

REVIEWED

By Mike Buchanan at 10:18 am, Apr 09, 2024



ENSOLUM

January 15, 2024

New Mexico Oil Conservation Division

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

Re: Fourth Quarter 2023 – SVE System Update

Hare #14M
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NRM2028852747

Review of the Fourth Quarter 2023--SVE System Update Hare #14M: Content Satisfactory
1. Continue to conduct O&M visits bimonthly as planned. Include volume calculations for next report submission.
2. Submit next quarterly report in 2024.

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Fourth Quarter 2023 –SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the Hare #14M natural gas production well (Site), located in Unit D of Section 10, Township 29 North, Range 10 West, San Juan County, New Mexico (Figure 1). The SVE system was put into operation on June 6, 2023, to remediate subsurface soil impacts resulting from approximately 36 barrels (bbls) of natural gas condensate released from an aboveground storage tank. This report summarizes Site activities performed in October, November, and December of 2023.

SVE SYSTEM SPECIFICATIONS

The SVE system at the Site consists of a 3-phase, 6 horsepower Atlantic Blower AB-802 regenerative blower capable of producing 399 cubic feet per minute (cfm) flow and 125 inches of water column (IWC) vacuum. The system is powered by a permanent power drop and is intended to run 24 hours per day. Seven SVE wells are currently in operation and are shown on Figures 2 and 3. SVE wells SVE01, SVE07, and SVE09 are screened within “shallow zone” soil at depths up to 25 feet below ground surface (bgs). SVE wells SVE02, SVE03, SVE06, and SVE08 are screened within “deep zone” soil at depths up to 40 feet bgs.

FOURTH QUARTER 2023 ACTIVITIES

The SVE system began operation on June 6, 2023. Based on the New Mexico Oil Conservation Division (NMOCD) Conditions of Approval (COAs), dated November 7, 2022, field data measurements were collected monthly from the system during the fourth quarter of 2023 and included the following parameters: total system flow, flow rates from each SVE well, photoionization detector (PID) measurements of volatile organic compounds (VOCs) from each SVE well and the total system influent, and oxygen/carbon dioxide measurements via hand-held analyzers from each SVE well. Of note, vacuum measurements were not recorded for the individual SVE wells during fourth quarter 2023 field visits. As stated in the *Third Quarter 2023 – SVE System Update* report, dated October 12, 2023, pitot tubes were installed on the individual SVE wells on November 2, 2023, in order to measure flow from each SVE well. Individual flow

measurements were recorded during the November and December 2023 site visits. Field notes taken during operations and maintenance (O&M) visits are presented in Appendix A.

Since startup, vacuum extraction has been performed on all Site SVE wells in order to remove mass from the impacted soil zones. Between September 29 and December 20, 2023, the SVE system operated for 1,718.7 hours for a runtime efficiency of 87 percent (%). During the O&M visit conducted on November 27, 2023, the SVE system was off upon arrival and the blower could not be restarted, despite no alarms being present. Upon further inspection, it was determined water had been pulled into both the blower and the associated motor, damaging the motor beyond repair. Hilcorp immediately ordered a replacement blower for the system, which was installed on December 8, 2023. Appendix B presents photographs of the runtime meter for calculating the fourth quarter 2023 runtime efficiency. Table 1 presents the SVE system operational hours and calculated percentage runtime.

Based on the November 2022 COAs, air samples were required to be collected every other month during the second through fourth quarters of the first year of operation; however, because the system was down during the November 2023 O&M visit, an air sample was instead collected on December 11, 2023 once the new blower was installed. The air sample was collected from a sample port located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. Prior to collection, the emission sample was field screened with a PID for organic vapor monitoring (OVM). The emission sample was collected directly into two 1-Liter Tedlar® bags and submitted to Eurofins Environment Testing (Eurofins) 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, VOCs following EPA Method 8260B, and fixed gas analysis of oxygen and carbon dioxide following Gas Processors Association (GPA) Method 2261. A summary of field measurements and analytical data collected at the Site are presented in Tables 2 and 3, respectively. Full laboratory analytical reports are attached as Appendix C. Oxygen and carbon dioxide levels over time are presented at Graphs 1 and 2, respectively.

Air sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE system (Table 4). Based on these estimates, 2,319 pounds (1.16 tons) of TVPH have been removed by the system to date. No phase-separated hydrocarbons were recovered from the system during the O&M and sampling period described above.

DISCUSSION AND RECOMMENDATIONS

As noted above, vacuum measurements were not recorded during the fourth quarter 2023 O&M visits. During future O&M visits beginning in the first quarter of 2024, vacuum measurements will again be collected and included in future reports. In addition, flow rates calculated from the pitot tube differential pressure readings were compared to the manufacturer specifications for the Atlantic Blower AB-802 blower and found to be more accurate than the inline rotameters installed on the system. As such, the pitot tube will be used moving forward to calculate flow and mass recovery for the Site.

Monthly O&M visits and bi-monthly (every other month) sampling events will continue to be performed by Ensolum and/or Hilcorp personnel to verify the SVE system is 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.

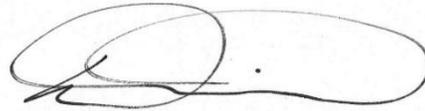
We appreciate the opportunity to provide this report to the NMOCD. If you should have any questions or comments regarding this report, please contact the undersigned.

