

**ENSOLUM**

NV

October 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: Third Quarter 2023 – SVE System Update

Howell M#1
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NRM2022755502

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Third Quarter 2023 – SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the Howell M#1 natural gas production well (Site), located in Unit N of Section 30, Township 30 North, Range 8 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 historical impacts discovered at the Site. This report summarizes Site activities performed in June, July, August, and September of 2023.

SVE SYSTEM SPECIFICATIONS

The SVE system at the Site consists of a 3-phase, 3.5 horsepower Atlantic Blower AB-500 regenerative blower capable of producing 230 cubic feet per minute (cfm) flow and 88 inches of water column (IWC) vacuum. The system is powered by a permanent power drop and is intended to run 24 hours per day. Six SVE wells, SVE01 through SVE06, are currently in operation and are shown on Figure 2.

SYSTEM STARTUP AND THIRD 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 from the system daily for the first week of operation and then weekly thereafter for the remainder of June, July, August, and September 2023. Field measurements included the following parameters: total system flow, estimated flow rates from each SVE well, photoionization detector (PID) measurements of volatile organic compounds (VOCs) from each SVE well, vacuum measurements from each SVE well, and oxygen/carbon dioxide measurements via hand-held analyzers from each SVE well. Field notes taken during operations and maintenance (O&M) visits are presented in Appendix A.

Since startup, all Site SVE wells were operated in order to induce flow in impacted soil zones. Although the system was initially started on June 6, 2023, during the Site visit on June 7th, it was noted that the system was off upon arrival and had only run for 4 hours between 2:00 PM on

June 6 and 11:15 AM on June 7. The variable frequency drive (VFD) was adjusted and the system was restarted at 12:35 PM on June 7, 2023. As such, June 7, 2023, has been used for calculating runtime for the first quarter of system operation. Between June 7 and September 29, 2023, the SVE system operated for 2,687.4 hours for a runtime efficiency of 98 percent (%). Appendix B presents photographs of the runtime meter for calculating the third quarter 2023 runtime efficiency. Table 1 presents the SVE system operational hours and calculated percent runtime.

Based on the November 7, 2022 COAs, initial air samples were collected on June 6 and June 7, 2023 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 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. Subsequent samples were collected weekly for the first month of operation and then bi-weekly (twice per month) through the end of the third quarter of 2023. Tables 2 and 3 present a summary of field measurements and analytical data, respectively, collected between June and September 2023. Full laboratory analytical reports are attached as Appendix C. Graphs 1 and 2 present oxygen and carbon dioxide levels over time, 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, 14,571 pounds (7.3 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 approved by the NMOCD (Appendix D), activities and data collected during the of the second and all of the third quarter of 2023 are summarized in this report. Flow measurements during the first quarter of operation were estimated for each SVE well based on the total system flow. In order to measure flow at each individual well, Hilcorp and Ensolum will install flow gauges in the fourth quarter of 2023 for future measurements. Additionally, flow readings collected from the system's inline rotameter and flows calculated from the differential pressure readings collected from the system pitot tube and magnehelic gauge were found to be consistently different throughout O&M visits performed at the Site. Ensolum has been working to troubleshoot the discrepancy and determine the most accurate method for collecting system flow measurements. To be conservative, Ensolum used the lower flow rates for calculating system mass recovery. The fourth quarter 2023 report will present further details regarding this effort and corrected mass recovery calculations, if necessary.

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

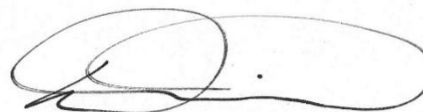
We appreciate the opportunity to provide this report to the NMOCD. If you should have any questions or comments regarding this report, please contact the undersigned.

Sincerely,

Ensolum, LLC



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



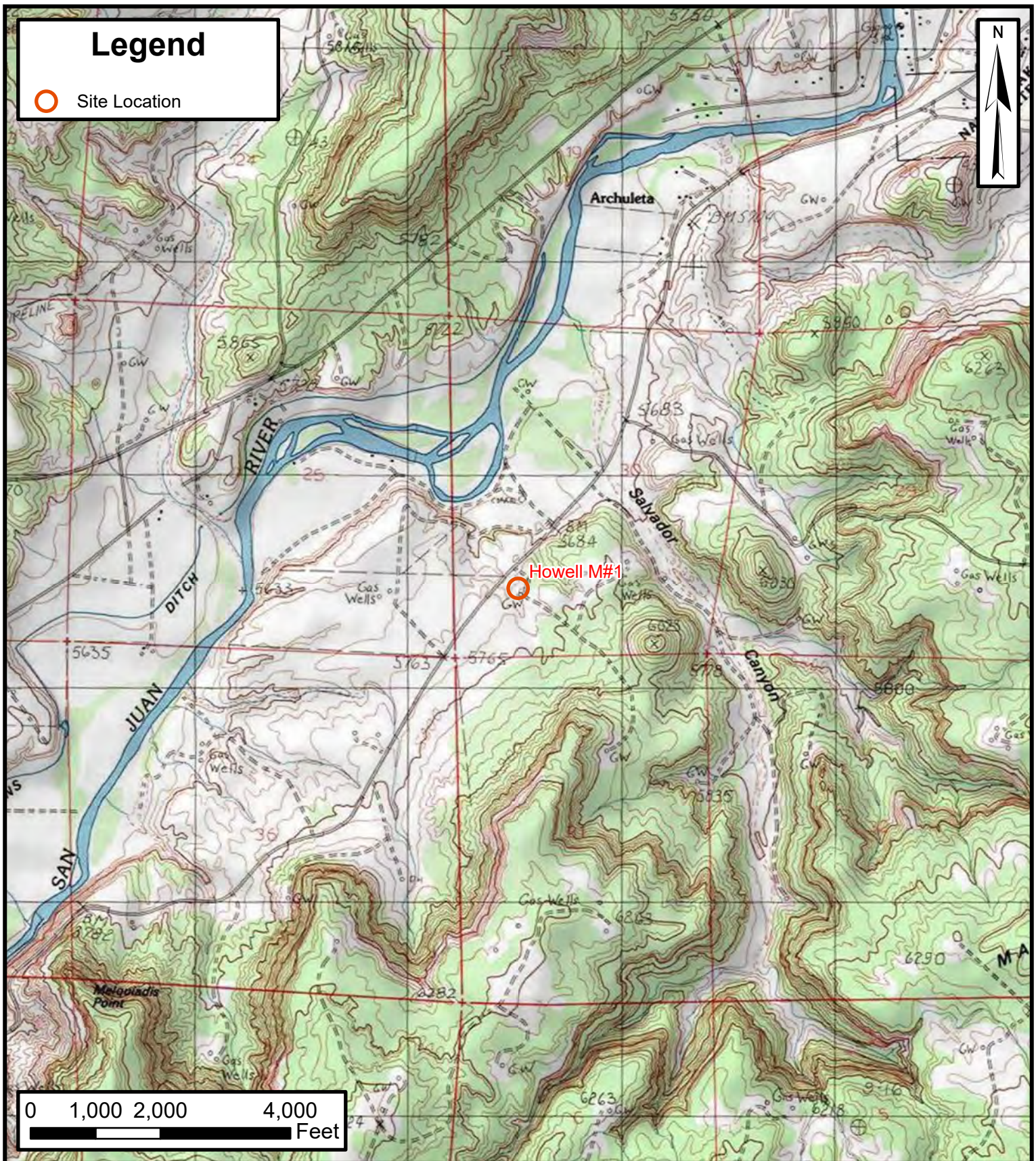
Daniel R. Moir, PG
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Attachments:

Figure 1	Site Location Map
Figure 2	Radius of Influence and Effect
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
Appendix D	NMOCD Correspondence



FIGURES



Site Location Map

Howell M#1

Hilcorp Energy Company

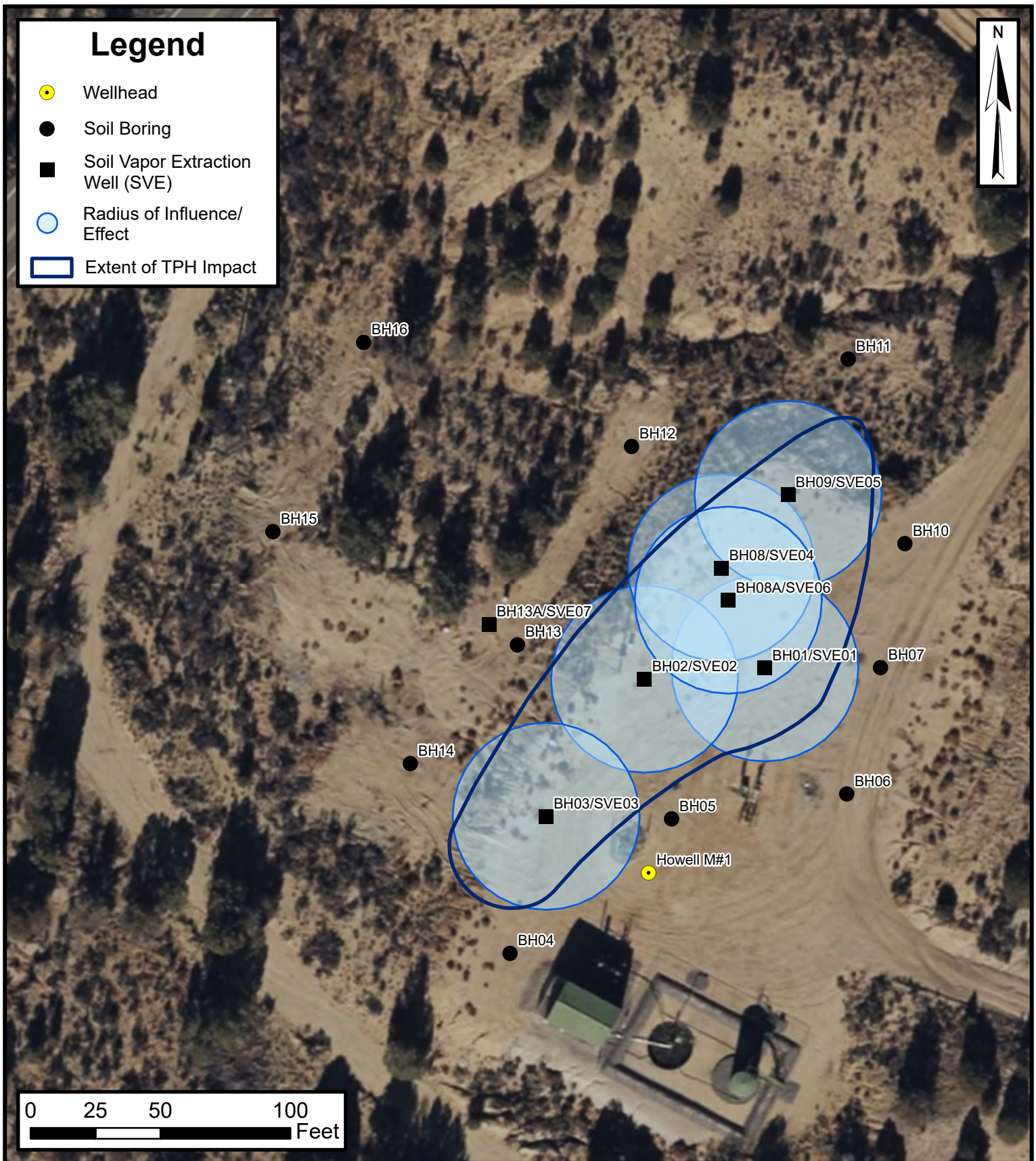
36.777808, -107.717657

San Juan County, New Mexico

FIGURE

1





RADIUS OF INFLUENCE AND EFFECT HOWELL M #1

Howell M#1
Hilcorp Energy Company
36.777808, -107.717657
San Juan County, New Mexico

FIGURE
2



TABLES AND GRAPHS



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

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
6/7/2023	4.0	Startup		
9/29/2023	2,687.4	2,683.4	114	98%



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM FIELD MEASUREMENTS
 Howell M#1
 Hilcorp Energy Company
 San Juan County, New Mexico

SVE Well ID	Date	PID (ppm)	Flow Rate (cfm)(1)	Vacuum (IWC)	Oxygen (%)	Carbon Dioxide (%)
Influent, All Wells	6/6/2023	1,910	60	28.0	--	--
	6/7/2023	1,953	60	28.0	--	--
	6/13/2023	1,878	55	28.0	--	--
	6/22/2023	1,625	60	28.0	--	--
	6/29/2023	1,877	60	28.0	--	--
	7/13/2023	2,280	60	28.0	--	--
	7/27/2023	1,942	70	37.0	--	--
	8/9/2023	1,553	62	28.0	--	--
	8/24/2023	1,858	60	38.0	--	--
SVE01	9/8/2023	1,652	60	28.0	--	--
	9/21/2023	1,274	60	28.0	--	--
	6/6/2023	2,152	10.0	--	--	--
	6/7/2023	2,650	10.0	7.80	0.50	0.05
	6/13/2023	2,315	9.2	10.0	15.3	>5.0
	6/22/2023	1,953	10.0	9.60	19.6	3.99
	6/29/2023	1,935	10.0	9.90	21.4	1.52
	7/13/2023	1,515	10.0	--	21.9	0.64
	7/27/2023	2,265	11.7	9.60	21.1	1.48
SVE02	8/9/2023	1,384	10.3	10.1	21.9	0.92
	8/24/2023	541.0	10.0	10.3	22.4	0.02
	9/8/2023	1,333	10.0	--	20.9	0.56
	9/21/2023	1,015	10.0	9.30	20.9	0.64
	6/6/2023	2,201	10.0	--	--	--
	6/7/2023	2,216	10.0	8.30	3.30	0.05
	6/13/2023	2,243	9.2	9.40	20.9	2.22
	6/22/2023	1,820	10.0	8.80	21.7	0.90
	6/29/2023	2,395	10.0	8.80	21.7	0.84
SVE03	7/13/2023	264	10.0	--	22.5	0.02
	7/27/2023	2,205	11.7	9.10	22.9	0.54
	8/9/2023	1,520	10.3	9.30	22.4	0.42
	8/24/2023	146.0	10.0	9.50	22.4	0.04
	9/8/2023	1,086	10.0	--	20.9	0.14
	9/21/2023	1,189	10.0	8.80	20.9	0.24
	6/6/2023	1,694	10.0	--	--	--
	6/7/2023	1,895	10.0	7.20	1.00	0.05
	6/13/2023	1,804	9.2	9.00	17.2	4.34
SVE03	6/22/2023	1,530	10.0	8.50	20.5	2.36
	6/29/2023	1,782	10.0	8.40	20.9	1.92
	7/13/2023	2,025	10.0	--	20.9	1.34
	7/27/2023	1,795	11.7	8.90	21.7	1.28
	8/9/2023	1,402	10.3	9.30	21.9	0.96
	8/24/2023	1,785	10.0	9.20	21.2	0.88
	9/8/2023	1,527	10.0	--	20.9	0.77
	9/21/2023	1,467	10.0	8.80	20.9	0.70



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM FIELD MEASUREMENTS
 Howell M#1
 Hilcorp Energy Company
 San Juan County, New Mexico

SVE Well ID	Date	PID (ppm)	Flow Rate (cfm)(1)	Vacuum (IWC)	Oxygen (%)	Carbon Dioxide (%)
SVE04	6/6/2023	1,859	10.0	--	--	--
	6/7/2023	2,260	10.0	8.60	7.40	0.05
	6/13/2023	1,944	9.20	9.00	20.9	2.26
	6/22/2023	1,650	10.0	8.90	21.9	0.94
	6/29/2023	609	10.0	8.30	23.2	0.12
	7/13/2023	2,375	10.0	--	21.9	0.68
	7/27/2023	1,844	11.7	8.80	22.8	0.56
	8/9/2023	1,340	10.3	9.20	22.4	0.42
	8/24/2023	325.0	10.0	9.30	22.4	0.08
	9/8/2023	791.0	10.0	--	21.1	0.20
	9/21/2023	192.0	10.0	9.20	21.1	0.00
SVE05	6/6/2023	1,922	10.0	--	--	--
	6/7/2023	2,110	10.0	10.0	16.8	0.05
	6/13/2023	1,265	9.20	10.2	22.4	1.96
	6/22/2023	950.0	10.0	9.70	22.8	0.90
	6/29/2023	1,043	10.0	9.40	22.8	0.72
	7/13/2023	1,205	10.0	--	22.5	0.58
	7/27/2023	875.2	11.7	9.80	23.4	0.42
	8/9/2023	795.0	10.3	10.0	22.5	0.38
	8/24/2023	475.0	10.0	10.5	22.5	0.28
	9/8/2023	398.0	10.0	--	20.9	0.28
	9/21/2023	219.0	10.0	10.2	21.2	0.06
SVE06	6/6/2023	1,713	10.0	--	--	--
	6/7/2023	1,701	10.0	9.20	0.80	0.05
	6/13/2023	1,262	9.20	10.4	12.1	>5.0
	6/22/2023	1,715	10.0	9.90	19.1	2.40
	6/29/2023	1,829	10.0	9.30	17.9	3.48
	7/13/2023	2,560	10.0	--	21.1	0.72
	7/27/2023	2,142	11.7	9.80	19.9	2.26
	8/9/2023	1,775	10.3	10.4	21.9	0.66
	8/24/2023	3,131	10.0	10.2	20.9	1.48
	9/8/2023	2,396	10.0	--	20.9	1.43
	9/21/2023	2,470	10.0	9.90	20.5	1.26

Notes:

(1): flow rates estimated based on total flow for field measurements collected between 6/6/2023 and 9/21/2023

IWC: inches of water column

PID: photoionization detector

ppm: parts per million

cfm: cubic feet per minute

%: percent

--: not measured



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS
Howell M#1
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	1,910	330	1,100	48	540	100,000	3.83%	10.23%
6/7/2023	1,953	190	730	31	320	93,000	8.07%	8.12%
6/13/2023	1,878	87	430	31	360	39,000	19.30%	2.47%
6/22/2023	1,625	42	200	12	120	26,000	20.33%	1.31%
6/29/2023	1,877	46	270	19	210	25,000	20.70%	0.98%
7/13/2023	2,280	51	360	28	320	25,000	21.38%	0.49%
7/27/2023	1,942	49	340	27	310	24,000	20.97%	0.72%
8/9/2023	1,553	34	230	16	180	17,000	21.35%	0.60%
8/24/2023	1,858	32	230	19	220	16,000	21.40%	0.55%
9/8/2023	1,652	23	250	25	290	18,000	21.48%	0.46%
9/21/2023	1,274	25	240	22	260	18,000	21.48%	0.48%

Notes:

GRO: gasoline range organics

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent



TABLE 4
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS

Howell M#1
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)
6/6/2023	1,910	330	1,100	48	540	100,000
6/7/2023	1,953	190	730	31	320	93,000
6/13/2023	1,878	87	430	31	360	39,000
6/22/2023	1,625	42	200	12	120	26,000
6/29/2023	1,877	46	270	19	210	25,000
7/13/2023	2,280	51	360	28	320	25,000
7/27/2023	1,942	49	340	27	310	24,000
8/9/2023	1,553	34	230	16	180	17,000
8/24/2023	1,858	32	230	19	220	16,000
9/8/2023	1,652	23	250	25	290	18,000
9/21/2023	1,274	25	240	22	260	18,000
Average	1,800	83	398	25	285	36,455

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)
6/6/2023	--	System Startup						
6/7/2023	60	100,440	100,440	0.058	0.21	0.0089	0.096	22
6/13/2023	55	564,420	463,980	0.030	0.12	0.0067	0.073	14
6/23/2023	60	1,427,340	862,920	0.014	0.068	0.0046	0.052	7.0
6/29/2023	60	1,950,420	523,080	0.0099	0.053	0.0035	0.037	5.7
7/13/2023	60	3,166,860	1,216,440	0.011	0.071	0.0053	0.059	5.6
7/27/2023	70	4,566,300	1,399,440	0.012	0.085	0.0067	0.077	6.0
8/9/2023	62	5,735,124	1,168,824	0.010	0.070	0.0053	0.060	5.1
8/24/2023	60	6,934,644	1,199,520	0.0075	0.052	0.0040	0.046	3.8
9/8/2023	60	8,065,764	1,131,120	0.0062	0.054	0.0049	0.057	3.8
9/21/2023	60	9,197,964	1,132,200	0.0054	0.055	0.0053	0.062	4.0
Average				0.016	0.084	0.0055	0.062	7.7

Flow and Laboratory Analysis

Date	Total Operational Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
6/6/2023	292	System Startup						
6/7/2023	319	28	1.6	5.7	0.25	2.7	604	0.30
6/13/2023	460	141	4.2	18	0.94	10	1,996	1.00
6/23/2023	700	240	3.3	16	1.1	12	1,675	0.84
6/29/2023	845	145	1.4	7.7	0.51	5.4	831	0.42
7/13/2023	1,183	338	3.7	24	1.8	20.1	1,896	0.95
7/27/2023	1,516	333	4.1	28	2.2	26	1,985	0.99
8/9/2023	1,830	314	3.2	22	1.7	19	1,590	0.79
8/24/2023	2,191	361	2.7	19	1.4	16	1,359	0.68
9/8/2023	2,549	358	2.2	19	1.8	20	1,366	0.68
9/21/2023	2,864	315	1.7	17	1.7	19	1,270	0.64
Total Mass Recovery to Date			28	177	13	152	14,571	7.3

Notes:

cf: cubic feet

cfm: cubic feet per minute

µg/L: micrograms per liter

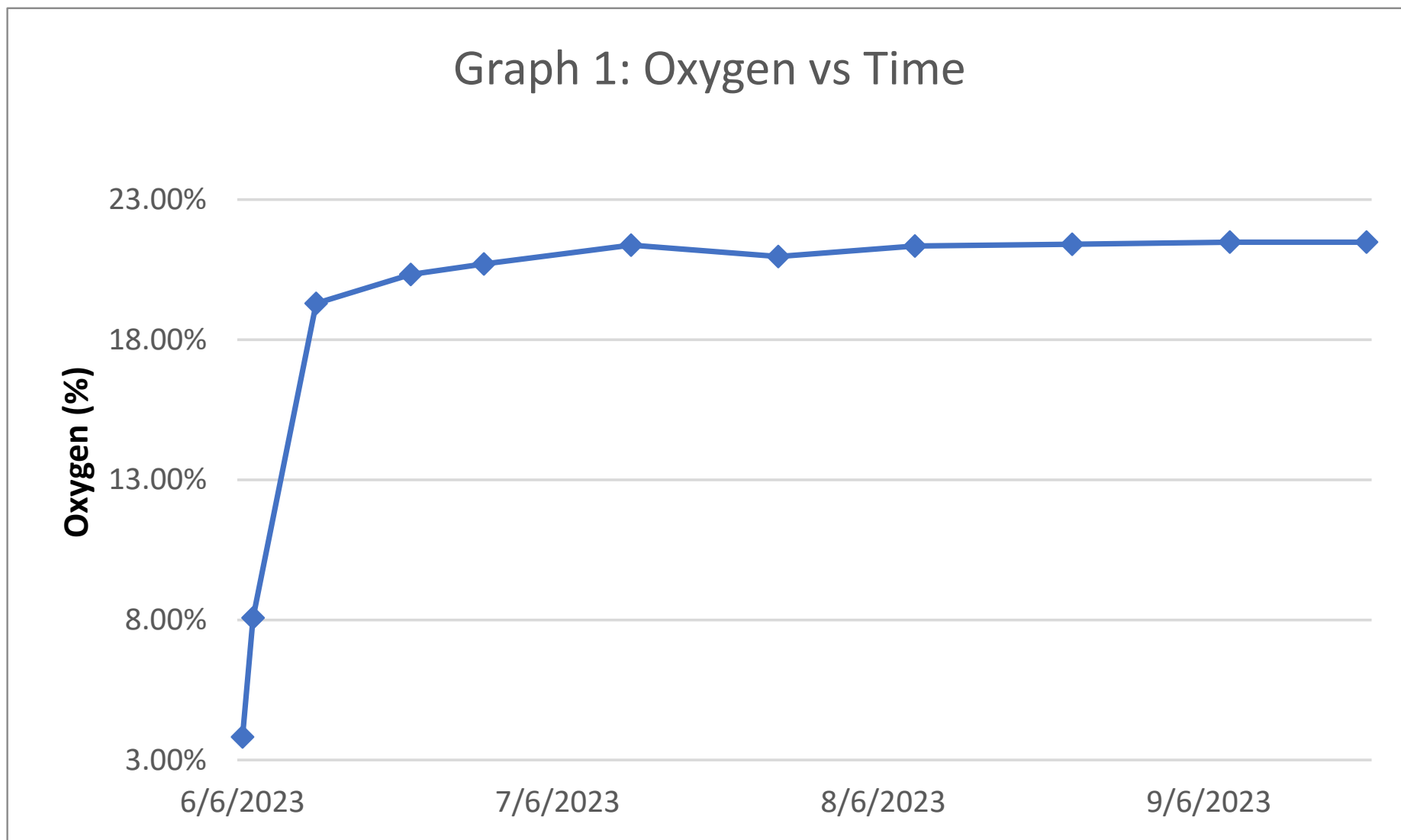
lb/hr: pounds per hour

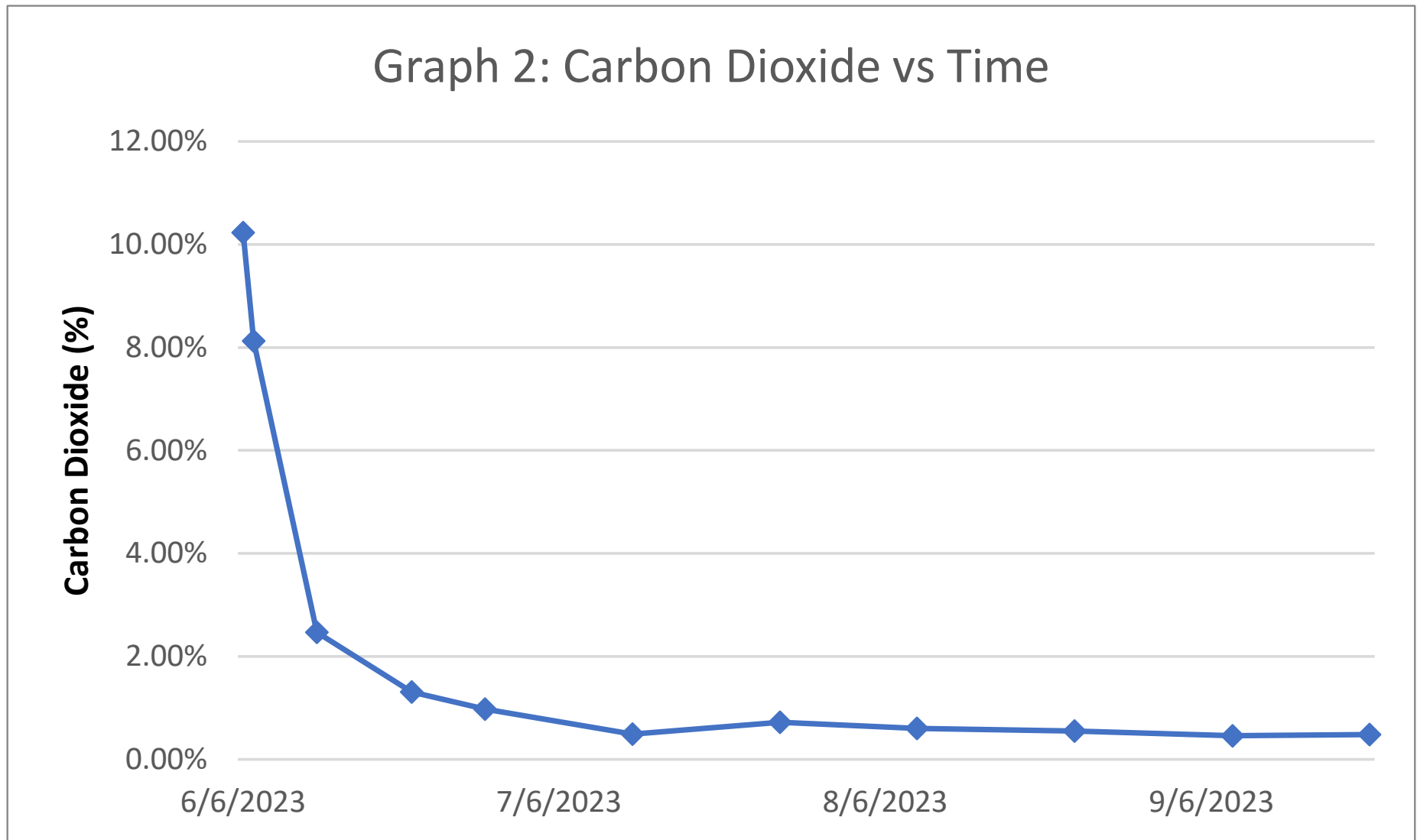
--: not measured

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons







APPENDIX A

Field Notes

Location Howell M#1Date 6-6-23Project / Client HEC

DB

SVE Install

1405 - Onsite to turn on SVE system

Headspace w/ no system

SVE 01	- 1.921 ppm	2,152 ppm
02	- 2.741	2,201
03	- 1.675	1,694
04	- 532	1.859
05	- 1.723	1.922
06	- 905	1.713
		system on

1445 - Start SVE system
Hours @ 0.7

Rotameter - 60 scfm

vac gauge - 28 iwc

Diff. Pressure - 4.0 iwc

1505 - "Influent All Wells"
collected. PID - 1,910 ppm

Exhaust Stack PID - 1,902 ppm

Inlet CH₄ - 46% LEL | 44% LEL

Oxy - 1.7 vol% | 0.6 vol%

H₂S - 0.0 | 0.0

CO - 18 ppm | 33 ppm

CO₂ - 5.00 vol% over | 5.00 vol% over

114

Location

Howell M#1

Date

6-7-23

Project / Client

HEC

Partly cloudy, 80s

DB

Truck/Tools, PID, 6-gas, HVAS

1115- Onsite for SVE ATM

System down upon arrival. Error code on VFD is "F006-Imbalance or input phase loss" which according to manual may be caused by

- phase missing at inverter's input power supply
- Input voltage imbalance $>5\%$

Only 4.0 hours on run time hour meter.

Called Dana Daniel w/ HEC and he came and worked on VFD settings. System turns on now and is running as of 12:35

1315- DB back onsite.

SVE Flow - Rotameter - 60 SCFM
Vac - 28 inwc

Diff. Press - 4 inwc

No liquids in KO Tank stem glass

Location

Howell M#1

Date

6-7-23

Project / Client

HEC

SVE O&M cont'd

	<u>CH₄</u>	<u>O₂</u>	<u>H₂S</u>	<u>CO</u>	<u>CO₂</u>	<u>PID</u>
SVE 01	35%	0.5	0	0	5%	2,650
02	51%	3.3	0	0	5%	2,216
03	48%	1.0	0	26	5%	1,895
04	52%	7.4	0	0	5%	2,260
05	26%	16.8	0	0	5%	2,110
06	41%	0.8	0	35	5%	1,701
Inlet	54%	3.6	0	2	5%	1,977
Exhaust	58%	3.5	0	2	5%	1,954
Unit	%	vol%	ppm	ppm	vol%	ppm

Vacuum @ WH

SVE 01

7.8

02

8.3

03

7.2

04

8.6

IWC

05

10.0

IWC

06

9.2

IWC

1410-"Influent All Wells" collected
PID - 1,953

1420- offsite

Location Howell M#1 Date 6-8-23

Project / Client HEC Sunny, 80's

DB/ZM Truck/tools, HVAS, PID, 6-Gas

1100 - Onsite for SVE O&M/Startup
Review HASP + sign JSA.

System running upon arrival. All
wells open and active.

SVE operating conditions:

Rotameter Flow - 60 SCFM

Vac gauge - 28 IWC

Diff. Press - 3.8 IWC

No liquids in KO sight tube

Runtime Hrs. - 28.0 @ 12:30

	<u>Vac</u>	<u>CH₄</u>	<u>Oxy</u>	<u>H₂S</u>	<u>CO</u>	<u>CO₂</u>	<u>PID</u>
SVE 01	9.8	37	2.2	0	0	5%	2,760
02	9.1	44	12.8	0	0	5	1,190
03	9.1	37	9.8	0	0	5	1,950
04	9.4	33	14.7	0	0	5	2,280
05	10.1	13	19.1	0	0	4.78	1,590
06	9.8	71	3.6	0	341	5	1,620
Inlet	28	38	13.2	0	0	5	2,160
Exhaust		38	12.9	0	0	5	2,052
units	IWC	%	Vol %	ppm	ppm	Vol %	ppm

12:30 - offsite

120

Location

Howell M#1

Date

6-9-23

Project / Client

HEC

Sunny, 80s

DB

Truck/boks, PID, 6-gas, HVAS.

1030 - Onsite for SVE O&M, start up week
Review HASP, sign JSA.

System running upon arrival. All wells
open & active.

SVE System Conditions

Rotameter Flow - 60

Vac Gauge - 28

D: H. Pressure - 3.8

No liquids in KO tank sight tube

Runtime @ 1135 - 51.1 Hours

	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
SVE01	9.9	31	6.7	0	34	5%	3,493
02	8.4	38	16.6	0	19	5%	2,413
03	8.0	30	13.5	0	19	5%	1,906
04	8.4	29	17.7	0	15	>5%	2,375
05	9.8	12	20.9	0	0	3.82	1,516
06	9.5	93	6.6	0	28	>5%	1,641
Inlet		32	16.1	0	19	>5%	2,110
Exhaust		36	15.9	0	19	>5%	2,146
IWC	%	vd %	ppm	ppm	vol %	ppm	

1200 - Offsite

122

Location

Plant M #1

Date

6-12-23

Project / Client

HEC

Sunny, hot, 80's

Truck/tools, HVAS, PID, 6-gas

DB

1230 - Onsite for O&M

1345

System running upon arrival. All wells active.

SVE System Conditions

Rotameter - 55 SCFM

Vac Gauge - 28 inwc

Diff. Press - 3.8 inwc

No liquids in KO Tank

Runtime @ 14:12 - ~~125.8~~ Hrs

	Vac	CH ₄	Oxy	H ₂ S	CO	CO ₂	PID
--	-----	-----------------	-----	------------------	----	-----------------	-----

SVE 01	10.0	28	15.3	0	34	>5%	2,315
02	9.4	30	20.9	0	15	2.22	1,265 2,243
03	9.0	26	17.2	0	18	4.34	1,804
04	9.0	22	20.9	0	0	2.26	1,944
05	10.2	11	22.4	0	0	1.96	1,265
06	10.4	87	12.1	0	36	>5%	1,262
Inlet	-	24	19.4	0	15	3.06	1,878
Outlet	-	28	19.4	0	8	3.38	2,135

inwc	%	vol%	ppm	ppm	vol%	ppm
------	---	------	-----	-----	------	-----

1420 - "Influent All Wells" air sample collected. PID - 1,878 ppm

1430 - Offsite

132

Location Howell ~~WMA~~ M #1Date 6-22Project / Client HEC

ZM, truck, 4-gas, 6-gas, PID, sample kit

hot, clear 80°

10:50 onsite for O+M, gas sampling

- System running, all 6 valves open

- PID calibrated, JSA signed

SVE
System
Condensing

Rotameter 60 scfm

No liquids in KO tank

Vac gauge 28 IWC

Runtime @ 11:00

Diff Press 3.8 IWC

→ 363.4 hrs

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	9.6	24	19.6	0	17	3.99	1953
02	8.8	25	21.7	0	0	0.90	1820
03	8.5	22	20.5	0	15	2.36	1530
04	8.9	17	21.9	0	0	0.94	1650
05	9.7	10	22.8	0	0	0.90	950
06	9.9	50	19.1	0	22	2.40	1715
Inlet	20	21.2	0	0	1.26	1.625	
Outlet	23	20.9	0	0	1.42	1.685	
IWC	% LEL	Vol %	ppm	ppm	Vol %	ppm	

12:00 difficulty w/ Vac pump, left to get tools to take it apart

13:40 - back onsite, fixing Vac pump

14:25 2x Tedlar bag gas samples PID 1625 ppm
 > Inlet

14:35 leaving site

ZM

Location Howell M#1 Date 6-29-23Project / Client HEC Partly cloudy, 90sDB Truck/tools, HVAS, PID, 6 gas, air sample1330- Onsite for O&M. HASP, JSA.- System running upon arrival.- All wells open. KO Tank empty.

