

SITE INFORMATION

Report Type: Closure Report 1RP-5301

General Site Information:

Site:	Red Hills Unit #16H					
Company:	Cimarex Energy					
Section, Township and Range	Unit D	Sec. 33	T 25S	R 33E		
Lease Number:	API No. 30-025-42324					
County:	Lea County					
GPS:	32.093036°			-103.583740°		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of J-1 (Orla Rd) and Pipeline Rd, go east on Pipeline Rd for 5.04 miles, turn hard left (northwest) onto unnamed lease road and go 0.7 miles, turn right (northeast) and and go 0.4 miles, turn left (northwest) and go 0.12 miles, turn right (northeast and go 0.92 miles, from here the work area is on the caliche pad 800 feet to the east.					

Release Data:

Date Released:	12/5/2018
Type Release:	Produced Water
Source of Contamination:	Sump dump valves and high level kill switch on sand trap pit
Fluid Released:	90 bbls
Fluids Recovered:	60 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@Tetrattech.com

Site Characterization

Depth to Groundwater:	212' below surface
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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	2,500 mg/kg	20,000 mg/kg



January 30, 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 #16H, Unit D, Section 33, Township 25 South, Range 33 East, Lea County, New Mexico. 1RP-5301

Ms. Garza:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cimarex Energy (Cimarex) to prepare a closure report for a spill at the Red Hills Unit #16H, Unit D, Section 33, Township 25 South, Range 33 East, Lea County, New Mexico (site). The spill site coordinates are 32.093036°, -103.583740°. 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 December 5, 2018, and released approximately ninety (90) barrels of produced water due to the failure of both the automatic sand dump valves and the high level kill switch on the sand trap pit. Approximately sixty (60) barrels of produced water was recovered. The release occurred on the pad area and measured approximately 110' x 270'. The initial 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 1.1 miles northwest of the site, and has a reported depth to groundwater of 212 feet below ground surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is approximately 200' below 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, updated August 14, 2018. 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) and 2,500 mg/kg (GRO + DRO + MRO). Additionally, based on the reported depth to groundwater in the area, the proposed RRAL for chlorides is 20,000 mg/kg.

Soil Assessment and Analytical Results

On January 14, 2019, Tetra Tech personnel were onsite to evaluate and sample the release area. Six (6) auger holes (AH-1, AH-2, AH-3, AH-4, AH-5, and AH-6) were installed in the spill foot print to total depths ranging from 3.0'-3.5' and 5.0'-5.5' below surface. 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, all analyzed samples showed benzene, total BTEX, TPH, and chloride concentrations below the RRAL's.

Conclusion

Based on the laboratory results and the location of the release on the facilities pad, 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

A handwritten signature in blue ink that reads 'Clair Gonzales'.

Clair Gonzales,
Project Manager

A handwritten signature in blue ink that reads 'Johnathon Kell'.

Johnathon Kell,
Geologist

cc: Shelly Tucker – BLM

Maps/Plats



Cavern City Air Terminal

Eddy

Lea

RED HILLS UNIT # 16H



ICO

NEW MEXICO
TEXAS

Loving

Reeves

Loving
Winkler

0 20,833 41,666
1 inch = 20,833 feet
Feet



FIGURE 1

RED HILL UNIT # 16H
(32.093036°, -103.583740°)

