SITE INFORMATION

Report Type: Closure Report 1RP-5559

General Site Information:						
Site:	**Red Hills Unit 17H**					
Company:	**Cimarex Energy**					
Section, Township and Range	**Unit D**	**Sec. 33**	**T 25S**	**R 33E**		
Lease Number:	**API No. 30-025-42325**					
County:	**Lea County**					
GPS:	**32.091227º**			**-103.578962º**		
Surface Owner:	Federal					
Directions:	From the intersection of CR 1 and Pipeline Rd, travel east on Pipeline Rd for 5 miles, turn north onto lease road and continue for 2.10 miles, turn east onto lease road for 0.30 miles to location on north side of lease road.					

Release Data:	
Date Released:	6/1/2019
Type Release:	Produced Water
Source of Contamination:	Ball valve
Fluid Released:	10 bbls
Fluids Recovered:	0 bbls

Official Communication:			
Name:	Gloria Garza		Clair Gonzales
Company:	Cimarex Energy		Tetra Tech
Address:	600 N. Marienfield St.		901 W. Wall St.
	Ste 400		Ste 100
City:	Midland Texas, 79701		Midland, Texas, 79701
Phone number:	(432) 234-3204		(432) 687-8123
Fax:			
Email:	ggarza@cimarex.com		Clair.Gonzales@Tetratech.com

Site Characterization	
Depth to Groundwater:	*200' below ground surface*
Karst Potential:	*Low*

Recommended Remedial Action Levels (RRALs)				
Benzene	***Total BTEX***	***TPH (GRO+DRO)***	***TPH (GRO+DRO+MRO)***	***Chlorides***
10 mg/kg	*50 mg/kg*	*1,000 mg/kg*	*2,5000 mg/kg*	*20,000 mg/kg*

TETRA TECH

August 22, 2019

Gloria Garza
ESH Specialist – Permian Basin
Cimarex Energy
600 N. Marienfeld St.
Midland, Texas 79701

Re: Closure Report for the Cimarex Energy, Red Hills Unit #17H, Unit D, Section 33, Township 25 South, Range 33 East, Lea County, New Mexico. 1RP-5559.

Ms. Garza:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cimarex Energy (Cimarex) to prepare a assess a release that occurred at the Red Hills Unit #17H, Unit D, Section 33, Township 25 South, Range 33 East, Lea County, New Mexico (site). The spill site coordinates are 32.091227º, -103.578962º. The site location is shown on Maps 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on June 1, 2019, and released approximately 10 barrels of produced water due to a ball valve being left open. None of the fluids were recovered. The release impacted an area on the pad measuring approximately 23' x 35'. The C-141 Form is included in Appendix A.

Site Characterization

A site characterization was performed for the site and no watercourses, lakebeds, sinkholes, playa lakes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, springs, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the specified distances and the site is in a low karst potential area. The nearest well is listed on the USGS National Water Information System in Section 20, approximately 1.10 miles northwest of the site, and has a reported depth to groundwater of 213 feet below ground surface. The groundwater data is shown in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of

the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg (GRO+DRO) or 2,500 mg/kg (GRO+DRO+MRO). Additionally, the proposed RRAL for chlorides is 20,000 mg/kg.

Remediation and Analytical Results

Tetra Tech personnel were onsite on July 19, 2019, to assess the release area. Two auger holes (AH-1 and AH-2) were installed inside the spill footprint to total depths of 6'-6.5' and 5-5.5', respectively. Additionally, four horizontal delineation samples (North Horizontal, South Horizontal, East Horizontal, and West Horizontal) were collected at 0-6" below surface in order to laterally define the release area. Selected samples were analyzed for TPH analysis by EPA Method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included. The results of the sampling are summarized in Table 1. The sample locations are shown in Plat 3.

Referring to Table 1, none of the samples collected showed benzene, total BTEX, or TPH concentrations above the laboratory reporting limits. Additionally, chlorides ranged from 3.02 mg/kg to 498 mg/kg.

Conclusion

Based on the laboratory results, Cimarex requests closure of this spill issue. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment activities for this site, please call at (432) 682-4559.

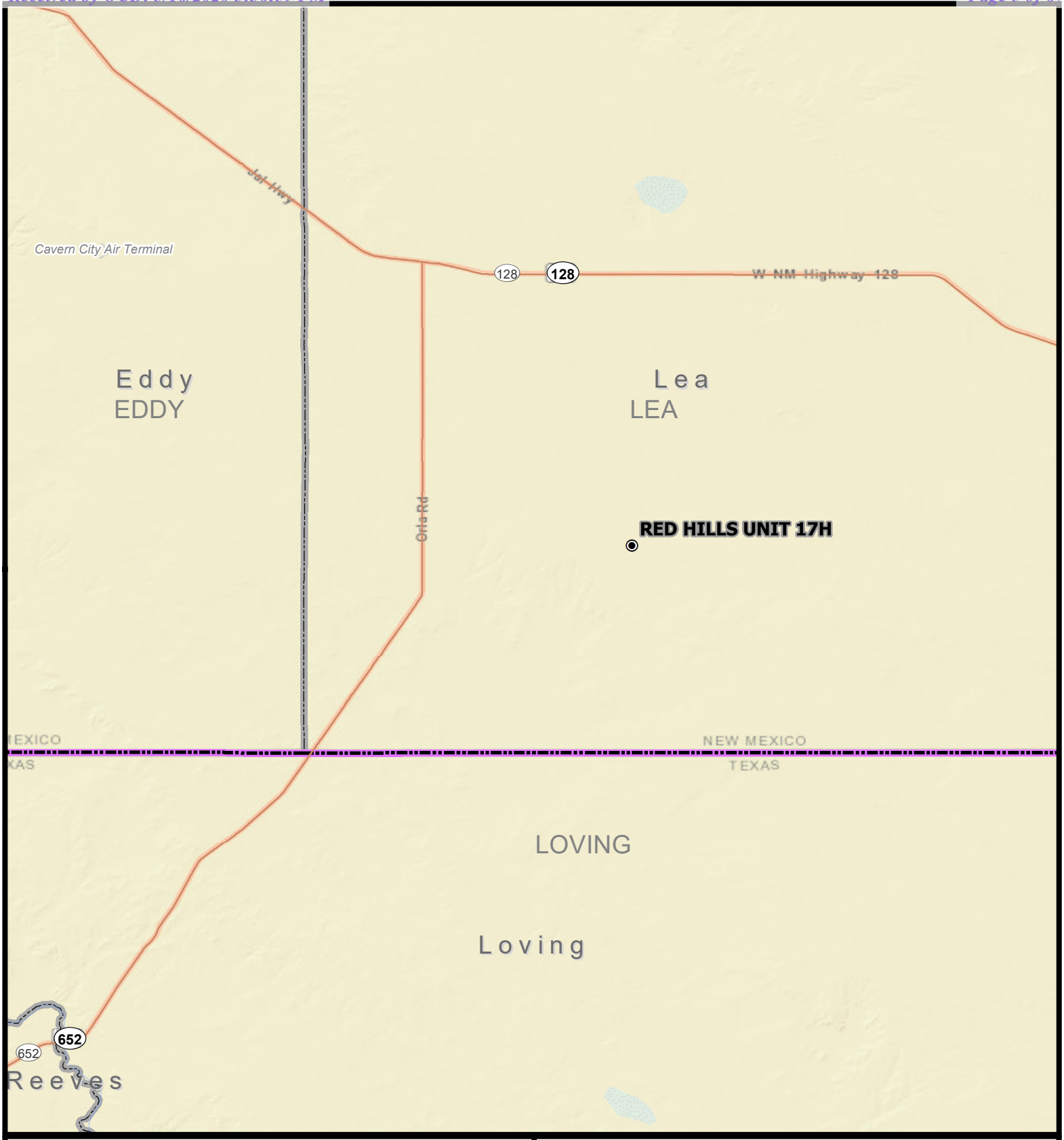
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