<u>SVE</u>	<u>Rotameter</u>	<u>- 60</u>	<u>scfm</u>
<u>System</u>	<u>Vac Gauge</u>	<u>- 28</u>	<u>invc</u>
<u>conditions</u>	<u>Diff. Press.</u>	<u>- 3.8</u>	<u>invc</u>

<u>SVE</u>	<u>Vac</u>	<u>CH₄</u>	<u>Ox</u>	<u>H₂S</u>	<u>CO</u>	<u>CO₂</u>	<u>PID</u>
01	9.9	11	21.4	0	0	1.52	1,935
02	8.8	25	21.7	0	8	0.84	2,395
03	8.4	20	20.9	0	15	1.92	1,782
04	8.3	2	23.2	0	0	0.12	609
05	9.4	7	22.8	0	0	0.72	1,043
06	9.3	70	17.9	0	25	3.48	1,829
In	—	17	21.4	0	8	1.02	1,825
Out	—	23	21.1	0	15	1.24	1,944

<u>Sample - 19</u>	<u>21.4</u>	<u>0</u>	<u>15</u>	<u>1.08</u>	<u>1.877</u>
--------------------	-------------	----------	-----------	-------------	--------------

1420- "Influent All Wells" air sample
collected. PID - 1,877

138

Location Howell M #1Date 7/6/23Project / Client HilcorpRH, Track, PID, HVAS, Eagle, 4-gas

1235 - RH on site for O&M

- system running on arrival
- all wells open

Rotometer = 50

Vac = 31

PIFF press = 3.8

SVE	Vac	CH ₄	Ox	H ₂ S	CO	CO ₂	PIO
01	10.5	11	21.9	0	0	1.32	2,675
02	9.7	17	22.6	0	0	0.60	2,775
03	9.5	19	21.1	0	0	1.58	2,085
04	9.1	14	22.6	0	0	0.70	645
05	10.1	7	23.0	0	0	0.62	1,190
06	10.0	67	19.3	0	19	2.82	2,445
In	-	23	21.9	0	0	1.06	2,255
Out	-	20	22.1	0	0	1.02	2,265

Hours = 701.2 @ 12:45

1335 - RH off site

~~RH~~

Location HowellDate 7/13/23Project / Client HEC

2M, truck, 4-ges, vac sampler, PID 95° sunny

Onsite at 12:00, had to pick up Tedlar bags from Christine and Eagle from Rebecca and Dany

System running, all valves open

- Operating parameters

• 60 scfm

• no fluids in KO tank

• 28 inches WC

869.0 hours at 12:00

• 3.8 diff pres

SVE	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	7	21.9	0	0	0.64	1515
02	1	22.5	0	0	0.02	264
03	14	20.9	0	0	1.34	2025
04	15	21.9	0	0	0.68	2375
05	7	22.5	0	0	0.58	1265
06	21	21.1	0	0	0.72	2560
Inlet	18	21.1	0	0	0.88	2280
Exhaust	18	21.2	0	11	0.82	2205
	LEL %	Vol %	ppm	ppm	Vol %	ppm

2x total influent gas samples taken

at 12:55 "Howell M# / Influent"

- PID 2280

leaving at 13:05

136

Location Howell M # 1

Date 7-18-23

Project / Client HEC

truck, 4-gas, PID, vac sampler 90° sunny

10:30 ZM + SW onsite for O+M of SVE

JSA signed, PID calibrated

Operating Parameters - system running
all valves open

60 xcfm

no fluids in KO tank

28 WC

987.7 hours at

3.8 diff pres

10:50

	Pres	CH ₄	H ₂ S	CO	CO ₂	PID	O ₂
SVE							
01	9.7	12	0.0	21.96	1815		21.4
02	9.1	18	0.0	2.46	1665		21.9
03	9.0	18	0.0	11	1.09	1980	20.9
04	9.0	12	0.0	0.0	0.46	1625	22.2
05	10.0	5	0.0	0.0	0.44	865	22.9
06	9.9	56	0.0	17	1.86	2191	20.7
Inlet		15	0.0	11	.68	1711	21.7
Exhaust		15	0.0	11	.60	1680	21.7
	WC	%LE	ppm	ppm	Vol%	ppm	vol%

11:50 leaving for Hare 14

ZM

142

Location

Howell M#1

Date

7-27-23

Project / Client

HFC

2M truck, PID, HVAS, sample kit, 4-gs clear 980

12:30 onsite for O+M and sampling

- cleaned out HVAS

~~System Running~~ all valves open, System OFF

System Under Voltage no liquids in KO tank

Error Message

hours 1178.1 @ 12:40

- reset and restarted

Rotometer: 70 scfm

Diff Pres: 3.9 in WC

Vac: 37 in WC

SVE	VAC	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	9.6	17	21.1	0.0	8	1.48	2265
02	9.1	20	22.9	0.0	0	0.54	2205
03	8.9	20	21.7	0.0	0	1.28	1795
04	8.8	16	22.8	0.0	0	0.56	1844
05	9.8	6	23.4	0.0	0	0.42	875.2
06	9.8	66	19.9	0.0	28	2.26	2142
IN	-	18	22.8	0.0	0	0.78	1942
OUT	-	18	22.8	0.0	0	0.80	1958
	inWC	% LEL	Vol %	ppm	ppm	Vol %	ppm

13:20

Johnny Coltr from Hilcorp showed up to turn system back on, says he got an alert around 10:30pm yesterday that system turned off, evidence of recent rainstorm

2x feel far bag gas samples "Howell M#1 Inflow" @ 13:40
PID: 1942 ppm

Leaving @ 14:00

EM

Location

Towell #1

Date

8/3/23

Project / Client

It: Corp

KH, Truck/Wells, HVAS, PID, Eagle, 4-gas

78°, Sunny

1045 - RH on site for O&M

- system running on arrival, all wells open

Inlet:

Flow = 65, Vac = 28" WC, Diff: 3.9 in H₂O

Hours @ 10:53 = 1315.2

- sign SSA, review HASP

- calibrate PID w/ 100 ppm Isobutylene

SVE	VAC	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	10.3	10	21.7	0	0	1.32	1,778
02	9.6	11	22.9	0	0	0.50 2.04	1,646
03	9.4	15	23.0	0	0	0.02	1,706
04	9.8	9	22.5	0	0	0.46	1,208
05	10.5	5	22.6	0	0	0.44	852
06	10.5	52	20.9	0	8	2.04	2,479
IN	-	16	22.2	0	0	0.72	1,850
Out	-	14	22.2	0	0	0.70	1,883
	in WC	LEL	Vol %	ppm	ppm	Vol %	ppm
	9.4	15	21.7	0	0	1.16	1,706

1215 - RH off site

RST

4

Howell M #1

8/9/23 Hilcorp

Rt, Tools/Tools, HVAS, PID, Eagle, 4-gal, Sample Kit

78° Sunny

11:00 - Rt on site For O&M + bi-weekly sampling

- Calibrate PID w/ low ppm Isobutylene

- Sign JSA, review HASP

- System running on arrival

Inlet Manifold:

Flow = 62 scfm, Vac = 28" WC, Diff = 3.7

Hours @ 11:20 = 1459.8

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	10.1	7	21.9	0	0	0.92	1,384
02	9.3	11	22.4	0	0	0.42	1,520
03	9.3	10	21.9	0	0	0.96	1,402
04	9.2	8	22.4	0	0	0.42	1,340
05	10.0	4	22.5	0	0	0.38	795
06	10.4	17	21.9	0	0	0.66	1,775
Influent	-	12	22.1	0	0	0.62	1,553
Exhaust	-	12	22.1	0	0	0.64	1,687

* Exhaust needs additional support

Sample "Influent" @ 11:48

1205 - Rt off site

Rt

Howell M/D 1 8/17/23 Hilcorp

RH, Trach / Tools, PID, HVAS, Eagle, 4-gal

85°F Sunny

11:35 RH on Site for O&M

- Calibrate PID w/ 100 ppm Isobutylene

- Sign TSA review HARP

- System running on arrival

Inlet Manifold.

Flow 52 SCFM, $V_{ac} = 28"$ WC, Diff: 3.6 in H_2O

Hours @ 12:15 = 1653.0

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	9.9	9	21.7	0	0	0.94	1,616
02	9.9	15	22.1	0	0	0.48	1,810
03	9.1	11	21.9	0	0	0.90	1,470
04	9.1	9	21.9	0	0	0.44	1,480
05	10.1	15	22.2	0	0	0.42	753
06	10.0	46	20.9	0	8	1.60	2,650
Influent	—	15	21.4	0	0	0.60	1,834
Exhaust	—	14	21.4	0	0	0.60	1,782

- Clean out HVAS before taking readings

13:00 - RH off site

[Signature]

Howell M#1 H. Corp 8-24-23

ZM, truck, PID, eagle, HVAS, sample kit, 485 cloudy 70°
HASP reviewed, JSA signed, PID calibrated raining

10:45 - ZM on site for O&M and sampling

System Parameters - running upon arrival

Vac : 38 inWC [1.819.9 hours at

D&P res: 3.7 inWC [10:55

Flow = 60 scfm - all valves open

- Clean out HVAS - no fluids in KO tank

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	10.3	2	22.4	0.0	0	0.02	541
02	9.5	0	22.4	0.0	0	0.04	146
03	9.2	14	21.2	0.0	0	0.88	1785
04	9.3	2	22.4	0.0	0	0.08	325
05	10.5	2	22.5	0.0	0	0.28	475
06	10.2	42	20.9	0.0	5	1.48	3131
In	-	12	21.9	0.0	0	0.52	1858
Out	-	12	21.9	0.0	0	0.54	1989
	inWC	% LEL	Vol%	ppm	ppm	Vol%	ppm

Sample "Howell M#1 Influent" PID 1,858 ppm
- 2x tedlar bags at 12:00

12:15 ZM leaving site, heading to Hase 14M

ZM

14 Howell M #1 Hilcorp 9-1-23
 Zm truck, eagle, PID, HVAS, 4-ggs partly cloudy 82°

10:40 Zm onsite for SVE OTHM
 HASP reviewed, JSA signed, PID calibrated
 - needed to clean out HVAS to get full vacuum

System running upon arrival, all valves open

Vac 28 inWC 2.012.5 hours

Diff press 3.7 inWC at 11:00

Flow 60 scfm no fluids in KO tank

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01		8	20.9	0.0	0	0.58	1352
02		7	21.4	0.0	0	0.16	1106
		14	20.9	0.0	0	0.80	1557
		5	21.7	0.0	0	0.22	805
		4	21.4	0.0	0	0.32	415
06		46	20.9	0.0	0	1.50	2415
IN	-	13	20.9	0.0	0	0.50	1645
OUT	-	13	20.9	0.0	0	0.52	1656
	inWC	% LEL	Vol %	ppm		Vol %	ppm

12:00 Zm leaving site, heading to Hare 14M

Howell M #1

9-8-23

17

12:15 Ec on site for O&M

System on and running all wells
open

Vac: 28 IWC

Flow 60 SCFM

Diff pres: 3.8 IWC

Hours 2181.6 @ 12:15

	% LEL	Vol%	ppm	ppm	Vol%	ppm
SVE	CH ₄	O ₂	H ₂ S	CO	CO ₂	PIP
01	6	20.9	0.0	0	0.56	1333
02	4	20.9			0.14	1086
03	14	20.9			0.77	1527
04	3	21.1			0.20	791
05	4	20.9			0.28	398
06	46	20.9			1.43	2396
In	12	20.9			0.53	1652
Exh	12	20.9	↓	↓	0.52	1661

"Howell influent" collected @ 1240

18 Howell M#1

9-14-23

ZM, truck, PID, Eagle, HVAS, 4-gas

partly cloudy 80°

11:15 ZM onsite for SVE O+M

HASP reviewed, JSA signed, PID calibrated

- cleaned at HVAS to get full vac pressure

System running, all valves open

Vac 28 in WC

2325.6 hours

D.P. Pos 3.7 in WC

at 11:30

Flow 60 scfm

no fluids in KO tank

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	9.9	5	20.9	0.0	0	0.12	1183
02	9.6	1	20.9	0.0	0	0.02	230
03	9.1	12	20.9	0.0	0	0.74	1012
04	9.4	5	20.9	0.0	0	0.32	1219
05	10.2	1	21.2	0.0	0	0.10	292
06	10.0	42	20.5	0.0	0	1.42	1903
IN	-	10	20.9	0.0	0	0.46	1001
OUT	-	10	20.9	0.0	0	0.48	1038
	in WC	% LEL	Vol %	ppm		Vol %	ppm

12:25 ZM leaving site, heading to Home 14M

ZM

Howell M#1

9-21-23

Hilcorp

ZM, truck, 4-gc, 6-gs, PID, HVAS, sample kit 75° sunny

11:00 ZM onsite for SVE system O&M and sampling

- System running upon arrival, all valves open

Vac = 28 in WC

2,493.2 hours

D.A. Pres 3.7 in WC

at 11:00

Flow 60 scfm

No floods in KO tank

- HASP renewed, JSA signed, PID calibrated

SVE	Vac	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
01	9.3	6	20.9	0.0	0	0.64	1015
02	8.8	7	20.9	0.0	0	0.24	1189
03	8.8	12	20.9	0.0	0	0.70	1467
04	9.2	0	21.1	0.0	0	0.00	192
05	10.2	0	21.2	0.0	0	0.06	219
06	9.4	39	20.5	0.0	0	1.26	2470
IN	-	11	20.4	0.0	0	0.44	1274
OUT	-	11	20.9	0.0	0	0.46	1507
	in WC	%LEL	Vol %	ppm	ppm	Vol %	ppm

2x Tedlar bag samples taken

"Howell M#1 Influent" at 1155 PID: 1274 ppm

- leaving site at 1205

Howell M#1

9-29-23

EC TRUCK, PID, VAC

Sunny 70's

13:20 EC on site for OBM

System on & running

VAC: 28 IWC

Hours: 2687.4

diff Press: 3.6 IWC

Flow 60 SCFM

Well	VAC	CH ₄	O ₂	H ₂ S	CO	CO ₂	PID
SVE01	9.8	5	20.9	0	0	0.12	479
02	9.7	11	20.9	0	0	0.02	222
03	9.0	11	20.9	0	0	0.71	1015
04	9.5	4	20.9	0	0	0.29	1220
05	10.1	1	20.9	0	0	0.10	288
06	10.0	40	20.9	0	0	1.43	1897
int	-	11	20.9	0	0	0.46	1043

No water in KO Tank



Borehole on pad open needs to
be backfilled no shovel in truck



APPENDIX B

Project Photographs

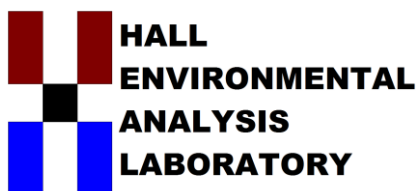
PROJECT PHOTOGRAPHS
Howell M#1
San Juan County, New Mexico
Hilcorp Energy Company

<p>Photograph 1</p> <p>Runtime meter taken on June 7, 2023 at 11:20 AM Hours = 4.0</p>	
<p>Photograph 2</p> <p>Runtime meter taken on September 29, 2023 at 1:09 PM Hours = 2,687.4</p>	



APPENDIX C

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

June 23, 2023

Stuart Hyde

Hilcorp Energy

PO Box 61529

Houston, TX 77208-1529

TEL: (337) 276-7676

FAX:

RE: Howell M1

OrderNo.: 2306415

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/8/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2306415

Date Reported: 6/23/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/6/2023 3:05:00 PM

Lab ID: 2306415-001

Matrix: AIR

Received Date: 6/8/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: JJP
Gasoline Range Organics (GRO)	100000	500	E	µg/L	100	6/13/2023 2:01:33 PM	GA97399
Surr: BFB	228	15-412		%Rec	100	6/13/2023 2:01:33 PM	GA97399
EPA METHOD 8260B: VOLATILES							Analyst: RAA
Benzene	330	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Toluene	1100	10	E	µg/L	100	6/14/2023 2:32:22 PM	R97458
Ethylbenzene	48	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2,4-Trimethylbenzene	14	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,3,5-Trimethylbenzene	15	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2-Dichloroethane (EDC)	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2-Dibromoethane (EDB)	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Naphthalene	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
1-Methylnaphthalene	ND	40		µg/L	100	6/14/2023 2:32:22 PM	R97458
2-Methylnaphthalene	ND	40		µg/L	100	6/14/2023 2:32:22 PM	R97458
Acetone	ND	100		µg/L	100	6/14/2023 2:32:22 PM	R97458
Bromobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Bromodichloromethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Bromoform	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Bromomethane	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
2-Butanone	ND	100		µg/L	100	6/14/2023 2:32:22 PM	R97458
Carbon disulfide	ND	100		µg/L	100	6/14/2023 2:32:22 PM	R97458
Carbon tetrachloride	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Chlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Chloroethane	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
Chloroform	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Chloromethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
2-Chlorotoluene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
4-Chlorotoluene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
cis-1,2-DCE	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
cis-1,3-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2-Dibromo-3-chloropropane	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
Dibromochloromethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Dibromomethane	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,3-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,4-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Dichlorodifluoromethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1-Dichloroethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1-Dichloroethene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2306415

Date Reported: 6/23/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/6/2023 3:05:00 PM

Lab ID: 2306415-001

Matrix: AIR

Received Date: 6/8/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: RAA
1,2-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,3-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
2,2-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Hexachlorobutadiene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
2-Hexanone	ND	100		µg/L	100	6/14/2023 2:32:22 PM	R97458
Isopropylbenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
4-Isopropyltoluene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
4-Methyl-2-pentanone	ND	100		µg/L	100	6/14/2023 2:32:22 PM	R97458
Methylene chloride	ND	30		µg/L	100	6/14/2023 2:32:22 PM	R97458
n-Butylbenzene	ND	30		µg/L	100	6/14/2023 2:32:22 PM	R97458
n-Propylbenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
sec-Butylbenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Styrene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
tert-Butylbenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1,1,2-Tetrachloroethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1,2,2-Tetrachloroethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Tetrachloroethene (PCE)	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
trans-1,2-DCE	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
trans-1,3-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2,3-Trichlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2,4-Trichlorobenzene	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1,1-Trichloroethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,1,2-Trichloroethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Trichloroethene (TCE)	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Trichlorofluoromethane	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
1,2,3-Trichloropropane	ND	20		µg/L	100	6/14/2023 2:32:22 PM	R97458
Vinyl chloride	ND	10		µg/L	100	6/14/2023 2:32:22 PM	R97458
Xylenes, Total	540	15		µg/L	100	6/14/2023 2:32:22 PM	R97458
Surr: Dibromofluoromethane	71.5	70-130		%Rec	100	6/14/2023 2:32:22 PM	R97458
Surr: 1,2-Dichloroethane-d4	73.6	70-130		%Rec	100	6/14/2023 2:32:22 PM	R97458
Surr: Toluene-d8	106	70-130		%Rec	100	6/14/2023 2:32:22 PM	R97458
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	100	6/14/2023 2:32:22 PM	R97458

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2306415

Date Reported: 6/23/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/7/2023 2:10:00 PM

