NV

October 25, 2021

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

Subject: **Third Quarter 2021 - Remediation System Update**
Hilcorp Energy Company
Federal 18 #1T
San Juan County, New Mexico
Incident # NCS2103335776

Dear Mr. Smith:

WSP USA Inc. (WSP), on behalf of Hilcorp Energy Company (Hilcorp), presents the following third quarter 2021 summary report discussing the current activities being conducted at the former Federal 18 #1T coalbed methane gas well (Site). The casing of this well has been modified to vent gas and purge water from the Ojo Alamo Formation. The setup and initial installation of this system is detailed in a report submitted to the New Mexico Oil Conservation Division (NMOCD) in November 2010. Since 2010, quarterly reports have been submitted to the NMOCD to record activities performed at the Site, as well as document well-casing pressures, the volume of gas vented from well Federal 18 #1T, and water-quality analytical results collected from the well.

BACKGROUND

A vacuum system installed at the Site is being operated as part of an ongoing effort between the NMOCD and Hilcorp (project formerly under XTO Energy, Inc.) to vent gas from the Nacimiento formation just above the Ojo Alamo Formation. Gas was found in the Nacimiento formation, which could have come from several contributing sources in the area including existing and abandoned gas wells in close proximity. In agreement with the NMOCD, XTO Energy, Inc. (XTO) modified a nearby gas well that was scheduled to be plugged, Federal 18 #1T, to act as a venting well by setting a plug at a depth of approximately 513 feet. Perforations were made in the casing at 437 feet and 457 feet in order to assess the groundwater and vent gas from the Nacimiento.

On September 24, 2010, a swab rig was used to determine if the well would produce water using the perforations. The swab rig recovered approximately 2 barrels of water, indicating that the perforations would produce water. A sample collected during the swab returned results above New Mexico Water Quality Control Commission (NMWQCC) standards for benzene, total xylenes, and total chloride (see attached Table 1). Due to the low pH and high chloride, it was inferred that the acid used to dissolve cement during perforation activities may have infiltrated the aquifer, causing the increased concentrations shown in the sampling results. XTO recommended pumping the aquifer until sampling results were below the NMWQCC standards for BTEX and chloride.

A pump was installed in the Federal 18 #1T on November 9, 2010 at a depth of approximately 485 feet. During the pump installation, the water level was measured using a Keck ET Long water level indicator. The static water level was measured as 402.20 feet. The pump was initially set to operate four times a day for 15 minutes, purging approximately 260 gallons per day. During swab and pump installation activities, no gas was observed flowing from the well. On November 11, 2010, a small vacuum pump was installed at the Federal 18 #1T to determine if gas could be vented. The discharge from the vacuum was monitored using a MSA 4-Gas Monitor, which confirmed that methane was being vented from the vacuum pump discharge. The vacuum pump operated at a discharge rate of 3 standard cubic feet per minute (scfm), which is equivalent to approximately 6 actual cubic feet per minute (acfm) based on elevation. This volume was calculated using the conversion factors provided by the vacuum pump manufacturer, Becker. The vacuum pump initially held a vacuum of approximately negative (-) 12 inches of mercury on the casing of the Federal 18 #1T during operation. A portable generator placed on-site powered both the

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vacuum pump and the water pump. The water pump was plumbed into the existing water lines at the Site, so that all water would pump into the 210-barrel water tank left on-Site from production activities. Water piping above ground was wrapped with heat trace and insulation to prevent freezing.

The system was electrified on February 3, 2011 to prevent down time due to generator maintenance issues. Operation and maintenance inspections include visual checks of the system, generally on a weekly to biweekly basis, depending on weather-related delays. The site check includes verifying pump operation, vacuum operation, recording volume changes based on prior visit, and verifying that no other site conditions need adjustment. The nearby SJ 1737 production well is used to monitor potential pressure variations in the subsurface resulting from the vacuum pump. The SJ 1737 is generally evaluated on a weekly basis to open the valve for a week and then close the valve the following week. Before the valve is opened the subsequent week, pressure is measured before opening the valve. Casing pressure readings for the SJ 1737 are summarized on Table 2.

THIRD QUARTER 2021 ACTIVITIES

As discussed in Hilcorp's *2021 1st Quarter Report* (dated May 2021), Hilcorp replaced a malfunctioned vacuum pump and restarted the vacuum system on March 23, 2021. In order to maintain operations and sustain the life of the pump, the pump is set on a timer and runs for 15 minutes twice a day.