Sincerely,

Ensolum, LLC



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Attachments:

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|------------|---|
| Figure 1 | Site Location Map |
| Figure 2 | SVE System Shallow Zone Wells |
| Figure 3 | SVE System Deep Zone Wells |
| Table 1 | Soil Vapor Extraction System Runtime Calculations |
| Table 2 | Soil Vapor Extraction System Field Measurements |
| Table 3 | Soil Vapor Extraction System Air Analytical Results |
| Table 4 | Soil Vapor Extraction System Mass Removal and Emissions |
| Graph 1 | Oxygen vs Time |
| Graph 2 | Carbon Dioxide vs Time |
| Appendix A | Field Notes |
| Appendix B | Project Photographs |
| Appendix C | Laboratory Analytical Reports |



FIGURES



TABLES AND GRAPHS



TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS
Hare #14M
Hilcorp Energy Company
San Juan County, New Mexico

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
9/29/2023	3,056	--	--	--
12/20/2023	4,774	1,718.7	82.0	87%



TABLE 2 SOIL VAPOR EXTRACTION SYSTEM FIELD MEASUREMENTS Hare #14M Hilcorp Energy Company San Juan County, New Mexico									
SVE Well ID	Date	PID (ppm)	Differential Pressure (IWC)	Flow Rate (acfm)	Flow Rate (scfm) ⁽¹⁾⁽²⁾⁽³⁾	Vacuum (IWC)	Vacuum (psi)	Oxygen (%)	Carbon Dioxide (%)
Influent, All Wells	6/6/2023	1,769	--	--	--	--	--	--	--
	6/7/2023	1,367	--	--	70	78	2.82	--	--
	6/13/2023	1,023	--	--	35	44	1.59	--	--
	6/23/2023	675	--	--	40	40	1.44	--	--
	6/29/2023	781	--	--	40	40	1.44	--	--
	7/13/2023	745	--	--	42	37	1.34	--	--
	7/27/2023	414	--	--	45	36	1.30	--	--
	8/9/2023	403	--	--	48	34	1.23	--	--
	8/24/2023	610	--	--	46	37	1.34	--	--
	9/8/2023	444	--	--	48	36	1.30	--	--
	9/21/2023	398	--	--	46	36	1.30	--	--
	10/31/2023	140	3.3	159	115	33	1.19	--	--
11/2/2023	--	6.6	225	156	46	1.66	--	--	
12/11/2023	126	6.3	219	152	47	1.70	--	--	
12/20/2023	103	6.23	218	151	49	1.77	--	--	
SVE01	6/6/2023	1,620	--	--	--	--	--	--	--
	6/7/2023	1,983	--	--	10	61.9	2.23	20.9	2.28
	6/13/2023	1,520	--	--	5.0	29.3	1.06	22.9	0.48
	6/23/2023	1,245	--	--	5.7	23.9	0.86	23.2	0.26
	6/29/2023	1,441	--	--	5.7	24.2	0.87	23.2	0.24
	7/13/2023	1,585	--	--	6.0	--	--	22.9	0.26
	7/27/2023	1,292	--	--	6.4	20.8	0.75	22.5	0.24
	8/9/2023	923	--	--	6.9	18.8	0.68	22.8	0.18
	8/24/2023	982	--	--	6.6	21.2	0.77	22.1	0.12
	9/8/2023	763	--	--	6.9	--	--	22.0	0.14
	9/21/2023	435	--	--	6.6	20.7	0.75	21.4	0.080
	10/31/2023	8.5	--	--	--	--	--	20.9	0.042
	11/2/2023	--	0.20	39	27.2	46	1.66	20.9	0.044
	12/11/2023	397	0.13	32	21.9	47	1.70	20.9	0.044
12/20/2023	412	0.09	26	18.1	49	1.77	20.9	0.020	
SVE02	6/6/2023	738	--	--	--	--	--	--	--
	6/7/2023	195	--	--	10	63.3	2.28	23.2	0.04
	6/13/2023	281	--	--	5.0	30.2	1.09	23.3	0.04
	6/23/2023	98.0	--	--	5.7	24.7	0.89	23.4	0.06
	6/29/2023	120	--	--	5.7	24.7	0.89	23.4	0.00
	7/13/2023	109	--	--	6.0	--	--	23.3	0.00
	7/27/2023	265	--	--	6.4	21.2	0.77	22.6	0.02
	8/9/2023	368	--	--	6.9	19.7	0.71	22.9	0.04
	8/24/2023	248	--	--	6.6	21.8	0.79	22.2	0.02
	9/8/2023	89.6	--	--	6.9	--	--	22.2	0.02
	9/21/2023	135	--	--	6.6	21.1	0.76	21.7	0.04
	10/31/2023	18	--	--	--	--	--	20.9	0.034
	11/2/2023	--	0.20	39.1	27.2	46	1.66	20.9	0.004
	12/11/2023	54	0.01	8.7	6.1	47	1.70	20.9	0.004
12/20/2023	11.1	0.01	8.7	6.0	49	1.77	20.9	0.002	
SVE03	6/6/2023	1,030	--	--	--	--	--	--	--
	6/7/2023	130	--	--	10	61.8	2.23	23.2	0.00
	6/13/2023	35.0	--	--	5.0	30.4	1.10	23.4	0.00
	6/23/2023	15.0	--	--	5.7	25.6	0.92	23.2	0.04
	6/29/2023	29.0	--	--	5.7	25.1	0.91	22.8	0.00
	7/13/2023	56.5	--	--	6.0	--	--	23.3	0.00
	7/27/2023	59.5	--	--	6.4	20.0	0.72	22.5	0.02
	8/9/2023	171	--	--	6.9	17.8	0.64	23.0	0.04
	8/24/2023	108	--	--	6.6	21.2	0.77	21.9	0.18
	9/8/2023	65.2	--	--	6.9	--	--	22.3	0.11
	9/21/2023	64.0	--	--	6.6	19.5	0.70	21.4	0.020
	10/31/2023	7.9	--	--	--	--	--	20.9	0.054
	11/2/2023	--	0.20	39	27.2	46	1.66	20.9	0.010
	12/20/2023	16.3	0.76	76	52.9	47	1.70	20.9	0.010
12/20/2023	16.3	0.76	76	52.6	49	1.77	20.9	0.010	