Lab ID: 2306415-002

Matrix: AIR

Received Date: 6/8/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: JJP
Gasoline Range Organics (GRO)	93000	500	E	µg/L	100	6/13/2023 2:48:59 PM	GA97399
Surr: BFB	247	15-412		%Rec	100	6/13/2023 2:48:59 PM	GA97399
EPA METHOD 8260B: VOLATILES							Analyst: RAA
Benzene	190	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Toluene	730	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Ethylbenzene	31	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2,4-Trimethylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,3,5-Trimethylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2-Dichloroethane (EDC)	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2-Dibromoethane (EDB)	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Naphthalene	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
1-Methylnaphthalene	ND	40		µg/L	100	6/14/2023 2:59:57 PM	R97458
2-Methylnaphthalene	ND	40		µg/L	100	6/14/2023 2:59:57 PM	R97458
Acetone	ND	100		µg/L	100	6/14/2023 2:59:57 PM	R97458
Bromobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Bromodichloromethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Bromoform	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Bromomethane	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
2-Butanone	ND	100		µg/L	100	6/14/2023 2:59:57 PM	R97458
Carbon disulfide	ND	100		µg/L	100	6/14/2023 2:59:57 PM	R97458
Carbon tetrachloride	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Chlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Chloroethane	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
Chloroform	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Chloromethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
2-Chlorotoluene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
4-Chlorotoluene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
cis-1,2-DCE	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
cis-1,3-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2-Dibromo-3-chloropropane	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
Dibromochloromethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Dibromomethane	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,3-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,4-Dichlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Dichlorodifluoromethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1-Dichloroethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1-Dichloroethene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Analytical Report

Lab Order 2306415

Date Reported: 6/23/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/7/2023 2:10:00 PM

Lab ID: 2306415-002

Matrix: AIR

Received Date: 6/8/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: RAA
1,2-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,3-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
2,2-Dichloropropane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Hexachlorobutadiene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
2-Hexanone	ND	100		µg/L	100	6/14/2023 2:59:57 PM	R97458
Isopropylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
4-Isopropyltoluene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
4-Methyl-2-pentanone	ND	100		µg/L	100	6/14/2023 2:59:57 PM	R97458
Methylene chloride	ND	30		µg/L	100	6/14/2023 2:59:57 PM	R97458
n-Butylbenzene	ND	30		µg/L	100	6/14/2023 2:59:57 PM	R97458
n-Propylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
sec-Butylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Styrene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
tert-Butylbenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1,1,2-Tetrachloroethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1,2,2-Tetrachloroethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Tetrachloroethene (PCE)	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
trans-1,2-DCE	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
trans-1,3-Dichloropropene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2,3-Trichlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2,4-Trichlorobenzene	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1,1-Trichloroethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,1,2-Trichloroethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Trichloroethene (TCE)	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Trichlorofluoromethane	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
1,2,3-Trichloropropane	ND	20		µg/L	100	6/14/2023 2:59:57 PM	R97458
Vinyl chloride	ND	10		µg/L	100	6/14/2023 2:59:57 PM	R97458
Xylenes, Total	320	15		µg/L	100	6/14/2023 2:59:57 PM	R97458
Surr: Dibromofluoromethane	73.2	70-130		%Rec	100	6/14/2023 2:59:57 PM	R97458
Surr: 1,2-Dichloroethane-d4	79.0	70-130		%Rec	100	6/14/2023 2:59:57 PM	R97458
Surr: Toluene-d8	106	70-130		%Rec	100	6/14/2023 2:59:57 PM	R97458
Surr: 4-Bromofluorobenzene	91.5	70-130		%Rec	100	6/14/2023 2:59:57 PM	R97458

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 22, 2023

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

Work Order: G23060201

Project Name: 2306415

Energy Laboratories Inc. Gillette WY received the following 2 samples for Hall Environmental on 6/9/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G23060201-001	2306415-001B; Influent All Wells	06/06/23 15:05	06/09/23	Gas	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo- Critical Pressure Natural Gas Analysis - Psuedo- Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base
G23060201-002	2306415-002B; influent All Wells	06/07/23 14:10	06/09/23	Gas	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the 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 tests results, please contact your Project Manager.

Report Approved By:



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

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: 2306415
Client Sample ID: 2306415-001B; Influent All Wells
Location:
Lab ID: G23060201-001

Report Date: 06/22/23
Collection Date: 06/06/23 15:05
Date Received: 06/09/23
Sampled By: Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
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NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT

Oxygen	3.829	Mol %		GPA 2261	06/21/23 10:04 / blb
Nitrogen	84.594	Mol %		GPA 2261	06/21/23 10:04 / blb
Carbon Dioxide	10.231	Mol %		GPA 2261	06/21/23 10:04 / blb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
Methane	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
Ethane	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
Propane	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
Isobutane	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
n-Butane	< 0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
Isopentane	0.001	Mol %		GPA 2261	06/21/23 10:04 / blb
n-Pentane	0.003	Mol %		GPA 2261	06/21/23 10:04 / blb
Hexanes plus	1.342	Mol %		GPA 2261	06/21/23 10:04 / blb

GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS

GPM Ethane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM n-Pentane	0.0010	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Hexanes plus	0.5840	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Pentanes plus	0.5860	gal/MCF		GPA 2261	06/21/23 10:04 / blb
GPM Total	0.5860	gal/MCF		GPA 2261	06/21/23 10:04 / blb

CALCULATED PROPERTIES

Calculation Pressure Base	14.730	psia		GPA 2261	06/21/23 10:04 / blb
Calculation Temperature Base	60	°F		GPA 2261	06/21/23 10:04 / blb
Compressibility Factor, Z	0.99900	unitless		GPA 2261	06/21/23 10:04 / blb
Molecular Weight	30.66	unitless		GPA 2261	06/21/23 10:04 / blb
Pseudo-critical Pressure, psia	561	psia		GPA 2261	06/21/23 10:04 / blb
Pseudo-critical Temperature, deg R	272	deg R		GPA 2261	06/21/23 10:04 / blb
Specific Gravity (air=1.000)	1.062	unitless		GPA 2261	06/21/23 10:04 / blb
Gross BTU per cu ft @ std cond, dry	69.21	BTU/cu ft		GPA 2261	06/21/23 10:04 / blb
Gross BTU per cu ft @ std cond, wet	68.01	BTU/cu ft		GPA 2261	06/21/23 10:04 / blb

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

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



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: 2306415
Client Sample ID: 2306415-002B; influent All Wells
Location:
Lab ID: G23060201-002

Report Date: 06/22/23
Collection Date: 06/07/23 14:10
Date Received: 06/09/23
Sampled By: Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
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NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT

Oxygen	8.067	Mol %		GPA 2261	06/21/23 10:19 / blb
Nitrogen	82.670	Mol %		GPA 2261	06/21/23 10:19 / blb
Carbon Dioxide	8.124	Mol %		GPA 2261	06/21/23 10:19 / blb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
Methane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
Ethane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
Propane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
Isobutane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
n-Butane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
Isopentane	< 0.001	Mol %		GPA 2261	06/21/23 10:19 / blb
n-Pentane	0.002	Mol %		GPA 2261	06/21/23 10:19 / blb
Hexanes plus	1.137	Mol %		GPA 2261	06/21/23 10:19 / blb

GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS

GPM Ethane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM n-Pentane	0.0010	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Hexanes plus	0.4950	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Pentanes plus	0.4960	gal/MCF		GPA 2261	06/21/23 10:19 / blb
GPM Total	0.4960	gal/MCF		GPA 2261	06/21/23 10:19 / blb

CALCULATED PROPERTIES

Calculation Pressure Base	14.730	psia		GPA 2261	06/21/23 10:19 / blb
Calculation Temperature Base	60	°F		GPA 2261	06/21/23 10:19 / blb
Compressibility Factor, Z	0.99900	unitless		GPA 2261	06/21/23 10:19 / blb
Molecular Weight	30.36	unitless		GPA 2261	06/21/23 10:19 / blb
Pseudo-critical Pressure, psia	559	psia		GPA 2261	06/21/23 10:19 / blb
Pseudo-critical Temperature, deg R	266	deg R		GPA 2261	06/21/23 10:19 / blb
Specific Gravity (air=1.000)	1.052	unitless		GPA 2261	06/21/23 10:19 / blb
Gross BTU per cu ft @ std cond, dry	58.56	BTU/cu ft		GPA 2261	06/21/23 10:19 / blb
Gross BTU per cu ft @ std cond, wet	57.55	BTU/cu ft		GPA 2261	06/21/23 10:19 / blb

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

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



QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental

Work Order: G23060201

Report Date: 06/22/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261								Analytical Run: R277757		
Lab ID: ICV-2306210937	12 Initial Calibration Verification Standard								06/21/23 09:37	
Oxygen		0.381	Mol %	0.001	95	75	110			
Nitrogen		5.051	Mol %	0.001	101	90	110			
Carbon Dioxide		4.887	Mol %	0.001	98	90	110			
Hydrogen Sulfide		0.132	Mol %	0.001	133	100	136			
Methane		73.295	Mol %	0.001	100	90	110			
Ethane		5.005	Mol %	0.001	101	90	110			
Propane		5.011	Mol %	0.001	100	90	110			
Isobutane		1.984	Mol %	0.001	99	90	110			
n-Butane		1.966	Mol %	0.001	98	90	110			
Isopentane		0.985	Mol %	0.001	98	90	110			
n-Pentane		0.996	Mol %	0.001	100	90	110			
Hexanes plus		0.307	Mol %	0.001	102	90	110			
Lab ID: CCV-2306210945	12 Continuing Calibration Verification Standard								06/21/23 09:45	
Oxygen		0.594	Mol %	0.001	99	90	110			
Nitrogen		1.296	Mol %	0.001	93	85	110			
Carbon Dioxide		0.945	Mol %	0.001	95	90	110			
Hydrogen Sulfide		0.026	Mol %	0.001	104	70	130			
Methane		93.588	Mol %	0.001	100	90	110			
Ethane		1.011	Mol %	0.001	101	90	110			
Propane		1.008	Mol %	0.001	101	90	110			
Isobutane		0.491	Mol %	0.001	98	90	110			
n-Butane		0.490	Mol %	0.001	98	90	110			
Isopentane		0.198	Mol %	0.001	99	90	110			
n-Pentane		0.199	Mol %	0.001	99	90	110			
Hexanes plus		0.154	Mol %	0.001	103	90	110			
Method: GPA 2261								Batch: R277757		
Lab ID: G23060201-001ADUP	12 Sample Duplicate								Run: Varian GC_230621A	
Oxygen		3.822	Mol %	0.001				0.2	10	06/21/23 10:09
Nitrogen		84.561	Mol %	0.001				0	10	
Carbon Dioxide		10.235	Mol %	0.001				0	10	
Hydrogen Sulfide		< 0.001	Mol %	0.001					10	
Methane		< 0.001	Mol %	0.001					10	
Ethane		< 0.001	Mol %	0.001					10	
Propane		< 0.001	Mol %	0.001					10	
Isobutane		< 0.001	Mol %	0.001					10	
n-Butane		< 0.001	Mol %	0.001					10	
Isopentane		0.001	Mol %	0.001				0.0	10	
n-Pentane		0.003	Mol %	0.001				0.0	10	
Hexanes plus		1.378	Mol %	0.001				2.6	10	
Lab ID: G23060201-002ADUP	12 Sample Duplicate								Run: Varian GC_230621A	
Oxygen		8.078	Mol %	0.001				0.1	10	06/21/23 10:23
Nitrogen		82.680	Mol %	0.001				0	10	
Carbon Dioxide		8.109	Mol %	0.001				0.2	10	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental

Work Order: G23060201

Report Date: 06/22/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261									Batch: R277757	
Lab ID: G23060201-002ADUP 12 Sample Duplicate									Run: Varian GC_230621A 06/21/23 10:23	
Hydrogen Sulfide		< 0.001	Mol %	0.001					10	
Methane		< 0.001	Mol %	0.001					10	
Ethane		< 0.001	Mol %	0.001					10	
Propane		< 0.001	Mol %	0.001					10	
Isobutane		< 0.001	Mol %	0.001					10	
n-Butane		< 0.001	Mol %	0.001					10	
Isopentane		< 0.001	Mol %	0.001					10	
n-Pentane		0.002	Mol %	0.001				0.0	10	
Hexanes plus		1.131	Mol %	0.001				0.5	10	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



Trust our People. Trust our Data.
www.energylab.com

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

G23060201

Login completed by: Casey A. Mondle

Date Received: 6/9/2023

Reviewed by: cjohnson

Received by: cam

Reviewed Date: 6/12/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>
Container/Temp Blank temperature:	N/A°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

Standard Reporting Procedures:

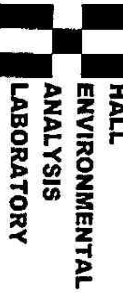
Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

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:

Return cooler fee charges have been split with a subsequent workorder-Chantel S. Johnson 06/12/2023



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

623060201

SUB CONTRACTOR	Energy Labs-Gillette	COMPANY	Energy Laboratories	PHONE	(866) 686-7175	FAX	
ADDRESS	400 W Boxelder Rd			ACCOUNT #		EMAIL	
CITY, STATE, ZIP	Gillette, WY 82718						
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2306415-001B	Influent All Wells	TEDLAR	Air	6/6/2023 3:05:00 PM	1 Fixed Gases	
2	2306415-002B	Influent All Wells	TEDLAR	Air	6/7/2023 2:10:00 PM	1 Fixed Gases	

SPECIAL INSTRUCTIONS/COMMENTS:

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

Submitted By	Date	Time	Received By	Date	Time	REPORT TRANSMITTAL DESIRED
Redempted By	Date	Time	Received By	Date	Time	<input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
Relinquished By	Date	Time	Received By	Date	Time	FOR LAB USE ONLY
TAT:	Standard	RUSH	Next BD	2nd BD	3rd BD	Temp of samples <input type="checkbox"/> Attempt to Cool? <input type="checkbox"/>
Comments						



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

Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2306415

RcptNo: 1

Received By: Tracy Casarrubias 6/8/2023 6:25:00 AM

Completed By: Tracy Casarrubias 6/8/2023 10:18:31 AM

Reviewed By: *OMC* 6/8/23

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: *ju 6/8/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

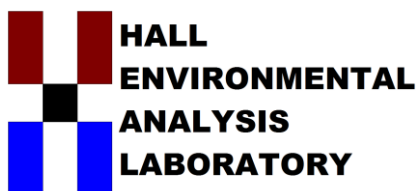
Regarding: _____

Client Instructions: Mailing address, phone number and Email are missing on COC- TMC 6/8/23

16. Additional remarks:

17. Cooler Information

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



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

June 30, 2023

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

RE: Howell M 1

OrderNo.: 2306811

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/15/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2306811

Date Reported: 6/30/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells

Project: Howell M 1

Collection Date: 6/13/2023 2:20:00 PM

Lab ID: 2306811-001

Matrix: AIR

Received Date: 6/15/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	39000	500		µg/L	100	6/21/2023 1:29:27 PM
Surr: BFB	240	15-412		%Rec	100	6/21/2023 1:29:27 PM
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	87	5.0		µg/L	50	6/23/2023 2:35:00 PM
Toluene	430	5.0		µg/L	50	6/23/2023 2:35:00 PM
Ethylbenzene	31	5.0		µg/L	50	6/23/2023 2:35:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2,4-Trimethylbenzene	15	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,3,5-Trimethylbenzene	16	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Naphthalene	ND	10		µg/L	50	6/23/2023 2:35:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	6/23/2023 2:35:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	6/23/2023 2:35:00 PM
Acetone	ND	50		µg/L	50	6/23/2023 2:35:00 PM
Bromobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Bromoform	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Bromomethane	ND	10		µg/L	50	6/23/2023 2:35:00 PM
2-Butanone	ND	50		µg/L	50	6/23/2023 2:35:00 PM
Carbon disulfide	ND	50		µg/L	50	6/23/2023 2:35:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Chlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Chloroethane	ND	10		µg/L	50	6/23/2023 2:35:00 PM
Chloroform	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Chloromethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	6/23/2023 2:35:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Dibromomethane	ND	10		µg/L	50	6/23/2023 2:35:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Page 1 of 2

Analytical Report

Lab Order 2306811

Date Reported: 6/30/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells

Project: Howell M 1

Collection Date: 6/13/2023 2:20:00 PM

Lab ID: 2306811-001

Matrix: AIR

Received Date: 6/15/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,2-Dichloropropane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1-Dichloropropene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
2-Hexanone	ND	50		µg/L	50	6/23/2023 2:35:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	6/23/2023 2:35:00 PM
Methylene chloride	ND	15		µg/L	50	6/23/2023 2:35:00 PM
n-Butylbenzene	ND	15		µg/L	50	6/23/2023 2:35:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Styrene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	6/23/2023 2:35:00 PM
Vinyl chloride	ND	5.0		µg/L	50	6/23/2023 2:35:00 PM
Xylenes, Total	360	7.5		µg/L	50	6/23/2023 2:35:00 PM
Surr: Dibromofluoromethane	98.3	70-130		%Rec	50	6/23/2023 2:35:00 PM
Surr: 1,2-Dichloroethane-d4	89.5	70-130		%Rec	50	6/23/2023 2:35:00 PM
Surr: Toluene-d8	127	70-130		%Rec	50	6/23/2023 2:35:00 PM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	50	6/23/2023 2:35:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Page 2 of 2



ANALYTICAL SUMMARY REPORT

June 22, 2023

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

Work Order: B23061531 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 6/16/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23061531-001	2306811-001B, Influent All Wells	06/13/23 14:20	06/16/23	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:



Trust our People. Trust our Data.
www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23061531-001
Client Sample ID: 2306811-001B, Influent All Wells

Report Date: 06/22/23
Collection Date: 06/13/23 14:20
Date Received: 06/16/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	19.30	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Nitrogen	78.23	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Carbon Dioxide	2.47	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Hexanes plus	<0.01	Mol %		0.01		GPA 2261-95	06/19/23 11:23 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
Hexanes plus	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
GPM Total	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj
GPM Pentanes plus	< 0.001	gpm		0.001		GPA 2261-95	06/19/23 11:23 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	ND		1		GPA 2261-95	06/19/23 11:23 / jrj
Net BTU per cu ft @ std cond. (LHV)	ND		1		GPA 2261-95	06/19/23 11:23 / jrj
Pseudo-critical Pressure, psia	553		1		GPA 2261-95	06/19/23 11:23 / jrj
Pseudo-critical Temperature, deg R	245		1		GPA 2261-95	06/19/23 11:23 / jrj
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	06/19/23 11:23 / jrj
Air, %	88.18		0.01		GPA 2261-95	06/19/23 11:23 / jrj

- The analysis was not corrected for air.

