
Appendix D Laboratory Analytical Reports



FIGURES



ENSOLUM
 Environmental & Hydrogeologic Consultants

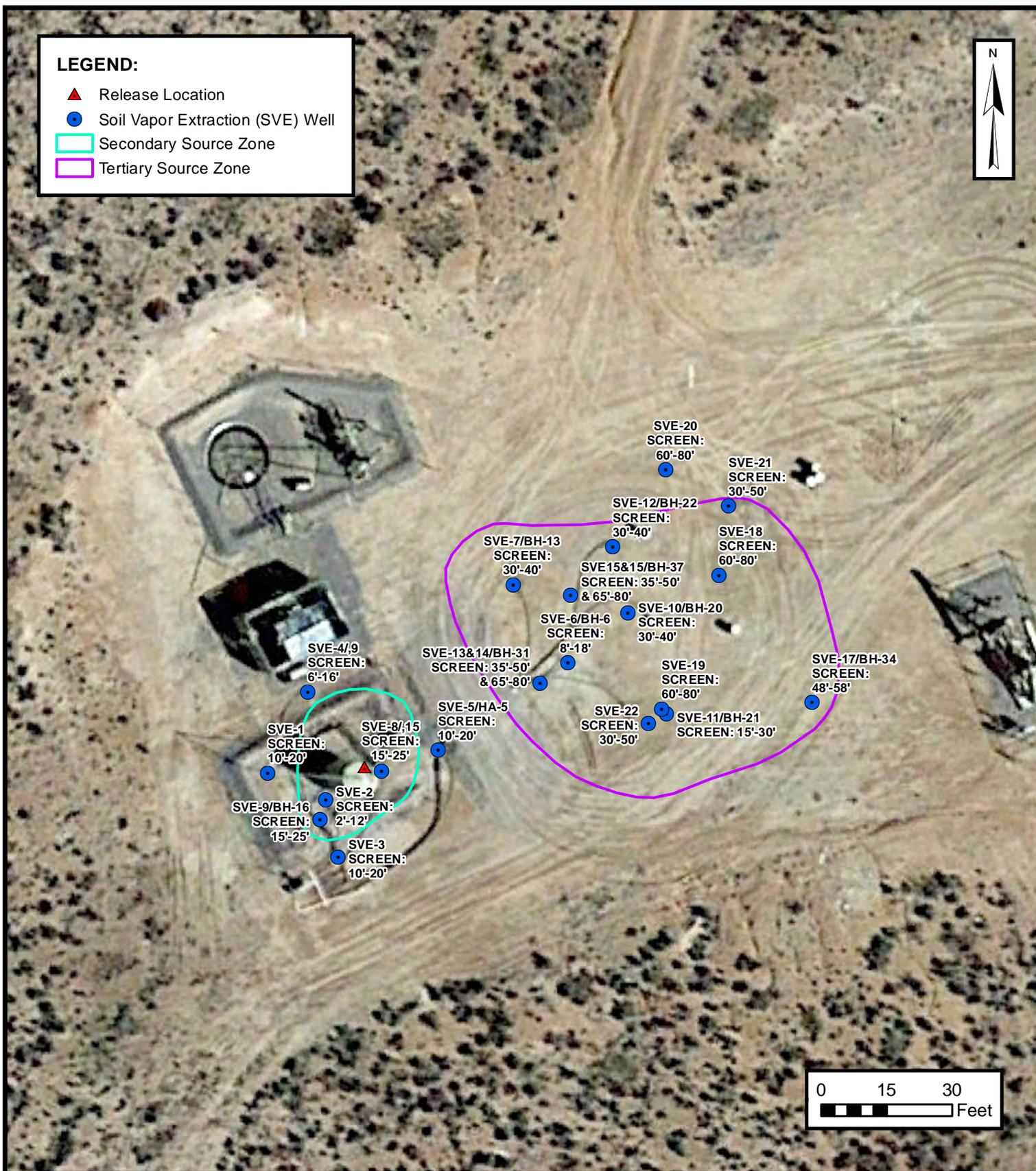
SITE LOCATION MAP

HILCORP ENERGY COMPANY
 OH RANDEL #5
 NWNW SEC 10 T26N R11W, San Juan County, New Mexico
 36.506504° N, 107.996993° W

PROJECT NUMBER: 07A1988025

FIGURE

1



SVE SYSTEM LAYOUT

HILCORP ENERGY COMPANY
OH RANDEL #5
NWNW SEC 10 T26N R11W, San Juan County, New Mexico
36.506504° N, 107.996993° W

PROJECT NUMBER: 07A1988025

FIGURE
2



TABLES



TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS
 OH Randel #5
 Hilcorp Energy Company
 San Juan County, New Mexico

SVE Skid 1 - Original System Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
3/10/2023	40,824.1	--	--	--
6/23/2023	43,065.2	2,241	105	89%