Hilcorp contracted WSP to conduct second quarter 2021 sampling. During the Site visit on June 29, 2021, WSP discovered that the water pump was not running and a water sample could not be collected at that time. However, WSP verified that the water pump timer was functioning correctly and collected flow-meter measurements to record water volume removed since the previous Site visit. Hilcorp verified that the water pump had broken sometime between March and June 2021 and ordered a replacement pump. The replacement water pump was installed in the well on September 30, 2021, at which time a water sample was collected and submitted to Hall Environmental Analysis Laboratory (Hall) for the following constituents: benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260, chloride by EPA Method 300.0, conductivity by Method SM2510B, pH by Method SM4500-H+B, and total dissolved solids (TDS) by Method SM2540C. Analytical results are summarized in Table 1, with laboratory reports attached as Enclosure A.

To date, a total of 1,134,167 gallons of water have been removed from the Federal 18 #1T well (Table 1). Additionally, 29,401 thousand cubic feet (MCF) of gas has been vented from the well as of this date (Table 3). Groundwater sampling will continue in the third quarter of 2021 to monitor the benzene concentrations in the groundwater. Hilcorp also proposes the continued operation of the vacuum pump and water pump at the Federal 18 #1T. Once benzene concentrations decrease to below NMWQCC standards, an alternative sampling schedule may be recommended for operation, maintenance, and groundwater sampling.

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact Mitch Killough at (713) 757-5247 or at mkillough@hilcorp.com.

Kind regards,

Stuart Hyde, L.G.
Senior Geologist

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

Enclosures:

Table 1 – Water Analytical Results
Table 2 – Well SJ-01737 Casing Pressure Readings
Table 3 – Gas Vented