Johnathon Kell,
Geologist II

cc: Jim Amos - BLM

Maps/Plats



SITE LOCATION

N
W E
S

0 10,416.5 20,833

Approximate Scale in Feet

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

STATE LOCATOR MAP

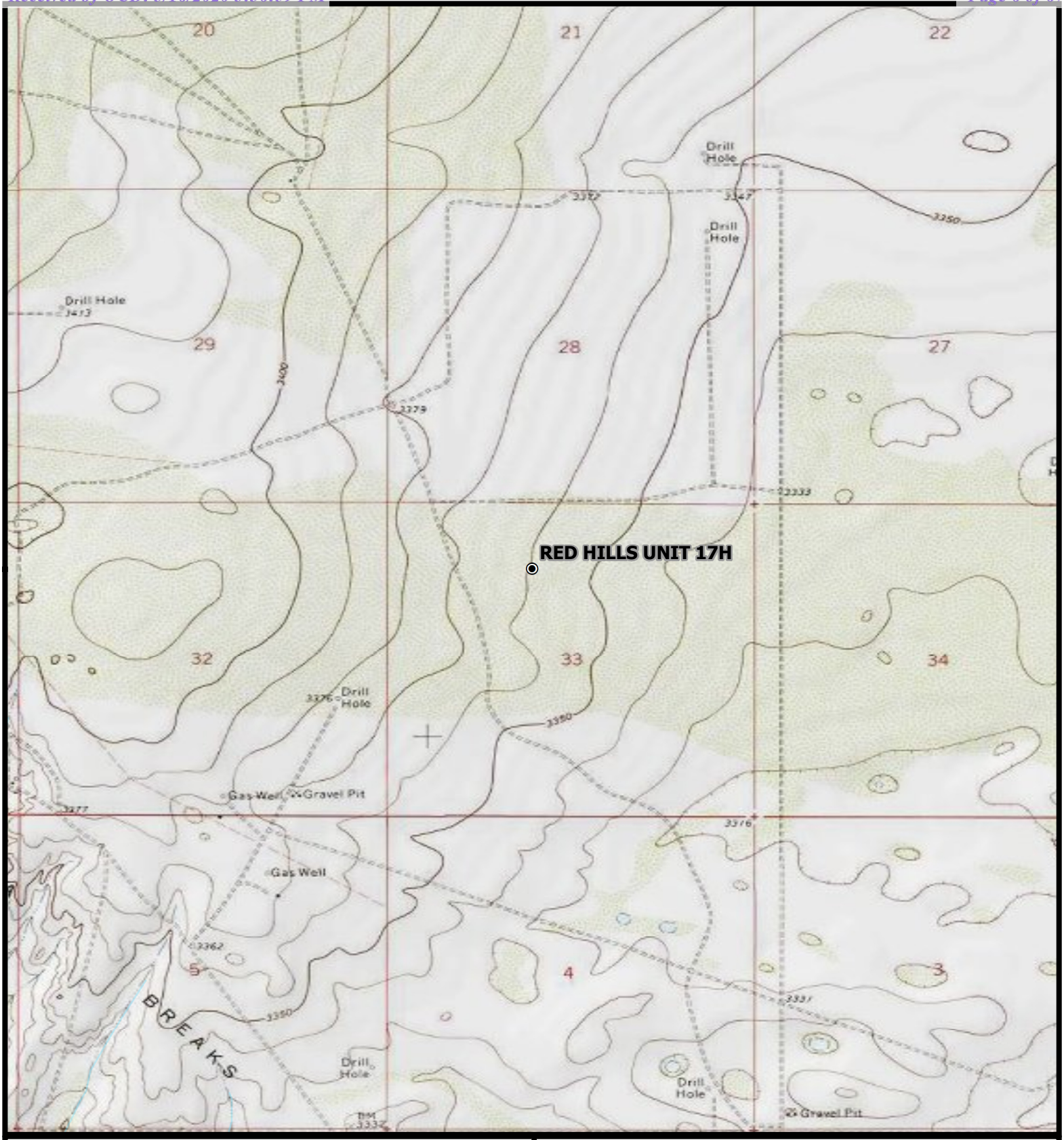
OVERVIEW MAP
RED HILLS UNIT 17H
PROPERTY LOCATED AT 32.091227°,-103.578962°
LEA COUNTY, NEW MEXCIO

CIMAREX

Project #:
212C-MD-011829

FIGURE
1

Document Path: C:\Users\MISTI.MORGAN\Desktop\project folder\212C-MD-01829 RED HILLS UNIT 17H\MXD\212C-MD-01829 RED HILL UNIT 17H FIG. 1.mxd



SITE LOCATION

N
W E
S

0 1,000 2,000

Approximate Scale in Feet

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

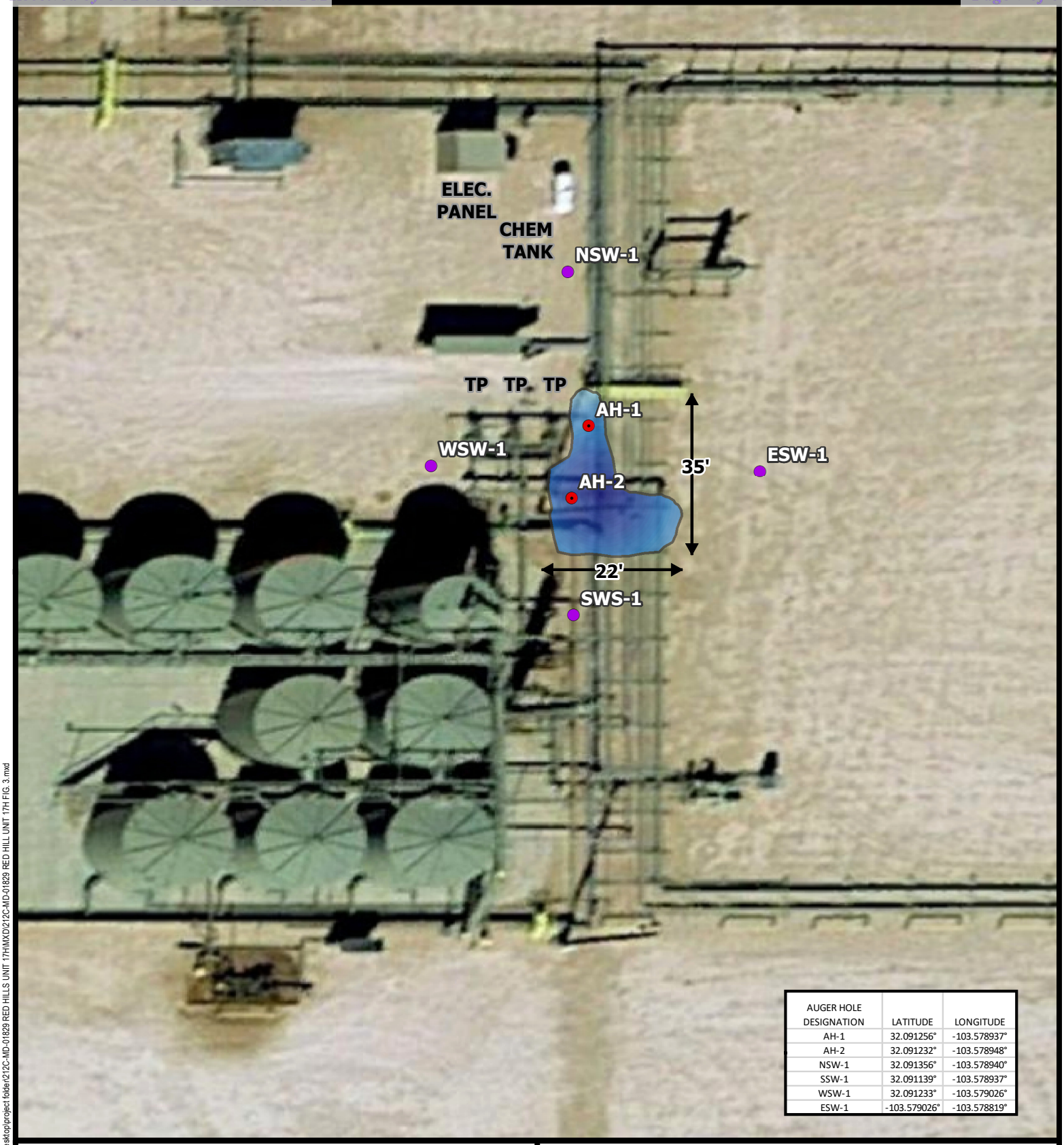
TOPOGRAPHIC MAP
RED HILLS UNIT 17H
PROPERTY LOCATED AT 32.091227°,-103.578962°
LEA COUNTY, NEW MEXCIO