TABLE 2 SOIL VAPOR EXTRACTION SYSTEM FIELD MEASUREMENTS Hare #14M Hilcorp Energy Company San Juan County, New Mexico									
SVE Well ID	Date	PID (ppm)	Differential Pressure (IWC)	Flow Rate (acfm)	Flow Rate (scfm) ⁽¹⁾⁽²⁾⁽³⁾	Vacuum (IWC)	Vacuum (psi)	Oxygen (%)	Carbon Dioxide (%)
SVE06	6/6/2023	967	--	--	--	--	--	--	--
	6/7/2023	1,120	--	--	10	62.3	2.25	21.4	2.81
	6/13/2023	814	--	--	5.0	30.8	1.11	22.9	0.56
	6/23/2023	15.0	--	--	5.7	26.3	0.95	23.2	0.06
	6/29/2023	23.0	--	--	5.7	25.4	0.92	23.0	0.00
	7/13/2023	14.2	--	--	6.0	--	--	23.3	0.00
	7/27/2023	174	--	--	6.4	20.8	0.75	22.5	0.04
	8/9/2023	227	--	--	6.9	19.5	0.70	23.0	0.10
	8/24/2023	216	--	--	6.6	21.5	0.78	22.2	0.04
	9/8/2023	178	--	--	6.9	--	--	22.3	0.06
	9/21/2023	180	--	--	6.6	21.7	0.78	21.7	0.00
	10/31/2023	32.8	--	--	--	--	--	20.9	0.048
	11/2/2023	--	0.20	--	39.1	27.2	46	1.66	20.9
12/11/2023	55.1	0.01	--	8.7	6.1	47	1.70	20.9	0.000
12/20/2023	11.3	0.01	--	8.7	6.0	49	1.77	20.9	0.006
SVE07	6/6/2023	617	--	--	--	--	--	--	--
	6/7/2023	967	--	--	10	61.7	2.23	21.1	2.12
	6/13/2023	786	--	--	5.0	30.2	1.09	22.8	0.52
	6/23/2023	575	--	--	5.7	24.9	0.90	22.9	0.24
	6/29/2023	649	--	--	5.7	24.6	0.89	22.8	0.28
	7/13/2023	605	--	--	6.0	--	--	23.2	0.20
	7/27/2023	582	--	--	6.4	19.9	0.72	22.4	0.24
	8/9/2023	420	--	--	6.9	19.3	0.70	22.8	0.24
	8/24/2023	195	--	--	6.6	20.8	0.75	22.1	0.04
	9/8/2023	439	--	--	6.9	--	--	22.3	0.04
	9/21/2023	335	--	--	6.6	21.5	0.78	21.2	0.12
	10/31/2023	148	--	--	--	--	--	20.9	0.078
	11/2/2023	--	0.20	--	39	27.2	46	1.66	20.9
12/11/2023	156	0.35	--	52	35.9	47	1.70	20.9	0.042
12/20/2023	149	0.38	--	54	37.2	49	1.77	20.9	0.028
SVE08	6/6/2023	1,065	--	--	--	--	--	--	--
	6/7/2023	1,168	--	--	10	61.8	2.23	22.2	1.04
	6/13/2023	102	--	--	5.0	28.6	1.03	23.2	0.00
	6/23/2023	55.0	--	--	5.7	25.4	0.92	23.0	0.06
	6/29/2023	68.0	--	--	5.7	25.7	0.93	22.9	0.00
	7/13/2023	58.5	--	--	6.0	--	--	23.3	0.00
	7/27/2023	44.5	--	--	6.4	20.5	0.74	22.5	0.04
	8/9/2023	144	--	--	6.9	19.0	0.69	23.0	0.04
	8/24/2023	112	--	--	6.6	21.6	0.78	22.1	0.06
	9/8/2023	75.7	--	--	6.9	--	--	22.4	0.02
	9/21/2023	91.0	--	--	6.6	20.1	0.73	21.7	0.04
	10/31/2023	10.9	--	--	--	--	--	20.9	0.034
	11/2/2023	--	0.20	--	39.1	27.2	46	1.66	20.9
12/11/2023	479	0.76	--	76.2	52.9	47	1.70	20.9	0.21
12/20/2023	11.3	0.02	--	12.4	8.5	49	1.77	20.9	0.00
SVE09	6/6/2023	1,518	--	--	--	--	--	--	--
	6/7/2023	545	--	--	10	60.3	2.18	22.6	0.78
	6/13/2023	242	--	--	5.0	27.2	0.98	22.9	0.52
	6/23/2023	165	--	--	5.7	24.1	0.87	22.9	0.08
	6/29/2023	425	--	--	5.7	23.8	0.86	22.6	0.30
	7/13/2023	42.5	--	--	6.0	--	--	23.3	0.00
	7/27/2023	277	--	--	6.4	19.3	0.70	22.4	0.18
	8/9/2023	226	--	--	6.9	18.2	0.66	23.0	0.12
	8/24/2023	250	--	--	6.6	20.9	0.75	22.1	0.10
	9/8/2023	41.0	--	--	6.9	--	--	22.4	0.020
	9/21/2023	62.0	--	--	6.6	19.2	0.69	21.7	0.040
	10/31/2023	22.6	--	--	--	--	--	20.9	0.038
	11/2/2023	--	0.20	--	39	27.2	46	1.66	20.9
12/11/2023	139	0.76	--	76	52.9	47	1.70	20.9	0.048
12/20/2023	99.3	0.38	--	54	37.2	49	1.77	20.9	0.00

Notes:

- (1): flow rates in scfm estimated based on total flow for total system rotometer field measurements collected between 6/6/2023 and 9/21/2023
- (2): flow rates in scfm after 9/21/2023 are calculated based on total system pitot tube differential pressure measurements
- (3): flow rates in scfm after 9/21/2023 based on an assumed temperature of 70F
- IWC: inches of water column
- PID: photoionization detector
- ppm: parts per million
- acfm: actual cubic feet per minute
- scfm: standard cubic feet per minute
- %: percent
- : not measured



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS
 Hare #14M
 Hilcorp Energy Company
 San Juan County, New Mexico

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
6/6/2023	1,769	84	480	25	270	31,000	15.34	3.53
6/7/2023	1,367	43	280	17	200	14,000	21.26	1.14
6/13/2023	1,023	27	220	14	160	11,000	21.47	0.63
6/23/2023	675	2.7	41	3.9	50	3,400	21.59	0.38
6/29/2023	781	8.8	150	13	160	5,000	21.63	0.31
7/13/2023	745	<5.0	120	11	140	4,500	21.64	0.28
7/27/2023	414	<5.0	62	5.7	73	2,700	21.70	0.22
8/9/2023	403	<5.0	55	5.5	69	2,600	21.73	0.23
8/24/2023	610	<5.0	53	7.5	99	2,700	21.66	0.24
9/8/2023	444	<5.0	37	5.6	74	2,100	21.72	0.20
9/21/2023	398	<5.0	39	6.6	96	2,300	21.75	0.18
12/11/2023	126	0.28	9.6	2.2	31	720	21.64	0.12

Notes:

GRO: gasoline range organics

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

‰: percent

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



TABLE 4
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS
 Hare #14M
 Hilcorp Energy Company
 San Juan County, New Mexico

Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
6/6/2023	1,769	84	480	25	270	31,000
6/7/2023	1,367	43	280	17	200	14,000
6/13/2023	1,023	27	220	14	160	11,000
6/23/2023	675	2.7	41	3.9	50	3,400
6/29/2023	781	8.8	150	13	160	5,000
7/13/2023	745	5.0	120	11	140	4,500
7/27/2023	414	5.0	62	5.7	73	2,700
8/9/2023	403	5.0	55	5.5	69	2,600
8/24/2023	610	5.0	53	7.5	99	2,700
9/8/2023	444	5.0	37	5.6	74	2,100
9/21/2023	398	5.0	39	6.6	96	2,300
12/11/2023	126	0.28	9.6	2.2	31	720
Average	784	18	140	10	126	7,391

Vapor Extraction Summary

Date	Flow Rate (scfm)	Total System Flow (cf)	Delta Flow (cf)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
6/6/2023	--							
6/7/2023	70	117,180	117,180	0.017	0.099	0.0055	0.062	5.9
6/13/2023	35	412,440	295,260	0.0069	0.049	0.0030	0.035	2.5
6/23/2023	40	987,720	575,280	0.0021	0.018	0.0013	0.015	1.0
6/29/2023	40	1,336,440	348,720	0.00086	0.014	0.0013	0.016	0.63
7/13/2023	42	2,187,948	851,508	0.0011	0.021	0.0018	0.023	0.73
7/27/2023	45	3,087,588	899,640	0.00081	0.015	0.0014	0.017	0.59
8/9/2023	48	3,992,484	904,896	0.00087	0.010	0.0010	0.012	0.46
8/24/2023	46	4,912,116	919,632	0.00088	0.0095	0.0011	0.015	0.47
9/8/2023	48	5,817,012	904,896	0.00088	0.0079	0.0012	0.015	0.42
9/21/2023	46	6,685,032	868,020	0.00088	0.0067	0.0011	0.015	0.39
12/11/2023	152	22,137,048	15,452,016	0.00046	0.0043	0.0008	0.011	0.27
Average				0.0029	0.023	0.0018	0.021	1.2