Enclosure A – Analytical Laboratory Reports

TABLES

TABLE 1
WATER ANALYTICAL RESULTS

FEDERAL 18 #1T
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Date	Lab	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	Chlorides (mg/L)	TDS (mg/L)	EC (umhos/cm)	pH	Purge Water Volume (gallons)
NMWQCC Standard		5	1,000	700	620	250	1,000	NA	6 thru 9	---
11/5/2010	ESC	ND	5.2	ND	ND	15	**1400**	2600	7.2	NM
9/24/2010	ESC	**150**	BDL	76	**670**	NS	NS	NS	NS	NM
9/24/2010	ESC	**190**	170	24	210	**6800**	**13000**	18000	6.1	NM
9/24/2010	Etech	**143**	221	63.6	**950**	NS	NS	NS	NS	NM
9/24/2010	Etech	**320**	377	31.8	568	**7150**	**11100**	16000	**5.84**	NM
12/10/2011	Hall	NS	NS	NS	NS	**2800**	**7610**	8900	6.36	3032.5
1/5/2011	Hall	**67**	93	7.9	25	NS	NS	NS	NS	7,798
1/5/2011	ESC	**73**	99	10	39	**1600**	**4800**	6000	6.6	7,798
1/29/2011	ESC	**60**	93	10	33	**930**	NS	4900	6.4	10791.0
2/28/2011	ESC	**42**	60	6.1	20	**550**	**3400**	4000	6.7	14795.0
4/1/2011	ESC	**23**	27	1.8	6.8	**260**	**2700**	3100	6.8	31237.5
4/29/2011	ESC	**29**	28	2.4	7.3	140	**2600**	2900	6.9	50217.0
5/31/2011	ESC	**14**	19	1.4	4.9	89	**2500**	2800	6.7	76513.0
6/14/2011	ESC	**55**	81	2.8	15	73	**2500**	2700	6.7	88120.0
6/30/2011	ESC	**52**	67	2.6	12	61	**2500**	2700	6.9	101208.5
8/15/2011	ESC	**21**	25	1.2	5.8	44	**2500**	2600	6.8	140267.0
9/2/2011	ESC	**10**	12	0.64	3.2	41	**2500**	2600	7.2	155801.0
9/16/2011	ESC	**9.6**	11	0.64	3	38	**2400**	2500	7.2	168040.0
9/30/2011	ESC	**7.2**	8.7	0.64	2.5	35	**2500**	2600	7	180392.5
10/28/2011	ESC	**5.1**	BDL	1.8	2.7	31	**2300**	2600	6.9	205,220
11/30/2011	ESC	4	BDL	3.9	2	27	**2500**	2600	7.1	233,487.5
12/30/2011	ESC	3.4	BDL	BDL	2.9	27	**2500**	2500	7.5	261,390.5
4/3/2012	ESC	**6**	BDL	BDL	1.6	NS	NS	NS	NS	351,300
4/9/2012	ESC	NS	NS	NS	NS	19	**2400**	2400	7.4	NM
7/3/2012	ESC	**5.3**	BDL	BDL	BDL	16	**2300**	2400	7.4	NM
7/6/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	441,053
9/19/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	521,271
9/27/2012	ESC	**6.2**	BDL	BDL	BDL	15	**2300**	2500	7.1	NM
12/14/2012	NA	NS	NS	NS	NS	NS	NS	NS	NS	598,540
12/31/2012	Etech	**13.9**	1.1	ND	3.3	15.5	**2690**	2440	7.05	604,689
1/23/2013	ESC	**160**	190	BDL	26	15	**2400**	2500	8	NM
2/22/2013	ESC	**7.1**	77	BDL	1.8	15	**2100**	2500	7.1	605,860
5/2/2013	ESC	**9**	6.9	BDL	BDL	15	**2400**	2600	7.5	612,601
8/19/2013	ESC	**20**	11	BDL	2.3	16	**2200**	2600	7.2	NM
9/23/2013	ESC	**13**	11	BDL	2.2	16	**2300**	2500	7.1	621,744
11/25/2013	ESC	4.6	5.2	BDL	BDL	15	**2200**	2700	7.7	631,430
2/4/2014	ESC	**15**	17	0.72	3.1	16	**2200**	2500	7.3	636,120
10/1/2015	ESC	**54.2**	57	1.37	9.77	21.3	**2260**	2640	6.98	639,410
10/20/2015	ESC	**42.3**	39.9	0.964	7.06	18.1	**2330**	1460	7.09	642,650
3/28/2016	ESC	**38**	34.1	0.835	4.82	21.6	**2230**	2570	6.86	650,850
6/14/2016	ESC	**78.3**	58.4	1.16	7.22	13.7	**2890**	2600	6.89	704,371
8/29/2016	ESC	**19**	BDL	BDL	2.18	14.8	**2410**	2590	7.02	763,261
11/18/2016	ESC	**13.2**	5.61	BDL	2.33	13.9	**2470**	2580	7.03	842,610
3/31/2017	ESC	**9.61**	7.87	BDL	BDL	14.4	**2300**	2570	7.28	858,190
6/16/2017	ESC	**64.6**	29.2	0.781	5.4	14.2	**2360**	2570	7.05	927,854
9/7/2017	ESC	4.61	1.73	BDL	BDL	13.7	**2030**	2450	7.14	997,330
12/5/2017	ESC	**138**	51.5	1.65	9.378	14.4	**2230**	2590	7.2	1,080,550
3/6/2018	ESC	**19.9**	14.8	0.543	2.71	14.4	**2290**	2620	7.13	1,080,840
8/7/2018	Pace	**7.9**	8.06	<0.5	<1.5	13.7	**2200**	2300	7.19	1,082,751
1/3/2019	Pace	**7.07**	3.29	0.177	1.08	15.8	**2080**	6750	6.35	1,120,220
2/22/2019	Pace	**19.8**	11.1	<0.5	3.97	14.1	**2270**	2710	7.46	1,120,366
5/24/2019	Pace	**11.9**	10.8	ND	ND	13.4	**2,380**	2,760	7.15	1,123,853
9/10/2019	Pace	**23.2**	18.8	ND	ND	14.3	**2,260**	2,600	7.37	1,125,478
10/29/2019	Pace	**5.41**	5.68	ND	ND	14	**2,300**	2,530	7.09	1,127,076
2/27/2020	Pace	**20.7**	19.3	ND	ND	14.4	**2,280**	2,580	7.06	1,128,506
5/15/2020	Pace	**10.3**	8.91	ND	ND	13.6	**2,460**	2,570	7.27	1,131,033
8/25/2020	Pace	3.9	3.5	ND	ND	13.9	**2,190**	2,640	7.62	1,131,100
10/27/2020	Pace	**31.1**	24.4	ND	ND	13.9	**2,240**	2,530	7.43	1,131,119
2/17/2021	Hall	**73**	<1	<1	<1.5	18	**2,200**	2,400	7.42	1,131,123
6/29/2021 (1)	---	NS	NS	NS	NS	NS	NS	NS	NS	1,134,031
9/30/2021	Hall	**130**	87	<5.0	8.1	19	**2,300**	2,500	7.20	1,134,167