CIMAREX

Project #:
212C-MD-011829

FIGURE
2

Document Path: C:\Users\MISTI.MORGAN\Desktop\project folder\212C-MD-01829 RED HILLS UNIT 17H\MXD\212C-MD-01829 RED HILL UNIT 17H FIG. 2.mxd



AUGER HOLE DESIGNATION	LATITUDE	LONGITUDE
AH-1	32.091256°	-103.578937°
AH-2	32.091232°	-103.578948°
NSW-1	32.091356°	-103.578940°
SSW-1	32.091139°	-103.578937°
WSW-1	32.091233°	-103.579026°
ESW-1	-103.579026°	-103.578819°

HORIZONTAL SAMPLE LOCATIONS

AUGER HOLE SAMPLE LOCATIONS

AFFECTED SPILL AREA

N W E S

0 15 30

Approximate Scale in Feet

Source: "New Mexico". 32° 5'28.42"N, 103°34'44.26"W. **Google Earth**. February 2019. August 20, 2019

SPILL ASSESSMENT MAP
RED HILLS UNIT 17H
Property Located at coordinates 32.091227°, -103.578962°
LEA COUNTY, NEW MEXCIO

CIMAREX

Project #:
212C-MD-01829

FIGURE 3

Date: 8/20/2019 Document Path: C:\Users\MISTI.MORGAN\Desktop\project folder\212C-MD-01829 RED HILLS UNIT 17HMXD\212C-MD-01829 RED HILL UNIT 17H FIG. 3.mxd

Lab Analysis

Table 1
Cimarex
Red Hills Unit 17 H
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	ORO	Total						
AH-1	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	5.67
	"	1-1.5'	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	3.02
	"	2-2.5'	X		-	-	-	-	-	-	-	-	-	9.71
	"	3-3.5'	X		-	-	-	-	-	-	-	-	-	83.6
	"	4-4.5'	X		-	-	-	-	-	-	-	-	-	31.4
	"	5-5.5'	X		-	-	-	-	-	-	-	-	-	10.7
	"	6-6.5'	X		-	-	-	-	-	-	-	-	-	59.2
AH-2	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	263
	"	1-1.5'	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	85.6
	"	2-2.5'	X		-	-	-	-	-	-	-	-	-	220
	"	3-3.5'	X		-	-	-	-	-	-	-	-	-	498
	"	4-4.5'	X		-	-	-	-	-	-	-	-	-	217
	"	5-5.5'	X		-	-	-	-	-	-	-	-	-	158
North Horizontal	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	6.42
South Horizontal	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	4.86
East Horizontal	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	3.62
West Horizontal	7/19/2019	0-6"	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	12.3

(-) Not Analyzed
ND Not Detected

PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701

PBELAB

Analytical Report

Prepared for:

John Kell

Tetra Tech

901 W Wall Street, Ste 100

Midland, TX 79705

Project: Red Hills Unit 17H

Project Number: 212C-MD-01829

Location: Lea County, NM

Lab Order Number: 9G23016

NELAP/TCEQ # T104704516-18-9

Report Date: 07/30/19

Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
North Horizontal	9G23016-01	Soil	07/17/19 00:00	07-23-2019 11:08
South Horizontal	9G23016-02	Soil	07/17/19 00:00	07-23-2019 11:08
East Horizontal	9G23016-03	Soil	07/17/19 00:00	07-23-2019 11:08
West Horizontal	9G23016-04	Soil	07/17/19 00:00	07-23-2019 11:08

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

North Horizontal

9G23016-01 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00108	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00108	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*107 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*91.3 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**6.42**	1.08	mg/kg dry	1	P9G2512	07/25/19	07/26/19	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.9	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*113 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*115 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	07/24/19	07/25/19	calc	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

South Horizontal

9G23016-02 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*89.2 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*105 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**4.86**	1.06	mg/kg dry	1	P9G2512	07/25/19	07/26/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.6	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C12-C28	ND	26.6	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*120 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*124 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	26.6	mg/kg dry	1	[CALC]	07/24/19	07/25/19	calc	

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

East Horizontal

9G23016-03 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00103	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00103	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00103	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00206	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00103	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*96.9 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*89.0 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**3.62**	1.03	mg/kg dry	1	P9G2512	07/25/19	07/26/19	EPA 300.0	
% Moisture	**3.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	25.8	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*116 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*121 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	07/24/19	07/25/19	calc	

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

West Horizontal

9G23016-04 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*91.6 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*98.4 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**12.3**	1.04	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.0	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P9G2409	07/24/19	07/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*110 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*116 %*	*70-130*		*P9G2409*	*07/24/19*	*07/25/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	07/24/19	07/25/19	calc	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Blank (P9G2403-BLK1)				Prepared & Analyzed: 07/24/19						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	*0.102*		*"*	*0.120*		*85.3*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.117*		*"*	*0.120*		*97.3*	*75-125*			
LCS (P9G2403-BS1)				Prepared & Analyzed: 07/24/19						
Benzene	0.117	0.00100	mg/kg wet	0.100		117	70-130			
Toluene	0.114	0.00100	"	0.100		114	70-130			
Ethylbenzene	0.110	0.00100	"	0.100		110	70-130			
Xylene (p/m)	0.226	0.00200	"	0.200		113	70-130			
Xylene (o)	0.119	0.00100	"	0.100		119	70-130			
Surrogate: 1,4-Difluorobenzene	*0.120*		*"*	*0.120*		*100*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.109*		*"*	*0.120*		*90.7*	*75-125*			
LCS Dup (P9G2403-BSD1)				Prepared & Analyzed: 07/24/19						
Benzene	0.111	0.00100	mg/kg wet	0.100		111	70-130	5.34	20	
Toluene	0.112	0.00100	"	0.100		112	70-130	2.15	20	
Ethylbenzene	0.110	0.00100	"	0.100		110	70-130	0.00	20	
Xylene (p/m)	0.233	0.00200	"	0.200		117	70-130	3.07	20	
Xylene (o)	0.119	0.00100	"	0.100		119	70-130	0.0924	20	
Surrogate: 1,4-Difluorobenzene	*0.119*		*"*	*0.120*		*98.9*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.112*		*"*	*0.120*		*93.0*	*75-125*			
Calibration Blank (P9G2403-CCB2)				Prepared & Analyzed: 07/24/19						
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	*0.103*		*"*	*0.120*		*86.1*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.115*		*"*	*0.120*		*96.0*	*75-125*			

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Calibration Blank (P9G2403-CCB3)				Prepared & Analyzed: 07/24/19						
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	*0.108*		*"*	*0.120*		*89.7*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.115*		*"*	*0.120*		*95.8*	*75-125*			
Calibration Check (P9G2403-CCV2)				Prepared & Analyzed: 07/24/19						
Benzene	0.109	0.00100	mg/kg wet	0.100		109	80-120			
Toluene	0.106	0.00100	"	0.100		106	80-120			
Ethylbenzene	0.0984	0.00100	"	0.100		98.4	80-120			
Xylene (p/m)	0.211	0.00200	"	0.200		105	80-120			
Xylene (o)	0.117	0.00100	"	0.100		117	80-120			
Surrogate: 4-Bromofluorobenzene	*0.113*		*"*	*0.120*		*94.0*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.113*		*"*	*0.120*		*94.4*	*75-125*			
Calibration Check (P9G2403-CCV3)				Prepared & Analyzed: 07/24/19						
Benzene	0.108	0.00100	mg/kg wet	0.100		108	80-120			
Toluene	0.109	0.00100	"	0.100		109	80-120			
Ethylbenzene	0.107	0.00100	"	0.100		107	80-120			
Xylene (p/m)	0.204	0.00200	"	0.200		102	80-120			
Xylene (o)	0.113	0.00100	"	0.100		113	80-120			
Surrogate: 4-Bromofluorobenzene	*0.123*		*"*	*0.120*		*103*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.139*		*"*	*0.120*		*116*	*75-125*			
Matrix Spike (P9G2403-MS1)	**Source: 9G23016-01**			Prepared & Analyzed: 07/24/19						
Benzene	0.0973	0.00108	mg/kg dry	0.108	ND	90.5	80-120			
Toluene	0.106	0.00108	"	0.108	ND	98.3	80-120			
Ethylbenzene	0.101	0.00108	"	0.108	ND	93.5	80-120			
Xylene (p/m)	0.235	0.00215	"	0.215	ND	109	80-120			
Xylene (o)	0.105	0.00108	"	0.108	ND	97.8	80-120			
Surrogate: 1,4-Difluorobenzene	*0.144*		*"*	*0.129*		*112*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.148*		*"*	*0.129*		*115*	*75-125*			

