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REVIEWED
By Nelson Velez at 8:58 am, Jan 26, 2023

1. Follow the recommendations provided.
2. OCD will require quarterly report for 2023. Next report due no later than April 28, 2023.
3. Since the system was re-started in December 2021, OCD will accept bi-annual (twice a year) reporting initiating in 2024.

January 13, 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: Fourth Quarter 2022 – SVE System Update
Sullivan GC D #1E
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NCS1518952648

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Fourth Quarter 2022 – SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the Sullivan GC D #1E natural gas production well (Site), located in Unit F of Section 26, Township 29 North, Range 11 West in San Juan County, New Mexico (Figure 1). Specifically, this report summarizes Site activities performed in October, November, and December of 2022 to the New Mexico Oil Conservation Division (NMOCD).

SVE SYSTEM SPECIFICATIONS

The original SVE system was installed at the Site in April 2016 by XTO Energy, the previous Site owner, in response to a release originating from a broken fiberglass line used to transfer natural gas condensate. The original SVE system was purchased from Geotech Environmental Equipment, Inc. (Geotech) and operated successfully until the summer of 2018. Due to a broken SVE blower motor, the Site's SVE system did not operate between 2018 and March of 2022; however, a rental SVE system was brought onto the Site and began operation on December 2, 2021. The blower motor from the original Geotech system was replaced on March 21, 2022 and the Geotech SVE system was put back into service.

The current Geotech SVE system is configured with vacuum applied to wells PR-1, MW-01, MW-02, MW-05, and MW-06 (shown on Figure 2). The SVE system consists of a 3 horsepower Rotron Model EN656 regenerative blower capable of producing 212 standard cubic feet per minute (scfm) of flow and 73 inches of water column (IWC) vacuum. The layout of the SVE system and piping is shown on Figure 2.

FOURTH QUARTER 2022 ACTIVITIES

During the fourth quarter of 2022, Ensolum and Hilcorp personnel performed bi-weekly operation and maintenance (O&M) visits to verify the system was operating as designed and to perform any required maintenance. Field notes taken during O&M visits are presented in Appendix A. During the fourth quarter of 2022, all SVE wells (PR-1, MW-01, MW-02, MW-05, and MW-06) were operated in order to induce air flow through impacted soil within the source area. Between September 22 and December 10, 2022, the SVE system operated for 1,899.9 hours, with a runtime efficiency of 100 percent (%). Appendix B

presents photographs of the runtime meter for calculating the fourth quarter runtime efficiency. Table 1 presents the SVE system operational hours and percent runtime.

A fourth quarter emissions sample was collected from the SVE system on December 10, 2022 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 photoionization detector (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), located in Albuquerque, New Mexico, for analysis of total volatile petroleum hydrocarbons (TVPH, also referred to 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 Processor Association (GPS) Method 2261. Table 2 presents a summary of analytical data collected during this sampling event and previous sampling events, with the full laboratory analytical report included in Appendix C.

Since the system was restarted in December 2021, there has been a significant decline in BTEX and TVPH concentrations detected in the emissions sample collected from the system. This decline was first suspected to be caused by a cracked joint in the SVE piping allowing ambient air to enter the system and effectively dilute the emissions sample. However, based on a thorough evaluation of the system piping and other components, as well as the relatively stable concentrations detected between March and December 2022, it appears that the subsurface concentrations have been reduced since the system was restarted in December 2021. Additionally, concentrations of phase separated hydrocarbons (PSH) detected in wells PR-1, PR-2, and MW01 through MW05 have been reduced between September 2021 and December 2022, as noted during quarterly groundwater monitoring activities conducted by Hilcorp (reported to the NMOCD under a separate annual report summarizing groundwater monitoring activities at the Site). Specifically, PSH has been reduced from a thickness of 0.99 feet in September 2021 to trace/non-detectable levels in October and December 2022.

Emission sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE system (Table 3). Based on these estimates, 89,113 pounds (45 tons) of TVPH have been removed by the system to date.

RECOMMENDATIONS

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

We appreciate the opportunity to provide this report to the 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
Senior Managing Geologist
(303) 887-2946
dmoir@ensolum.com

Attachments:

Figure 1	Site Location
Figure 2	SVE System Layout
Table 1	Soil Vapor Extraction System Runtime Calculations
Table 2	Soil Vapor Extraction System Emission Analytical Results
Table 3	Soil Vapor Extraction System Mass Removal and Emissions
Appendix A	Field Notes
Appendix B	Project Photographs
Appendix C	Laboratory Analytical Reports