Mass Recovery

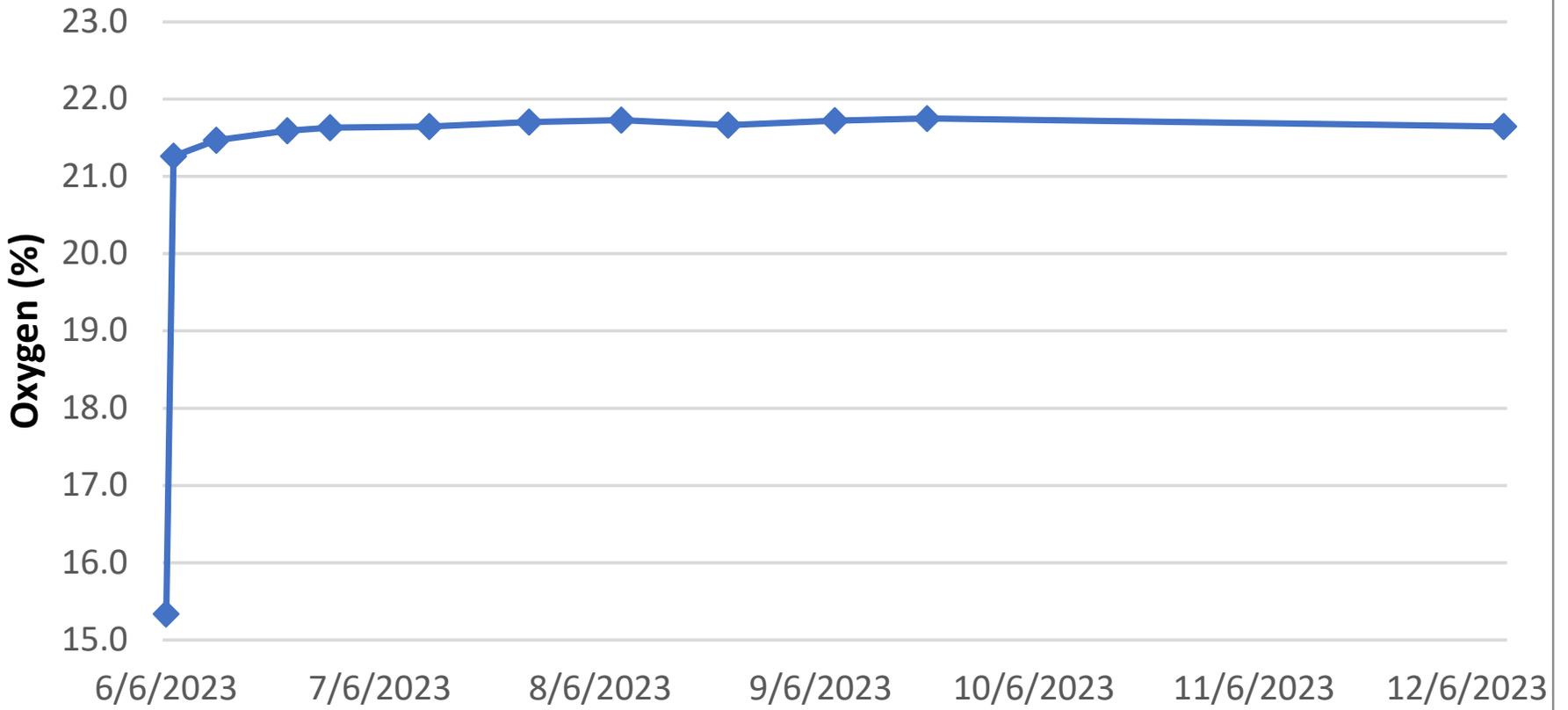
Date	Total Operational Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
6/6/2023	292							
6/7/2023	319	28	0.464	2.78	0.153	1.7	164	0.082
6/13/2023	460	141	0.966	6.90	0.43	5.0	345	0.173
6/23/2023	700	240	0.499	4.39	0.301	3.53	242	0.121
6/29/2023	845	145	0.125	2.08	0.184	2.28	91	0.046
7/13/2023	1,183	338	0.36	7.0	0.622	7.77	246	0.123
7/27/2023	1,516	333	0.27	4.9	0.45	5.8	195	0.098
8/9/2023	1,830	314	0.27	3.2	0.31	3.9	145	0.072
8/24/2023	2,191	361	0.317	3.4	0.41	5.3	168	0.084
9/8/2023	2,549	358	0.315	2.8	0.41	5.4	151	0.076
9/21/2023	2,864	315	0.276	2.1	0.34	4.7	122	0.061
12/11/2023	4,558	1,694	0.786	7.2	1.31	18.9	450	0.225
Total Mass Recovery to Date			4.7	47	4.9	64	2,319	1.16

Notes:

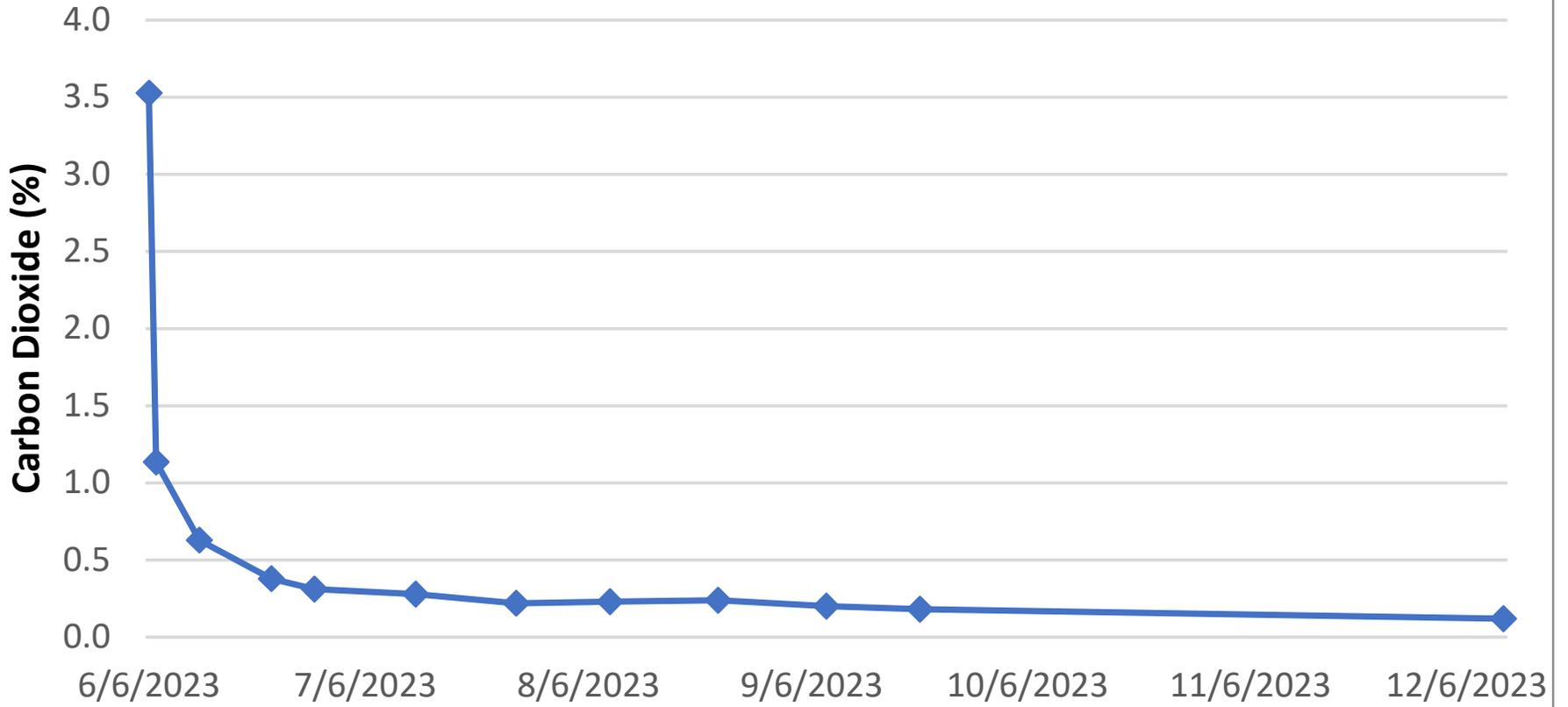
cf: cubic feet
 scfm: standard cubic feet per minute
 µg/L: micrograms per liter
 lb/hr: pounds per hour
 --: not sampled