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Matrix Spike Dup (P9G2403-MSD1)		**Source: 9G23016-01**		Prepared & Analyzed: 07/24/19						
Benzene	0.0945	0.00108	mg/kg dry	0.108	ND	87.9	80-120	2.90	20	
Toluene	0.105	0.00108	"	0.108	ND	97.8	80-120	0.500	20	
Ethylbenzene	0.109	0.00108	"	0.108	ND	102	80-120	8.24	20	
Xylene (p/m)	0.228	0.00215	"	0.215	ND	106	80-120	3.00	20	
Xylene (o)	0.111	0.00108	"	0.108	ND	103	80-120	5.47	20	
Surrogate: 1,4-Difluorobenzene	*0.143*		*"*	*0.129*		*110*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.142*		*"*	*0.129*		*110*	*75-125*			

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Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2404 - * DEFAULT PREP *** **										
Blank (P9G2404-BLK1)				Prepared & Analyzed: 07/24/19						
% Moisture	ND	0.1	%							
Duplicate (P9G2404-DUP1)		**Source: 9G23009-01**		Prepared & Analyzed: 07/24/19						
% Moisture	5.0	0.1	%		2.0			85.7	20	
Duplicate (P9G2404-DUP2)		**Source: 9G23019-09**		Prepared & Analyzed: 07/24/19						
% Moisture	10.0	0.1	%		10.0			0.00	20	
Duplicate (P9G2404-DUP3)		**Source: 9G23021-10**		Prepared & Analyzed: 07/24/19						
% Moisture	2.0	0.1	%		2.0			0.00	20	
Batch P9G2512 - * DEFAULT PREP *** **										
Blank (P9G2512-BLK1)				Prepared & Analyzed: 07/25/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9G2512-BS1)				Prepared & Analyzed: 07/25/19						
Chloride	203	1.00	mg/kg wet	200		102	80-120			
LCS Dup (P9G2512-BSD1)				Prepared & Analyzed: 07/25/19						
Chloride	198	1.00	mg/kg wet	200		99.0	80-120	2.61	20	
Calibration Blank (P9G2512-CCB1)				Prepared & Analyzed: 07/25/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9G2512-CCB2)				Prepared & Analyzed: 07/25/19						
Chloride	0.00		mg/kg wet							

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Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2512 - * DEFAULT PREP *** **										
Calibration Check (P9G2512-CCV1)				Prepared & Analyzed: 07/25/19						
Chloride	9.42		mg/kg	10.0		94.2	0-200			
Calibration Check (P9G2512-CCV2)				Prepared & Analyzed: 07/25/19						
Chloride	9.93		mg/kg	10.0		99.3	0-200			
Calibration Check (P9G2512-CCV3)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	10.1		mg/kg	10.0		101	0-200			
Matrix Spike (P9G2512-MS1)		**Source: 9G24023-03**		Prepared & Analyzed: 07/25/19						
Chloride	5770	11.4	mg/kg dry	1140	4760	89.1	80-120			
Matrix Spike (P9G2512-MS2)		**Source: 9G24023-11**		Prepared & Analyzed: 07/25/19						
Chloride	1750	6.02	mg/kg dry	602	1220	88.7	80-120			
Matrix Spike Dup (P9G2512-MSD1)		**Source: 9G24023-03**		Prepared & Analyzed: 07/25/19						
Chloride	5730	11.4	mg/kg dry	1140	4760	85.8	80-120	0.646	20	
Matrix Spike Dup (P9G2512-MSD2)		**Source: 9G24023-11**		Prepared & Analyzed: 07/25/19						
Chloride	1730	6.02	mg/kg dry	602	1220	85.0	80-120	1.26	20	
Batch P9G2513 - * DEFAULT PREP *** **										
Blank (P9G2513-BLK1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9G2513-BS1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	200	1.00	mg/kg wet	200		100	80-120			

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2513 - * DEFAULT PREP *** **										
LCS Dup (P9G2513-BSD1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	205	1.00	mg/kg wet	200		103	80-120	2.50	20	
Calibration Blank (P9G2513-CCB1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9G2513-CCB2)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	0.00		mg/kg wet							
Calibration Check (P9G2513-CCV1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	10.1		mg/kg	10.0		101	0-200			
Calibration Check (P9G2513-CCV2)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	9.64		mg/kg	10.0		96.4	0-200			
Calibration Check (P9G2513-CCV3)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	9.68		mg/kg	10.0		96.8	0-200			
Matrix Spike (P9G2513-MS1)		**Source: 9G23016-04**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	521	1.04	mg/kg dry	521	12.3	97.7	80-120			
Matrix Spike (P9G2513-MS2)		**Source: 9G23019-02**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	513	1.06	mg/kg dry	532	3.02	96.0	80-120			
Matrix Spike Dup (P9G2513-MSD1)		**Source: 9G23016-04**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	523	1.04	mg/kg dry	521	12.3	98.0	80-120	0.347	20	
Matrix Spike Dup (P9G2513-MSD2)		**Source: 9G23019-02**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	520	1.06	mg/kg dry	532	3.02	97.2	80-120	1.26	20	

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2409 - General Preparation (GC)										
Blank (P9G2409-BLK1)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	*87.7*		*"*	*100*		*87.7*	*70-130*			
Surrogate: o-Terphenyl	*46.4*		*"*	*50.0*		*92.8*	*70-130*			
LCS Dup (P9G2409-BSD1)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	813	25.0	mg/kg wet	1000		81.3	75-125		20	
>C12-C28	846	25.0	"	1000		84.6	75-125		20	
Surrogate: 1-Chlorooctane	*107*		*"*	*100*		*107*	*70-130*			
Surrogate: o-Terphenyl	*42.4*		*"*	*50.0*		*84.8*	*70-130*			
Calibration Blank (P9G2409-CCB1)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	9.78		mg/kg wet							
>C12-C28	4.15		"							
Surrogate: 1-Chlorooctane	*95.5*		*"*	*100*		*95.5*	*70-130*			
Surrogate: o-Terphenyl	*50.2*		*"*	*50.0*		*100*	*70-130*			
Calibration Blank (P9G2409-CCB2)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	12.7		mg/kg wet							
>C12-C28	7.53		"							
Surrogate: 1-Chlorooctane	*96.2*		*"*	*100*		*96.2*	*70-130*			
Surrogate: o-Terphenyl	*51.0*		*"*	*50.0*		*102*	*70-130*			
Calibration Check (P9G2409-CCV1)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	456	25.0	mg/kg wet	500		91.1	85-115			
>C12-C28	466	25.0	"	500		93.1	85-115			
Surrogate: 1-Chlorooctane	*102*		*"*	*100*		*102*	*70-130*			
Surrogate: o-Terphenyl	*46.0*		*"*	*50.0*		*91.9*	*70-130*			

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2409 - General Preparation (GC)										
Calibration Check (P9G2409-CCV2)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	464	25.0	mg/kg wet	500		92.7	85-115			
>C12-C28	473	25.0	"	500		94.5	85-115			
Surrogate: 1-Chlorooctane	*105*		*"*	*100*		*105*	*70-130*			
Surrogate: o-Terphenyl	*46.9*		*"*	*50.0*		*93.8*	*70-130*			
Calibration Check (P9G2409-CCV3)				Prepared: 07/24/19 Analyzed: 07/26/19						
C6-C12	466	25.0	mg/kg wet	500		93.2	85-115			
>C12-C28	466	25.0	"	500		93.2	85-115			
Surrogate: 1-Chlorooctane	*103*		*"*	*100*		*103*	*70-130*			
Surrogate: o-Terphenyl	*46.6*		*"*	*50.0*		*93.2*	*70-130*			
Duplicate (P9G2409-DUP1)	**Source: 9G23017-03**			Prepared: 07/24/19 Analyzed: 07/25/19						
C6-C12	15.9	26.6	mg/kg dry		14.5			9.37	20	
>C12-C28	ND	26.6	"		10.6				20	
Surrogate: 1-Chlorooctane	*194*		*"*	*160*		*121*	*70-130*			
Surrogate: o-Terphenyl	*97.9*		*"*	*79.8*		*123*	*70-130*			

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Notes and Definitions

ROI	Received on Ice
BULK	Samples received in Bulk soil containers
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Brent Barron Date: 7/30/2019

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

Analysis Request of Chain of Custody Record

Tetra Tech, Inc.