SVE Skid 2 - New System Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
3/10/2023	8,724.2	--	--	--
6/23/2023	10,556.7	1,833	105	73%



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS

OH Randel #5
Hilcorp Energy Company
San Juan County, New Mexico

SVE Skid 1 - Original System Analytical Results

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
8/11/2016	4,072	160	1,700	61	500	46,000	--	--
8/17/2018	719	130	230	10	110	8,900	--	--
6/28/2019	1,257	7,200	15,000	360	3,000	460,000	--	--
12/16/2019	1,685	1,800	4,400	83	660	170,000	--	--
3/10/2020	897	1,700	3,300	89	700	130,000	--	--
4/30/2020	1,853	2,440	4,737	128	1,005	186,592	--	--
6/24/2020 (1)	--	--	--	--	--	--	--	--
11/10/2020	1,385	320	1,100	43	380	43,000	21.45%	0.35%
2/10/2021	865	360	950	35	250	32,000	--	--
6/11/2021	400	170	390	11	110	18,000	22.05%	0.15%
9/29/2021	505	99	190	7.0	55	8,200	--	--
12/15/2021	1,163	130	290	6.9	62	37,137	22.21%	0.092%
3/21/2022	274	6.5	23	0.98	11	550	22.38%	0.041%
6/17/2022	88	5.5	19	0.69	7.0	650	21.83%	0.060%
9/22/2022	55	9.0	42	1.9	20	670	21.84%	0.10%
12/7/2022	28	5.2	34	1.5	15	480	21.92%	0.05%
3/10/2023	87	2.5	8.2	<1.0	4.2	260	21.85%	0.06%
6/23/2023	290	4.8	31	2.0	24	670	21.82%	0.07%

SVE Skid 2 - Original System Analytical Results

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)	Oxygen (%)	Carbon Dioxide (%)
3/21/2022	1,354	310	510	13	120	35,000	21.81%	0.31%
6/17/2022	1,058	200	410	<10	66	33,000	21.27%	0.39%
9/8/2022	1,258	479	1,190	26	1,041	31,900	20.10%	0.50%
12/7/2022	918	230	370	9.1	65	18,000	21.53%	0.36%
3/10/2023	1,790	140	230	7.5	60	12,000	21.71%	0.17%
6/23/2023	1,450	160	430	12	100	18,000	21.29%	0.39%

Notes:

(1) - blower not operational for sampling in May and June 2020

GRO: gasoline range organics

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled

<0.037: gray indicates result less than the stated laboratory reporting limit (PQL)



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS - SKID 1
 OH Randel #5
 Hilcorp Energy Company
 San Juan County, New Mexico

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
8/11/2016	4,072	160	1,700	61	500	46,000
8/17/2018	719	130	230	10	110	8,900
12/16/2019	1,902	1,800	4,400	83	660	170,000
3/10/2020	897	1,700	3,300	89	700	130,000
4/30/2020	1,853	2,440	4,737	128	1,005	186,592
6/24/2020	Blower Not Operational (1)					
11/10/2021	1,385	320	1,100	43	380	43,000
2/10/2021	865	360	950	35	250	32,000
6/11/2021	400	170	390	11	110	18,000
9/29/2021	505	99	190	7.0	55	8,200
12/15/2021	1,163	130	290	6.9	62	37,137
3/21/2022	274	6.5	23	1.0	11	550
6/17/2022	88	6	19	0.7	7	650
9/22/2022	55	9.0	42	1.9	20	670
12/7/2022	28	5.2	34	1.5	15	480
3/10/2023	87	2.5	8.2	1.0	4.2	260
6/23/2023	290	4.8	31.0	2.0	24.0	670
Average	911	459	1,090	30	245	42,694

Vapor Extraction Summary

Date	Flow Rate (cfm)	Total System Flow (cf)	Delta Flow (cf)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
8/11/2016	105	31,500	31,500	0.063	0.67	0.024	0.20	18
8/17/2018	100	59,647,500	59,616,000	0.054	0.36	0.013	0.11	10
12/16/2019	110	109,635,900	49,988,400	0.40	0.95	0.019	0.16	37
3/10/2020	110	121,707,300	12,071,400	0.72	1.6	0.035	0.28	62
4/30/2020 (1)	105	130,917,900	9,210,600	0.81	1.6	0.043	0.33	62
6/24/2020 (1)	Blower Not Operational							
11/10/2021	105	130,917,900	0	0	0	0	0	0
2/10/2021	92	143,580,780	12,662,880	0.12	0.35	0.013	0.11	13
6/11/2021	90	158,657,580	15,076,800	0.089	0.23	0.0077	0.061	8.4
9/29/2021	69	168,249,960	9,592,380	0.035	0.075	0.0023	0.021	3.4
12/15/2021	90	178,207,560	9,957,600	0.039	0.081	0.0023	0.020	7.6
3/16/2022	70	187,343,904	9,136,344	0.018	0.041	0.0010	0.010	4.9
6/17/2022	70	196,703,520	9,359,616	0.0016	0.0055	0.00022	0.0024	0.16
9/21/2022	65	205,627,890	8,924,370	0.0018	0.0074	0.00031	0.0033	0.16
12/7/2022	70	213,411,456	7,783,566	0.0019	0.0099	0.00045	0.0046	0.15
3/10/2023	73	223,160,241	9,748,785	0.0011	0.0058	0.0003	0.0026	0.1010
6/23/2023	60	231,228,093	8,067,852	0.0008	0.0044	0.0003	0.0032	0.1043
Average				0.15	0.37	0.010	0.082	14