Notes:
(1) - Water pump not functioning
BDL - Below Detection Limits
ND - Not Detected above laboratory reporting limits
NM - Not Measured
NMWQCC - New Mexico Water Quality Control Commission
NS - Not Sampled
Values in **BOLD** exceed WQCC Standards
Baseline Sample (Well SJ 1737)

TABLE 2
WELL SJ-01737 CASING PRESSURE READINGS

FEDERAL 18 #1T
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Date	Casing Pressure (ounces)	Average
9/17/2019	1	0.143
10/7/2019	0	0.000
10/21/2019	1.75	0.125
10/28/2019	0	0.000
12/5/2019	0	0.000
12/19/2019	3	0.214
1/7/2020	0	0.000
1/17/2020	1.25	0.125
1/30/2020	0	0.000
2/12/2020	2.25	0.173
2/25/2020	0	0.000
4/3/2020	1.75	0.046
4/9/2020	0	0.000
4/15/2020	3	0.500
4/23/2020	0	0.000
4/30/2020	0.5	0.071
5/15/2020	0	0.000
5/21/2020	1.25	0.208
5/29/2020	0	0.000
6/5/2020	0.5	0.071
6/29/2020	0	0.000
7/8/2020	0.75	0.083
7/22/2020	0	0.000
8/11/2020	0	0.000
8/25/2020	0	0.000
9/16/2020	0	0.000
9/22/2020	0	0.000
10/26/2020	2.75	0.081
11/9/2020	0	0.000
12/8/2020	0	0.000
12/18/2020	0	0.000
1/5/2021	1.75	0.097
1/20/2021	0	0.000
2/11/2021	1.75	0.080
2/17/2021	0	0.000
3/25/2021	3.5	0.097
4/15/2021	0	0.000
4/28/2021	2	0.154

TABLE 3
GAS VENTED

FEDERAL 18 #1T
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Date	SCFM	ACFM	Gas Vented Total (MCF)
9/17/2019	4	6	26676.8
10/7/2019	4	6	26848.8
10/21/2019	4	6	26969.2
10/28/2019	4	6	27029.6
12/5/2019	4	6	27356.4
12/19/2019	4	6	27477.2
1/7/2020	4	6	27954.1
1/17/2020	4	6	28040.4
1/30/2020	4	6	28152.6
2/12/2020	4	6	28264.8
2/25/2020	4	6	28377.0
4/3/2020	4	6	28704.6
4/9/2020	4	6	28756.3
4/15/2020	4	6	28808.0
4/23/2020	4	6	28877.0
4/30/2020	4	6	28937.4
5/15/2020	4	6	29066.7
5/21/2020	4	6	29118.4
5/29/2020	4	6	29178.8
6/5/2020	4	6	29239.2
6/29/2020	0	0	Hot, not running
7/8/2020	0	0	Unit Down
8/11/2020	0	0	Unit Down
8/25/2020	0	0	Unit Down
9/16/2020	0	0	Unit Down
9/22/2020	0	0	Unit Down
10/26/2020	0	0	Unit Down
11/9/2020	0	0	Unit Down
12/8/2020	0	0	Unit Down
1/5/2021	0	0	Unit Down
1/20/2021	0	0	Unit Down
2/11/2021	0	0	Unit Down
2/17/2021	0	0	Unit Down
3/22/2021	0	0	Unit Down
*3/31/2021	0.7	1.05	29251.3
6/29/2021	0.7	1.05	29401.0
9/30/2021	0.7	1.05	29550.7

Notes:

ACFM - pumping rate in actual cubic feet per minute
MCF - thousand cubic feet
SCFM - pumping rate in standard cubic feet per minute
* - Pump operated from 3/23 - 3/31/2021.
scf per day based on manufacture specifications.