901W Wall Street, Ste 100
Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

9GZ30116

Client Name: Cimarex

Site Manager: John Kell

Project Name: Red Hills Unit 17H

Project Location: (county, state) Lea Co, NM

Project #: 212C-MD-01829

Invoice to: Cimarex - Christine Alderman

Receiving Laboratory: PBE

Sampler Signature: Tony Legonda

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None	# CONTAINERS	FILTERED (Y/N)
1	North Horizontal	7/17/19			X			X		1	N
2	South Horizontal				X			X		1	N
3	East Horizontal				X			X		1	N
4	West Horizontal				X			X		1	N

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
1	X		X												X				
2	X		X												X				
3	X		X												X				
4	X		X												X				

Relinquished by: Date: 7/23/19 Time: 1108am

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: 7-23-19 Time: 1108am

LAB USE ONLY

Sample Temperature 4.2 5.2 CF 1.0

REMARKS:

☑ STANDARD

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

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PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701

PBELAB

Analytical Report

Prepared for:

John Kell

Tetra Tech

901 W Wall Street, Ste 100

Midland, TX 79705

Project: Red Hills Unit 17H

Project Number: 212C-MD-01829

Location: Lea County, NM

Lab Order Number: 9G23019

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704516-18-9

Report Date: 07/30/19

Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AH 1 @ 0-1'	9G23019-01	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 1-1.5'	9G23019-02	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 2-2.5'	9G23019-03	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 3-3.5'	9G23019-04	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 4-4.5'	9G23019-05	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 5-5.5'	9G23019-06	Soil	07/17/19 00:00	07-23-2019 11:08
AH 1 @ 6-6.5'	9G23019-07	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 0-1'	9G23019-08	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 1-1.5'	9G23019-09	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 2-2.5'	9G23019-10	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 3-3.5'	9G23019-11	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 4-4.5'	9G23019-12	Soil	07/17/19 00:00	07-23-2019 11:08
AH 2 @ 5-5.5'	9G23019-13	Soil	07/17/19 00:00	07-23-2019 11:08

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 0-1'

9G23019-01 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*113 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*95.1 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**5.67**	1.04	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.0	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*80.6 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*87.1 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	07/25/19	07/26/19	calc	

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901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 1-1.5'

9G23019-02 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*89.6 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*102 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**3.02**	1.06	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.6	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C12-C28	ND	26.6	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*79.0 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*83.3 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	26.6	mg/kg dry	1	[CALC]	07/25/19	07/26/19	calc	

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Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 2-2.5'

9G23019-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**9.71**	1.11	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 3-3.5'

9G23019-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**83.6**	1.09	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**8.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 4-4.5'

9G23019-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**31.4**	1.08	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 5-5.5'

9G23019-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**10.7**	1.06	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 1 @ 6-6.5'

9G23019-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**59.2**	1.04	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 0-1'

9G23019-08 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00109	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00109	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*94.3 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*107 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**263**	1.09	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**8.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	27.2	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*83.0 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*87.1 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	07/25/19	07/26/19	calc	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 1-1.5'

9G23019-09 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00111	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Toluene	ND	0.00111	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Ethylbenzene	ND	0.00111	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (p/m)	ND	0.00222	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Xylene (o)	ND	0.00111	mg/kg dry	1	P9G2403	07/24/19	07/24/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*105 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*86.7 %*	*75-125*		*P9G2403*	*07/24/19*	*07/24/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**85.6**	1.11	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	27.8	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C12-C28	ND	27.8	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
>C28-C35	ND	27.8	mg/kg dry	1	P9G2508	07/25/19	07/26/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*80.6 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*84.3 %*	*70-130*		*P9G2508*	*07/25/19*	*07/26/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	27.8	mg/kg dry	1	[CALC]	07/25/19	07/26/19	calc	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 2-2.5'

9G23019-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**220**	1.10	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**9.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 3-3.5'

9G23019-11 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**498**	1.06	mg/kg dry	1	P9G2513	07/25/19	07/26/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 4-4.5'

9G23019-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**217**	1.11	mg/kg dry	1	P9G2801	07/28/19	07/28/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

AH 2 @ 5-5.5'

9G23019-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**158**	1.15	mg/kg dry	1	P9G2801	07/28/19	07/28/19	EPA 300.0	
% Moisture	**13.0**	0.1	%	1	P9G2404	07/24/19	07/24/19	ASTM D2216	

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Midland TX, 79705	Project Manager: John Kell	

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Blank (P9G2403-BLK1)				Prepared & Analyzed: 07/24/19						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	*0.102*		*"*	*0.120*		*85.3*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.117*		*"*	*0.120*		*97.3*	*75-125*			
LCS (P9G2403-BS1)				Prepared & Analyzed: 07/24/19						
Benzene	0.117	0.00100	mg/kg wet	0.100		117	70-130			
Toluene	0.114	0.00100	"	0.100		114	70-130			
Ethylbenzene	0.110	0.00100	"	0.100		110	70-130			
Xylene (p/m)	0.226	0.00200	"	0.200		113	70-130			
Xylene (o)	0.119	0.00100	"	0.100		119	70-130			
Surrogate: 1,4-Difluorobenzene	*0.120*		*"*	*0.120*		*100*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.109*		*"*	*0.120*		*90.7*	*75-125*			
LCS Dup (P9G2403-BSD1)				Prepared & Analyzed: 07/24/19						
Benzene	0.111	0.00100	mg/kg wet	0.100		111	70-130	5.34	20	
Toluene	0.112	0.00100	"	0.100		112	70-130	2.15	20	
Ethylbenzene	0.110	0.00100	"	0.100		110	70-130	0.00	20	
Xylene (p/m)	0.233	0.00200	"	0.200		117	70-130	3.07	20	
Xylene (o)	0.119	0.00100	"	0.100		119	70-130	0.0924	20	
Surrogate: 4-Bromofluorobenzene	*0.112*		*"*	*0.120*		*93.0*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.119*		*"*	*0.120*		*98.9*	*75-125*			
Calibration Blank (P9G2403-CCB2)				Prepared & Analyzed: 07/24/19						
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	*0.103*		*"*	*0.120*		*86.1*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.115*		*"*	*0.120*		*96.0*	*75-125*			

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Midland TX, 79705	Project Manager: John Kell	