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
8/11/2016	5	5	0.31	3.3	0.12	1.0	90	0.045
8/17/2018	9,941	9,936	539	3,586	132	1,133	102,008	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 (1)	Blower Not Operational							
11/10/2021	20,806	0	0	0	0	0	0	0
2/10/2021	23,100	2,294	268	809	31	249	29,600	15
6/11/2021	25,892	2,792	249	630	22	169	23,495	12
9/29/2021	28,209	2,317	80	173	5.4	49	7,833	3.9
12/15/2021	30,053	1,844	71	149	4.3	36	14,070	7.0
3/16/2022	32,228	2,175	39	89	2.2	21	10,732	5.4
6/17/2022	34,457	2,228	3.5	12	0.49	5.3	350	0.18
9/21/2022	36,745	2,288	4.0	17	0.72	7.5	367	0.18
12/7/2022	38,598	1,853	3.4	18	0.82	8.5	279	0.14
3/10/2023	40,824	2,226	2.3	13	0.76	5.8	225	0.11
6/23/2023	43,065	2,241	1.8	10	0.75	7.1	234	0.12
Total Mass Recovery to Date			6,774	17,928	472	3,894	671,766	336

Notes:

- (1) - 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
- : not sampled
- PID: photoionization detector
- ppm: parts per million
- TVPH: total volatile petroleum hydrocarbons
- gray: laboratory reporting limit used for calculating emissions



TABLE 4
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS - SKID 2
 OH Randel #5
 Hilcorp Energy Company
 San Juan County, New Mexico

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
3/21/2022	1,354	310	510	13	120	35,000
6/17/2022	1,058	200	410	10	66	33,000
9/8/2022	1,258	479	1,190	26	1,041	31,900
12/7/2022	918	230	370	9.0	65	18,000
3/10/2023	1,790	140	230	7.5	60	12,000
6/23/2023	1,450	160	430	12	100	18,000
Average	1,305	253	523	13	242	24,650

Vapor Extraction Summary

Date	Flow Rate (cfm)	Total System Flow (cf)	Delta Flow (cf)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
3/16/2022	70	499,800	499,800	0.081	0.13	0.0034	0.031	9.2
6/17/2022	60	8,533,560	8,033,760	0.057	0.10	0.0026	0.021	7.6
9/8/2022	56	15,138,648	6,605,088	0.071	0.17	0.0038	0.12	6.8
12/7/2022 (1)	56	22,499,736	7,361,088	0.074	0.16	0.0037	0.12	5.2
3/10/2023	58	30,214,896	7,715,160	0.040	0.065	0.002	0.014	3.254
6/23/2023	64	37,670,256	7,455,360	0.036	0.079	0.002	0.019	3.590
Average				0.060	0.119	0.0029	0.053	5.9

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
3/16/2022	119	119	10	16	0.41	3.7	1,090	0.55
6/17/2022	2,351	2,232	128	230	5.8	47	17,027	8.5
9/8/2022	4,316	1,966	140	329	7.4	228	13,361	6.7
12/7/2022 (1)	6,507	2,191	163	358	8.0	254	11,448	5.7
3/10/2023	8,724	2,217	89	144	4.0	30	7,214	3.6
6/23/2023	10,666	1,942	70	153	4.5	37	6,971	3.5
Total Mass Recovery to Date			598	1,231	30	599	57,111	29

Notes:

- (1): rotameter float frozen in place, flow rate based on 11/16/2022 site visit flow rate and similar applied vacuum recorded during 11/16/2022 and 12/7/2022 site visits
- cf: cubic feet
- cfm: cubic feet per minute
- µg/L: micrograms per liter
- lb/hr: pounds per hour
- PID: photoionization detector
- ppm: parts per million
- TVPH: total volatile petroleum hydrocarbons
- gray: laboratory reporting limit used for calculating emissions



APPENDIX A

Field Notes

**OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM**

DATE: 4-4
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: KO TANK HIGH LEVEL