OVERVIEW MAP

LEA COUNTY, NEW MEXICO

Project : 212C-MD-01557

Date : 01/23/2019

File : H:\GIS\212C-MD-01557



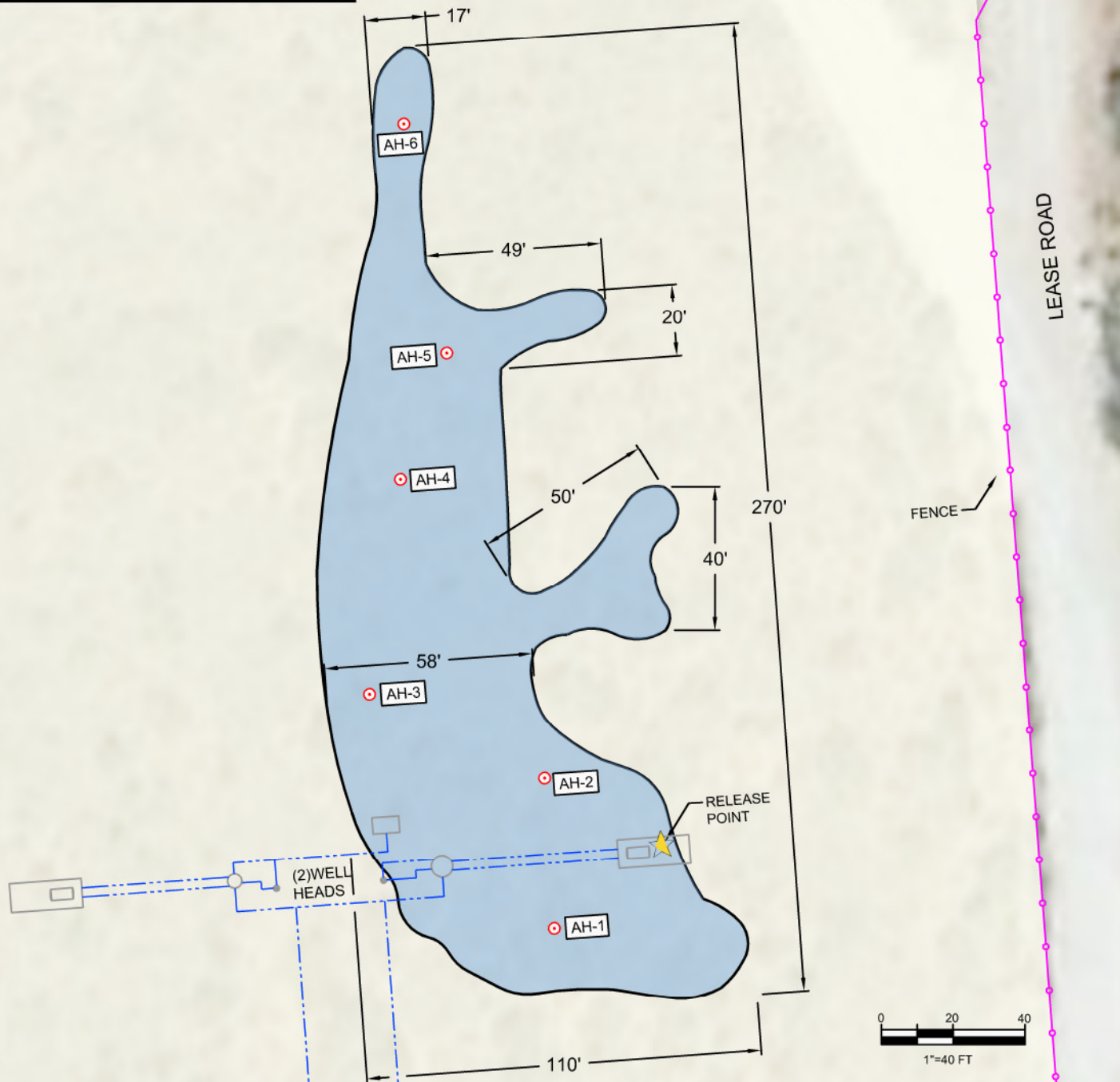
Sources: Esri, HERE, Garmin,
Japan, METI, Esri China (Hong
Kong), Swatch, OpenStreetMap contributors, and the
Geo-Community

LEGEND

● SITE LOCATION



AUGER HOLE SAMPLE LOCATIONS	LATITUDE	LONGITUDE
AH-1	32.092879	-103.583749
AH-2	32.092981	-103.583736
AH-3	32.093058	-103.583875
AH-4	32.093198	-103.583818
AH-5	32.093277	-103.58376
AH-6	32.093434	-103.583764



LEGEND	
●	AUGER HOLE SAMPLE LOCATIONS
	SPILL AREA
	EQUIPMENT
---	STEEL PIPE



FIGURE 3

RED HILL UNIT # 16H
(32.093036°, -103.583740°)

SPILL ASSESSMENT MAP
LEA COUNTY, NEW MEXICO

Project: 212C-MD-01557

Date: 01/23/2019

File: H:\GIS\212C-MD-01557



Lab Analysis

Table 1
Cimarex
Red Hills Unit 16
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB 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	1/14/2019	0-1	-	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	556
	"	1-1.5	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	88.7
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	107
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	113
	"	4-4.5	-	X		-	-	-	-	-	-	-	-	-	20.9
	"	5-5.5	-	X		-	-	-	-	-	-	-	-	-	<4.95
AH-2	1/14/2019	0-1	-	X		<15.0	21.4	<15.0	21.4	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	3,430
	"	1-1.5	-	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	4,220
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	3,330
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	212
	"	4-4.5	-	X		-	-	-	-	-	-	-	-	-	16.9
AH-3	1/14/2019	0-1	-	X		<15.0	56.5	<15.0	56.5	<0.00200	<0.00200	<0.00200	0.0206	0.0206	102
	"	1-1.5	-	X		<15.0	75.7	<15.0	75.7	<0.00200	<0.00200	<0.00200	0.00204	0.00204	137
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	37.8
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	29.7
	"	4-4.5	-	X		-	-	-	-	-	-	-	-	-	158
AH-4	1/14/2019	0-1	-	X		<15.0	24.0	<15.0	24.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	845
	"	1-1.5	-	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	292
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	1,710
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	6,060
AH-5	1/14/2019	0-1	-	X		<15.0	33.3	<15.0	33.3	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	166
	"	1-1.5	-	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	38.0
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	111
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	128
AH-6	1/14/2019	0-1	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	464
	"	1-1.5	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-	243
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	97.4
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	-	307