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Calibration Blank (P9G2403-CCB3)				Prepared & Analyzed: 07/24/19						
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	*0.108*		*"*	*0.120*		*89.7*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.115*		*"*	*0.120*		*95.8*	*75-125*			
Calibration Check (P9G2403-CCV2)				Prepared & Analyzed: 07/24/19						
Benzene	0.109	0.00100	mg/kg wet	0.100		109	80-120			
Toluene	0.106	0.00100	"	0.100		106	80-120			
Ethylbenzene	0.0984	0.00100	"	0.100		98.4	80-120			
Xylene (p/m)	0.211	0.00200	"	0.200		105	80-120			
Xylene (o)	0.117	0.00100	"	0.100		117	80-120			
Surrogate: 1,4-Difluorobenzene	*0.113*		*"*	*0.120*		*94.4*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.113*		*"*	*0.120*		*94.0*	*75-125*			
Calibration Check (P9G2403-CCV3)				Prepared & Analyzed: 07/24/19						
Benzene	0.108	0.00100	mg/kg wet	0.100		108	80-120			
Toluene	0.109	0.00100	"	0.100		109	80-120			
Ethylbenzene	0.107	0.00100	"	0.100		107	80-120			
Xylene (p/m)	0.204	0.00200	"	0.200		102	80-120			
Xylene (o)	0.113	0.00100	"	0.100		113	80-120			
Surrogate: 4-Bromofluorobenzene	*0.123*		*"*	*0.120*		*103*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.139*		*"*	*0.120*		*116*	*75-125*			
Matrix Spike (P9G2403-MS1)		**Source: 9G23016-01**		Prepared & Analyzed: 07/24/19						
Benzene	0.0973	0.00108	mg/kg dry	0.108	ND	90.5	80-120			
Toluene	0.106	0.00108	"	0.108	ND	98.3	80-120			
Ethylbenzene	0.101	0.00108	"	0.108	ND	93.5	80-120			
Xylene (p/m)	0.235	0.00215	"	0.215	ND	109	80-120			
Xylene (o)	0.105	0.00108	"	0.108	ND	97.8	80-120			
Surrogate: 4-Bromofluorobenzene	*0.148*		*"*	*0.129*		*115*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.144*		*"*	*0.129*		*112*	*75-125*			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2403 - General Preparation (GC)										
Matrix Spike Dup (P9G2403-MSD1)		**Source: 9G23016-01**		Prepared & Analyzed: 07/24/19						
Benzene	0.0945	0.00108	mg/kg dry	0.108	ND	87.9	80-120	2.90	20	
Toluene	0.105	0.00108	"	0.108	ND	97.8	80-120	0.500	20	
Ethylbenzene	0.109	0.00108	"	0.108	ND	102	80-120	8.24	20	
Xylene (p/m)	0.228	0.00215	"	0.215	ND	106	80-120	3.00	20	
Xylene (o)	0.111	0.00108	"	0.108	ND	103	80-120	5.47	20	
Surrogate: 4-Bromofluorobenzene	*0.142*		*"*	*0.129*		*110*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.143*		*"*	*0.129*		*110*	*75-125*			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2404 - * DEFAULT PREP *** **										
Blank (P9G2404-BLK1)				Prepared & Analyzed: 07/24/19						
% Moisture	ND	0.1	%							
Duplicate (P9G2404-DUP1)		**Source: 9G23009-01**		Prepared & Analyzed: 07/24/19						
% Moisture	5.0	0.1	%		2.0			85.7	20	
Duplicate (P9G2404-DUP2)		**Source: 9G23019-09**		Prepared & Analyzed: 07/24/19						
% Moisture	10.0	0.1	%		10.0			0.00	20	
Duplicate (P9G2404-DUP3)		**Source: 9G23021-10**		Prepared & Analyzed: 07/24/19						
% Moisture	2.0	0.1	%		2.0			0.00	20	
Batch P9G2513 - * DEFAULT PREP *** **										
Blank (P9G2513-BLK1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9G2513-BS1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	200	1.00	mg/kg wet	200		100	80-120			
LCS Dup (P9G2513-BSD1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	205	1.00	mg/kg wet	200		103	80-120	2.50	20	
Calibration Blank (P9G2513-CCB1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9G2513-CCB2)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	0.00		mg/kg wet							

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2513 - * DEFAULT PREP *** **										
Calibration Check (P9G2513-CCV1)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	10.1		mg/kg	10.0		101	0-200			
Calibration Check (P9G2513-CCV2)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	9.64		mg/kg	10.0		96.4	0-200			
Calibration Check (P9G2513-CCV3)				Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	9.68		mg/kg	10.0		96.8	0-200			
Matrix Spike (P9G2513-MS1)		**Source: 9G23016-04**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	521	1.04	mg/kg dry	521	12.3	97.7	80-120			
Matrix Spike (P9G2513-MS2)		**Source: 9G23019-02**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	513	1.06	mg/kg dry	532	3.02	96.0	80-120			
Matrix Spike Dup (P9G2513-MSD1)		**Source: 9G23016-04**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	523	1.04	mg/kg dry	521	12.3	98.0	80-120	0.347	20	
Matrix Spike Dup (P9G2513-MSD2)		**Source: 9G23019-02**		Prepared: 07/25/19 Analyzed: 07/26/19						
Chloride	520	1.06	mg/kg dry	532	3.02	97.2	80-120	1.26	20	
Batch P9G2801 - * DEFAULT PREP *** **										
Blank (P9G2801-BLK1)				Prepared & Analyzed: 07/28/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9G2801-BS1)				Prepared & Analyzed: 07/28/19						
Chloride	205	1.00	mg/kg wet	200		103	80-120			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech
901 W Wall Street, Ste 100
Midland TX, 79705

Project: Red Hills Unit 17H
Project Number: 212C-MD-01829
Project Manager: John Kell

Fax: (432) 686-8085

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2801 - * DEFAULT PREP *** **										
LCS Dup (P9G2801-BSD1)				Prepared & Analyzed: 07/28/19						
Chloride	204	1.00	mg/kg wet	200		102	80-120	0.362	20	
Calibration Blank (P9G2801-CCB1)				Prepared & Analyzed: 07/28/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9G2801-CCB2)				Prepared & Analyzed: 07/28/19						
Chloride	0.00		mg/kg wet							
Calibration Check (P9G2801-CCV1)				Prepared & Analyzed: 07/28/19						
Chloride	9.91	0.100	mg/kg wet				0-200			
Calibration Check (P9G2801-CCV2)				Prepared & Analyzed: 07/28/19						
Chloride	10.1	0.100	mg/kg wet				0-200			
Calibration Check (P9G2801-CCV3)				Prepared & Analyzed: 07/28/19						
Chloride	9.89	0.100	mg/kg wet				0-200			
Matrix Spike (P9G2801-MS1)		**Source: 9G26016-03**		Prepared & Analyzed: 07/28/19						
Chloride	506	1.06	mg/kg dry	532	4.29	94.4	80-120			
Matrix Spike (P9G2801-MS2)		**Source: 9G23019-12**		Prepared & Analyzed: 07/28/19						
Chloride	751	1.11	mg/kg dry	556	217	96.0	80-120			
Matrix Spike Dup (P9G2801-MSD1)		**Source: 9G26016-03**		Prepared & Analyzed: 07/28/19						
Chloride	506	1.06	mg/kg dry	532	4.29	94.4	80-120	0.0168	20	
Matrix Spike Dup (P9G2801-MSD2)		**Source: 9G23019-12**		Prepared & Analyzed: 07/28/19						
Chloride	737	1.11	mg/kg dry	556	217	93.5	80-120	1.90	20	

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Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2508 - TX 1005										
Blank (P9G2508-BLK1)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	*88.8*		*"*	*100*		*88.8*	*70-130*			
Surrogate: o-Terphenyl	*46.4*		*"*	*50.0*		*92.8*	*70-130*			
LCS (P9G2508-BS1)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	831	25.0	mg/kg wet	1000		83.1	75-125			
>C12-C28	867	25.0	"	1000		86.7	75-125			
Surrogate: 1-Chlorooctane	*112*		*"*	*100*		*112*	*70-130*			
Surrogate: o-Terphenyl	*47.2*		*"*	*50.0*		*94.3*	*70-130*			
LCS Dup (P9G2508-BSD1)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	816	25.0	mg/kg wet	1000		81.6	75-125	1.92	20	
>C12-C28	854	25.0	"	1000		85.4	75-125	1.51	20	
Surrogate: 1-Chlorooctane	*109*		*"*	*100*		*109*	*70-130*			
Surrogate: o-Terphenyl	*44.9*		*"*	*50.0*		*89.8*	*70-130*			
Calibration Blank (P9G2508-CCB1)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	12.2		mg/kg wet							
>C12-C28	8.12		"							
Surrogate: 1-Chlorooctane	*91.0*		*"*	*100*		*91.0*	*70-130*			
Surrogate: o-Terphenyl	*47.6*		*"*	*50.0*		*95.2*	*70-130*			
Calibration Blank (P9G2508-CCB2)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	9.65		mg/kg wet							
>C12-C28	12.3		"							
Surrogate: 1-Chlorooctane	*91.7*		*"*	*100*		*91.7*	*70-130*			
Surrogate: o-Terphenyl	*48.0*		*"*	*50.0*		*96.1*	*70-130*			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9G2508 - TX 1005										
Calibration Check (P9G2508-CCV1)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	460	25.0	mg/kg wet	500		92.0	85-115			
>C12-C28	475	25.0	"	500		95.0	85-115			
Surrogate: 1-Chlorooctane	*105*		*"*	*100*		*105*	*70-130*			
Surrogate: o-Terphenyl	*47.7*		*"*	*50.0*		*95.4*	*70-130*			
Calibration Check (P9G2508-CCV2)				Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	473	25.0	mg/kg wet	500		94.5	85-115			
>C12-C28	479	25.0	"	500		95.9	85-115			
Surrogate: 1-Chlorooctane	*106*		*"*	*100*		*106*	*70-130*			
Surrogate: o-Terphenyl	*47.3*		*"*	*50.0*		*94.6*	*70-130*			
Duplicate (P9G2508-DUP1)		**Source: 9G23020-02**		Prepared: 07/25/19 Analyzed: 07/26/19						
C6-C12	14.4	26.0	mg/kg dry		16.7			15.1	20	
>C12-C28	ND	26.0	"		ND				20	
Surrogate: 1-Chlorooctane	*83.7*		*"*	*104*		*80.4*	*70-130*			
Surrogate: o-Terphenyl	*44.9*		*"*	*52.1*		*86.3*	*70-130*			