COMMENTS

- 06/19/23 11:23 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23061531

Report Date: 06/22/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R403974	
Lab ID: B23061530-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230619A 06/19/23 10:57	
Oxygen		21.5	Mol %	0.01				0	20	
Nitrogen		77.9	Mol %	0.01				0	20	
Carbon Dioxide		0.64	Mol %	0.01				1.6	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					20	
Lab ID: LCS061923 11 Laboratory Control Sample									Run: GCNGA-B_230619A 06/19/23 12:42	
Oxygen		0.61	Mol %	0.01	122	70	130			
Nitrogen		5.99	Mol %	0.01	100	70	130			
Carbon Dioxide		0.99	Mol %	0.01	100	70	130			
Methane		74.2	Mol %	0.01	99	70	130			
Ethane		6.01	Mol %	0.01	100	70	130			
Propane		5.42	Mol %	0.01	110	70	130			
Isobutane		1.99	Mol %	0.01	99	70	130			
n-Butane		2.00	Mol %	0.01	100	70	130			
Isopentane		1.02	Mol %	0.01	102	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.75	Mol %	0.01	94	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23061531

Login completed by: Yvonna E. Smith

Date Received: 6/16/2023

Reviewed by: cindy

Received by: yes

Reviewed Date: 6/20/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	20.2°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs -Billings		COMPANY:		Energy Laboratories		PHONE:		(406) 869-6253		FAX:		(406) 252-6069	
ADDRESS:		1120 South 27th Street													
CITY, STATE, ZIP:		Billings, MT 59107													
ACCOUNT #:															
EMAIL:															
ANALYTICAL COMMENTS		B23001531													
ITEM		SAMPLE		CLIENT SAMPLE ID		BOTTLE TYPE		MATRIX		COLLECTION DATE		# CONTAINERS			
1		2306811-001B		Influent All Wells		TEDLAR		Air		6/13/2023 2:20:00 PM		1		Natural Gas Analysis, O2, CO2	

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:		Date:		Time:		Received By:		Date:		Time:		REPORT TRANSMITTAL DESIRED:	
Relinquished By:		Date:		Time:		Received By:		Date:		Time:		<input type="checkbox"/> HARDCOPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE	
Relinquished By:		Date:		Time:		Received By:		Date:		Time:		FOR LAB USE ONLY	
TAT:		Standard		RUSH		NA		2nd BD		3rd BD		Temp of samples	
												C Attempt to Cool ?	
												Comments	



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2306811

RcptNo: 1

Received By: Cheyenne Cason 6/15/2023 7:00:00 AM

Completed By: Tracy Casarrubias 6/15/2023 9:55:34 AM

Reviewed By: *mg 6/15/23*

Client

Chain of Custody

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

Log In

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

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *TR 6/15/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: Mailing address, phone number and Email missing on COC- TMC 6/15/23

16. Additional remarks:

17. Cooler Information

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

Chain-of-Custody Record

Client: Hilcorp Energy Co
Kate Kaufman
 Mailing Address:

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

Date: 6-13 Time: 1420 Matrix: Air Sample Name: Influent All Wells

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Howell M#1

Project #:

Project Manager:

Stuart Hyde

Sampler:

Danny BurnsOn Ice: ☐ Yes ☒ No# of Coolers: 1Cooler Temp (including CFI): N/A

(°C)

Container Type and #

2-teller NR

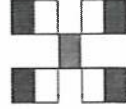
Preservative Type

NR

HEAL No.

2300811001Date: 6-14 Time: 1431Relinquished by: Eddie CarrollDate: 6-14 Time: 1618Relinquished by: Stuart HydeDate: 6-14 Time: 1618Relinquished by: Stuart HydeDate: 6-14 Time: 1618Relinquished by: Stuart HydeReceived by: Stuart HydeVia: HandDate: 6/14/23Time: 1431Received by: One ContVia: HandDate: 6/15/23Time: 0702

Remarks:

BurnsShyneCC: @ensohum.com2 cartons

HALL ENVIRONMENTAL ANALYSIS LABORATORY

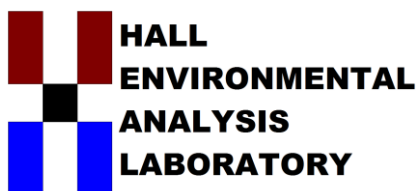
www.hallenvironmental.com

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, NO₃, NO₂, PO₄, SO₄ ☐
 8260 (VOA) ☒ Full List
 8270 (Semi-VOA) ☐
 Total Coliform (Present/Absent) ☒ For Gas O₂ + CO₂



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

July 12, 2023

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

RE: Howell M1

OrderNo.: 2306E15

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/28/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2306E15

Date Reported: 7/12/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent

Project: Howell M1

Collection Date: 6/22/2023 2:25:00 PM

Lab ID: 2306E15-001

Matrix: AIR

Received Date: 6/28/2023 6:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: JJP
Gasoline Range Organics (GRO)	26000	500		µg/L	100	6/30/2023 3:19:35 PM	GA97857
Surr: BFB	164	15-412		%Rec	100	6/30/2023 3:19:35 PM	GA97857
EPA METHOD 8260B: VOLATILES							Analyst: JR
Benzene	42	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Toluene	200	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Ethylbenzene	12	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2,4-Trimethylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,3,5-Trimethylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2-Dichloroethane (EDC)	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2-Dibromoethane (EDB)	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Naphthalene	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
1-Methylnaphthalene	ND	40		µg/L	100	7/6/2023 11:31:12 AM	R97974
2-Methylnaphthalene	ND	40		µg/L	100	7/6/2023 11:31:12 AM	R97974
Acetone	ND	100		µg/L	100	7/6/2023 11:31:12 AM	R97974
Bromobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Bromodichloromethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Bromoform	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Bromomethane	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
2-Butanone	ND	100		µg/L	100	7/6/2023 11:31:12 AM	R97974
Carbon disulfide	ND	100		µg/L	100	7/6/2023 11:31:12 AM	R97974
Carbon tetrachloride	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Chlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Chloroethane	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
Chloroform	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Chloromethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
2-Chlorotoluene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
4-Chlorotoluene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
cis-1,2-DCE	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
cis-1,3-Dichloropropene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2-Dibromo-3-chloropropane	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
Dibromochloromethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Dibromomethane	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2-Dichlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,3-Dichlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,4-Dichlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Dichlorodifluoromethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1-Dichloroethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1-Dichloroethene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 1 of 2

Analytical Report

Lab Order 2306E15

Date Reported: 7/12/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent

Project: Howell M1

Collection Date: 6/22/2023 2:25:00 PM

Lab ID: 2306E15-001

Matrix: AIR

Received Date: 6/28/2023 6:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: JR
1,2-Dichloropropane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,3-Dichloropropane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
2,2-Dichloropropane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1-Dichloropropene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Hexachlorobutadiene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
2-Hexanone	ND	100		µg/L	100	7/6/2023 11:31:12 AM	R97974
Isopropylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
4-Isopropyltoluene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
4-Methyl-2-pentanone	ND	100		µg/L	100	7/6/2023 11:31:12 AM	R97974
Methylene chloride	ND	30		µg/L	100	7/6/2023 11:31:12 AM	R97974
n-Butylbenzene	ND	30		µg/L	100	7/6/2023 11:31:12 AM	R97974
n-Propylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
sec-Butylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Styrene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
tert-Butylbenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1,1,2-Tetrachloroethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1,2,2-Tetrachloroethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Tetrachloroethene (PCE)	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
trans-1,2-DCE	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
trans-1,3-Dichloropropene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2,3-Trichlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2,4-Trichlorobenzene	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1,1-Trichloroethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,1,2-Trichloroethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Trichloroethene (TCE)	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Trichlorofluoromethane	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
1,2,3-Trichloropropane	ND	20		µg/L	100	7/6/2023 11:31:12 AM	R97974
Vinyl chloride	ND	10		µg/L	100	7/6/2023 11:31:12 AM	R97974
Xylenes, Total	120	15		µg/L	100	7/6/2023 11:31:12 AM	R97974
Surr: Dibromofluoromethane	100	70-130		%Rec	100	7/6/2023 11:31:12 AM	R97974
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	100	7/6/2023 11:31:12 AM	R97974
Surr: Toluene-d8	104	70-130		%Rec	100	7/6/2023 11:31:12 AM	R97974
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	100	7/6/2023 11:31:12 AM	R97974

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 2 of 2



ANALYTICAL SUMMARY REPORT

July 06, 2023

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

Work Order: B23062507 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 6/29/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23062507-001	2306E15-001B, Influent	06/22/23 14:25	06/29/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23062507-001
Client Sample ID: 2306E15-001B, Influent

Report Date: 07/06/23
Collection Date: 06/22/23 14:25
Date Received: 06/29/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	20.33	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Nitrogen	77.25	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Carbon Dioxide	1.31	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Hexanes plus	1.11	Mol %		0.01		GPA 2261-95	06/30/23 10:25 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
Hexanes plus	0.468	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
GPM Total	0.468	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj
GPM Pentanes plus	0.468	gpm		0.001		GPA 2261-95	06/30/23 10:25 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	53		1		GPA 2261-95	06/30/23 10:25 / jrj
Net BTU per cu ft @ std cond. (LHV)	49		1		GPA 2261-95	06/30/23 10:25 / jrj
Pseudo-critical Pressure, psia	548		1		GPA 2261-95	06/30/23 10:25 / jrj
Pseudo-critical Temperature, deg R	250		1		GPA 2261-95	06/30/23 10:25 / jrj
Specific Gravity @ 60/60F	1.02		0.001		D3588-81	06/30/23 10:25 / jrj
Air, %	92.88		0.01		GPA 2261-95	06/30/23 10:25 / jrj

- The analysis was not corrected for air.

COMMENTS

-	-	06/30/23 10:25 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23062507

Report Date: 07/06/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R404747	
Lab ID: B23062510-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230630A 06/30/23 12:12	
Oxygen		21.6	Mol %	0.01				0	20	
Nitrogen		77.8	Mol %	0.01				0	20	
Carbon Dioxide		0.38	Mol %	0.01				0.0	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		0.25	Mol %	0.01				4.1	20	
Lab ID: LCS063023 11 Laboratory Control Sample									Run: GCNGA-B_230630A 06/30/23 12:48	
Oxygen		0.59	Mol %	0.01	118	70	130			
Nitrogen		6.05	Mol %	0.01	101	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.4	Mol %	0.01	99	70	130			
Ethane		6.02	Mol %	0.01	100	70	130			
Propane		5.20	Mol %	0.01	105	70	130			
Isobutane		1.99	Mol %	0.01	99	70	130			
n-Butane		2.00	Mol %	0.01	100	70	130			
Isopentane		1.00	Mol %	0.01	100	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.79	Mol %	0.01	99	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23062507

Login completed by: Yvonna E. Smith

Date Received: 6/29/2023

Reviewed by: cindy

Received by: htm

Reviewed Date: 7/5/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	17.8°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs -Billings		COMPANY:	Energy Laboratories		PHONE:	(406) 869-6253	FAX:	(406) 252-6069
ADDRESS:		1120 South 27th Street		ACCOUNT #:						
CITY, STATE, ZIP:		Billings, MT 59107								

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS
1	2306E15-001B	Influent	TEDLAR	Air	6/22/2023 2:25:00 PM	1 Natural Gas Analysis 02, CO2 B23002507

CONTAINERS

1 Natural Gas Analysis 02, CO2

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:	Date:	6/28/2023	Time:	8:52 AM	Received By:	Date:	Time:
Relinquished By:	Date:		Time:		Received By:	Date:	Time:
Relinquished By:	Date:		Time:		Received By:	Date:	Time:

TAT:	Standard	RUSH	Next BD	2nd BD	3rd BD
------	----------	------	---------	--------	--------

REPORT TRANSMITTAL DESIRED:	
<input type="checkbox"/> HARD COPY (extra cost)	<input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
FOR LAB USE ONLY	
Temp of samples	C Attempt to Cool ?
Comments:	



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

Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2306E15

RcptNo: 1

Received By: Tracy Casarrubias 6/28/2023 6:45:00 AM

Completed By: Tracy Casarrubias 6/28/2023 8:51:18 AM

Reviewed By: *mg* 6/28/23

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☐ No ☐ NA ☒
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☐ NA ☒
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐ # of preserved bottles checked for pH: (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐ Adjusted?
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐ Checked by: *mg* 6/28/23

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

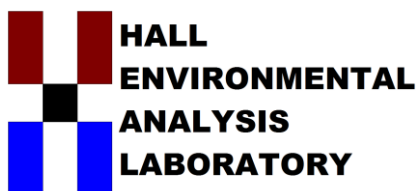
Regarding: _____

Client Instructions: Mailing address, phone number, and Email/Fax are missing on COC- TMC 6/28/23

16. Additional remarks:

17. Cooler Information

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



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

July 18, 2023

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

RE: Howell M1

OrderNo.: 2306G12

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/30/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2306G12

Date Reported: 7/18/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/29/2023 2:20:00 PM

Lab ID: 2306G12-001

Matrix: AIR

Received Date: 6/30/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: KMN
Gasoline Range Organics (GRO)	25000	250		µg/L	50	7/5/2023 2:48:00 PM
Surr: BFB	144	15-412		%Rec	50	7/5/2023 2:48:00 PM
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	46	5.0		µg/L	50	7/12/2023 11:47:00 AM
Toluene	270	5.0		µg/L	50	7/12/2023 11:47:00 AM
Ethylbenzene	19	5.0		µg/L	50	7/12/2023 11:47:00 AM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2,4-Trimethylbenzene	6.9	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,3,5-Trimethylbenzene	7.7	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Naphthalene	ND	10		µg/L	50	7/12/2023 11:47:00 AM
1-Methylnaphthalene	ND	20		µg/L	50	7/12/2023 11:47:00 AM
2-Methylnaphthalene	ND	20		µg/L	50	7/12/2023 11:47:00 AM
Acetone	ND	50		µg/L	50	7/12/2023 11:47:00 AM
Bromobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Bromodichloromethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Bromoform	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Bromomethane	ND	10		µg/L	50	7/12/2023 11:47:00 AM
2-Butanone	ND	50		µg/L	50	7/12/2023 11:47:00 AM
Carbon disulfide	ND	50		µg/L	50	7/12/2023 11:47:00 AM
Carbon tetrachloride	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Chlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Chloroethane	ND	10		µg/L	50	7/12/2023 11:47:00 AM
Chloroform	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Chloromethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
2-Chlorotoluene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
4-Chlorotoluene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
cis-1,2-DCE	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	7/12/2023 11:47:00 AM
Dibromochloromethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Dibromomethane	ND	10		µg/L	50	7/12/2023 11:47:00 AM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Dichlorodifluoromethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1-Dichloroethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1-Dichloroethene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 1 of 2

Analytical Report

Lab Order 2306G12

Date Reported: 7/18/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells

Project: Howell M1

Collection Date: 6/29/2023 2:20:00 PM

Lab ID: 2306G12-001

Matrix: AIR

Received Date: 6/30/2023 6:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,2-Dichloropropane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,3-Dichloropropane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
2,2-Dichloropropane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1-Dichloropropene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Hexachlorobutadiene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
2-Hexanone	ND	50		µg/L	50	7/12/2023 11:47:00 AM
Isopropylbenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
4-Isopropyltoluene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
4-Methyl-2-pentanone	ND	50		µg/L	50	7/12/2023 11:47:00 AM
Methylene chloride	ND	15		µg/L	50	7/12/2023 11:47:00 AM
n-Butylbenzene	ND	15		µg/L	50	7/12/2023 11:47:00 AM
n-Propylbenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
sec-Butylbenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Styrene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
tert-Butylbenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
trans-1,2-DCE	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Trichloroethene (TCE)	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Trichlorofluoromethane	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
1,2,3-Trichloropropane	ND	10		µg/L	50	7/12/2023 11:47:00 AM
Vinyl chloride	ND	5.0		µg/L	50	7/12/2023 11:47:00 AM
Xylenes, Total	210	7.5		µg/L	50	7/12/2023 11:47:00 AM
Surr: Dibromofluoromethane	101	70-130		%Rec	50	7/12/2023 11:47:00 AM
Surr: 1,2-Dichloroethane-d4	93.8	70-130		%Rec	50	7/12/2023 11:47:00 AM
Surr: Toluene-d8	138	70-130	S	%Rec	50	7/12/2023 11:47:00 AM
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	50	7/12/2023 11:47:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 2 of 2



ANALYTICAL SUMMARY REPORT

July 17, 2023

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

Work Order: B23070297 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 7/6/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23070297-001	2306G12-001B, Influent All Wells	06/29/23 14:40	07/06/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23070297-001
Client Sample ID: 2306G12-001B, Influent All Wells

Report Date: 07/17/23
Collection Date: 06/29/23 14:40
Date Received: 07/06/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	20.70	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Nitrogen	77.12	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Carbon Dioxide	0.98	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Hexanes plus	1.20	Mol %		0.01		GPA 2261-95	07/10/23 10:55 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
Hexanes plus	0.506	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
GPM Total	0.506	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj
GPM Pentanes plus	0.506	gpm		0.001		GPA 2261-95	07/10/23 10:55 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	57		1		GPA 2261-95	07/10/23 10:55 / jrj
Net BTU per cu ft @ std cond. (LHV)	53		1		GPA 2261-95	07/10/23 10:55 / jrj
Pseudo-critical Pressure, psia	547		1		GPA 2261-95	07/10/23 10:55 / jrj
Pseudo-critical Temperature, deg R	249		1		GPA 2261-95	07/10/23 10:55 / jrj
Specific Gravity @ 60/60F	1.03		0.001		D3588-81	07/10/23 10:55 / jrj
Air, %	94.57		0.01		GPA 2261-95	07/10/23 10:55 / jrj

- The analysis was not corrected for air.