ENCLOSURE A – ANALYTICAL LABORATORY REPORT

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 15, 2021

Mitch Killough

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

RE: Federal 18 IT OrderNo.: 2110004

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 1 sample(s) on 10/1/2021 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2110004**
Date Reported: **10/15/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** Tubing
Project: Federal 18 IT **Collection Date:** 9/30/2021 1:35:00 PM
Lab ID: 2110004-001 **Matrix:** GROUNDWA **Received Date:** 10/1/2021 7:21:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **LRN**
Chloride	19	5.0		mg/L	10	10/1/2021 6:35:44 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**
Benzene	130	5.0		µg/L	5	10/1/2021 9:19:15 PM
Toluene	87	5.0		µg/L	5	10/1/2021 9:19:15 PM
Ethylbenzene	ND	5.0		µg/L	5	10/1/2021 9:19:15 PM
Xylenes, Total	8.1	7.5		µg/L	5	10/1/2021 9:19:15 PM
Surr: 1,2-Dichloroethane-d4	90.6	70-130		%Rec	5	10/1/2021 9:19:15 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	5	10/1/2021 9:19:15 PM
Surr: Dibromofluoromethane	98.4	70-130		%Rec	5	10/1/2021 9:19:15 PM
Surr: Toluene-d8	95.0	70-130		%Rec	5	10/1/2021 9:19:15 PM
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **LRN**
Conductivity	2500	10		µmhos/c	1	10/6/2021 12:27:11 PM
SM4500-H+B / 9040C: PH						Analyst: **LRN**
pH	7.20		H	pH units	1	10/6/2021 12:27:11 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	2300	40.0	*D	mg/L	1	10/11/2021 12:41:00 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	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2110004**

15-Oct-21

Client: HILCORP ENERGY

Project: Federal 18 IT

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R81751**	RunNo: **81751**
Prep Date:	Analysis Date: **10/1/2021**	SeqNo: **2890630** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R81751**	RunNo: **81751**
Prep Date:	Analysis Date: **10/1/2021**	SeqNo: **2890631** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.2	90	110			

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 range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2110004**

15-Oct-21

Client: HILCORP ENERGY

Project: Federal 18 IT

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL81760**	RunNo: **81760**
Prep Date:	Analysis Date: **10/1/2021**	SeqNo: **2898188** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	92.4	70	130			
Toluene	17	1.0	20.00	0	84.9	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		94.9	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.5	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.1	70	130			
Surr: Toluene-d8	9.4		10.00		93.5	70	130			

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL81760**	RunNo: **81760**
Prep Date:	Analysis Date: **10/1/2021**	SeqNo: **2898190** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.4	70	130			
Surr: Toluene-d8	9.5		10.00		94.9	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2110004**

15-Oct-21

Client: HILCORP ENERGY

Project: Federal 18 IT

Sample ID: **lcs-1 98.7uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R81861**	RunNo: **81861**
Prep Date:	Analysis Date: **10/6/2021**	SeqNo: **2896206** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	10	98.70	0	101	85	115			

Sample ID: **lcs-2 98.7uS eC**	SampType: **lcs**	TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW**	Batch ID: **R81861**	RunNo: **81861**
Prep Date:	Analysis Date: **10/6/2021**	SeqNo: **2896234** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	10	98.70	0	102	85	115			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2110004**

15-Oct-21

Client: HILCORP ENERGY

Project: Federal 18 IT

Sample ID: **MB-63133**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **63133**	RunNo: **81946**
Prep Date: **10/7/2021**	Analysis Date: **10/11/2021**	SeqNo: **2900854** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-63133**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **63133**	RunNo: **81946**
Prep Date: **10/7/2021**	Analysis Date: **10/11/2021**	SeqNo: **2900855** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

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 range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
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: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 2110004 RcptNo: 1

Received By: **Tracy Casarrubias** 10/1/2021 7:21:00 AM

Completed By: **Sean Livingston** 10/1/2021 8:39:36 AM Sean Livingston

Reviewed By: JR 10/1/21

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° 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 10-1-21

Special Handling (if applicable)

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

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

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good				

Chain-of-Custody Record

Client: Hilcorp Energy

Mailing Address:

Phone #: 505-486-9543

email or Fax#: MKillough@hilcorp.com

QA/QC Package: khoekstra@hilcorp.com

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name: Federal 18# 1T

Project #:

Project Manager: Mitch Killough

Sampler: Kurt

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.3-0.1=2.2 (°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. 2110004	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) BTEX	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Chloride, pH	SPCON, TDS	No Samples Field Filtered			
9-30	1:35	GW	Tubing	5	on ice	001								X			X	X	X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-30	1533	Kurt Hoekstra	Christine Walker		9/30/21	1533
9/30/21	1803	Christine Walker		cso	10/1/21	7:21

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

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 61574
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 179088 for most updated status.	3/23/2023