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	41413.40	9318.8
Inlet Vacuum (IWC)	47	56
Inlet Flow from Rotameter (SCFM)	71	62
Exhaust Vacuum (IWC)	-53	-66
Inlet PID	269.2	1274
Exhaust PID	63.8	1316
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)	1	15.5

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)
OPERATING WELLS: _____

ZONES

Change in Well Operation:

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5		150.5	
SVE-8		428	

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-6			
SVE-7		786.8	
SVE-10		423	
SVE-11			
SVE-12		715.8	
SVE-13		2610	
SVE-14		1232	
SVE-15		1071	
SVE-16		2186	
SVE-17		1257	
SVE-18		2220	
SVE-19		2019	
SVE-20		1647	
SVE-21		415.7	
SVE-22		1668	

COMMENTS/OTHER MAINTENANCE:

**OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM**

DATE: 4-17
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	41725.53	9631
Inlet Vacuum (IWC)	47	53
Inlet Flow from Rotameter (SCFM)	72	65
Exhaust Vacuum (IWC)	-54	-64
Inlet PID	50.9	572.4
Exhaust PID	75.4	1569
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID:	SAMPLE TIME:
Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)	
OPERATING WELLS	

ZONES

Change in Well Operation: _____

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5		33.6	
SVE-8		806.8	
		125.4	

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-6			
SVE-7		392.1	
SVE-10		401	
SVE-11			
SVE-12		1143	
SVE-13		2326	
SVE-14		1519	
SVE-15		1168	
SVE-16		1835	
SVE-17		1089	
SVE-18		2315	
SVE-19		2388	
SVE-20		1766	
SVE-21		331.4	
SVE-22		1312	

COMMENTS/OTHER MAINTENANCE:

Replaced MW-13 well cap
MW-14

**OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM**

DATE: 5-1
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	42059.02	9965.8
Inlet Vacuum (IWC)	46	53
Inlet Flow from Rotameter (SCFM)	63	62
Exhaust Vacuum (IWC)	-53	-64
Inlet PID	249.7	1423
Exhaust PID	77.9	1506
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)

OPERATING WELLS _____

ZONES

Change in Well Operation: _____

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5		60.5	
SVE-8		386.2	
9		671.5	

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-6			
SVE-7		676.4	
SVE-10		348.6	
SVE-11			
SVE-12		1043	
SVE-13		829	
SVE-14		134	
SVE-15		1403	
SVE-16		1611	
SVE-17		762.8	
SVE-18		2231	
SVE-19		1900	
SVE-20		1747	
SVE-21		404.4	
SVE-22		537.8	

COMMENTS/OTHER MAINTENANCE: _____

OH RANDEL #5 SVE SYSTEM BIWEEKLY O&M FORM

DATE: 5-16
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	42420.89	10327.6
Inlet Vacuum (IWC)	44	54
Inlet Flow from Rotameter (SCFM)	64	63
Exhaust Vacuum (IWC)	-54	-64
Inlet PID	191.8	1273
Exhaust PID	66.5	1468
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID:	SAMPLE TIME:
Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)	
OPERATING WELLS	

ZONES

Change in Well Operation: _____

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5		38.1	
SVE-8		162.8	
9		261	

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-6			
SVE-7		671.6	
SVE-10		399.1	
SVE-11			
SVE-12		818.9	
SVE-13		1864	
SVE-14		1714	
SVE-15		1225	
SVE-16		1499	
SVE-17		724.1	
SVE-18		2225	
SVE-19		2135	
SVE-20		1745	
SVE-21		400.2	
SVE-22		785.4	

COMMENTS/OTHER MAINTENANCE: _____

Empty box for comments and other maintenance notes.

OH RANDEL #5 SVE SYSTEM BIWEEKLY O&M FORM

DATE: 6-6
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	42656.23	10403.7
Inlet Vacuum (IWC)	48	
Inlet Flow from Rotameter (SCFM)	72	
Exhaust Vacuum (IWC)	-53	
Inlet PID	110.6	
Exhaust PID	143.8	
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)
 OPERATING WELLS: _____

ZONES

Change in Well Operation: _____

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5	8.7		
SVE-8	107.8		
9	114.2		

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
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			
SVE-22			

COMMENTS/OTHER MAINTENANCE:

Skid #2 motor offline. Apparently this is due to deer mice moving in through exhaust while system was down from the lightning strike.