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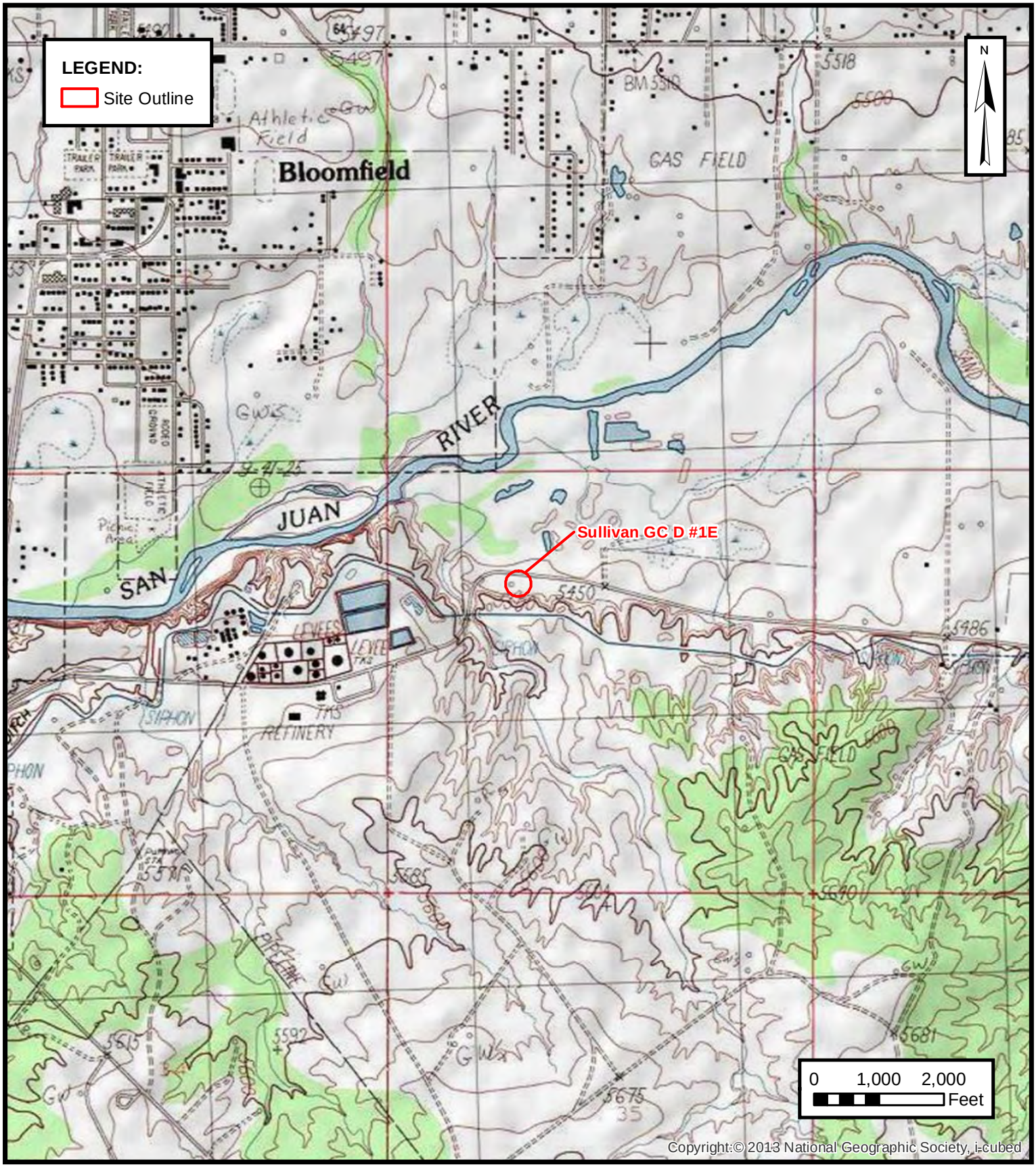
FIGURES