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

Tetra Tech	Project: Red Hills Unit 17H	Fax: (432) 686-8085
901 W Wall Street, Ste 100	Project Number: 212C-MD-01829	
Midland TX, 79705	Project Manager: John Kell	

Notes and Definitions

ROI	Received on Ice
BULK	Samples received in Bulk soil containers
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Brent Barron Date: 7/30/2019

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

Page 50 of 67

Analysis Request of Chain of Custody Record

Page 25 of 26

Tetra Tech, Inc.

901W Wall Street, Ste 100
Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

9G23019

Client Name: Cimarex

Site Manager: John Kell

Project Name: Red Hills Unit 17H

Project Location: (county, state) Lea CO, NM

Project #: 212C-MD-01829

Invoice to: Cimarex - Christine Alderman

Receiving Laboratory: PBE

Sampler Signature: Tony Loganda

Comments: Run deeper samples for BTEX if Benzene is greater than 50 mg/kg
" for TPH if TPH is " 100 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2019 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE HCL	PRESERVATIVE HNO_3	PRESERVATIVE ICE	PRESERVATIVE None	# CONTAINERS	FILTERED (Y/N)
1	AH 1 0-1'	7/17/19			X			X		1	N
2	AH 1 1-1.5'										
3	AH 1 2-2.5'										
4	AH 1 3-3.5'										
5	AH 1 4-4.5'										
6	AH 1 5-5.5'										
7	AH 1 6-6.5'										
8	AH 2 (0-1')										
9	AH 2 1-1.5'										
10	AH 2 2-2.5'										

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB #	BTEX 8021B 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
1	X		X												X				
2	X		X												X				
3															X				
4															X				
5															X				
6															X				
7															X				
8	X		X												X				
9	X		X												X				
10															X				

Relinquished by: Date: 7/23/19 Time: 1108am

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: 7-23-19 Time: 1108am

LAB USE ONLY

Sample Temperature 4.2 5.2

CF1.LQ

REMARKS:

☒ STANDARD

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

Received by OCD: 3/16/2020 3:36:59 PM

Analysis Request of Chain of Custody Record

Tetra Tech, Inc.

901W Wall Street, Ste 100
Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

9G23019

Client Name: Cimarex

Site Manager: John Kell

Project Name: Red Hills Unit 17 H

Project Location: (county, state) Lea Co, NM

Project #: 212C-MD-01829

Invoice to: Cimarex- Christine Alderman

Receiving Laboratory: PBE

Sampler Signature: Tony Lugarda

Comments: Run deeper samples for BTEX Benzene if TPH BTEX Benzene TPH is greater than 50 to 100 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None	# CONTAINERS	FILTERED (Y/N)
11	AH 2 3-3.5'	7/17/19			X			X		1	N
12	AH 2 4-4.5'	7/17/19			X			X		1	N
13	AH 2 5-5.5'	7/17/19			X			X		1	N

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance			Hold
														X						
														X						
														X						

Relinquished by: Date: 7/23/19 Time: 1108am

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: 7-23-19 1108am

LAB USE ONLY

Sample Temperature #4.2 5.2 #1.6

REMARKS:

☒ STANDARD

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY

Received by OCD: 3/16/2020 3:36:59 PM

Photos

Cimarex Energy
Red Hills Unit #17H
Lea County, New Mexico

TETRA TECH

View North – Area of AH-1

View East – Area of AH-2

Appendix A: Agency Forms

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NDHR1917155056
District RP	1RP-5559
Facility ID	
Application ID	pDHR1917154668

Release Notification

Responsible Party

Responsible Party Cimarex Energy	OGRID 162683
Contact Name Christine Alderman	Contact Telephone 432-853-7059
Contact email calderman@cimarex.com	Incident # *(assigned by OCD)*
Contact mailing address 600 N Marienfeld Ste 60, Midland, TX 79701	

Location of Release Source

Latitude 32.091227 Longitude -103.578962
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Red Hills Unit 17H	Site Type production battery
Date Release Discovered 6/1/2019	API# *(if applicable)* 30-025-42325

Unit Letter	Section	Township	Range	County
D	33	25S	33E	Lea

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 10	Volume Recovered (bbls) 0
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A ¼" ball valve had inadvertanly been left open and released produced water onto location pad. Area it approximately 35' x 23' x 1".

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NDHR1917155056
District RP	1RP-5559
Facility ID	
Application ID	pDHR1917154668

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
No
Christine Alderman
District 1 email

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Christine Alderman Title: ESH Supervisor

Signature: Christine Alderman Date: 6/5/2019

email: calderman@cimarex.com Telephone: 432-853-7059

OCD Only

Received by: Dylan Rose-Coss Date: 06/20/2019

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	_____ (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☐ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☐ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☐ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☐ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☐ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☐ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☐ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☐ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☐ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☐ Data table of soil contaminant concentration data
- ☐ Depth to water determination
- ☐ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☐ Boring or excavation logs
- ☐ Photographs including date and GIS information
- ☐ Topographic/Aerial maps
- ☐ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _____ Title: _____

Signature: gloria garza _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☐ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☐ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: _____ Title: _____

Signature: gloria garza _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Appendix B: Groundwater Data

Water Well Data
Average Depth to Groundwater (ft)
Cimarex - Red Hills Unit #17H, Lea County, New Mexico

24 South 32 East

6	5	4	3	2	1
7	8	9	10 **20**	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33 **290**	34	35	36

24 South 33 East

6	5	4	3	2	1
7	8	9	10 **20** **22**	11	12
18	17	16	15	14	13
19	20	21	22	23 **208**	24 **16.9**
30	29	28	27	26	25
31	32	33 **93.2**	34	35	36

24 South 34 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32 **290**	33	34	35	36

25 South 33 East

6	5 **90**	4 **Maljamar**	3 172	2	1
7	8	9	10	11 140	12 200
18	17	16	15	14	13 **185**
19	20 **200**	21 120	22	23	24
30	29	28	27 125	26 **110**	25
31 **190**	32	33	34	35	36

25 South 34 East

6	5	4	3	2	1 **260**
7	8	9	10	11	12
18	17	16	15 **135**	14	13
19	20	21	22	23	24 **300**
30	29 50	28	27	26	25
31	32	33	34	35	36

26 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 **333** **180**	22	23	24
30	29	28	27	26	25
31 **295**	32	33	34	35	36

26 South 33 East

6	5	4	3 **180**	2	1
7	8	9 **106**	10 **124**	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27 **80**	26	25
31	32	33	34	35	36

26 South 34 East

6 **130**	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports
105 USGS Well Reports
90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
Geology and Groundwater Resources of Eddy County, NM (Report 3)
34 NMOCD - Groundwater Data
121 Abandoned Waterwell (recently measured)

National Water Information System: Web Interface

Click to hideNews Bulletins

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- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 320615103352601