SAUNDERS
www.saunders-usa.com

OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 6-23
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL

SVE SYSTEM	Skid 1	Skid 2
Blower Hours (take photo)	43065.15	10665.7
Inlet Vacuum (IWC)	97	58
Inlet Flow from Rotameter (SCFM)	60	64
Exhaust Vacuum (IWC)	-54	-71
Inlet PID	290.8	14.50
Exhaust PID	52.2	1640
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)
 OPERATING WELLS: _____

ZONES

Change in Well Operation: _____

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-5		103.8	
SVE-8		210.7	
SVE-9		393.8	

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE-6			
SVE-7		390.3	
SVE-10		320.9	
SVE-11			
SVE-12		301.6	
SVE-13		122.6	
SVE-14		178.1	
SVE-15		784.8	
SVE-16		184.1	
SVE-17		461.4	
SVE-18		200.7	
SVE-19		267.9	
SVE-20		154.6	
SVE-21		268.1	
SVE-22		438.9	

COMMENTS/OTHER MAINTENANCE:



APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company

<p>Photograph 1</p> <p>Runtime meter taken on March 10, 2023 from SVE Skid 1 (original SVE system) at 11:10 AM Hours = 40,824.08</p>	
<p>Photograph 2</p> <p>Runtime meter taken on March 10, 2023 from SVE Skid 2 (new SVE system) at 11:11 AM Hours = 8,724.1</p>	

PROJECT PHOTOGRAPHS
OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company

<p>Photograph 3</p> <p>Runtime meter taken on June 23, 2023 from SVE Skid 1 (original SVE system) at 12:16 PM Hours = 43,065.15</p>	
<p>Photograph 4</p> <p>Runtime meter taken on June 23, 2023 from SVE Skid 2 (new SVE system) at 12:16 PM Hours = 10,665.7</p>	



APPENDIX C

NMOCD Correspondence

From: [Velez, Nelson, EMNRD](#)
To: [Kate Kaufman](#)
Cc: [Stuart Hyde](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] OH Randel #5 SVE (NMOCD Incident ID nVF1602039091)
Date: Wednesday, June 7, 2023 2:55:18 PM
Attachments: [Outlook-vxqpetai.png](#)

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

Hi Kate,

Thanks for the update. Best of luck.

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: Kate Kaufman <kkaufman@hilcorp.com>
Sent: Wednesday, June 7, 2023 1:04 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Stuart Hyde <shyde@ensolum.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] OH Randel #5 SVE (NMOCD Incident ID nVF1602039091)

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

Good morning Nelson,

I am writing to let you know we discovered an operational issue with one of the two SVE units installed at the OH Randel #5 remediation site. A recent O&M visit by Ensolum revealed the new skid at the OH Randel #5 was offline. It appears a capacitor on the blower malfunctioned. Our electrician is currently on PTO and will be back to work next week, but Ensolum has contacted the vendor to inquire about purchasing a replacement capacitor and troubleshoot any other issues in the interim. The older SVE skid is fully operational, however we anticipate runtime for the newer skid will be below 90% for the quarter while we order new parts for the system. I wanted to make you aware of this, and assure you we are working diligently to get it running as quickly as possible. Please let me know if you have any questions, or we can discuss further next week.

Thank you,

Kate

Kate Kaufman | Senior Environmental Specialist | Hilcorp Energy Company
O: 346-237-2275 | C: 907-244-8292 | kkaufman@hilcorp.com

1111 Travis St. | Houston | TX | 77002

The information contained in this email message is confidential and may be legally privileged and is intended only for the use of the individual or entity named above. If you are not an intended recipient or if you have received this message in error, you are hereby notified that any dissemination, distribution, or copy of this email is strictly prohibited. If you have received this email in error, please immediately notify us by return email or telephone if the sender's phone number is listed above, then promptly and permanently delete this message.

While all reasonable care has been taken to avoid the transmission of viruses, it is the responsibility of the recipient to ensure that the onward transmission, opening, or use of this message and any attachments will not adversely affect its systems or data. No responsibility is accepted by the company in this regard and the recipient should carry out such virus and other checks as it considers appropriate.



APPENDIX D

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 11, 2023

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

RE: OH Randel 5

OrderNo.: 2306C78

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/24/2023 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued June 29, 2023.

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. 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. All samples are reported as received unless otherwise indicated.