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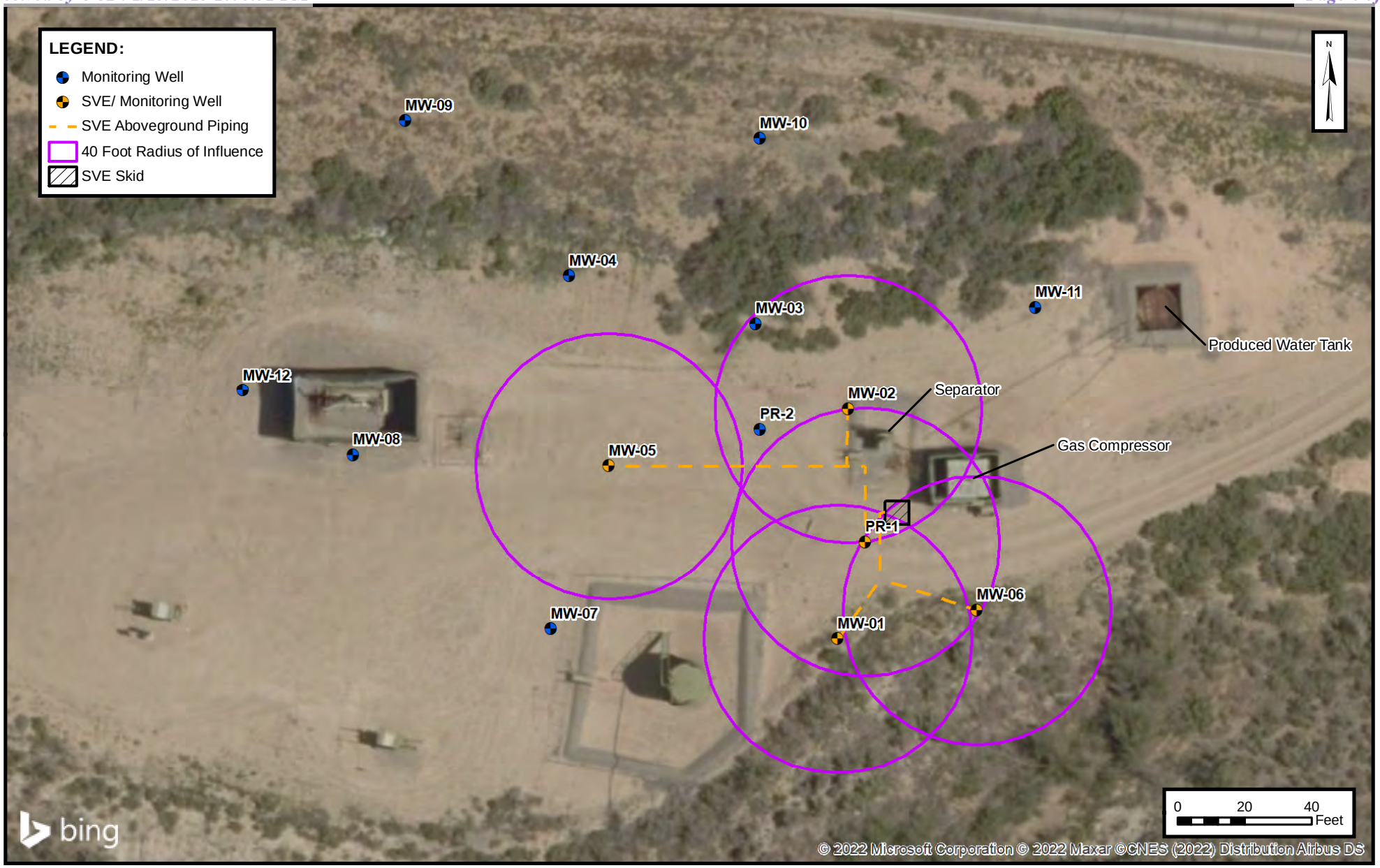
Environmental & Hydrogeologic Consultants

SITE LOCATION

HILLCORP ENERGY COMPANY
SULLIVAN GC D #1E
San Juan County, New Mexico
36.885855° N, 107.899525° W

PROJECT NUMBER: 07A1988029

FIGURE
1



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Environmental & Hydrogeologic Consultants

SVE SYSTEM LAYOUT

HILCORP ENERGY COMPANY
SULLIVAN GC D #1E
San Juan County, New Mexico
36.885855° N, 107.899525° W

PROJECT NUMBER:07A1988029

FIGURE

2

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TABLES

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TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS
Hilcorp Energy Company - Sullivan GC D#1E
San Juan County, New Mexico

Ensolum Project No. 07A1988029

Permanent Geotech SVE Skid Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	% Runtime
9/22/2022	4,440.8	--	--	--
12/10/2022	6,340.7	1,899.9	79	100%

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TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS
Hilcorp Energy Company - Sullivan GC D#1E
San Juan County, New Mexico

Ensolum Project No. 07A1988029

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
4/18/2016	--	840	1,900	87	840	140,000	--	--
4/20/2016	2,375	840	1,900	87	840	140,000	--	--
4/29/2017	3,520	280	1,000	64	630	65,000	--	--
8/11/2016	4,215	92	700	90	910	23,000	--	--
1/24/2018	2,837	46	140	<5.0	410	21,000	--	--
6/29/2018	3,000	63	210	<5.0	410	27,000	--	--
12/2/2021	741	15	<5.0	<5.0	99	33,000	--	--
3/16/2022	982	<0.10	<0.10	<0.10	1.1	64	19.4	1.23
6/17/2022	327	<0.10	<0.10	<0.10	0.25	10	21.5	0.29
9/22/2022	266	<0.10	<0.10	<0.10	<0.15	<5.0	20.6	1.00
12/10/2022	68	0.75	4.9	0.49	9.0	490	21.0	0.65

Notes:

GRO: gasoline range hydrocarbons

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled

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

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TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS
Hilcorp Energy Company - Sullivan GC D #1E
San Juan County, New Mexico

Ensolum Project No. 07A1988029

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
4/18/2016	--	840	1,900	87	840	140,000
4/20/2016	2,375	840	1,900	87	840	140,000
4/29/2017	3,520	280	1,000	64	630	65,000
8/11/2016	4,215	92	700	90	910	23,000
1/24/2018	2,837	46	140	*5.0*	410	21,000
6/29/2018	3,000	63	210	*5.0*	410	27,000
12/2/2021	741	15	*5.0*	*5.0*	99	33,000
3/16/2022	982	*0.10*	*0.10*	*0.10*	1.1	64
6/17/2022	327	*0.10*	*0.10*	*0.10*	0.25	10
9/22/2022	266	*0.10*	*0.10*	*0.10*	*0.15*	*5.0*
12/10/2022	68	0.75	4.9	0.49	9.0	490
Average	1,833	198	533	31	377	40,870