Certificate of Analysis Summary 611308

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex Red Hills Unit 16



Project Id: 212C-MD-01557
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Jan-15-19 10:10 am
Report Date: 21-JAN-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	611308-001	611308-002	611308-003	611308-004	611308-005	611308-006
	<i>Field Id:</i>	AH #1 (0-1')	AH #1 (1-1.5')	AH #1 (2-2.5')	AH #1 (3-3.5')	AH #1 (4-4.5')	AH #1 (5-5.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00
BTEX by EPA 8021B	<i>Extracted:</i>	Jan-18-19 13:00	Jan-18-19 13:00				
	<i>Analyzed:</i>	Jan-18-19 22:55	Jan-18-19 23:17				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Benzene		<0.00202 0.00202	<0.00200 0.00200				
Toluene		<0.00202 0.00202	<0.00200 0.00200				
Ethylbenzene		<0.00202 0.00202	<0.00200 0.00200				
m,p-Xylenes		<0.00403 0.00403	<0.00400 0.00400				
o-Xylene		<0.00202 0.00202	<0.00200 0.00200				
Total Xylenes		<0.00202 0.00202	<0.00200 0.00200				
Total BTEX		<0.00202 0.00202	<0.00200 0.00200				
Chloride by EPA 300	<i>Extracted:</i>	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30
	<i>Analyzed:</i>	Jan-17-19 14:09	Jan-17-19 14:33	Jan-17-19 14:39	Jan-17-19 15:01	Jan-17-19 15:07	Jan-17-19 15:13
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		556 4.97	88.7 4.98	107 4.95	113 4.99	20.9 4.99	<4.95 4.95
TPH By SW8015 Mod	<i>Extracted:</i>	Jan-18-19 15:00	Jan-18-19 15:00				
	<i>Analyzed:</i>	Jan-19-19 02:37	Jan-19-19 01:18				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0				
Diesel Range Organics (DRO)		<15.0 15.0	<15.0 15.0				
Motor Oil Range Hydrocarbons (MRO)		<15.0 15.0	<15.0 15.0				
Total TPH		<15.0 15.0	<15.0 15.0				

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Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 611308

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex Red Hills Unit 16



Project Id: 212C-MD-01557
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Jan-15-19 10:10 am
Report Date: 21-JAN-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	611308-007	611308-008	611308-009	611308-010	611308-011	611308-012
	<i>Field Id:</i>	AH #2 (0-1')	AH #2 (1-1.5')	AH #2 (2-2.5')	AH #2 (3-3.5')	AH #2 (4-4.5')	AH #3 (0-1')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00
BTEX by EPA 8021B	<i>Extracted:</i>	Jan-18-19 13:00	Jan-18-19 13:00				Jan-18-19 13:00
	<i>Analyzed:</i>	Jan-18-19 23:38	Jan-19-19 00:00				Jan-19-19 00:21
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				mg/kg RL
Benzene		<0.00201 0.00201	<0.00199 0.00199				<0.00200 0.00200
Toluene		<0.00201 0.00201	<0.00199 0.00199				<0.00200 0.00200
Ethylbenzene		<0.00201 0.00201	<0.00199 0.00199				<0.00200 0.00200
m,p-Xylenes		<0.00402 0.00402	<0.00398 0.00398				0.00616 0.00401
o-Xylene		<0.00201 0.00201	<0.00199 0.00199				0.0144 0.00200
Total Xylenes		<0.00201 0.00201	<0.00199 0.00199				0.0206 0.00200
Total BTEX		<0.00201 0.00201	<0.00199 0.00199				0.0206 0.00200
Chloride by EPA 300	<i>Extracted:</i>	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 09:30	Jan-17-19 10:00	Jan-17-19 10:00
	<i>Analyzed:</i>	Jan-17-19 15:20	Jan-17-19 15:26	Jan-17-19 15:32	Jan-17-19 15:38	Jan-17-19 16:43	Jan-17-19 16:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		3430 25.0	4220 25.0	3330 25.0	212 5.00	16.9 5.00	102 4.95
TPH By SW8015 Mod	<i>Extracted:</i>	Jan-18-19 15:00	Jan-18-19 15:00				Jan-18-19 15:00
	<i>Analyzed:</i>	Jan-19-19 00:58	Jan-19-19 00:38				Jan-19-19 00:19
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0				<15.0 15.0
Diesel Range Organics (DRO)		21.4 15.0	<15.0 15.0				56.5 15.0
Motor Oil Range Hydrocarbons (MRO)		<15.0 15.0	<15.0 15.0				<15.0 15.0
Total TPH		21.4 15.0	<15.0 15.0				56.5 15.0