COMMENTS

- 07/10/23 10:55 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23070297

Report Date: 07/17/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R405186	
Lab ID: B23070297-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230710A 07/10/23 11:21	
Oxygen		20.7	Mol %	0.01				0.1	20	
Nitrogen		77.2	Mol %	0.01				0.1	20	
Carbon Dioxide		0.98	Mol %	0.01				0.0	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		1.07	Mol %	0.01				11	20	
Lab ID: LCS071023 11 Laboratory Control Sample									Run: GCNGA-B_230710A 07/10/23 12:23	
Oxygen		0.61	Mol %	0.01	122	70	130			
Nitrogen		5.97	Mol %	0.01	99	70	130			
Carbon Dioxide		1.01	Mol %	0.01	102	70	130			
Methane		74.2	Mol %	0.01	99	70	130			
Ethane		6.03	Mol %	0.01	100	70	130			
Propane		5.15	Mol %	0.01	104	70	130			
Isobutane		2.02	Mol %	0.01	101	70	130			
n-Butane		2.04	Mol %	0.01	102	70	130			
Isopentane		1.02	Mol %	0.01	102	70	130			
n-Pentane		1.05	Mol %	0.01	105	70	130			
Hexanes plus		0.87	Mol %	0.01	109	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23070297

Login completed by: Yvonna E. Smith

Date Received: 7/6/2023

Reviewed by: gmccartney

Received by: crs

Reviewed Date: 7/15/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	19.5°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs -Billings		COMPANY:	Energy Laboratories		PHONE:	(406) 869-6253		FAX:	(406) 252-6069	
ADDRESS		1120 South 27th Street		ACCOUNT #:								
CITY, STATE, ZIP		Billings, MT 59107										

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS
1	2306G12-001B	Influent All Wells	TEDLAR	Air	6/29/2023 2:20:00 PM	1 Natural Gas Analysis. O2, CO2 B23070297

CONTAINERS

1 Natural Gas Analysis. O2, CO2

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED	HARDCOPY (extra cost)	FAX	EMAIL	ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY				
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Temp of samples				
TAT:			Standard			C Attempt to Cool ?				
						Comments:				



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2306G12

RcptNo: 1

Received By: Tracy Casarrubias 6/30/2023 6:25:00 AM

Completed By: Tracy Casarrubias 6/30/2023 7:30:22 AM

Reviewed By: *TM 6/30/23*

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

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *SCM 06/30/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: Mailing address, phone number and Email/Fax are missing on COC- TMC 6/30/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	NA	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy Co
 Attn: Kate Kaufman
 Mailing Address: _____

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

Date: 6-29-23 Time: 14:20 Matrix: Air Sample Name: Influent All Wells

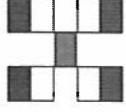
Turn-Around Time: ☒ Standard ☐ Rush
 Project Name: Howell M#1
 Project #: _____

Project Manager: Stuart Hyde
 Sampler: Danny Burns
 On Ice: ☐ Yes ☒ No
 # of Coolers: 1
 Cooler Temp (including CF): N/A (°C)

Container Type and # 2-1L cooler Preservative Type N/A HEAL No. 23060612

Date: 6-29-23 Time: 1504 Relinquished by: [Signature]
 Date: 6-29-23 Time: 1824 Relinquished by: [Signature]

Received by: [Signature] Date: 6/29/23 Time: 1504
 Received by: [Signature] Date: 6/29/23 Time: 1824



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

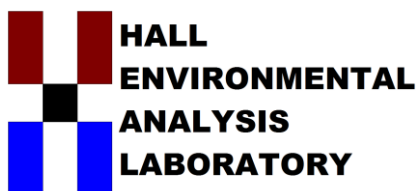
4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

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

Remarks: burns
 CC: dhennemann Perseolum
zmyers .com



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

July 21, 2023

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

RE: Howell M 1

OrderNo.: 2307628

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 7/14/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2307628

Date Reported: 7/21/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 7/13/2023 12:55:00 PM

Lab ID: 2307628-001

Matrix: AIR

Received Date: 7/14/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE							Analyst: CCM
Gasoline Range Organics (GRO)	25000	250		µg/L	1	7/14/2023 3:29:00 PM	G98239
Surr: BFB	103	70-130		%Rec	1	7/14/2023 3:29:00 PM	G98239
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	51	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Toluene	360	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Ethylbenzene	28	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2,4-Trimethylbenzene	11	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,3,5-Trimethylbenzene	11	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Naphthalene	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
1-Methylnaphthalene	ND	20		µg/L	50	7/14/2023 3:29:00 PM	R98239
2-Methylnaphthalene	ND	20		µg/L	50	7/14/2023 3:29:00 PM	R98239
Acetone	ND	50		µg/L	50	7/14/2023 3:29:00 PM	R98239
Bromobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Bromodichloromethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Bromoform	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Bromomethane	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
2-Butanone	ND	50		µg/L	50	7/14/2023 3:29:00 PM	R98239
Carbon disulfide	ND	50		µg/L	50	7/14/2023 3:29:00 PM	R98239
Carbon tetrachloride	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Chlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Chloroethane	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
Chloroform	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Chloromethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
2-Chlorotoluene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
4-Chlorotoluene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
cis-1,2-DCE	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
Dibromochloromethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Dibromomethane	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2-Dichlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,3-Dichlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,4-Dichlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Dichlorodifluoromethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1-Dichloroethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1-Dichloroethene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 1 of 2

Analytical Report

Lab Order 2307628

Date Reported: 7/21/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 7/13/2023 12:55:00 PM

Lab ID: 2307628-001

Matrix: AIR

Received Date: 7/14/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
1,2-Dichloropropane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,3-Dichloropropane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
2,2-Dichloropropane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1-Dichloropropene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Hexachlorobutadiene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
2-Hexanone	ND	50		µg/L	50	7/14/2023 3:29:00 PM	R98239
Isopropylbenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
4-Isopropyltoluene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
4-Methyl-2-pentanone	ND	50		µg/L	50	7/14/2023 3:29:00 PM	R98239
Methylene chloride	ND	15		µg/L	50	7/14/2023 3:29:00 PM	R98239
n-Butylbenzene	ND	15		µg/L	50	7/14/2023 3:29:00 PM	R98239
n-Propylbenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
sec-Butylbenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Styrene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
tert-Butylbenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
trans-1,2-DCE	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1,1-Trichloroethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,1,2-Trichloroethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Trichloroethene (TCE)	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Trichlorofluoromethane	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
1,2,3-Trichloropropane	ND	10		µg/L	50	7/14/2023 3:29:00 PM	R98239
Vinyl chloride	ND	5.0		µg/L	50	7/14/2023 3:29:00 PM	R98239
Xylenes, Total	320	7.5		µg/L	50	7/14/2023 3:29:00 PM	R98239
Surr: Dibromofluoromethane	102	70-130		%Rec	50	7/14/2023 3:29:00 PM	R98239
Surr: 1,2-Dichloroethane-d4	93.4	70-130		%Rec	50	7/14/2023 3:29:00 PM	R98239
Surr: Toluene-d8	142	70-130	S	%Rec	50	7/14/2023 3:29:00 PM	R98239
Surr: 4-Bromofluorobenzene	122	70-130		%Rec	50	7/14/2023 3:29:00 PM	R98239

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

July 20, 2023

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

Work Order: B23071208 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 7/18/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23071208-001	2307628-001B, Howell M#1 Influent	07/13/23 12:55	07/18/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23071208-001
Client Sample ID: 2307628-001B, Howell M#1 Influent

Report Date: 07/20/23
Collection Date: 07/13/23 12:55
Date Received: 07/18/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.38	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Nitrogen	77.44	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Carbon Dioxide	0.49	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Methane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Ethane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Propane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Hexanes plus	0.69	Mol %		0.01		GPA 2261-95	07/19/23 09:40 / ikc
Propane	< 0.001	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
Hexanes plus	0.291	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
GPM Total	0.291	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc
GPM Pentanes plus	0.291	gpm		0.001		GPA 2261-95	07/19/23 09:40 / ikc

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	33		1		GPA 2261-95	07/19/23 09:40 / ikc
Net BTU per cu ft @ std cond. (LHV)	30		1		GPA 2261-95	07/19/23 09:40 / ikc
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	07/19/23 09:40 / ikc
Pseudo-critical Temperature, deg R	245		1		GPA 2261-95	07/19/23 09:40 / ikc
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	07/19/23 09:40 / ikc
Air, %	97.70		0.01		GPA 2261-95	07/19/23 09:40 / ikc

- The analysis was not corrected for air.

COMMENTS

- 07/19/23 09:40 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23071208

Report Date: 07/20/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R405676	
Lab ID: B23071208-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230719A 07/19/23 10:05	
Oxygen		21.4	Mol %	0.01				0.1	20	
Nitrogen		77.5	Mol %	0.01				0	20	
Carbon Dioxide		0.48	Mol %	0.01				2.1	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		0.65	Mol %	0.01				6.0	20	
Lab ID: LCS071923 11 Laboratory Control Sample									Run: GCNGA-B_230719A 07/19/23 15:40	
Oxygen		0.60	Mol %	0.01	120	70	130			
Nitrogen		5.99	Mol %	0.01	100	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.4	Mol %	0.01	99	70	130			
Ethane		6.04	Mol %	0.01	101	70	130			
Propane		5.27	Mol %	0.01	107	70	130			
Isobutane		1.99	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		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.75	Mol %	0.01	94	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23071208

Login completed by: Leslie S. Cadreau

Date Received: 7/18/2023

Reviewed by: gmccartney

Received by: lel

Reviewed Date: 7/19/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	22.6°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs - Billings		COMPANY	Energy Laboratories		PHONE	(406) 869-6253	FAX	(406) 252-6069
ADDRESS		1120 South 27th Street		ACCOUNT #						
CITY, STATE, ZIP		Billings, MT 59107								

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS
1	2307628-001B	Howell M#1 Influent	TEDLAR	Air	7/13/2023 12:55:00 PM	1 **5 DAY TAT** Natural Gas Analysis 02,CO2

B23071208

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	HARDCOPY (extra cost) FAX EMAIL ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY
TAT:			Temp of samples			Attempt to Cool?
			Comments:			



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

Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2307628

RcptNo: 1

Received By: Tracy Casarrubias 7/14/2023 6:30:00 AM

Completed By: Tracy Casarrubias 7/14/2023 7:00:09 AM

Reviewed By: *[Signature]* 7-14-23

Chain of Custody

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

Log In

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

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *jr 7/14/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

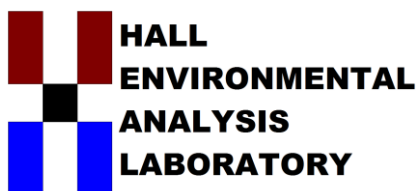
Regarding: _____

Client Instructions: Mailing address, phone number, and Email/Fax are missing on COC- TMC 7/14/23

16. Additional remarks:

17. Cooler Information

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



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

August 10, 2023

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

RE: Howell M1

OrderNo.: 2307D98

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 7/28/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2307D98

Date Reported: 8/10/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M1

Collection Date: 7/27/2023 1:40:00 PM

Lab ID: 2307D98-001

Matrix: AIR

Received Date: 7/28/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	49	5.0		µg/L	50	8/2/2023 2:02:00 PM
Toluene	340	5.0		µg/L	50	8/2/2023 2:02:00 PM
Ethylbenzene	27	5.0		µg/L	50	8/2/2023 2:02:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2,4-Trimethylbenzene	11	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,3,5-Trimethylbenzene	12	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Naphthalene	ND	10		µg/L	50	8/2/2023 2:02:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	8/2/2023 2:02:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	8/2/2023 2:02:00 PM
Acetone	ND	50		µg/L	50	8/2/2023 2:02:00 PM
Bromobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Bromoform	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Bromomethane	ND	10		µg/L	50	8/2/2023 2:02:00 PM
2-Butanone	ND	50		µg/L	50	8/2/2023 2:02:00 PM
Carbon disulfide	ND	50		µg/L	50	8/2/2023 2:02:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Chlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Chloroethane	ND	10		µg/L	50	8/2/2023 2:02:00 PM
Chloroform	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Chloromethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	8/2/2023 2:02:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Dibromomethane	ND	10		µg/L	50	8/2/2023 2:02:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Page 1 of 2

Analytical Report

Lab Order 2307D98

Date Reported: 8/10/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M1

Collection Date: 7/27/2023 1:40:00 PM

Lab ID: 2307D98-001

Matrix: AIR

Received Date: 7/28/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
2-Hexanone	ND	50		µg/L	50	8/2/2023 2:02:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	8/2/2023 2:02:00 PM
Methylene chloride	ND	15		µg/L	50	8/2/2023 2:02:00 PM
n-Butylbenzene	ND	15		µg/L	50	8/2/2023 2:02:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Styrene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	8/2/2023 2:02:00 PM
Vinyl chloride	ND	5.0		µg/L	50	8/2/2023 2:02:00 PM
Xylenes, Total	310	7.5		µg/L	50	8/2/2023 2:02:00 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	50	8/2/2023 2:02:00 PM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	50	8/2/2023 2:02:00 PM
Surr: Toluene-d8	141	70-130	S	%Rec	50	8/2/2023 2:02:00 PM
Surr: 4-Bromofluorobenzene	130	70-130		%Rec	50	8/2/2023 2:02:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	24000	250		µg/L	50	8/2/2023 2:02:00 PM
Surr: BFB	98.6	70-130		%Rec	50	8/2/2023 2:02:00 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 SUMMARY REPORT

August 09, 2023

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

Work Order: B23080296 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 8/2/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23080296-001	2307D98-001B, Howell M#1 Influent	07/27/23 13:40	08/02/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23080296-001
Client Sample ID: 2307D98-001B, Howell M#1 Influent

Report Date: 08/09/23
Collection Date: 07/27/23 13:40
Date Received: 08/02/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	20.97	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Nitrogen	77.40	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Carbon Dioxide	0.72	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Hexanes plus	0.91	Mol %		0.01		GPA 2261-95	08/03/23 09:33 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
Hexanes plus	0.383	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
GPM Total	0.383	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj
GPM Pentanes plus	0.383	gpm		0.001		GPA 2261-95	08/03/23 09:33 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	43		1		GPA 2261-95	08/03/23 09:33 / jrj
Net BTU per cu ft @ std cond. (LHV)	40		1		GPA 2261-95	08/03/23 09:33 / jrj
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	08/03/23 09:33 / jrj
Pseudo-critical Temperature, deg R	247		1		GPA 2261-95	08/03/23 09:33 / jrj
Specific Gravity @ 60/60F	1.02		0.001		D3588-81	08/03/23 09:33 / jrj
Air, %	95.79		0.01		GPA 2261-95	08/03/23 09:33 / jrj

- The analysis was not corrected for air.

COMMENTS

- 08/03/23 09:33 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23080296

Report Date: 08/09/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R406457	
Lab ID: B23080296-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230803A 08/03/23 10:00	
Oxygen		21.0	Mol %	0.01				0.1	20	
Nitrogen		77.4	Mol %	0.01				0.1	20	
Carbon Dioxide		0.72	Mol %	0.01				0.0	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		0.97	Mol %	0.01				6.4	20	
Lab ID: LCS080323 11 Laboratory Control Sample									Run: GCNGA-B_230803A 08/03/23 12:42	
Oxygen		0.59	Mol %	0.01	118	70	130			
Nitrogen		5.92	Mol %	0.01	99	70	130			
Carbon Dioxide		1.01	Mol %	0.01	102	70	130			
Methane		74.3	Mol %	0.01	99	70	130			
Ethane		6.07	Mol %	0.01	101	70	130			
Propane		5.16	Mol %	0.01	105	70	130			
Isobutane		2.02	Mol %	0.01	101	70	130			
n-Butane		2.03	Mol %	0.01	101	70	130			
Isopentane		1.03	Mol %	0.01	103	70	130			
n-Pentane		1.04	Mol %	0.01	104	70	130			
Hexanes plus		0.82	Mol %	0.01	103	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23080296

Login completed by: Leslie S. Cadreau

Date Received: 8/2/2023

Reviewed by: gmccartney

Received by: yes

Reviewed Date: 8/4/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	23.4°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs -Billings		COMPANY		Energy Laboratories		PHONE		(406) 869-6253		FAX		(406) 252-6069	
ADDRESS		1120 South 27th Street										ACCOUNT #			
CITY, STATE, ZIP		Billings, MT 59107													

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS
1	2307D98-001B	Howell M#1 Influent	TEDLAR	Air	7/27/2023 1:40:00 PM	1 **5 DAY TAT** Natural Gas Analysis- CO2 +02 <i>323080296</i>

CONTAINERS

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:	Date:	Time:	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED:	
<i>[Signature]</i>	7/28/2023	9:06 AM	<i>[Signature]</i>	8/2/23	09:25	<input type="checkbox"/> HARDCOPY (extra cost)	<input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY	
			<i>[Signature]</i>	8/2/23	09:25	Temp of samples	°C Attempt to Cool ?
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Comments:	
			<i>[Signature]</i>	8/2/23	09:25		



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2307D98

RcptNo: 1

Received By: Tracy Casarrubias 7/28/2023 7:00:00 AM

Completed By: Tracy Casarrubias 7/28/2023 9:04:59 AM

Reviewed By: *[Signature]* 7-28-23

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

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *SCM 07/28/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

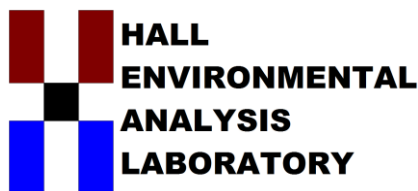
Regarding: _____

Client Instructions: Mailing address, phone number, and Email/Fax are missing on COC- TMC 7/28/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	N/A	Good	Yes			



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

August 25, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Howell M 1

OrderNo.: 2308659

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 1 sample(s) on 8/11/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman".

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2308659

Date Reported: 8/25/2023

CLIENT: HILCORP ENERGY

Client Sample ID: Influent

Project: Howell M 1

Collection Date: 8/9/2023 11:48:00 AM

Lab ID: 2308659-001

Matrix: AIR

Received Date: 8/11/2023 6:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	34	5.0		µg/L	50	8/14/2023 1:04:00 PM
Toluene	230	5.0		µg/L	50	8/14/2023 1:04:00 PM
Ethylbenzene	16	5.0		µg/L	50	8/14/2023 1:04:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2,4-Trimethylbenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,3,5-Trimethylbenzene	5.0	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Naphthalene	ND	10		µg/L	50	8/14/2023 1:04:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	8/14/2023 1:04:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	8/14/2023 1:04:00 PM
Acetone	ND	50		µg/L	50	8/14/2023 1:04:00 PM
Bromobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Bromoform	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Bromomethane	ND	10		µg/L	50	8/14/2023 1:04:00 PM
2-Butanone	ND	50		µg/L	50	8/14/2023 1:04:00 PM
Carbon disulfide	ND	50		µg/L	50	8/14/2023 1:04:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Chlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Chloroethane	ND	10		µg/L	50	8/14/2023 1:04:00 PM
Chloroform	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Chloromethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	8/14/2023 1:04:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Dibromomethane	ND	10		µg/L	50	8/14/2023 1:04:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2308659

Date Reported: 8/25/2023

CLIENT: HILCORP ENERGY

Client Sample ID: Influent

Project: Howell M 1

Collection Date: 8/9/2023 11:48:00 AM

Lab ID: 2308659-001

Matrix: AIR

Received Date: 8/11/2023 6:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
2-Hexanone	ND	50		µg/L	50	8/14/2023 1:04:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	8/14/2023 1:04:00 PM
Methylene chloride	ND	15		µg/L	50	8/14/2023 1:04:00 PM
n-Butylbenzene	ND	15		µg/L	50	8/14/2023 1:04:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Styrene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	8/14/2023 1:04:00 PM
Vinyl chloride	ND	5.0		µg/L	50	8/14/2023 1:04:00 PM
Xylenes, Total	180	7.5		µg/L	50	8/14/2023 1:04:00 PM
Surr: Dibromofluoromethane	106	70-130		%Rec	50	8/14/2023 1:04:00 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	50	8/14/2023 1:04:00 PM
Surr: Toluene-d8	132	70-130	S	%Rec	50	8/14/2023 1:04:00 PM
Surr: 4-Bromofluorobenzene	126	70-130		%Rec	50	8/14/2023 1:04:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	17000	250		µg/L	50	8/14/2023 1:04:00 PM
Surr: BFB	92.8	70-130		%Rec	50	8/14/2023 1:04:00 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 SUMMARY REPORT

August 24, 2023

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

Work Order: B23081529 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 8/15/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23081529-001	2308659-001B, Influent	08/09/23 11:48	08/15/23	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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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23081529-001
Client Sample ID: 2308659-001B, Influent

Report Date: 08/24/23
Collection Date: 08/09/23 11:48
Date Received: 08/15/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.35	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Nitrogen	77.36	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Carbon Dioxide	0.60	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Hexanes plus	0.69	Mol %		0.01		GPA 2261-95	08/17/23 12:10 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
Hexanes plus	0.291	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
GPM Total	0.291	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj
GPM Pentanes plus	0.291	gpm		0.001		GPA 2261-95	08/17/23 12:10 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	33		1		GPA 2261-95	08/17/23 12:10 / jrj
Net BTU per cu ft @ std cond. (LHV)	30		1		GPA 2261-95	08/17/23 12:10 / jrj
Pseudo-critical Pressure, psia	547		1		GPA 2261-95	08/17/23 12:10 / jrj
Pseudo-critical Temperature, deg R	245		1		GPA 2261-95	08/17/23 12:10 / jrj
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	08/17/23 12:10 / jrj
Air, %	97.57		0.01		GPA 2261-95	08/17/23 12:10 / jrj

- The analysis was not corrected for air.