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)
4/18/2016	90	0	0	0.28	0.64	0.029	0.28	47
4/20/2016	109	313,920	313,920	0.34	0.77	0.035	0.34	57
4/29/2017	90	1,480,320	1,166,400	0.19	0.49	0.025	0.25	35
8/11/2016	70	6,923,520	5,443,200	0.049	0.22	0.020	0.20	12
1/24/2018	60	--	--	0.015	0.094	0.011	0.15	4.9
6/29/2018	41	53,246,160	46,322,640	0.0084	0.027	0.001	0.063	3.7
12/2/2021	**Rental SVE System Startup**							
12/2/2021	49	53,246,160	0	0	0	0	0	0
3/16/2022	49	60,581,754	7,335,594	0.0014	0.00047	0.00047	0.0092	3.0
6/17/2022	80	70,724,634	10,142,880	0.000030	0.000030	0.000030	0.0002	0.011
9/22/2022	68	80,221,650	9,497,016	0.000025	0.000025	0.000025	0.000051	0.0019
12/10/2022	80	89,341,170	9,119,520	0.00013	0.00075	0.000088	0.0014	0.074
Average				0.081	0.20	0.011	0.12	15

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
4/18/2016	0	0	0.0	0.0	0.0	0.0	0.0	0.0
4/20/2016	48	48	16	37	1.7	16	2,740	1.4
4/29/2017	264	216	41	105	5.5	53	7,452	3.7
8/11/2016	1,560	1,296	63	288	26	261	14,929	7.5
1/24/2018	--	--	--	--	--	--	--	--
6/29/2018	16,848	15,288	128	410	12	961	56,264	28
12/2/2021	**Rental SVE System Startup**							
12/2/2021	968	0	0.0	0.0	0.0	0.0	0.0	0.0
3/16/2022	3,463	2,495	3.5	1.2	1.2	23	7,559	3.8
3/21/2022	**Permanent SVE System Startup**							
3/21/2022	0	0	0.0	0.0	0.0	0.0	0.0	0.0
6/17/2022	2,113	2,113	0.063	0.063	0.063	0.43	23	0.012
9/22/2022	4,441	2,328	0.059	0.059	0.059	0.12	4.4	0.002
12/10/2022	6,341	1,900	0.24	1.4	0.17	2.6	141	0.070
Total Mass Recovery to Date			252	844	46	1,318	89,113	45

Notes:

cf: cubic feet

cfm: cubic feet per minute

µg/L: micrograms per liter

lb/hr: pounds per hour

--: not sampled

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

gray: laboratory reporting limit used for calculating emissions

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APPENDIX A

Field Notes

SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 10-4
TIME ONSITE:

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)		
		HIGH/LOW VACUUM
		KO TANK HIGH LEVEL
		HIGH EXHAUST TEMPERATURE

Product Skimmer

Hours **(take photo)**	
Volume in bbl	
Volume removed	
Volume removed to date	

HOUSEKEEPING

	Check
Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM

	READING	TIME
Blower Hours **(take photo)**	4792.2	1336
Pre K/O Vacuum (IWC)	32	
Post K/O Vacuum (IWC)	35	
Total Flow (cfm)	65	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	205	
Exhaust Post GAC PID	415	
Liquid in K/O Sight Tube (Y/N)	N	
K/O Liquid Drained (gallons)		

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		18.3	
MW-02		21.4	
MW-05		423	
MW-06		42.7	
PR-1		64.7	