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 611308

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex Red Hills Unit 16



Project Id: 212C-MD-01557
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Jan-15-19 10:10 am
Report Date: 21-JAN-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	611308-013	611308-014	611308-015	611308-016	611308-017	611308-018
	<i>Field Id:</i>	AH #3 (1-1.5')	AH #3 (2-2.5')	AH #3 (3-3.5')	AH #3 (4-4.5')	AH #4 (0-1')	AH #4 (1-1.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00
BTEX by EPA 8021B	<i>Extracted:</i>	Jan-18-19 13:00				Jan-18-19 14:30	Jan-18-19 14:30
	<i>Analyzed:</i>	Jan-19-19 00:43				Jan-18-19 21:29	Jan-18-19 21:48
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200				<0.00200 0.00200	<0.00202 0.00202
Toluene		<0.00200 0.00200				<0.00200 0.00200	<0.00202 0.00202
Ethylbenzene		<0.00200 0.00200				<0.00200 0.00200	<0.00202 0.00202
m,p-Xylenes		<0.00399 0.00399				<0.00399 0.00399	<0.00403 0.00403
o-Xylene		0.00204 0.00200				<0.00200 0.00200	<0.00202 0.00202
Total Xylenes		0.00204 0.00200				<0.00200 0.00200	<0.00202 0.00202
Total BTEX		0.00204 0.00200				<0.00200 0.00200	<0.00202 0.00202
Chloride by EPA 300	<i>Extracted:</i>	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00
	<i>Analyzed:</i>	Jan-17-19 16:56	Jan-17-19 17:02	Jan-17-19 17:23	Jan-17-19 17:29	Jan-17-19 17:36	Jan-17-19 17:42
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		137 5.00	37.8 5.00	29.7 5.00	158 4.95	845 4.95	292 4.99
TPH By SW8015 Mod	<i>Extracted:</i>	Jan-18-19 15:00				Jan-18-19 15:00	Jan-18-19 15:00
	<i>Analyzed:</i>	Jan-18-19 23:59				Jan-18-19 23:40	Jan-18-19 23:20
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0				<15.0 15.0	<15.0 15.0
Diesel Range Organics (DRO)		75.7 15.0				24.0 15.0	<15.0 15.0
Motor Oil Range Hydrocarbons (MRO)		<15.0 15.0				<15.0 15.0	<15.0 15.0
Total TPH		75.7 15.0				24.0 15.0	<15.0 15.0

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Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 611308

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex Red Hills Unit 16



Project Id: 212C-MD-01557
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Jan-15-19 10:10 am
Report Date: 21-JAN-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	611308-019	611308-020	611308-021	611308-022	611308-023	611308-024
	<i>Field Id:</i>	AH #4 (2-2.5')	AH #4 (3-3.5')	AH #5 (0-1')	AH #5 (1-1.5')	AH #5 (2-2.5')	AH #5 (3-3.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00
BTEX by EPA 8021B	<i>Extracted:</i>			Jan-18-19 14:30	Jan-18-19 14:30		
	<i>Analyzed:</i>			Jan-18-19 22:07	Jan-18-19 22:26		
	<i>Units/RL:</i>			mg/kg RL	mg/kg RL		
Benzene				<0.00200 0.00200	<0.00201 0.00201		
Toluene				<0.00200 0.00200	<0.00201 0.00201		
Ethylbenzene				<0.00200 0.00200	<0.00201 0.00201		
m,p-Xylenes				<0.00401 0.00401	<0.00402 0.00402		
o-Xylene				<0.00200 0.00200	<0.00201 0.00201		
Total Xylenes				<0.00200 0.00200	<0.00201 0.00201		
Total BTEX				<0.00200 0.00200	<0.00201 0.00201		
Chloride by EPA 300	<i>Extracted:</i>	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00
	<i>Analyzed:</i>	Jan-17-19 17:48	Jan-17-19 18:13	Jan-17-19 17:54	Jan-17-19 18:19	Jan-17-19 18:40	Jan-17-19 18:47
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		1710 25.0	6060 49.6	166 4.97	38.0 4.98	111 4.97	128 5.00
TPH By SW8015 Mod	<i>Extracted:</i>			Jan-18-19 15:00	Jan-18-19 15:00		
	<i>Analyzed:</i>			Jan-18-19 22:41	Jan-19-19 02:17		
	<i>Units/RL:</i>			mg/kg RL	mg/kg RL		
Gasoline Range Hydrocarbons (GRO)				<15.0 15.0	<15.0 15.0		
Diesel Range Organics (DRO)				33.3 15.0	<15.0 15.0		
Motor Oil Range Hydrocarbons (MRO)				<15.0 15.0	<15.0 15.0		
Total TPH				33.3 15.0	<15.0 15.0		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use.
The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented.
Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 611308