COMMENTS

- 08/17/23 12:10 / 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 RL - Analyte Reporting Limit
Definitions: 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: B23081529

Report Date: 08/24/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R407236	
Lab ID: B23081332-018ADUP 12 Sample Duplicate									Run: GCNGA-B_230817A 08/17/23 10:08	
Oxygen		14.2	Mol %	0.01				0.0	20	
Nitrogen		52.5	Mol %	0.01				0.2	20	
Carbon Dioxide		0.17	Mol %	0.01				0.0	20	
Hydrogen Sulfide		<0.01	Mol %	0.01					20	
Methane		30.7	Mol %	0.01				0.3	20	
Ethane		1.51	Mol %	0.01				0.0	20	
Propane		0.37	Mol %	0.01				0.0	20	
Isobutane		0.14	Mol %	0.01				0.0	20	
n-Butane		0.22	Mol %	0.01				0.0	20	
Isopentane		0.08	Mol %	0.01				0.0	20	
n-Pentane		0.05	Mol %	0.01				0.0	20	
Hexanes plus		0.08	Mol %	0.01				13	20	
Lab ID: LCS081723 11 Laboratory Control Sample									Run: GCNGA-B_230817A 08/17/23 15:02	
Oxygen		0.60	Mol %	0.01	120	70	130			
Nitrogen		6.04	Mol %	0.01	101	70	130			
Carbon Dioxide		0.99	Mol %	0.01	100	70	130			
Methane		74.2	Mol %	0.01	99	70	130			
Ethane		6.01	Mol %	0.01	100	70	130			
Propane		5.31	Mol %	0.01	108	70	130			
Isobutane		1.99	Mol %	0.01	99	70	130			
n-Butane		2.01	Mol %	0.01	100	70	130			
Isopentane		1.01	Mol %	0.01	101	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.78	Mol %	0.01	98	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

B23081529

Login completed by: Leslie S. Cadreau

Date Received: 8/15/2023

Reviewed by: lleprorowse

Received by: lel

Reviewed Date: 8/19/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	22.4°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs - Billings		COMPANY	Energy Laboratories		PHONE:	(406) 869-6253		FAX:	(406) 252-6069	
ADDRESS		1120 South 27th Street										
CITY, STATE, ZIP		Billings, MT 59107										
ACCOUNT #												
ANALYTICAL COMMENTS												
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS						
1	2308659-001B	Influent	TEDLAR	Air	8/9/2023 11:48:00 AM	1 Natural Gas Analysis - O2+ CO2						
823081529												

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By:	Time	Date	Received By:	Time	Date	REPORT TRANSMITTAL DESIRED:	
Relinquished By:	Time	Date	Received By:	Time	Date	HARDCOPY (extra cost)	EMAIL
Relinquished By:	Time	Date	Received By:	Time	Date	FOR LAB USE ONLY	
TAT: Standard				RUSH		Temp of samples	Attempt to Cool ?
				Next BD		Comments	
				2nd BD			
				3rd BD			
				Date		Time	
				8/15/23		08:20	
				Signature			

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308659

25-Aug-23

Client: HILCORP ENERGY

Project: Howell M 1

Sample ID: 2308659-001adup		SampType: DUP		TestCode: EPA Method 8260B: Volatiles						
Client ID: Influent		Batch ID: R98960		RunNo: 98960						
Prep Date:		Analysis Date: 8/14/2023		SeqNo: 3606424		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	34	5.0						0.175	20	
Toluene	230	5.0						0.751	20	
Ethylbenzene	16	5.0						0.979	20	
Methyl tert-butyl ether (MTBE)	ND	5.0						0	20	
1,2,4-Trimethylbenzene	ND	5.0						0	20	
1,3,5-Trimethylbenzene	5.2	5.0						3.34	20	
1,2-Dichloroethane (EDC)	ND	5.0						0	20	
1,2-Dibromoethane (EDB)	ND	5.0						0	20	
Naphthalene	ND	10						0	20	
1-Methylnaphthalene	ND	20						0	20	
2-Methylnaphthalene	ND	20						0	20	
Acetone	ND	50						0	20	
Bromobenzene	ND	5.0						0	20	
Bromodichloromethane	ND	5.0						0	20	
Bromoform	ND	5.0						0	20	
Bromomethane	ND	10						0	20	
2-Butanone	ND	50						0	20	
Carbon disulfide	ND	50						0	20	
Carbon tetrachloride	ND	5.0						0	20	
Chlorobenzene	ND	5.0						0	20	
Chloroethane	ND	10						0	20	
Chloroform	ND	5.0						0	20	
Chloromethane	ND	5.0						0	20	
2-Chlorotoluene	ND	5.0						0	20	
4-Chlorotoluene	ND	5.0						0	20	
cis-1,2-DCE	ND	5.0						0	20	
cis-1,3-Dichloropropene	ND	5.0						0	20	
1,2-Dibromo-3-chloropropane	ND	10						0	20	
Dibromochloromethane	ND	5.0						0	20	
Dibromomethane	ND	10						0	20	
1,2-Dichlorobenzene	ND	5.0						0	20	
1,3-Dichlorobenzene	ND	5.0						0	20	
1,4-Dichlorobenzene	ND	5.0						0	20	
Dichlorodifluoromethane	ND	5.0						0	20	
1,1-Dichloroethane	ND	5.0						0	20	
1,1-Dichloroethene	ND	5.0						0	20	
1,2-Dichloropropane	ND	5.0						0	20	
1,3-Dichloropropane	ND	5.0						0	20	
2,2-Dichloropropane	ND	5.0						0	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

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

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

Page 3 of 5

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308659

25-Aug-23

Client: HILCORP ENERGY

Project: Howell M 1

Sample ID: 2308659-001adup	SampType: DUP	TestCode: EPA Method 8260B: Volatiles								
Client ID: Influent	Batch ID: R98960	RunNo: 98960								
Prep Date:	Analysis Date: 8/14/2023	SeqNo: 3606424	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	5.0						0	20	
Hexachlorobutadiene	ND	5.0						0	20	
2-Hexanone	ND	50						0	20	
Isopropylbenzene	ND	5.0						0	20	
4-Isopropyltoluene	ND	5.0						0	20	
4-Methyl-2-pentanone	ND	50						0	20	
Methylene chloride	ND	15						0	20	
n-Butylbenzene	ND	15						0	20	
n-Propylbenzene	ND	5.0						0	20	
sec-Butylbenzene	ND	5.0						0	20	
Styrene	ND	5.0						0	20	
tert-Butylbenzene	ND	5.0						0	20	
1,1,1,2-Tetrachloroethane	ND	5.0						0	20	
1,1,2,2-Tetrachloroethane	ND	5.0						0	20	
Tetrachloroethene (PCE)	ND	5.0						0	20	
trans-1,2-DCE	ND	5.0						0	20	
trans-1,3-Dichloropropene	ND	5.0						0	20	
1,2,3-Trichlorobenzene	ND	5.0						0	20	
1,2,4-Trichlorobenzene	ND	5.0						0	20	
1,1,1-Trichloroethane	ND	5.0						0	20	
1,1,2-Trichloroethane	ND	5.0						0	20	
Trichloroethene (TCE)	ND	5.0						0	20	
Trichlorofluoromethane	ND	5.0						0	20	
1,2,3-Trichloropropane	ND	10						0	20	
Vinyl chloride	ND	5.0						0	20	
Xylenes, Total	180	7.5						2.18	20	
Surr: Dibromofluoromethane	54		50.00		108	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	51		50.00		102	70	130	0	0	
Surr: Toluene-d8	65		50.00		131	70	130	0	0	S
Surr: 4-Bromofluorobenzene	63		50.00		125	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308659

25-Aug-23

Client: HILCORP ENERGY

Project: Howell M 1

Sample ID: 2308659-001adup	SampType: DUP	TestCode: EPA Method 8015D: Gasoline Range
Client ID: Influent	Batch ID: G98960	RunNo: 98960
Prep Date:	Analysis Date: 8/14/2023	SeqNo: 3606455 Units: µg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Gasoline Range Organics (GRO)	17000	250
Surr: BFB	46000	50000 92.7 70 130 0 0

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

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

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2308659

RcptNo: 1

Received By: Tracy Casarrubias 8/11/2023 6:15:00 AM

Completed By: Tracy Casarrubias 8/11/2023 7:14:25 AM

Reviewed By: *JA 8-11-23*

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: *SCM 08/11/23*

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

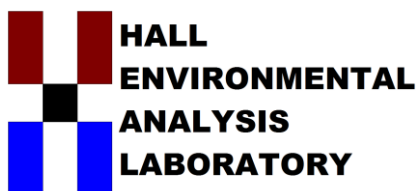
Regarding: _____

Client Instructions: Mailing address and phone number are missing on COC- TMC 8/11/23

16. Additional remarks:

17. Cooler Information

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



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

September 07, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Howell M 1

OrderNo.: 2308E03

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 1 sample(s) on 8/25/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2308E03

Date Reported: 9/7/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 8/24/2023 12:00:00 PM

Lab ID: 2308E03-001

Matrix: AIR

Received Date: 8/25/2023 7:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	32	5.0		µg/L	50	8/30/2023 2:35:00 PM
Toluene	230	5.0		µg/L	50	8/30/2023 2:35:00 PM
Ethylbenzene	19	5.0		µg/L	50	8/30/2023 2:35:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2,4-Trimethylbenzene	6.0	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,3,5-Trimethylbenzene	6.9	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Naphthalene	ND	10		µg/L	50	8/30/2023 2:35:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	8/30/2023 2:35:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	8/30/2023 2:35:00 PM
Acetone	ND	50		µg/L	50	8/30/2023 2:35:00 PM
Bromobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Bromoform	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Bromomethane	ND	10		µg/L	50	8/30/2023 2:35:00 PM
2-Butanone	ND	50		µg/L	50	8/30/2023 2:35:00 PM
Carbon disulfide	ND	50		µg/L	50	8/30/2023 2:35:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Chlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Chloroethane	ND	10		µg/L	50	8/30/2023 2:35:00 PM
Chloroform	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Chloromethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	8/30/2023 2:35:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Dibromomethane	ND	10		µg/L	50	8/30/2023 2:35:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Page 1 of 5

Analytical Report

Lab Order 2308E03

Date Reported: 9/7/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 8/24/2023 12:00:00 PM

Lab ID: 2308E03-001

Matrix: AIR

Received Date: 8/25/2023 7:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
2-Hexanone	ND	50		µg/L	50	8/30/2023 2:35:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	8/30/2023 2:35:00 PM
Methylene chloride	ND	15		µg/L	50	8/30/2023 2:35:00 PM
n-Butylbenzene	ND	15		µg/L	50	8/30/2023 2:35:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Styrene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	8/30/2023 2:35:00 PM
Vinyl chloride	ND	5.0		µg/L	50	8/30/2023 2:35:00 PM
Xylenes, Total	220	7.5		µg/L	50	8/30/2023 2:35:00 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	50	8/30/2023 2:35:00 PM
Surr: 1,2-Dichloroethane-d4	96.4	70-130		%Rec	50	8/30/2023 2:35:00 PM
Surr: Toluene-d8	124	70-130		%Rec	50	8/30/2023 2:35:00 PM
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	50	8/30/2023 2:35:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	16000	250		µg/L	50	8/30/2023 2:35:00 PM
Surr: BFB	100	70-130		%Rec	50	8/30/2023 2:35:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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



ANALYTICAL SUMMARY REPORT

September 06, 2023

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

Work Order: B23082662 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 8/29/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23082662-001	2308E03-001B, Howell M#1 Influent	08/24/23 12:00	08/29/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23082662-001
Client Sample ID: 2308E03-001B, Howell M#1 Influent

Report Date: 09/06/23
Collection Date: 08/24/23 12:00
Date Received: 08/29/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.40	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Nitrogen	77.46	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Carbon Dioxide	0.55	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Hexanes plus	0.59	Mol %		0.01		GPA 2261-95	08/30/23 09:10 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
Hexanes plus	0.249	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
GPM Total	0.249	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj
GPM Pentanes plus	0.249	gpm		0.001		GPA 2261-95	08/30/23 09:10 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	28		1		GPA 2261-95	08/30/23 09:10 / jrj
Net BTU per cu ft @ std cond. (LHV)	26		1		GPA 2261-95	08/30/23 09:10 / jrj
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	08/30/23 09:10 / jrj
Pseudo-critical Temperature, deg R	244		1		GPA 2261-95	08/30/23 09:10 / jrj
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	08/30/23 09:10 / jrj
Air, %	97.77		0.01		GPA 2261-95	08/30/23 09:10 / jrj

- The analysis was not corrected for air.

COMMENTS

-	-	08/30/23 09:10 / 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: B23082662

Report Date: 09/06/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R408000	
Lab ID: B23082662-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230830A 08/30/23 09:44	
Oxygen		21.4	Mol %	0.01				0.1	20	
Nitrogen		77.4	Mol %	0.01				0.1	20	
Carbon Dioxide		0.54	Mol %	0.01				1.8	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		0.66	Mol %	0.01				11	20	
Lab ID: LCS083023 11 Laboratory Control Sample									Run: GCNGA-B_230830A 08/30/23 12:42	
Oxygen		0.62	Mol %	0.01	124	70	130			
Nitrogen		6.05	Mol %	0.01	101	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.2	Mol %	0.01	99	70	130			
Ethane		6.02	Mol %	0.01	100	70	130			
Propane		5.37	Mol %	0.01	109	70	130			
Isobutane		1.99	Mol %	0.01	99	70	130			
n-Butane		2.01	Mol %	0.01	100	70	130			
Isopentane		1.00	Mol %	0.01	100	70	130			
n-Pentane		1.00	Mol %	0.01	100	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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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23082662

Login completed by: Lyndsi E. LeProwse

Date Received: 8/29/2023

Reviewed by: darcy

Received by: dnh

Reviewed Date: 8/30/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	24.2°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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

SUB CONTRACTOR		Energy Labs - Billings		COMPANY:	Energy Laboratories		PHONE:	(406) 869-6253	FAX:	(406) 252-6069
ADDRESS		1120 South 27th Street		ACCOUNT #:						
CITY, STATE, ZIP		Billings, MT 59107								

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS
1	2308E03-001B	Howell M#1 Influent	TEDLAR	Air	8/24/2023 12:00:00 PM	1 **5 DAY TAT** Natural Gas Analysis, 02+CO2 B23082662

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By	Date	Time	Received By	Date	Time	REPORT TRANSMITTAL DESIRED:	FOR LAB USE ONLY
Relinquished By	8/25/2023	8:05 AM	Received By	8/29/23	12:00	HARDCOPY (extra cost)	Temp of samples
Relinquished By			Received By			FAX	Attempt to Cool?
TAT:						Comments	ONLINE

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308E03

07-Sep-23

Client: HILCORP ENERGY

Project: Howell M 1

Sample ID: 2308E03-001adup	SampType: DUP	TestCode: EPA Method 8260B: Volatiles								
Client ID: Howell M#1 Influent	Batch ID: R99345	RunNo: 99345								
Prep Date:	Analysis Date: 8/30/2023	SeqNo: 3626080			Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	34	5.0						4.40	20	
Toluene	240	5.0						2.09	20	
Ethylbenzene	19	5.0						1.32	20	
Methyl tert-butyl ether (MTBE)	ND	5.0						0	20	
1,2,4-Trimethylbenzene	5.8	5.0						3.05	20	
1,3,5-Trimethylbenzene	6.6	5.0						3.86	20	
1,2-Dichloroethane (EDC)	ND	5.0						0	20	
1,2-Dibromoethane (EDB)	ND	5.0						0	20	
Naphthalene	ND	10						0	20	
1-Methylnaphthalene	ND	20						0	20	
2-Methylnaphthalene	ND	20						0	20	
Acetone	ND	50						0	20	
Bromobenzene	ND	5.0						0	20	
Bromodichloromethane	ND	5.0						0	20	
Bromoform	ND	5.0						0	20	
Bromomethane	ND	10						0	20	
2-Butanone	ND	50						0	20	
Carbon disulfide	ND	50						0	20	
Carbon tetrachloride	ND	5.0						0	20	
Chlorobenzene	ND	5.0						0	20	
Chloroethane	ND	10						0	20	
Chloroform	ND	5.0						0	20	
Chloromethane	ND	5.0						0	20	
2-Chlorotoluene	ND	5.0						0	20	
4-Chlorotoluene	ND	5.0						0	20	
cis-1,2-DCE	ND	5.0						0	20	
cis-1,3-Dichloropropene	ND	5.0						0	20	
1,2-Dibromo-3-chloropropane	ND	10						0	20	
Dibromochloromethane	ND	5.0						0	20	
Dibromomethane	ND	10						0	20	
1,2-Dichlorobenzene	ND	5.0						0	20	
1,3-Dichlorobenzene	ND	5.0						0	20	
1,4-Dichlorobenzene	ND	5.0						0	20	
Dichlorodifluoromethane	ND	5.0						0	20	
1,1-Dichloroethane	ND	5.0						0	20	
1,1-Dichloroethene	ND	5.0						0	20	
1,2-Dichloropropane	ND	5.0						0	20	
1,3-Dichloropropane	ND	5.0						0	20	
2,2-Dichloropropane	ND	5.0						0	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