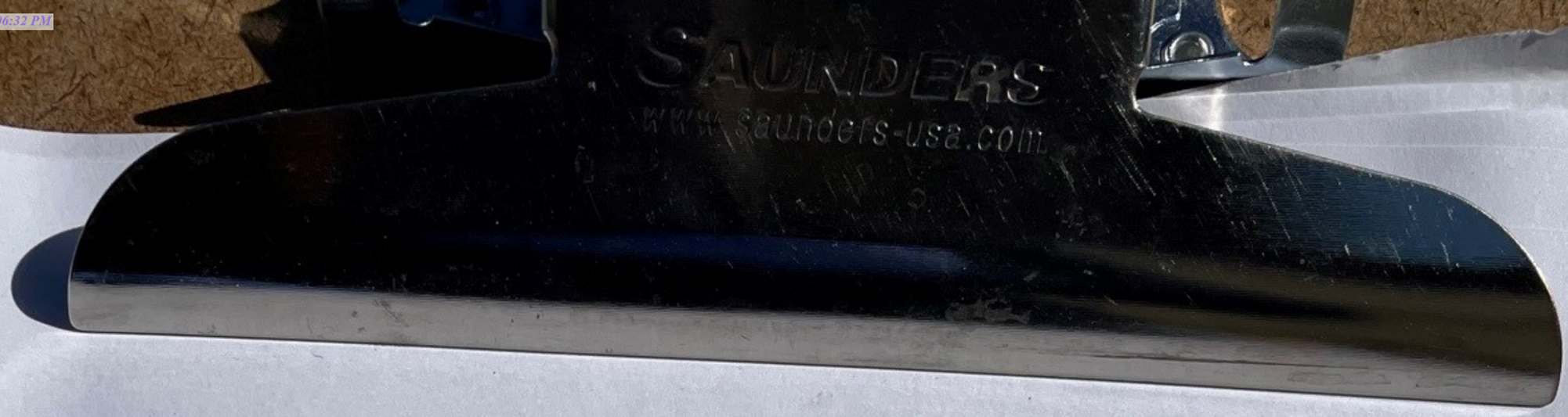
Product Recovery

Well

LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:

See spreadsheet for product recovery info



SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 10-20
TIME ONSITE:

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)	
	HIGH/LOW VACUUM
	KO TANK HIGH LEVEL
	HIGH EXHAUST TEMPERATURE

Product Skimmer

Hours **(take photo)**	
Volume in bbl	
Volume removed	
Volume removed to date	

SVE SYSTEM	READING	TIME
Blower Hours **(take photo)**	5109	0926
Pre K/O Vacuum (IWC)	33	
Post K/O Vacuum (IWC)	34	
Total Flow (cfm)	68	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	193	
Exhaust Post GAC PID	337	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)		

HOUSEKEEPING	Check
Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		25.1	
MW-02		28.6	
MW-05		415	
MW-06		43.9	
PR-1		61.8	

Product Recovery

Well

LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:

Drained 1/8 of overflow tank.

SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 11-2-22
TIME ONSITE:

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)	
	HIGH/LOW VACUUM
	KO TANK HIGH LEVEL
	HIGH EXHAUST TEMPERATURE

Product Skimmer
Hours **(take photo)**
Volume in bbl
Volume removed
Volume removed to date

SVE SYSTEM	READING	TIME
Blower Hours **(take photo)**	5428	1630
Pre K/O Vacuum (IWC)	33	
Post K/O Vacuum (IWC)	36	
Total Flow (cfm)	78	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	188	
Exhaust Post GAC PID	322	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)		

HOUSEKEEPING	Check
Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		67.4	
MW-02		41.2	
MW-05		428	
MW-06		105	
PR-1		81.9	

Product Recovery

Well

LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:
Drained ~ 1/4 of overflow tank & 5g from KO tank

SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 11-16-22
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)		
		HIGH/LOW VACUUM
		KO TANK HIGH LEVEL
		HIGH EXHAUST TEMPERATURE

Product Skimmer
Hours **(take photo)** _____
Volume in bbl _____
Volume removed _____
Volume removed to date _____

SVE SYSTEM	READING	TIME
Blower Hours **(take photo)**	5763.1	1458
Pre K/O Vacuum (IWC)	35	
Post K/O Vacuum (IWC)	38	
Total Flow (cfm)	75	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	130.4	
Exhaust Post GAC PID	303.9	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)		

HOUSEKEEPING	Check
Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		42.21	
MW-02		31.41	
MW-05		300.6	
MW-06		62.84	
PR-1		58.52	

Product Recovery

Well LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:
Drained 1/4 of overflow tank + 7g from KO tank.

SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 12-10
TIME ONSITE:

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)		
		HIGH/LOW VACUUM
		KO TANK HIGH LEVEL
		HIGH EXHAUST TEMPERATURE

Product Skimmer
Hours **(take photo)**
Volume in bbl
Volume removed
Volume removed to date

SVE SYSTEM	READING	TIME
Blower Hours **(take photo)**	6340.7	1643
Pre K/O Vacuum (IWC)	35	
Post K/O Vacuum (IWC)	38	
Total Flow (cfm)	80	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	68.31	
Exhaust Post GAC PID	194.8	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)	10	

HOUSEKEEPING

	Check
Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		14.67	
MW-02		18.04	
MW-05		166.4	
MW-06		34.84	
PR-1		31.61	

Product Recovery

Well

LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:

Drained ½ of runoff tank

SULLIVAN GC D#1E SVE SYSTEM (RENTAL UNIT)
BIWEEKLY O&M FORM

DATE: 12-21
TIME ONSITE:

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: (check if applicable)	
	HIGH/LOW VACUUM
	KO TANK HIGH LEVEL
	HIGH EXHAUST TEMPERATURE

Product Skimmer
Hours **(take photo)**
Volume in bbl
Volume removed
Volume removed to date

SVE SYSTEM	READING	TIME
Blower Hours **(take photo)**	6600.7	1256
Pre K/O Vacuum (IWC)	34	
Post K/O Vacuum (IWC)	37	
Total Flow (cfm)	715	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	73.97	
Exhaust Post GAC PID	251.6	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)	4.5	

HOUSEKEEPING Check

Inline Filter Clean	
Clean tank level alarm on skimmer	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		8.7	
MW-02		10.68	
MW-05		207.8	
MW-06		22.28	
PR-1		28.05	

Product Recovery

Well

LOCATION	Product thickness	Product removed from Sock (volume and color)	Volume removed total (gal or oz?)	Replace Sock? (Y/N0

COMMENTS/OTHER MAINTENANCE:

Water tank still 1/4 full. I could not drain it, likely due to ice in the line.