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex Red Hills Unit 16



Project Id: 212C-MD-01557
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Jan-15-19 10:10 am
Report Date: 21-JAN-19
Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	611308-025	611308-026	611308-027	611308-028		
	<i>Field Id:</i>	AH #6 (0-1')	AH #6 (1-1.5')	AH #6 (2-2.5')	AH #6 (3-3.5')		
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL		
	<i>Sampled:</i>	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00	Jan-14-19 00:00		
BTEX by EPA 8021B	<i>Extracted:</i>	Jan-18-19 14:30					
	<i>Analyzed:</i>	Jan-18-19 22:45					
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00200 0.00200					
Toluene		<0.00200 0.00200					
Ethylbenzene		<0.00200 0.00200					
m,p-Xylenes		<0.00399 0.00399					
o-Xylene		<0.00200 0.00200					
Total Xylenes		<0.00200 0.00200					
Total BTEX		<0.00200 0.00200					
Chloride by EPA 300	<i>Extracted:</i>	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00	Jan-17-19 10:00		
	<i>Analyzed:</i>	Jan-17-19 18:53	Jan-17-19 18:59	Jan-17-19 19:05	Jan-17-19 16:25		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		464 4.96	243 4.98	97.4 5.00	307 5.00		
TPH By SW8015 Mod	<i>Extracted:</i>	Jan-18-19 15:00	Jan-18-19 15:00				
	<i>Analyzed:</i>	Jan-18-19 21:41	Jan-18-19 23:00				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0				
Diesel Range Organics (DRO)		<15.0 15.0	<15.0 15.0				
Motor Oil Range Hydrocarbons (MRO)		<15.0 15.0	<15.0 15.0				
Total TPH		<15.0 15.0	<15.0 15.0				

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use.
 The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories.
 XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented.
 Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer

Jessica Kramer
Project Assistant

Analytical Report 611308

for
Tetra Tech- Midland

Project Manager: Clair Gonzales

Cimarex Red Hills Unit 16

212C-MD-01557

21-JAN-19

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429)

Xenco-Lakeland: Florida (E84098)



21-JAN-19

Project Manager: **Clair Gonzales**

Tetra Tech- Midland

901 West Wall ST

Midland, TX 79701

Reference: XENCO Report No(s): **611308**

Cimarex Red Hills Unit 16

Project Address: Lea Co,NM

Clair Gonzales:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 611308. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 611308 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'.

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH #1 (0-1')	S	01-14-19 00:00		611308-001
AH #1 (1-1.5')	S	01-14-19 00:00		611308-002
AH #1 (2-2.5')	S	01-14-19 00:00		611308-003
AH #1 (3-3.5')	S	01-14-19 00:00		611308-004
AH #1 (4-4.5')	S	01-14-19 00:00		611308-005
AH #1 (5-5.5')	S	01-14-19 00:00		611308-006
AH #2 (0-1')	S	01-14-19 00:00		611308-007
AH #2 (1-1.5')	S	01-14-19 00:00		611308-008
AH #2 (2-2.5')	S	01-14-19 00:00		611308-009
AH #2 (3-3.5')	S	01-14-19 00:00		611308-010
AH #2 (4-4.5')	S	01-14-19 00:00		611308-011
AH #3 (0-1')	S	01-14-19 00:00		611308-012
AH #3 (1-1.5')	S	01-14-19 00:00		611308-013
AH #3 (2-2.5')	S	01-14-19 00:00		611308-014
AH #3 (3-3.5')	S	01-14-19 00:00		611308-015
AH #3 (4-4.5')	S	01-14-19 00:00		611308-016
AH #4 (0-1')	S	01-14-19 00:00		611308-017
AH #4 (1-1.5')	S	01-14-19 00:00		611308-018
AH #4 (2-2.5')	S	01-14-19 00:00		611308-019
AH #4 (3-3.5')	S	01-14-19 00:00		611308-020
AH #5 (0-1')	S	01-14-19 00:00		611308-021
AH #5 (1-1.5')	S	01-14-19 00:00		611308-022
AH #5 (2-2.5')	S	01-14-19 00:00		611308-023
AH #5 (3-3.5')	S	01-14-19 00:00		611308-024
AH #6 (0-1')	S	01-14-19 00:00		611308-025
AH #6 (1-1.5')	S	01-14-19 00:00		611308-026
AH #6 (2-2.5')	S	01-14-19 00:00		611308-027
AH #6 (3-3.5')	S	01-14-19 00:00		611308-028

**CASE NARRATIVE****Client Name: Tetra Tech- Midland****Project Name: Cimarex Red Hills Unit 16**Project ID: 212C-MD-01557
Work Order Number(s): 611308Report Date: 21-JAN-19
Date Received: 01/15/2019**Sample receipt non conformances and comments:**

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3076360 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3076361 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Lab Sample ID 611308-017 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 611308-017, -018, -021, -022, -025.