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

Page 3 of 5

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308E0307-Sep-23

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: 2308E03-001adup		SampType: DUP		TestCode: EPA Method 8260B: Volatiles						
Client ID:	Howell M#1 Influent	Batch ID: R99345		RunNo: 99345						
Prep Date:		Analysis Date: 8/30/2023		SeqNo: 3626080			Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	5.0						0	20	
Hexachlorobutadiene	ND	5.0						0	20	
2-Hexanone	ND	50						0	20	
Isopropylbenzene	ND	5.0						0	20	
4-Isopropyltoluene	ND	5.0						0	20	
4-Methyl-2-pentanone	ND	50						0	20	
Methylene chloride	ND	15						0	20	
n-Butylbenzene	ND	15						0	20	
n-Propylbenzene	ND	5.0						0	20	
sec-Butylbenzene	ND	5.0						0	20	
Styrene	ND	5.0						0	20	
tert-Butylbenzene	ND	5.0						0	20	
1,1,1,2-Tetrachloroethane	ND	5.0						0	20	
1,1,2,2-Tetrachloroethane	ND	5.0						0	20	
Tetrachloroethene (PCE)	ND	5.0						0	20	
trans-1,2-DCE	ND	5.0						0	20	
trans-1,3-Dichloropropene	ND	5.0						0	20	
1,2,3-Trichlorobenzene	ND	5.0						0	20	
1,2,4-Trichlorobenzene	ND	5.0						0	20	
1,1,1-Trichloroethane	ND	5.0						0	20	
1,1,2-Trichloroethane	ND	5.0						0	20	
Trichloroethene (TCE)	ND	5.0						0	20	
Trichlorofluoromethane	ND	5.0						0	20	
1,2,3-Trichloropropane	ND	10						0	20	
Vinyl chloride	ND	5.0						0	20	
Xylenes, Total	220	7.5						0.266	20	
Surr: Dibromofluoromethane	52		50.00		104	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	49		50.00		97.4	70	130	0	0	
Surr: Toluene-d8	61		50.00		123	70	130	0	0	
Surr: 4-Bromofluorobenzene	62		50.00		123	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

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

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

Page 4 of 5

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2308E03
07-Sep-23

Client: HILCORP ENERGY
Project: Howell M 1

Sample ID: 2308E03-001adup		SampType: DUP		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: Howell M#1 Influent		Batch ID: G99345		RunNo: 99345						
Prep Date:		Analysis Date: 8/30/2023		SeqNo: 3625901		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	17000	250						2.30	20	
Surr: BFB	50000		50000		100	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

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

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

Page 5 of 5



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2308E03

RcptNo: 1

Received By: Juan Rojas

8/25/2023 7:10:00 AM

Completed By: Tracy Casarrubias

8/25/2023 8:01:15 AM

Reviewed By: *JR 8-25-23*

Juan Rojas

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 $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☐ NA ☒

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

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

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *scm 8/25/23*

Special Handling (if applicable)

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

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

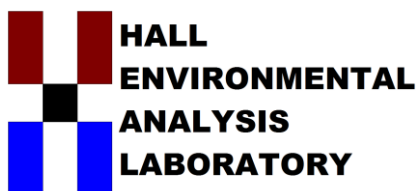
Regarding: _____

Client Instructions: Mailing address, phone number, and Email/Fax are missing on COC- TMC 8/25/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	N/A	Good	Yes			



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

September 28, 2023

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

RE: Howell M 1

OrderNo.: 2309464

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/9/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2309464

Date Reported: 9/28/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell Influent

Project: Howell M 1

Collection Date: 9/8/2023 12:40:00 PM

Lab ID: 2309464-001

Matrix: AIR

Received Date: 9/9/2023 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	23	5.0		µg/L	50	9/14/2023 2:18:00 PM
Toluene	250	5.0		µg/L	50	9/14/2023 2:18:00 PM
Ethylbenzene	25	5.0		µg/L	50	9/14/2023 2:18:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2,4-Trimethylbenzene	11	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,3,5-Trimethylbenzene	12	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Naphthalene	ND	10		µg/L	50	9/14/2023 2:18:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	9/14/2023 2:18:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	9/14/2023 2:18:00 PM
Acetone	ND	50		µg/L	50	9/14/2023 2:18:00 PM
Bromobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Bromoform	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Bromomethane	ND	10		µg/L	50	9/14/2023 2:18:00 PM
2-Butanone	ND	50		µg/L	50	9/14/2023 2:18:00 PM
Carbon disulfide	ND	50		µg/L	50	9/14/2023 2:18:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Chlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Chloroethane	ND	10		µg/L	50	9/14/2023 2:18:00 PM
Chloroform	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Chloromethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	9/14/2023 2:18:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Dibromomethane	ND	10		µg/L	50	9/14/2023 2:18:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Analytical Report

Lab Order 2309464

Date Reported: 9/28/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell Influent

Project: Howell M 1

Collection Date: 9/8/2023 12:40:00 PM

Lab ID: 2309464-001

Matrix: AIR

Received Date: 9/9/2023 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
2-Hexanone	ND	50		µg/L	50	9/14/2023 2:18:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	9/14/2023 2:18:00 PM
Methylene chloride	ND	15		µg/L	50	9/14/2023 2:18:00 PM
n-Butylbenzene	ND	15		µg/L	50	9/14/2023 2:18:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Styrene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	9/14/2023 2:18:00 PM
Vinyl chloride	ND	5.0		µg/L	50	9/14/2023 2:18:00 PM
Xylenes, Total	290	7.5		µg/L	50	9/14/2023 2:18:00 PM
Surr: Dibromofluoromethane	81.9	70-130		%Rec	50	9/14/2023 2:18:00 PM
Surr: 1,2-Dichloroethane-d4	74.4	70-130		%Rec	50	9/14/2023 2:18:00 PM
Surr: Toluene-d8	119	70-130		%Rec	50	9/14/2023 2:18:00 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	50	9/14/2023 2:18:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	18000	250		µg/L	50	9/14/2023 2:18:00 PM
Surr: BFB	94.0	70-130		%Rec	50	9/14/2023 2:18:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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



ANALYTICAL SUMMARY REPORT

September 28, 2023

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

Work Order: B23090882 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 9/12/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23090882-001	2309464-001B, Howell Influent	09/08/23 12:40	09/12/23	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:



Trust our People. Trust our Data.
www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23090882-001
Client Sample ID: 2309464-001B, Howell Influent

Report Date: 09/28/23
Collection Date: 09/08/23 12:40
Date Received: 09/12/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.48	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Nitrogen	77.52	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Carbon Dioxide	0.46	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Hexanes plus	0.54	Mol %		0.01		GPA 2261-95	09/13/23 11:45 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
Hexanes plus	0.228	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
GPM Total	0.228	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj
GPM Pentanes plus	0.228	gpm		0.001		GPA 2261-95	09/13/23 11:45 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	26		1		GPA 2261-95	09/13/23 11:45 / jrj
Net BTU per cu ft @ std cond. (LHV)	24		1		GPA 2261-95	09/13/23 11:45 / jrj
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	09/13/23 11:45 / jrj
Pseudo-critical Temperature, deg R	244		1		GPA 2261-95	09/13/23 11:45 / jrj
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	09/13/23 11:45 / jrj
Air, %	98.12		0.01		GPA 2261-95	09/13/23 11:45 / jrj

- The analysis was not corrected for air.

COMMENTS

-					-	09/13/23 11:45 / 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: B23090882

Report Date: 09/28/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R408732	
Lab ID: B23090881-001ADUP			12 Sample Duplicate			Run: GCNGA-B_230913A			09/13/23 11:18	
Oxygen		21.7	Mol %	0.01				0.1	20	
Nitrogen		78.1	Mol %	0.01				0	20	
Carbon Dioxide		0.20	Mol %	0.01				0.0	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					20	
Lab ID: LCS091323			11 Laboratory Control Sample			Run: GCNGA-B_230913A			09/13/23 15:06	
Oxygen		0.59	Mol %	0.01	118	70	130			
Nitrogen		5.89	Mol %	0.01	98	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.4	Mol %	0.01	100	70	130			
Ethane		6.02	Mol %	0.01	100	70	130			
Propane		5.23	Mol %	0.01	106	70	130			
Isobutane		2.00	Mol %	0.01	100	70	130			
n-Butane		2.00	Mol %	0.01	100	70	130			
Isopentane		0.99	Mol %	0.01	99	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.84	Mol %	0.01	105	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

Work Order Receipt Checklist

Hall Environmental

B23090882

Login completed by: Leslie S. Cadreau

Date Received: 9/12/2023

Reviewed by: gmccartney

Received by: lel

Reviewed Date: 9/16/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	18.6°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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: 505-245-3975
FAX: 505-245-4107
Website: www.hallenvironmental.com

SUB CONTRACTOR: Energy Labs -Billings		COMPANY: Energy Laboratories		PHONE:	FAX: (406) 869-6253	FAX: (406) 252-6069
ADDRESS: 1120 South 27th Street				ACCOUNT #:		
CITY, STATE, ZIP: Billings, MT 59107						

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2309464-001B	Howell Influent	TEDLAR	Air	9/8/2023 12:40:00 PM	1	Natural Gas Analysis- 02+C02 <i>B23090882</i>

SPECIAL INSTRUCTIONS/COMMENTS:

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

Relinquished By: <i>Car</i>	Date: 9/9/2023	Time: 10:29 AM	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE FOR LAB USE ONLY Temp of samples _____ °C Attempt to Cool ? _____ Comments: _____
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By: <i>Sybil Robinson</i>	Date: <i>9/12/23</i>	Time: <i>05:05</i>	

TAT: Standard <input checked="" type="checkbox"/> RUSH	Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>
--	--



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2309464

RcptNo: 1

Received By: Cheyenne Cason

9/9/2023 9:30:00 AM

Handwritten signature

Completed By: Cheyenne Cason

9/9/2023 10:27:39 AM

Handwritten signature

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

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: *Ume* 9/9/23

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

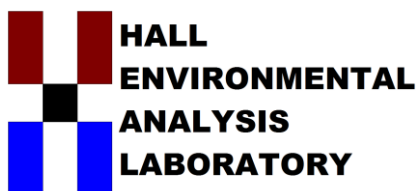
Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	N/A	Good	Yes	NA		



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

October 03, 2023

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

RE: Howell M 1

OrderNo.: 2309D09

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/23/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2309D09

Date Reported: 10/3/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 9/21/2023 11:55:00 AM

Lab ID: 2309D09-001

Matrix: AIR

Received Date: 9/23/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	25	5.0		µg/L	50	9/25/2023 3:13:00 PM
Toluene	240	5.0		µg/L	50	9/25/2023 3:13:00 PM
Ethylbenzene	22	5.0		µg/L	50	9/25/2023 3:13:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2,4-Trimethylbenzene	8.2	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,3,5-Trimethylbenzene	9.4	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Naphthalene	ND	10		µg/L	50	9/25/2023 3:13:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	9/25/2023 3:13:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	9/25/2023 3:13:00 PM
Acetone	ND	50		µg/L	50	9/25/2023 3:13:00 PM
Bromobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Bromoform	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Bromomethane	ND	10		µg/L	50	9/25/2023 3:13:00 PM
2-Butanone	ND	50		µg/L	50	9/25/2023 3:13:00 PM
Carbon disulfide	ND	50		µg/L	50	9/25/2023 3:13:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Chlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Chloroethane	ND	10		µg/L	50	9/25/2023 3:13:00 PM
Chloroform	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Chloromethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	9/25/2023 3:13:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Dibromomethane	ND	10		µg/L	50	9/25/2023 3:13:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.

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

Analytical Report

Lab Order 2309D09

Date Reported: 10/3/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Howell M#1 Influent

Project: Howell M 1

Collection Date: 9/21/2023 11:55:00 AM

Lab ID: 2309D09-001

Matrix: AIR

Received Date: 9/23/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
2-Hexanone	ND	50		µg/L	50	9/25/2023 3:13:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	9/25/2023 3:13:00 PM
Methylene chloride	ND	15		µg/L	50	9/25/2023 3:13:00 PM
n-Butylbenzene	ND	15		µg/L	50	9/25/2023 3:13:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Styrene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	9/25/2023 3:13:00 PM
Vinyl chloride	ND	5.0		µg/L	50	9/25/2023 3:13:00 PM
Xylenes, Total	260	7.5		µg/L	50	9/25/2023 3:13:00 PM
Surr: Dibromofluoromethane	86.3	70-130		%Rec	50	9/25/2023 3:13:00 PM
Surr: 1,2-Dichloroethane-d4	80.5	70-130		%Rec	50	9/25/2023 3:13:00 PM
Surr: Toluene-d8	118	70-130		%Rec	50	9/25/2023 3:13:00 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	50	9/25/2023 3:13:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	18000	250		µg/L	50	9/25/2023 3:13:00 PM
Surr: BFB	93.8	70-130		%Rec	50	9/25/2023 3:13:00 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 SUMMARY REPORT

October 02, 2023

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

Work Order: B23092176 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 9/26/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23092176-001	2309D09-001B, Howell M#1 Influent	09/21/23 11:55	09/26/23	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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www.energylab.com

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

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B23092176-001
Client Sample ID: 2309D09-001B, Howell M#1 Influent

Report Date: 10/02/23
Collection Date: 09/21/23 11:55
Date Received: 09/26/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.48	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Nitrogen	77.60	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Carbon Dioxide	0.48	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Methane	0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Hexanes plus	0.43	Mol %		0.01		GPA 2261-95	09/27/23 10:52 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
Hexanes plus	0.181	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
GPM Total	0.181	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj
GPM Pentanes plus	0.181	gpm		0.001		GPA 2261-95	09/27/23 10:52 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	21		1		GPA 2261-95	09/27/23 10:52 / jrj
Net BTU per cu ft @ std cond. (LHV)	19		1		GPA 2261-95	09/27/23 10:52 / jrj
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	09/27/23 10:52 / jrj
Pseudo-critical Temperature, deg R	243		1		GPA 2261-95	09/27/23 10:52 / jrj
Specific Gravity @ 60/60F	1.01		0.001		D3588-81	09/27/23 10:52 / jrj
Air, %	98.15		0.01		GPA 2261-95	09/27/23 10:52 / jrj

- The analysis was not corrected for air.

COMMENTS

-	-	09/27/23 10:52 / 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: B23092176

Report Date: 10/02/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R409565	
Lab ID: B23092155-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230927A 09/27/23 09:43	
Oxygen		21.9	Mol %	0.01				0	20	
Nitrogen		78.1	Mol %	0.01				0	20	
Carbon Dioxide		0.05	Mol %	0.01				0.0	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					20	
Lab ID: LCS092723 11 Laboratory Control Sample									Run: GCNGA-B_230927A 09/27/23 15:27	
Oxygen		0.62	Mol %	0.01	124	70	130			
Nitrogen		6.02	Mol %	0.01	100	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.3	Mol %	0.01	99	70	130			
Ethane		6.04	Mol %	0.01	101	70	130			
Propane		5.35	Mol %	0.01	108	70	130			
Isobutane		1.98	Mol %	0.01	99	70	130			
n-Butane		1.98	Mol %	0.01	99	70	130			
Isopentane		1.02	Mol %	0.01	102	70	130			
n-Pentane		1.00	Mol %	0.01	100	70	130			
Hexanes plus		0.73	Mol %	0.01	91	70	130			

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

B23092176

Login completed by: Addison A. Gilbert

Date Received: 9/26/2023

Reviewed by: gmccartney

Received by: dnh

Reviewed Date: 9/27/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	17.4°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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: 505-345-3973
FAX: 505-345-4107
Website: www.hallenvironmental.com

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	2309D09-001B	Howell M#1 Influent	TEDLAR	Air	9/21/2023 11:55:00 AM
# CONTAINERS: 1					Natural Gas analysis *5 Day TAT*
ANALYTICAL COMMENTS					

923092155
B23092176 AG 26 Sep 23

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By: <i>MLC</i>	Date: 9/25/2023	Time: 9:24 AM	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By: <i>[Signature]</i>	Date: 9/25/2023	Time: 9:24 AM	
TAT: Standard <input type="checkbox"/>			RUSH <input checked="" type="checkbox"/>		FOR LAB USE ONLY	
			Next BD <input type="checkbox"/>		Temp of samples: <input type="checkbox"/> Attempt to Cool? <input type="checkbox"/>	
			2nd BD <input type="checkbox"/>		Comments:	
			3rd BD <input type="checkbox"/>			



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2309D09

RcptNo: 1

Received By: Juan Rojas

9/23/2023 7:00:00 AM

Juan Rojas

Completed By: Cheyenne Cason

9/25/2023 9:19:52 AM

Cheyenne Cason

Reviewed By:

SCM 9/25/23

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Client

Log In

3. Was an attempt made to cool the samples? Yes ☐ No ☐ NA ☒

4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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:

7/24/25/23

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:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	NA	Good	Yes	NA		



APPENDIX D

NMOCD Correspondence

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Kate Kaufman](#); [Matt Henderson](#); [Devin Hencmann](#)
Subject: Re: [EXTERNAL] Hare 14M and Howell M#1 Quarterly Reports
Date: Wednesday, July 5, 2023 7:51:15 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-qf0i1snp.png](#)

[**EXTERNAL EMAIL**]

Good morning Stuart,

Thanks for the correspondence. Hilcorp can submit the first quarterly report summarizing both Q2 and Q3 activities (due October 15, 2023).

Hilcorp must submit quarterly reports similar to the current active SVE sites, no later than the 15th in April (1Q), July (2Q), October (3Q), and January (4Q).

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

Regards,

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



From: Stuart Hyde <shyde@ensolum.com>
Sent: Monday, July 3, 2023 12:05 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Kate Kaufman <kkaufman@hilcorp.com>; Matt Henderson <mhenderson@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] Hare 14M and Howell M#1 Quarterly Reports

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

Nelson,

Two things I wanted to clarify regarding the quarterly reports for the Hare 14M and Howell M#1 sites.

1. Both systems were started at the beginning of June and we only have a few data points for the second quarter 2023. Can we submit the first quarterly report summarizing both Q2 and Q3 activities? Or should we prepare a Q2 2023 report for the June data?
2. I did not see due dates associated with the quarterly reports in the conditions of approval. When are the quarterly reports due after the end of the subject quarter?

Thanks and happy 4th!



Stuart Hyde, LG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

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 275359

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 275359
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. Please see App ID 333281 for most updated status.	7/3/2024