ENSOLUM

APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
Sullivan GC D #1E
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 1 Runtime meter taken on September 22, 2022 at 1:11 PM Hours = 4440.8		
Photograph 2 Runtime meter taken on December 10, 2022 at 4:43 PM Hours = 6340.7		

Ensolum, LLC | Environmental & Hydrogeologic Consultants
Durango, Colorado | info@ensolum.com

ENSOLUM

APPENDIX C

Laboratory Analytical Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

January 03, 2023

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

RE: Sullivan GC D 1E OrderNo.: 2212729

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/13/2022 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2212729**
Date Reported: **1/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: SVE-1
Project: Sullivan GC D 1E
Collection Date: 12/10/2022 11:00:00 AM
Lab ID: 2212729-001 **Matrix:** AIR **Received Date:** 12/13/2022 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Benzene	0.75	0.10		µg/L	1	12/21/2022 2:14:00 PM
Toluene	4.9	0.10		µg/L	1	12/21/2022 2:14:00 PM
Ethylbenzene	0.49	0.10		µg/L	1	12/21/2022 2:14:00 PM
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2,4-Trimethylbenzene	0.96	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,3,5-Trimethylbenzene	1.5	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2-Dibromoethane (EDB)	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Naphthalene	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
1-Methylnaphthalene	ND	0.40		µg/L	1	12/21/2022 2:14:00 PM
2-Methylnaphthalene	ND	0.40		µg/L	1	12/21/2022 2:14:00 PM
Acetone	ND	1.0		µg/L	1	12/21/2022 2:14:00 PM
Bromobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Bromodichloromethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Bromoform	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Bromomethane	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
2-Butanone	ND	1.0		µg/L	1	12/21/2022 2:14:00 PM
Carbon disulfide	ND	1.0		µg/L	1	12/21/2022 2:14:00 PM
Carbon tetrachloride	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Chlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Chloroethane	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
Chloroform	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Chloromethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
2-Chlorotoluene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
4-Chlorotoluene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
cis-1,2-DCE	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2-Dibromo-3-chloropropane	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
Dibromochloromethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Dibromomethane	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
1,2-Dichlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,3-Dichlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,4-Dichlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Dichlorodifluoromethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1-Dichloroethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1-Dichloroethene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2-Dichloropropane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,3-Dichloropropane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
2,2-Dichloropropane	ND	0.10		µg/L	1	12/21/2022 2:14:00 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 Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2212729**
Date Reported: **1/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: SVE-1
Project: Sullivan GC D 1E
Collection Date: 12/10/2022 11:00:00 AM
Lab ID: 2212729-001 **Matrix:** AIR **Received Date:** 12/13/2022 7:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
1,1-Dichloropropene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Hexachlorobutadiene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
2-Hexanone	ND	1.0		µg/L	1	12/21/2022 2:14:00 PM
Isopropylbenzene	0.13	0.10		µg/L	1	12/21/2022 2:14:00 PM
4-Isopropyltoluene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
4-Methyl-2-pentanone	ND	1.0		µg/L	1	12/21/2022 2:14:00 PM
Methylene chloride	ND	0.30		µg/L	1	12/21/2022 2:14:00 PM
n-Butylbenzene	ND	0.30		µg/L	1	12/21/2022 2:14:00 PM
n-Propylbenzene	0.17	0.10		µg/L	1	12/21/2022 2:14:00 PM
sec-Butylbenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Styrene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
tert-Butylbenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Tetrachloroethene (PCE)	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
trans-1,2-DCE	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2,3-Trichlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2,4-Trichlorobenzene	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1,1-Trichloroethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,1,2-Trichloroethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Trichloroethene (TCE)	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Trichlorofluoromethane	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
1,2,3-Trichloropropane	ND	0.20		µg/L	1	12/21/2022 2:14:00 PM
Vinyl chloride	ND	0.10		µg/L	1	12/21/2022 2:14:00 PM
Xylenes, Total	9.0	0.15		µg/L	1	12/21/2022 2:14:00 PM
Surr: Dibromofluoromethane	81.7	70-130		%Rec	1	12/21/2022 2:14:00 PM
Surr: 1,2-Dichloroethane-d4	75.0	70-130		%Rec	1	12/21/2022 2:14:00 PM
Surr: Toluene-d8	122	70-130		%Rec	1	12/21/2022 2:14:00 PM
Surr: 4-Bromofluorobenzene	93.7	70-130		%Rec	1	12/21/2022 2:14:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	490	5.0		µg/L	1	12/21/2022 2:14:00 PM
Surr: BFB	84.5	70-130		%Rec	1	12/21/2022 2:14:00 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
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P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