The Laboratory Control Sample for m,p-Xylenes, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3076398 TPH By SW8015 Mod

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 611308-018,611308-001.



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #1 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-001

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	556	4.97	mg/kg	01.17.19 14.09		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 02.37	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.19.19 02.37	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 02.37	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.19.19 02.37	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	189	%	70-135	01.19.19 02.37	**	
o-Terphenyl	84-15-1	193	%	70-135	01.19.19 02.37	**	



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #1 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-001

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	01.18.19 22.55	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
Total BTEX		<0.00202	0.00202	mg/kg	01.18.19 22.55	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	102	%	70-130	01.18.19 22.55		
4-Bromofluorobenzene	460-00-4	106	%	70-130	01.18.19 22.55		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #1 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-002

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	88.7	4.98	mg/kg	01.17.19 14.33		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 01.18	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.19.19 01.18	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 01.18	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.19.19 01.18	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	01.19.19 01.18	
o-Terphenyl	84-15-1	92	%	70-135	01.19.19 01.18	



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #1 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-002

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	01.18.19 23.17	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
Total BTEX		<0.00200	0.00200	mg/kg	01.18.19 23.17	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	87	%	70-130	01.18.19 23.17		
1,4-Difluorobenzene	540-36-3	102	%	70-130	01.18.19 23.17		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #1 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-003

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	107	4.95	mg/kg	01.17.19 14.39		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #1 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-004

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	113	4.99	mg/kg	01.17.19 15.01		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #1 (4-4.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-005

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	20.9	4.99	mg/kg	01.17.19 15.07		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #1 (5-5.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-006

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	01.17.19 15.13	U	1



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #2 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-007

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3430	25.0	mg/kg	01.17.19 15.20		5

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 00.58	U	1
Diesel Range Organics (DRO)	C10C28DRO	21.4	15.0	mg/kg	01.19.19 00.58		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 00.58	U	1
Total TPH	PHC635	21.4	15.0	mg/kg	01.19.19 00.58		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	01.19.19 00.58	
o-Terphenyl	84-15-1	91	%	70-135	01.19.19 00.58	



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #2 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-007

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	01.18.19 23.38	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
Total BTEX		<0.00201	0.00201	mg/kg	01.18.19 23.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	101	%	70-130	01.18.19 23.38		
1,4-Difluorobenzene	540-36-3	109	%	70-130	01.18.19 23.38		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #2 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-008

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4220	25.0	mg/kg	01.17.19 15.26		5

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 00.38	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.19.19 00.38	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 00.38	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.19.19 00.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	87	%	70-135	01.19.19 00.38		
o-Terphenyl	84-15-1	89	%	70-135	01.19.19 00.38		



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #2 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-008

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	01.19.19 00.00	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
Total BTEX		<0.00199	0.00199	mg/kg	01.19.19 00.00	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	108	%	70-130	01.19.19 00.00		
1,4-Difluorobenzene	540-36-3	105	%	70-130	01.19.19 00.00		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #2 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-009

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3330	25.0	mg/kg	01.17.19 15.32		5



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #2 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-010

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 09.30

Basis: Wet Weight

Seq Number: 3076263

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	212	5.00	mg/kg	01.17.19 15.38		1



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #2 (4-4.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-011

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	16.9	5.00	mg/kg	01.17.19 16.43		1



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #3 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-012

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	102	4.95	mg/kg	01.17.19 16.49		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 00.19	U	1
Diesel Range Organics (DRO)	C10C28DRO	56.5	15.0	mg/kg	01.19.19 00.19		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 00.19	U	1
Total TPH	PHC635	56.5	15.0	mg/kg	01.19.19 00.19		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	91	%	70-135	01.19.19 00.19	
o-Terphenyl	84-15-1	94	%	70-135	01.19.19 00.19	



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #3 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-012

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.19.19 00.21	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.19.19 00.21	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.19.19 00.21	U	1
m,p-Xylenes	179601-23-1	0.00616	0.00401	mg/kg	01.19.19 00.21		1
o-Xylene	95-47-6	0.0144	0.00200	mg/kg	01.19.19 00.21		1
Total Xylenes	1330-20-7	0.0206	0.00200	mg/kg	01.19.19 00.21		1
Total BTEX		0.0206	0.00200	mg/kg	01.19.19 00.21		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	116	%	70-130	01.19.19 00.21		
1,4-Difluorobenzene	540-36-3	108	%	70-130	01.19.19 00.21		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #3 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-013