PID: photoionization detector
 ppm: parts per million
 TVPH: total volatile petroleum hydrocarbons
 gray: laboratory reporting limit used for calculating emissions

Graph 1: Oxygen vs Time



Graph 2: Carbon Dioxide vs Time





APPENDIX A

Field Notes

HARE 14M SVE SYSTEM
O&M FORM

DATE: 10-31
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____
KO TANK HIGH LEVEL

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	3824.5	1356
Total Flow (scfm)	55	
Inlet Vacuum (IWC)	33	
Differential Pressure	3.3	
Inlet PID	139.5	
Exhaust PID	181.7	
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: Sample Bi-Monthly (every other month) for TVPH (8015), BTEX (8260), Fixed Gas (CO2 AND O2)
 OPERATING WELLS _____

Change in Well Operation: _____

WELLHEAD MEASUREMENTS
SHALLOW ZONE WELLS

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE01		85	20.9	420
SVE03		7.9	20.9	540
SVE07		148.1	20.9	780
SVE09		22.6	20.9	380

DEEP ZONE WELLS

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE02		17.7	20.9	340
SVE06		32.8	20.9	480
SVE08		10.9	20.9	340

COMMENTS/OTHER MAINTENANCE:

HARE 14M

11-2

H EC

Scanny 60V

11:30 EC on site to install pilot tubes on each well of SVE system

Water in mist filter no water to tank

Install tubes & between valve and manifold for all wells

R- Remove bypass and add kinkle valve

Turn on blower @ 12:40

Vac: 46 IWC

Flow: 100 SCFM

Diff pres: 6.6 IWC

Well	Diff pressure	
SVE01	0.2 IWC	
02	0.2	
03	0.2	Need barbs
06	0.2	for pilot tubes
07	0.2	
08	0.2	
09	0.2	

1400 EC off-site

From: [Mitch Killough](#)
To: [Curt Williams - \(C\)](#)
Cc: [Kelly Davidson](#)
Subject: RE: Hare 14M SVE unit

Thanks Curt. It sounds like we need to get heat trace on this unit. I have done this with my other SVEs and we've had good runtime. If we need to make this upgrade, who should I speak with? Vernon?

Mitch Killough
Hilcorp Energy Company
713-757-5247 (Office)
281-851-2338 (Mobile)

From: Curt Williams - (C) <Curt.Williams@hilcorp.com>
Sent: Monday, November 27, 2023 11:38 AM
To: Mitch Killough <mkillough@hilcorp.com>
Cc: Kelly Davidson <mdavidson@hilcorp.com>
Subject: Hare 14M SVE unit

Good morning, Upon arrival to check location, the SVE unit was down and also showing down on cygnet. It only paged out once last night, and the crew on call got it started. From what I was told they had to get about 10-15 gallons of water out of the vessel. I drained some more out this morning and when I went to start it back up the motor sounds like it wants to start but does not fully come on. This is also the first time we have got water into the system on this one. Might be due to the rain we have had over the past couple of days. I talked to Mitch on the phone and he is going to get the 3rd party company to come look at it. Unit is down.

Curt Williams

HARE 14M SVE SYSTEM
O&M FORM

DATE: 12-11
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____
KO TANK HIGH LEVEL _____

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	4558.0	1122
Total Flow (scfm)	105	
Inlet Vacuum (IWC)	47	
Differential Pressure	6.3	
Inlet PID	126.2	
Exhaust PID	324.9	
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)	5	

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
Analytes: Sample Bi-Monthly (every other month) for TVPH (8015), BTEX (8260), Fixed Gas (CO2 AND O2)
OPERATING WELLS _____

Change in Well Operation: _____

WELLHEAD MEASUREMENTS

SHALLOW ZONE WELLS *diff pressure*

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE01	0.13	397.4	20.9	440
SVE03	0.73	31.7	20.9	180
SVE07	0.35	156	20.9	420
SVE09	0.76	138.9	20.9	480

DEEP ZONE WELLS *diff pressure*

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE02	0.01	53.5	20.9	40
SVE06	0.01	55.1	20.9	0
SVE08	0.76	478.6	20.9	2140

COMMENTS/OTHER MAINTENANCE:

HARE 14M SVE SYSTEM
O&M FORM

DATE: 12-20
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	4774.2	1118
Total Flow (scfm)	100	
Inlet Vacuum (IWC)	49	
Differential Pressure	6.23	
Inlet PID	103.4	
Exhaust PID	262.4	
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)	2	

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____	SAMPLE TIME: _____
Analytes: Sample Bi-Monthly (every other month) for TVPH (8015), BTEX (8260), Fixed Gas (CO2 AND O2)	
OPERATING WELLS _____	

Change in Well Operation: _____

WELLHEAD MEASUREMENTS

SHALLOW ZONE WELLS

Diff Pressure

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE01	0.09	411.7	20.9	200
SVE03	0.76	16.3	20.9	100
SVE07	0.38	148.6	20.9	280
SVE09	0.38	99.3	20.9	280

DEEP ZONE WELLS

WELL ID	VACUUM (IWC)	PID HEADSPACE (PPM)	OXYGEN	CARBON DIOXIDE
SVE02	0.01	11.1	20.9	20
SVE06	0.01	38	20.9	60
SVE08	0.02	11.3	20.9	0

COMMENTS/OTHER MAINTENANCE:

Empty box for comments or other maintenance notes.



APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
Hare #14M
San Juan County, New Mexico
Hilcorp Energy Company

<p>Photograph 1</p> <p>Runtime meter taken on September 29, 2023 at 12:28 PM Hours = 3,055.5</p>	
<p>Photograph 2</p> <p>Runtime meter taken on December 20, 2023 at 11:18 PM Hours = 4,774.2</p>	



APPENDIX C

Laboratory Analytical Reports



Eurofins Environment Testing South
Central, LLC
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 02, 2024

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

RE: Hare 14M

OrderNo.: 2312647

Dear Mitch Killough:

Eurofins Environment Testing South Central, LLC received 1 sample(s) on 12/12/2023 for the analyses presented in the following report.

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

Please do not hesitate to contact Eurofins Albuquerque 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".

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order **2312647**

Date Reported: **1/2/2024**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SVE-1

Project: Hare 14M

Collection Date: 12/11/2023 11:40:00 AM

Lab ID: 2312647-001

Matrix: AIR

Received Date: 12/12/2023 7:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	0.28	0.20		µg/L	2	12/21/2023 4:33:00 PM
Toluene	9.6	0.20		µg/L	2	12/21/2023 4:33:00 PM
Ethylbenzene	2.2	0.20		µg/L	2	12/21/2023 4:33:00 PM
Methyl tert-butyl ether (MTBE)	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2,4-Trimethylbenzene	1.5	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,3,5-Trimethylbenzene	2.0	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2-Dichloroethane (EDC)	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2-Dibromoethane (EDB)	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Naphthalene	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
1-Methylnaphthalene	ND	0.80		µg/L	2	12/21/2023 4:33:00 PM
2-Methylnaphthalene	ND	0.80		µg/L	2	12/21/2023 4:33:00 PM
Acetone	ND	2.0		µg/L	2	12/21/2023 4:33:00 PM
Bromobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Bromodichloromethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Bromoform	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Bromomethane	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
2-Butanone	ND	2.0		µg/L	2	12/21/2023 4:33:00 PM
Carbon disulfide	ND	2.0		µg/L	2	12/21/2023 4:33:00 PM
Carbon tetrachloride	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Chlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Chloroethane	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
Chloroform	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Chloromethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
2-Chlorotoluene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
4-Chlorotoluene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
cis-1,2-DCE	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
cis-1,3-Dichloropropene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2-Dibromo-3-chloropropane	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
Dibromochloromethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Dibromomethane	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
1,2-Dichlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,3-Dichlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,4-Dichlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Dichlorodifluoromethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1-Dichloroethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1-Dichloroethene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2-Dichloropropane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,3-Dichloropropane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
2,2-Dichloropropane	ND	0.20		µg/L	2	12/21/2023 4:33:00 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 **2312647**

Date Reported: **1/2/2024**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SVE-1

Project: Hare 14M

Collection Date: 12/11/2023 11:40:00 AM

Lab ID: 2312647-001

Matrix: AIR

Received Date: 12/12/2023 7:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Hexachlorobutadiene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
2-Hexanone	ND	2.0		µg/L	2	12/21/2023 4:33:00 PM
Isopropylbenzene	0.57	0.20		µg/L	2	12/21/2023 4:33:00 PM
4-Isopropyltoluene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
4-Methyl-2-pentanone	ND	2.0		µg/L	2	12/21/2023 4:33:00 PM
Methylene chloride	ND	0.60		µg/L	2	12/21/2023 4:33:00 PM
n-Butylbenzene	ND	0.60		µg/L	2	12/21/2023 4:33:00 PM
n-Propylbenzene	0.50	0.20		µg/L	2	12/21/2023 4:33:00 PM
sec-Butylbenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Styrene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
tert-Butylbenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1,1,2-Tetrachloroethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1,1,2,2-Tetrachloroethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Tetrachloroethene (PCE)	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
trans-1,2-DCE	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
trans-1,3-Dichloropropene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2,3-Trichlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2,4-Trichlorobenzene	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1,1-Trichloroethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,1,2-Trichloroethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Trichloroethene (TCE)	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Trichlorofluoromethane	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
1,2,3-Trichloropropane	ND	0.40		µg/L	2	12/21/2023 4:33:00 PM
Vinyl chloride	ND	0.20		µg/L	2	12/21/2023 4:33:00 PM
Xylenes, Total	31	0.30		µg/L	2	12/21/2023 4:33:00 PM
Surr: Dibromofluoromethane	96.1	70-130		%Rec	2	12/21/2023 4:33:00 PM
Surr: 1,2-Dichloroethane-d4	88.3	70-130		%Rec	2	12/21/2023 4:33:00 PM
Surr: Toluene-d8	127	70-130		%Rec	2	12/21/2023 4:33:00 PM
Surr: 4-Bromofluorobenzene	127	70-130		%Rec	2	12/21/2023 4:33:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	720	10		µg/L	2	12/21/2023 4:33:00 PM
Surr: BFB	124	70-130		%Rec	2	12/21/2023 4:33:00 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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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

ANALYTICAL SUMMARY REPORT

December 18, 2023

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

Work Order: B23120990 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 12/13/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23120990-001	2312647-001B, SVE-1	12/11/23 11:40	12/13/23	Air	Air Correction Calculations Appearance and Comments Calculated Properties GPM @ std cond./1000 cu. ft., moist. Free Natural Gas Analysis Specific Gravity @ 60/60