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 2306C78

Date Reported: 7/11/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Skid 1

Project: OH Randel 5

Collection Date: 6/23/2023 12:00:00 PM

Lab ID: 2306C78-001

Matrix: AIR

Received Date: 6/24/2023 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	670	50		µg/L	10	6/26/2023 3:03:21 PM
Surr: BFB	149	15-412		%Rec	10	6/26/2023 3:03:21 PM
EPA METHOD 8260B: VOLATILES						Analyst: RAA
Benzene	4.8	0.50		µg/L	5	7/5/2023 12:48:46 PM
Toluene	31	0.50		µg/L	5	7/5/2023 12:48:46 PM
Ethylbenzene	2.0	0.50		µg/L	5	7/5/2023 12:48:46 PM
Methyl tert-butyl ether (MTBE)	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2,4-Trimethylbenzene	1.4	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,3,5-Trimethylbenzene	1.4	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Naphthalene	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
1-Methylnaphthalene	ND	2.0		µg/L	5	7/5/2023 12:48:46 PM
2-Methylnaphthalene	ND	2.0		µg/L	5	7/5/2023 12:48:46 PM
Acetone	ND	5.0		µg/L	5	7/5/2023 12:48:46 PM
Bromobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Bromodichloromethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Bromoform	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Bromomethane	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
2-Butanone	ND	5.0		µg/L	5	7/5/2023 12:48:46 PM
Carbon disulfide	ND	5.0		µg/L	5	7/5/2023 12:48:46 PM
Carbon tetrachloride	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Chlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Chloroethane	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
Chloroform	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Chloromethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
2-Chlorotoluene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
4-Chlorotoluene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
cis-1,2-DCE	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
cis-1,3-Dichloropropene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2-Dibromo-3-chloropropane	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
Dibromochloromethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Dibromomethane	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
1,2-Dichlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,3-Dichlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,4-Dichlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Dichlorodifluoromethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1-Dichloroethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1-Dichloroethene	ND	0.50		µg/L	5	7/5/2023 12:48:46 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 **2306C78**

Date Reported: **7/11/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Skid 1

Project: OH Randel 5

Collection Date: 6/23/2023 12:00:00 PM

Lab ID: 2306C78-001

Matrix: AIR

Received Date: 6/24/2023 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: RAA
1,2-Dichloropropane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,3-Dichloropropane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
2,2-Dichloropropane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1-Dichloropropene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Hexachlorobutadiene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
2-Hexanone	ND	5.0		µg/L	5	7/5/2023 12:48:46 PM
Isopropylbenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
4-Isopropyltoluene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
4-Methyl-2-pentanone	ND	5.0		µg/L	5	7/5/2023 12:48:46 PM
Methylene chloride	ND	1.5		µg/L	5	7/5/2023 12:48:46 PM
n-Butylbenzene	ND	1.5		µg/L	5	7/5/2023 12:48:46 PM
n-Propylbenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
sec-Butylbenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Styrene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
tert-Butylbenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Tetrachloroethene (PCE)	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
trans-1,2-DCE	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
trans-1,3-Dichloropropene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2,3-Trichlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2,4-Trichlorobenzene	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1,1-Trichloroethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,1,2-Trichloroethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Trichloroethene (TCE)	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Trichlorofluoromethane	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
1,2,3-Trichloropropane	ND	1.0		µg/L	5	7/5/2023 12:48:46 PM
Vinyl chloride	ND	0.50		µg/L	5	7/5/2023 12:48:46 PM
Xylenes, Total	24	0.75		µg/L	5	7/5/2023 12:48:46 PM
Surr: Dibromofluoromethane	99.3	70-130		%Rec	5	7/5/2023 12:48:46 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	5	7/5/2023 12:48:46 PM
Surr: Toluene-d8	98.5	70-130		%Rec	5	7/5/2023 12:48:46 PM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	5	7/5/2023 12:48:46 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 **2306C78**

Date Reported: **7/11/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Skid 2

Project: OH Randel 5

Collection Date: 6/23/2023 12:15:00 PM

Lab ID: 2306C78-002

Matrix: AIR

Received Date: 6/24/2023 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	18000	250		µg/L	50	6/26/2023 3:27:51 PM
Surr: BFB	143	15-412		%Rec	50	6/26/2023 3:27:51 PM
EPA METHOD 8260B: VOLATILES						Analyst: RAA
Benzene	160	5.0		µg/L	50	7/5/2023 1:43:40 PM
Toluene	430	5.0		µg/L	50	7/5/2023 1:43:40 PM
Ethylbenzene	12	5.0		µg/L	50	7/5/2023 1:43:40 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2,4-Trimethylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,3,5-Trimethylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Naphthalene	ND	10		µg/L	50	7/5/2023 1:43:40 PM
1-Methylnaphthalene	ND	20		µg/L	50	7/5/2023 1:43:40 PM
2-Methylnaphthalene	ND	20		µg/L	50	7/5/2023 1:43:40 PM
Acetone	ND	50		µg/L	50	7/5/2023 1:43:40 PM
Bromobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Bromodichloromethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Bromoform	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Bromomethane	ND	10		µg/L	50	7/5/2023 1:43:40 PM
2-Butanone	ND	50		µg/L	50	7/5/2023 1:43:40 PM
Carbon disulfide	ND	50		µg/L	50	7/5/2023 1:43:40 PM
Carbon tetrachloride	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Chlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Chloroethane	ND	10		µg/L	50	7/5/2023 1:43:40 PM
Chloroform	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Chloromethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
2-Chlorotoluene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
4-Chlorotoluene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
cis-1,2-DCE	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	7/5/2023 1:43:40 PM
Dibromochloromethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Dibromomethane	ND	10		µg/L	50	7/5/2023 1:43:40 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	7/5/2023 1:43:40 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.	