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	137	5.00	mg/kg	01.17.19 16.56		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 23.59	U	1
Diesel Range Organics (DRO)	C10C28DRO	75.7	15.0	mg/kg	01.18.19 23.59		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 23.59	U	1
Total TPH	PHC635	75.7	15.0	mg/kg	01.18.19 23.59		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	89	%	70-135	01.18.19 23.59	
o-Terphenyl	84-15-1	91	%	70-135	01.18.19 23.59	



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #3 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-013

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 13.00

Basis: Wet Weight

Seq Number: 3076360

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.19.19 00.43	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.19.19 00.43	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.19.19 00.43	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	01.19.19 00.43	U	1
o-Xylene	95-47-6	0.00204	0.00200	mg/kg	01.19.19 00.43		1
Total Xylenes	1330-20-7	0.00204	0.00200	mg/kg	01.19.19 00.43		1
Total BTEX		0.00204	0.00200	mg/kg	01.19.19 00.43		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	109	%	70-130	01.19.19 00.43		
4-Bromofluorobenzene	460-00-4	123	%	70-130	01.19.19 00.43		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #3 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-014

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	37.8	5.00	mg/kg	01.17.19 17.02		1



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #3 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-015

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	29.7	5.00	mg/kg	01.17.19 17.23		1



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #3 (4-4.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-016

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	158	4.95	mg/kg	01.17.19 17.29		1



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #4 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-017

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	845	4.95	mg/kg	01.17.19 17.36		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 23.40	U	1
Diesel Range Organics (DRO)	C10C28DRO	24.0	15.0	mg/kg	01.18.19 23.40		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 23.40	U	1
Total TPH	PHC635	24.0	15.0	mg/kg	01.18.19 23.40		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	88	%	70-135	01.18.19 23.40	
o-Terphenyl	84-15-1	89	%	70-135	01.18.19 23.40	



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #4 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-017

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 14.30

Basis: Wet Weight

Seq Number: 3076361

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	01.18.19 21.29	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
Total BTEX		<0.00200	0.00200	mg/kg	01.18.19 21.29	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	01.18.19 21.29		
1,4-Difluorobenzene	540-36-3	115	%	70-130	01.18.19 21.29		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #4 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-018

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	292	4.99	mg/kg	01.17.19 17.42		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 23.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.18.19 23.20	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 23.20	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.18.19 23.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	172	%	70-135	01.18.19 23.20	**	
o-Terphenyl	84-15-1	174	%	70-135	01.18.19 23.20	**	



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #4 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-018

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 14.30

Basis: Wet Weight

Seq Number: 3076361

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	01.18.19 21.48	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
Total BTEX		<0.00202	0.00202	mg/kg	01.18.19 21.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	115	%	70-130	01.18.19 21.48		
1,4-Difluorobenzene	540-36-3	116	%	70-130	01.18.19 21.48		



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #4 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-019

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1710	25.0	mg/kg	01.17.19 17.48		5



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #4 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-020

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6060	49.6	mg/kg	01.17.19 18.13		10



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Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #5 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-021

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	166	4.97	mg/kg	01.17.19 17.54		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 22.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	33.3	15.0	mg/kg	01.18.19 22.41		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 22.41	U	1
Total TPH	PHC635	33.3	15.0	mg/kg	01.18.19 22.41		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	88	%	70-135	01.18.19 22.41	
o-Terphenyl	84-15-1	89	%	70-135	01.18.19 22.41	



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #5 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-021

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 14.30

Basis: Wet Weight

Seq Number: 3076361

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	01.18.19 22.07	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
Total BTEX		<0.00200	0.00200	mg/kg	01.18.19 22.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	120	%	70-130	01.18.19 22.07		
1,4-Difluorobenzene	540-36-3	114	%	70-130	01.18.19 22.07		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #5 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-022

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	38.0	4.98	mg/kg	01.17.19 18.19		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.19.19 02.17	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.19.19 02.17	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 02.17	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.19.19 02.17	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	87	%	70-135	01.19.19 02.17		
o-Terphenyl	84-15-1	87	%	70-135	01.19.19 02.17		



Certificate of Analytical Results 611308

Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #5 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-022

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 14.30

Basis: Wet Weight

Seq Number: 3076361

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	01.18.19 22.26	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
Total BTEX		<0.00201	0.00201	mg/kg	01.18.19 22.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	115	%	70-130	01.18.19 22.26		
1,4-Difluorobenzene	540-36-3	116	%	70-130	01.18.19 22.26		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #5 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-023

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	111	4.97	mg/kg	01.17.19 18.40		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #5 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-024

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	128	5.00	mg/kg	01.17.19 18.47		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #6 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-025

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	464	4.96	mg/kg	01.17.19 18.53		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 21.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.18.19 21.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 21.41	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.18.19 21.41	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	92	%	70-135	01.18.19 21.41		
o-Terphenyl	84-15-1	94	%	70-135	01.18.19 21.41		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #6 (0-1')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-025

Date Collected: 01.14.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 01.18.19 14.30