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ANALYTICAL SUMMARY REPORT

December 30, 2022

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

Work Order: B22121294 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 12/15/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22121294-001	2212729-001B, SVE-1	12/10/22 11:00	12/15/22	Air	Air Correction Calculations Appearance and Comments Calculated Properties GPM @ std cond,/1000 cu. ft., moist. Free Natural Gas Analysis Specific Gravity @ 60/60

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

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

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

Report Approved By:

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LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B22121294-001
Client Sample ID: 2212729-001B, SVE-1

Report Date: 12/30/22
Collection Date: 12/10/22 11:00
DateReceived: 12/15/22
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.02	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Nitrogen	78.33	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Carbon Dioxide	0.65	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Methane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Hexanes plus	<0.01	Mol %		0.01		GPA 2261-95	12/19/22 12:38 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
Hexanes plus	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
GPM Total	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
GPM Pentanes plus	< 0.001	gpm		0.001		GPA 2261-95	12/19/22 12:38 / jrj
CALCULATED PROPERTIES							
Gross BTU per cu ft @ Std Cond. (HHV)	ND			1		GPA 2261-95	12/19/22 12:38 / jrj
Net BTU per cu ft @ std cond. (LHV)	ND			1		GPA 2261-95	12/19/22 12:38 / jrj
Pseudo-critical Pressure, psia	546			1		GPA 2261-95	12/19/22 12:38 / jrj
Pseudo-critical Temperature, deg R	240			1		GPA 2261-95	12/19/22 12:38 / jrj
Specific Gravity @ 60/60F	1.00			0.001		D3588-81	12/19/22 12:38 / jrj
Air, %	96.05			0.01		GPA 2261-95	12/19/22 12:38 / jrj
- The analysis was not corrected for air.							

COMMENTS

-						-	12/19/22 12:38 / 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)

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QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental **Work Order:** B22121294 **Report Date:** 12/30/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **GPA 2261-95**										Batch: R393977
Lab ID: **B22121289-001ADUP**	12	Sample Duplicate				Run: GCNGA-B_221219A				12/19/22 11:12
Oxygen		21.7	Mol %	0.01				0.0	20	
Nitrogen		78.0	Mol %	0.01				0.0	20	
Carbon Dioxide		0.30	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: **LCS121922**	11	Laboratory Control Sample				Run: GCNGA-B_221219A				12/19/22 14:48
Oxygen		0.58	Mol %	0.01	116	70	130			
Nitrogen		6.02	Mol %	0.01	100	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.6	Mol %	0.01	100	70	130			
Ethane		6.04	Mol %	0.01	101	70	130			
Propane		5.01	Mol %	0.01	101	70	130			
Isobutane		1.99	Mol %	0.01	99	70	130			
n-Butane		1.99	Mol %	0.01	99	70	130			
Isopentane		1.01	Mol %	0.01	101	70	130			
n-Pentane		1.00	Mol %	0.01	100	70	130			
Hexanes plus		0.81	Mol %	0.01	101	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

B22121294

Login completed by:	Yvonna E. Smith	Date Received:	12/15/2022
Reviewed by:	tedwards	Received by:	llt
Reviewed Date:	12/20/2022	Carrier name:	UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	11.1°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

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

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

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

Contact and Corrective Action Comments:

None

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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 CONTRATOR:	**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	# CONTAINERS	ANALYTICAL COMMENTS
1	2212729-001B	SVE-1	TEDLAR	Air	12/10/2022 11:00:00 AM	1	Fixed Gases CO2, O2

B22121294

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: 12/13/2022	Time: 9:00 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: Laura L. Tay	Date: 12/15/22	Time: 0920

TAT: Standard ■ **RUSH** Next BD ☐ 2nd BD ☐ 3rd BD ☐

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

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2212729**

03-Jan-23

Client: HILCORP ENERGY

Project: Sullivan GC D 1E

Sample ID: **2212729-001adup**	SampType: **DUP**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **SVE-1**	Batch ID: **R93457**	RunNo: **93457**
Prep Date:	Analysis Date: **12/21/2022**	SeqNo: **3373231** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.76	0.10						2.36	20	
Toluene	5.0	0.10						1.80	20	
Ethylbenzene	0.50	0.10						2.52	20	
Methyl tert-butyl ether (MTBE)	ND	0.10						0	20	
1,2,4-Trimethylbenzene	0.98	0.10						2.85	20	
1,3,5-Trimethylbenzene	1.6	0.10						2.25	20	
1,2-Dichloroethane (EDC)	ND	0.10						0	20	
1,2-Dibromoethane (EDB)	ND	0.10						0	20	
Naphthalene	ND	0.20						0	20	
1-Methylnaphthalene	ND	0.40						0	20	
2-Methylnaphthalene	ND	0.40						0	20	
Acetone	ND	1.0						0	20	
Bromobenzene	ND	0.10						0	20	
Bromodichloromethane	ND	0.10						0	20	
Bromoform	ND	0.10						0	20	
Bromomethane	ND	0.20						0	20	
2-Butanone	ND	1.0						0	20	
Carbon disulfide	ND	1.0						0	20	
Carbon tetrachloride	ND	0.10						0	20	
Chlorobenzene	ND	0.10						0	20	
Chloroethane	ND	0.20						0	20	
Chloroform	ND	0.10						0	20	
Chloromethane	ND	0.10						0	20	
2-Chlorotoluene	ND	0.10						0	20	
4-Chlorotoluene	ND	0.10						0	20	
cis-1,2-DCE	ND	0.10						0	20	
cis-1,3-Dichloropropene	ND	0.10						0	20	
1,2-Dibromo-3-chloropropane	ND	0.20						0	20	
Dibromochloromethane	ND	0.10						0	20	
Dibromomethane	ND	0.20						0	20	
1,2-Dichlorobenzene	ND	0.10						0	20	
1,3-Dichlorobenzene	ND	0.10						0	20	
1,4-Dichlorobenzene	ND	0.10						0	20	
Dichlorodifluoromethane	ND	0.10						0	20	
1,1-Dichloroethane	ND	0.10						0	20	
1,1-Dichloroethene	ND	0.10						0	20	
1,2-Dichloropropane	ND	0.10						0	20	
1,3-Dichloropropane	ND	0.10						0	20	
2,2-Dichloropropane	ND	0.10						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 Quanitative 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#: **2212729**