Analytical Report

Lab Order **2306C78**

Date Reported: **7/11/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Skid 2

Project: OH Randel 5

Collection Date: 6/23/2023 12:15:00 PM

Lab ID: 2306C78-002

Matrix: AIR

Received Date: 6/24/2023 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: RAA
1,2-Dichloropropane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1-Dichloropropene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
2-Hexanone	ND	50		µg/L	50	7/5/2023 1:43:40 PM
Isopropylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	7/5/2023 1:43:40 PM
Methylene chloride	ND	15		µg/L	50	7/5/2023 1:43:40 PM
n-Butylbenzene	ND	15		µg/L	50	7/5/2023 1:43:40 PM
n-Propylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
sec-Butylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Styrene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
tert-Butylbenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
trans-1,2-DCE	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	7/5/2023 1:43:40 PM
Vinyl chloride	ND	5.0		µg/L	50	7/5/2023 1:43:40 PM
Xylenes, Total	100	7.5		µg/L	50	7/5/2023 1:43:40 PM
Surr: Dibromofluoromethane	87.3	70-130		%Rec	50	7/5/2023 1:43:40 PM
Surr: 1,2-Dichloroethane-d4	88.8	70-130		%Rec	50	7/5/2023 1:43:40 PM
Surr: Toluene-d8	102	70-130		%Rec	50	7/5/2023 1:43:40 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	50	7/5/2023 1:43:40 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.	



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ANALYTICAL SUMMARY REPORT

June 28, 2023

Hall Environmental

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

Work Order: B23062208 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 2 samples for Hall Environmental on 6/27/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23062208-001	2306C78-001B, Skid 1	06/23/23 12:00	06/27/23	Air	Air Correction Calculations Appearance and Comments Calculated Properties GPM @ std cond./1000 cu. ft., moist. Free Natural Gas Analysis Specific Gravity @ 60/60
B23062208-002	2306C78-002B, Skid 2	06/23/23 12:15	06/27/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. 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 test results, please contact your Project Manager.

Report Approved By:



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LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23062208-001
Client Sample ID: 2306C78-001B, Skid 1

Report Date: 06/28/23
Collection Date: 06/23/23 12:00
Date Received: 06/27/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.82	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Nitrogen	78.09	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Carbon Dioxide	0.07	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Methane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Ethane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Propane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Hexanes plus	0.02	Mol %		0.01		GPA 2261-95	06/27/23 15:17 / ikc
Propane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
Hexanes plus	0.008	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
GPM Total	0.008	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc
GPM Pentanes plus	0.008	gpm		0.001		GPA 2261-95	06/27/23 15:17 / ikc

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	1			1		GPA 2261-95	06/27/23 15:17 / ikc
Net BTU per cu ft @ std cond. (LHV)	1			1		GPA 2261-95	06/27/23 15:17 / ikc
Pseudo-critical Pressure, psia	545			1		GPA 2261-95	06/27/23 15:17 / ikc
Pseudo-critical Temperature, deg R	239			1		GPA 2261-95	06/27/23 15:17 / ikc
Specific Gravity @ 60/60F	0.998			0.001		D3588-81	06/27/23 15:17 / ikc
Air, %	99.68			0.01		GPA 2261-95	06/27/23 15:17 / ikc

- The analysis was not corrected for air.

COMMENTS

- 06/27/23 15:17 / ikc

- BTU, GPM, and specific gravity are corrected for deviation from ideal gas behavior.
- GPM = gallons of liquid at standard conditions per 1000 cu. ft. of moisture free gas @ standard conditions.
- To convert BTU to a water-saturated basis @ standard conditions, multiply by 0.9825.
- Standard conditions: 60 F & 14.73 psi on a dry basis.

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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LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23062208-002
Client Sample ID: 2306C78-002B, Skid 2

Report Date: 06/28/23
Collection Date: 06/23/23 12:15
Date Received: 06/27/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.29	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Nitrogen	77.85	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Carbon Dioxide	0.39	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Methane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Ethane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Propane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Hexanes plus	0.47	Mol %		0.01		GPA 2261-95	06/27/23 15:41 / ikc
Propane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
Hexanes plus	0.198	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
GPM Total	0.198	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc
GPM Pentanes plus	0.198	gpm		0.001		GPA 2261-95	06/27/23 15:41 / ikc

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	22			1		GPA 2261-95	06/27/23 15:41 / ikc
Net BTU per cu ft @ std cond. (LHV)	21			1		GPA 2261-95	06/27/23 15:41 / ikc
Pseudo-critical Pressure, psia	545			1		GPA 2261-95	06/27/23 15:41 / ikc
Pseudo-critical Temperature, deg R	243			1		GPA 2261-95	06/27/23 15:41 / ikc
Specific Gravity @ 60/60F	1.01			0.001		D3588-81	06/27/23 15:41 / ikc
Air, %	97.29			0.01		GPA 2261-95	06/27/23 15:41 / ikc

- The analysis was not corrected for air.