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

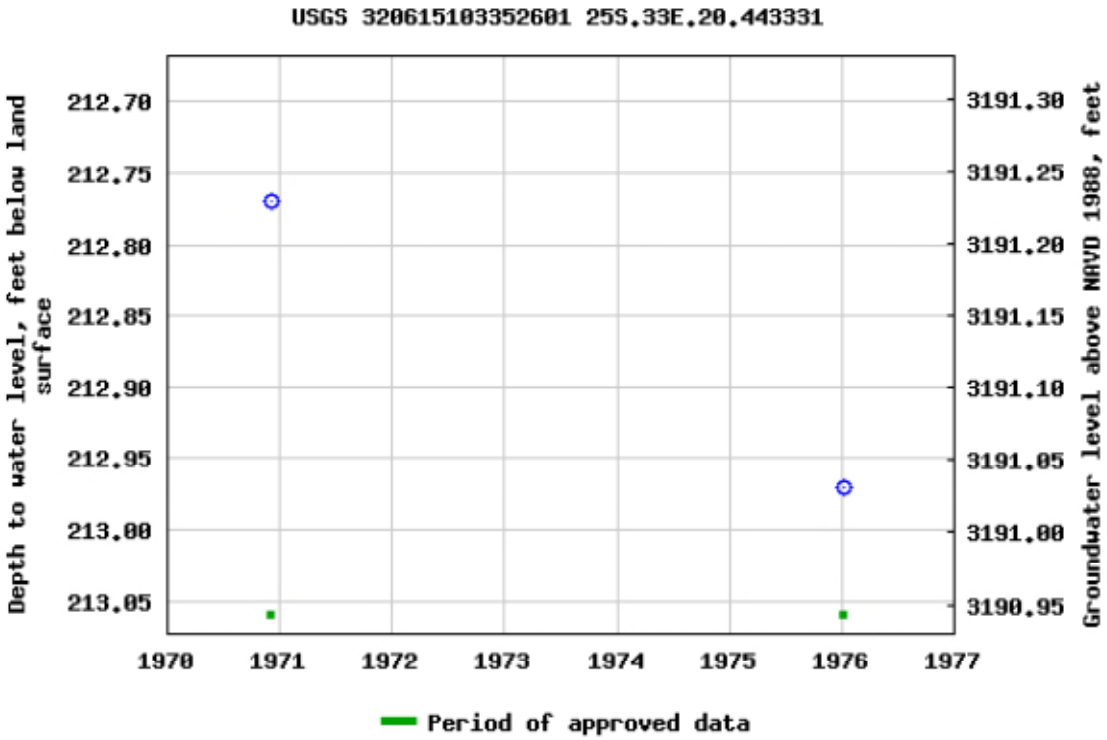
USGS 320615103352601 25S.33E.20.443331

Available data for this site Groundwater: Field measurements | GO

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°06'15", Longitude 103°35'26" NAD27
Land-surface elevation 3,404 feet above NAVD88
This well is completed in the Ogallala Formation (121OGLL) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
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Explanation of terms
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U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2019-08-06 11:32:33 EDT
22.53 1.31 nadww01

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02312		CUB	LE	1	2	1	05	25S	33E	632241	3559687*	150	90	60
C 02313		CUB	LE	2	3	3	26	25S	33E	636971	3552098*	150	110	40
C 02373 CLW317846	O	CUB	LE	2	1	1	13	25S	33E	638518	3556544*	625	185	440
C 02373 S		CUB	LE	1	2	1	13	25S	33E	638721	3556549*	625	185	440

Average Depth to Water: **142 feet**

Minimum Depth: **90 feet**

Maximum Depth: **185 feet**

Record Count: 4

PLSS Search:

Township: 25S **Range:** 33E

***UTM location was derived from PLSS - see Help**

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

USGS science for a changing world

National Water Information System: Mapper

Sites | Map

Search

Search by Street Address:

32.091227 -103.578962

Search by Place Name:

Enter Place Name

Search by Site Number(s):

Enter Site Number(s)

Search by State/Territory:

Select an Area

Search by Watershed Region:

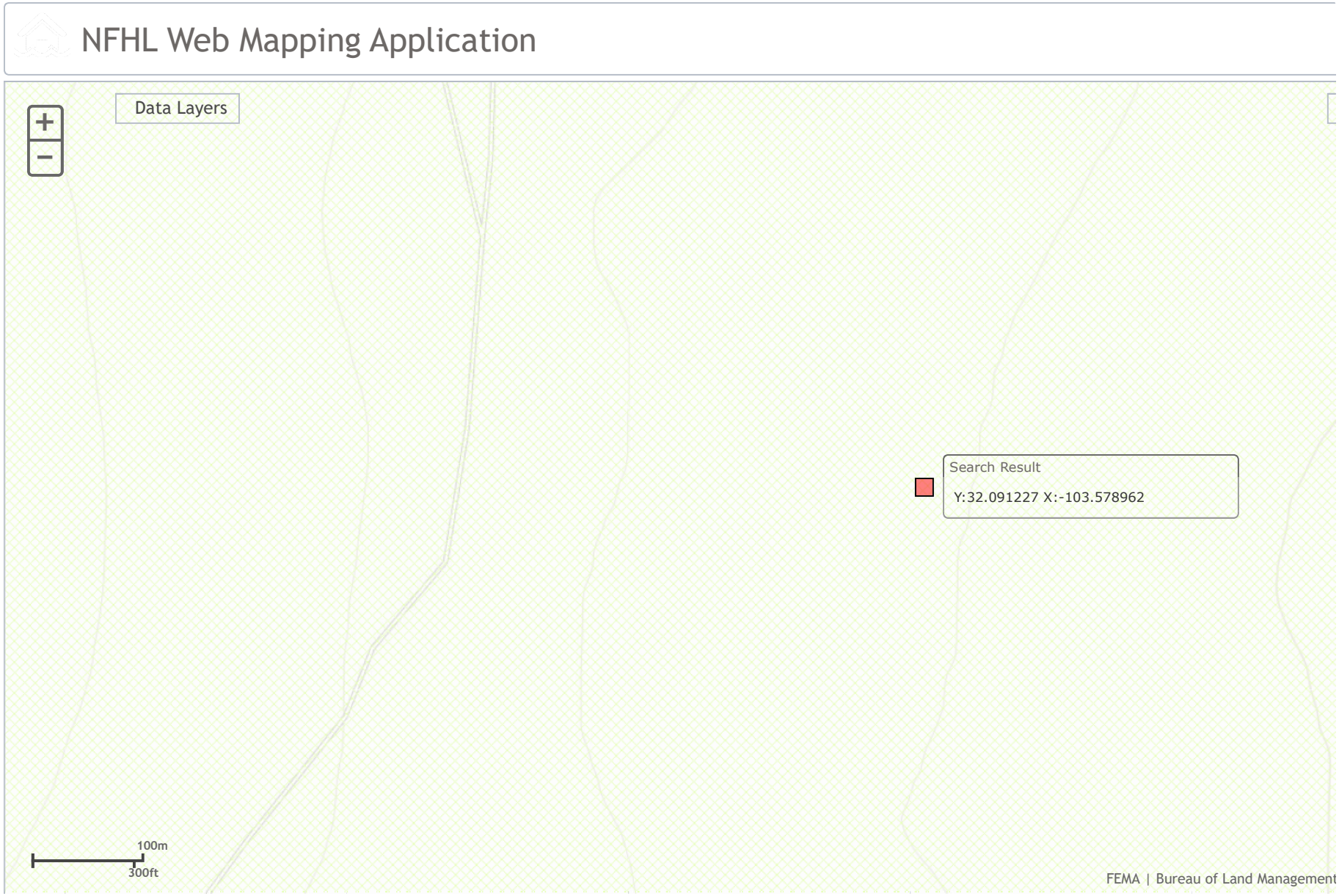
Select a Region

- Surface-Water Sites
- Groundwater Sites
- Springs
- Atmospheric Sites
- Other Sites

Site Information

Cimarex Red Hills Unit #17H

Karst Potential Map


NFHL Web Mapping Application
Data Layers
Search Result
Y:32.091227 X:-103.578962
100m
300ft
FEMA | Bureau of Land Management