03-Jan-23

Client: HILCORP ENERGY

Project: Sullivan GC D 1E

Sample ID: **2212729-001adup**	SampType: **DUP**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **SVE-1**	Batch ID: **R93457**	RunNo: **93457**
Prep Date:	Analysis Date: **12/21/2022**	SeqNo: **3373231** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10						0	20	
Hexachlorobutadiene	ND	0.10						0	20	
2-Hexanone	ND	1.0						0	20	
Isopropylbenzene	0.13	0.10						1.23	20	
4-Isopropyltoluene	ND	0.10						0	20	
4-Methyl-2-pentanone	ND	1.0						0	20	
Methylene chloride	ND	0.30						0	20	
n-Butylbenzene	ND	0.30						0	20	
n-Propylbenzene	0.18	0.10						4.55	20	
sec-Butylbenzene	ND	0.10						0	20	
Styrene	ND	0.10						0	20	
tert-Butylbenzene	ND	0.10						0	20	
1,1,1,2-Tetrachloroethane	ND	0.10						0	20	
1,1,2,2-Tetrachloroethane	ND	0.10						0	20	
Tetrachloroethene (PCE)	ND	0.10						0	20	
trans-1,2-DCE	ND	0.10						0	20	
trans-1,3-Dichloropropene	ND	0.10						0	20	
1,2,3-Trichlorobenzene	ND	0.10						0	20	
1,2,4-Trichlorobenzene	ND	0.10						0	20	
1,1,1-Trichloroethane	ND	0.10						0	20	
1,1,2-Trichloroethane	ND	0.10						0	20	
Trichloroethene (TCE)	ND	0.10						0	20	
Trichlorofluoromethane	ND	0.10						0	20	
1,2,3-Trichloropropane	ND	0.20						0	20	
Vinyl chloride	ND	0.10						0	20	
Xylenes, Total	9.2	0.15						1.74	20	
Surr: Dibromofluoromethane	0.82		1.000		82.4	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.71		1.000		71.2	70	130	0	0	
Surr: Toluene-d8	1.3		1.000		126	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.93		1.000		93.3	70	130	0	0	

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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2212729**

03-Jan-23

Client: HILCORP ENERGY

Project: Sullivan GC D 1E

Sample ID: **2212729-001adup**	SampType: **DUP**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SVE-1**	Batch ID: **G93457**	RunNo: **93457**
Prep Date:	Analysis Date: **12/21/2022**	SeqNo: **3373235** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	510	5.0						4.11	20	
Surr: BFB	850		1000		85.4	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 Quanitative 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

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: 2212729 RcptNo: 1

Received By: Cheyenne Cason 12/13/2022 7:50:00 AM

Completed By: Isaiah Ortiz 12/13/2022 8:50:13 AM

Reviewed By: 12-13-22

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: KPG 12-13-22

Special Handling (if applicable)

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

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:
17. Cooler Information

Chain-of-Custody Record

Client: Hilcorp

Mailing Address:

Phone #:

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

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: Sullivan GC D IE

Project #:

Project Manager: Kate Kaufman

Sampler: Brandon Sinclair

On Ice: ☐ Yes ☑ No

# of Coolers: 1

Cooler Temp(including CF): NA (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2212729	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	8015 TVPH	Fixed gases O_2 & CO_2				
12-10	1100	air	SVE-1	2 Tedlar		001								✓			✓	✓				

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
12-12	1540				12/12/22	1540
12/12/22	744			courier	12/13/22	0750

Remarks:

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

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

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

CONDITIONS

Action 175957

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 175957
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	1. Follow the recommendations provided. 2. OCD will require quarterly report for 2023. Next report due no later than April 28, 2023. 3. Since the system was re-started in December 2021, OCD will accept bi-annual (twice a year) reporting initiating in 2024.	1/26/2023