COMMENTS

- 06/27/23 15:41 / ikc

- BTU, GPM, and specific gravity are corrected for deviation from ideal gas behavior.
- GPM = gallons of liquid at standard conditions per 1000 cu. ft. of moisture free gas @ standard conditions.
- To convert BTU to a water-saturated basis @ standard conditions, multiply by 0.9825.
- Standard conditions: 60 F & 14.73 psi on a dry basis.

Report Definitions: RL - Analyte Reporting Limit
QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Work Order: B23062208

Report Date: 06/28/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95										
Batch: R404488										
Lab ID: LCS062723	11	Laboratory Control Sample			Run: GCNGA-B_230627A			06/27/23 11:57		
Oxygen		0.60	Mol %	0.01	120	70	130			
Nitrogen		5.92	Mol %	0.01	99	70	130			
Carbon Dioxide		0.99	Mol %	0.01	100	70	130			
Methane		74.4	Mol %	0.01	100	70	130			
Ethane		6.00	Mol %	0.01	100	70	130			
Propane		5.34	Mol %	0.01	108	70	130			
Isobutane		1.98	Mol %	0.01	99	70	130			
n-Butane		1.99	Mol %	0.01	99	70	130			
Isopentane		1.00	Mol %	0.01	100	70	130			
n-Pentane		1.00	Mol %	0.01	100	70	130			
Hexanes plus		0.78	Mol %	0.01	98	70	130			
Lab ID: B23062211-001ADUP	12	Sample Duplicate			Run: GCNGA-B_230627A			06/27/23 14:25		
Oxygen		17.0	Mol %	0.01				0.2	20	
Nitrogen		79.0	Mol %	0.01				0.0	20	
Carbon Dioxide		3.64	Mol %	0.01				0.3	20	
Hydrogen Sulfide		<0.01	Mol %	0.01					20	
Methane		<0.01	Mol %	0.01					20	
Ethane		<0.01	Mol %	0.01					20	
Propane		<0.01	Mol %	0.01					20	
Isobutane		<0.01	Mol %	0.01					20	
n-Butane		<0.01	Mol %	0.01					20	
Isopentane		<0.01	Mol %	0.01					20	
n-Pentane		<0.01	Mol %	0.01					20	
Hexanes plus		0.39	Mol %	0.01				2.6	20	
Lab ID: LCS062823	11	Laboratory Control Sample			Run: GCNGA-B_230627A			06/28/23 09:16		
Oxygen		0.60	Mol %	0.01	120	70	130			
Nitrogen		5.94	Mol %	0.01	99	70	130			
Carbon Dioxide		0.99	Mol %	0.01	100	70	130			
Methane		74.4	Mol %	0.01	100	70	130			
Ethane		5.95	Mol %	0.01	99	70	130			
Propane		5.52	Mol %	0.01	112	70	130			
Isobutane		1.97	Mol %	0.01	98	70	130			
n-Butane		1.97	Mol %	0.01	98	70	130			
Isopentane		0.96	Mol %	0.01	96	70	130			
n-Pentane		0.97	Mol %	0.01	97	70	130			
Hexanes plus		0.76	Mol %	0.01	95	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Work Order Receipt Checklist

Hall Environmental

B23062208

Login completed by: Yvonna E. Smith

Date Received: 6/27/2023

Reviewed by: darcy

Received by: lel

Reviewed Date: 6/28/2023

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: 17.8°C No Ice
- Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4"). 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.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None



CHAIN OF CUSTODY RECORD

PAGE: 1 OF 1

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

Form containing client information: Energy Labs - Billings, Energy Laboratories, 1120 South 27th Street, Billings, MT 59107. Includes analytical data table with columns for Item, Sample, Client Sample ID, Bottle Type, Matrix, Collection Date, and Analytical Comments.

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.

Form for chain of custody signatures and dates. Includes fields for Relinquished By, Received By, and TAT (Turnaround Time) with handwritten signatures and dates.



Hall Environmental Analysis Laboratory
4901 Hawks 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: 2306C78

RcptNo: 1

Received By: Tracy Casarrubias 6/24/2023 7:45:00 AM

Completed By: Tracy Casarrubias 6/24/2023 9:09:16 AM

Reviewed By: *jm 6/26/23*

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? Yes No

(Note discrepancies on chain of custody)

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? Yes No

(If no, notify customer for authorization.)

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: *TMC 6/24/23*

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 and phone number are missing on COC- TMC 6/24/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	N/A	Good	Yes			

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 240045

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 240045
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 275066 for most updated status.	10/27/2023