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: B23120990-001
Client Sample ID: 2312647-001B, SVE-1

Report Date: 12/18/23
Collection Date: 12/11/23 11:40
Date Received: 12/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.64	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Nitrogen	78.23	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Carbon Dioxide	0.12	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Hexanes plus	0.01	Mol %		0.01		GPA 2261-95	12/14/23 10:21 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
Hexanes plus	0.004	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
GPM Total	0.004	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj
GPM Pentanes plus	0.004	gpm		0.001		GPA 2261-95	12/14/23 10:21 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	ND			1		GPA 2261-95	12/14/23 10:21 / jrj
Net BTU per cu ft @ std cond. (LHV)	ND			1		GPA 2261-95	12/14/23 10:21 / jrj
Pseudo-critical Pressure, psia	545			1		GPA 2261-95	12/14/23 10:21 / jrj
Pseudo-critical Temperature, deg R	239			1		GPA 2261-95	12/14/23 10:21 / jrj
Specific Gravity @ 60/60F	0.998			0.001		D3588-81	12/14/23 10:21 / jrj
Air, %	98.87			0.01		GPA 2261-95	12/14/23 10:21 / jrj

- The analysis was not corrected for air.

COMMENTS

- 12/14/23 10:21 / jrj

- 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: B23120990

Report Date: 12/18/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
Method: GPA 2261-95											
Batch: R413779											
Lab ID: LCS121423	11 Laboratory Control Sample			Run: GCNGA-B_231214A				12/14/23 01:43			
Oxygen		0.65	Mol %	0.01	130	70	130				
Nitrogen		6.15	Mol %	0.01	102	70	130				
Carbon Dioxide		0.99	Mol %	0.01	100	70	130				
Methane		74.6	Mol %	0.01	100	70	130				
Ethane		6.02	Mol %	0.01	100	70	130				
Propane		5.00	Mol %	0.01	101	70	130				
Isobutane		1.84	Mol %	0.01	92	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		0.79	Mol %	0.01	99	70	130				
Lab ID: B23120990-001ADUP	12 Sample Duplicate			Run: GCNGA-B_231214A				12/14/23 02:33			
Oxygen		21.6	Mol %	0.01				0	20		
Nitrogen		78.2	Mol %	0.01				0	20		
Carbon Dioxide		0.13	Mol %	0.01				8.0	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		0.01	Mol %	0.01				0.0	20		

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Billings, MT 406.252.6325 • Casper, WY 307.235.0515
Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23120990

Login completed by: Danielle N. Harris

Date Received: 12/13/2023

Reviewed by: lleprosew

Received by: cmj

Reviewed Date: 12/18/2023

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: 10.6°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.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Contact and Corrective Action Comments:

None



Environment Testing

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Eurofins Environment Testing South Central, LLC
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975
 FAX: 505-345-4107
 Website: www.halleenvironmental.com

BLS 120910

SUB CONTRACTOR: Energy Labs -Billings		COMPANY: Energy Laboratories		PHONE: (406) 869-6253	FAX: (406) 252-6069
ADDRESS: 1120 South 27th Street				ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: Billings, MT 59107					
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE
1	2312647-001B	SVE-1	TEDLAR	Air	12/11/2023 11:40:00 AM
					# CONTAINERS: 1
ANALYTICAL COMMENTS					
1 Natural Gas Analysis, O2, CO2					

SPECIAL INSTRUCTIONS / COMMENTS:

Include the LAB ID and CLIENT SAMPLE ID on final reports. Email results to Hall.Lab@et.eurofinsus.com. For Questions email Hall.samplecontrol@et.eurofinsus.com. Please return all coolers and blue ice. Thank you.

Relinquished By: <i>One</i>	Date: 12/12/2023	Time: 12:37 PM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: <i>Jeff Crystal Zone</i>	Date: 12/12/23	Time: 07:15
TAT: Standard <input checked="" type="checkbox"/> RUSH	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>	Temp of samples _____ °C	Attempt to Cool? _____
Comments: _____					

REPORT TRANSMITTAL DESIRED:

HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY



Environment Testin

Eurofins Environment Testing South Central, LLC
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 2312647 RcptNo: 1

Received By: Juan Rojas 12/12/2023 7:25:00 AM *Juan Rojas*

Completed By: Cheyenne Cason 12/12/2023 10:44:35 AM *Cason*

Reviewed By: *SCM 12/12/23*

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: *JW 12/12/23*

Special Handling (if applicable)

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

Person Notified:	_____	Date:	_____
By Whom:	_____	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> 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	NA		

Chain-of-Custody Record

Client: Hilcorp

Mailing Address:

Phone #:

email or Fax#: brandon.sinclair@hilcorp.com

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

Accreditation: AZ Compliance
 NELAC Other

EDD (Type)

Turn-Around Time:
 Standard Rush

Project Name:
Hare 14M

Project #:

Project Manager:
Mitch Killough

Sampler: Brandon Sinclair

On Ice: Yes No

of Coolers: 1

Cooler Temp (including CF): N/A (°C)

Container Type and #
2 Tedlar

Preservative Type
001

HEAL No.
2312647



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

Analysis Request

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

Date: 12-11-1706 Relinquished by: BR Sinclair Received by: Indy West Date: 12/11/23 Time: 1700

Date: 12/11/23 Relinquished by: Chris Walker Received by: Indy West Date: 12/12/23 Time: 7:25

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 303737

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 303737
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the Fourth Quarter 2023--SVE System Update Hare #14M: Content Satisfactory 1. Continue to conduct O&M visits bimonthly as planned. Include volume calculations for next report submission. 2. Submit next quarterly report in 2024.	4/9/2024