Basis: Wet Weight

Seq Number: 3076361

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	01.18.19 22.45	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
Total BTEX		<0.00200	0.00200	mg/kg	01.18.19 22.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	115	%	70-130	01.18.19 22.45		
1,4-Difluorobenzene	540-36-3	115	%	70-130	01.18.19 22.45		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: **AH #6 (1-1.5')**

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-026

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	243	4.98	mg/kg	01.17.19 18.59		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 01.18.19 15.00

Basis: Wet Weight

Seq Number: 3076398

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	01.18.19 23.00	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	01.18.19 23.00	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.18.19 23.00	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	01.18.19 23.00	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	89	%	70-135	01.18.19 23.00		
o-Terphenyl	84-15-1	90	%	70-135	01.18.19 23.00		



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #6 (2-2.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-027

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	97.4	5.00	mg/kg	01.17.19 19.05		1



Certificate of Analytical Results 611308



Tetra Tech- Midland, Midland, TX

Cimarex Red Hills Unit 16

Sample Id: AH #6 (3-3.5')

Matrix: Soil

Date Received: 01.15.19 10.10

Lab Sample Id: 611308-028

Date Collected: 01.14.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 01.17.19 10.00

Basis: Wet Weight

Seq Number: 3076265

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	307	5.00	mg/kg	01.17.19 16.25		1



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Tetra Tech- Midland
Cimarex Red Hills Unit 16

Analytical Method: Chloride by EPA 300

Seq Number: 3076263

MB Sample Id: 7669892-1-BLK

Matrix: Solid

LCS Sample Id: 7669892-1-BKS

Prep Method: E300P

Date Prep: 01.17.19

LCSD Sample Id: 7669892-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	255	102	247	99	90-110	3	20	mg/kg	01.17.19 12:33	

Analytical Method: Chloride by EPA 300

Seq Number: 3076265

MB Sample Id: 7669893-1-BLK

Matrix: Solid

LCS Sample Id: 7669893-1-BKS

Prep Method: E300P

Date Prep: 01.17.19

LCSD Sample Id: 7669893-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	262	105	244	98	90-110	7	20	mg/kg	01.17.19 16:12	

Analytical Method: Chloride by EPA 300

Seq Number: 3076263

Parent Sample Id: 611257-006

Matrix: Soil

MS Sample Id: 611257-006 S

Prep Method: E300P

Date Prep: 01.17.19

MSD Sample Id: 611257-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	393	248	609	87	609	87	90-110	0	20	mg/kg	01.17.19 12:51	X

Analytical Method: Chloride by EPA 300

Seq Number: 3076263

Parent Sample Id: 611257-007

Matrix: Soil

MS Sample Id: 611257-007 S

Prep Method: E300P

Date Prep: 01.17.19

MSD Sample Id: 611257-007 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	423	249	649	91	644	89	90-110	1	20	mg/kg	01.17.19 14:21	X

Analytical Method: Chloride by EPA 300

Seq Number: 3076265

Parent Sample Id: 611308-021

Matrix: Soil

MS Sample Id: 611308-021 S

Prep Method: E300P

Date Prep: 01.17.19

MSD Sample Id: 611308-021 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	166	249	409	98	412	99	90-110	1	20	mg/kg	01.17.19 18:00	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Tetra Tech- Midland
Cimarex Red Hills Unit 16

Analytical Method: Chloride by EPA 300

Seq Number: 3076265

Parent Sample Id: 611308-028

Matrix: Soil

MS Sample Id: 611308-028 S

Prep Method: E300P

Date Prep: 01.17.19

MSD Sample Id: 611308-028 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	307	250	551	98	536	92	90-110	3	20	mg/kg	01.17.19 16:31	

Analytical Method: TPH By SW8015 Mod

Seq Number: 3076398

MB Sample Id: 7670057-1-BLK

Matrix: Solid

LCS Sample Id: 7670057-1-BKS

Prep Method: TX1005P

Date Prep: 01.18.19

LCSD Sample Id: 7670057-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	834	83	840	84	70-135	1	20	mg/kg	01.18.19 21:01	
Diesel Range Organics (DRO)	<8.13	1000	929	93	929	93	70-135	0	20	mg/kg	01.18.19 21:01	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	91		128		131		70-135	%	01.18.19 21:01
o-Terphenyl	92		123		131		70-135	%	01.18.19 21:01

Analytical Method: TPH By SW8015 Mod

Seq Number: 3076398

Parent Sample Id: 611308-025

Matrix: Soil

MS Sample Id: 611308-025 S

Prep Method: TX1005P

Date Prep: 01.18.19

MSD Sample Id: 611308-025 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	895	90	901	90	70-135	1	20	mg/kg	01.18.19 22:01	
Diesel Range Organics (DRO)	<8.13	1000	983	98	990	99	70-135	1	20	mg/kg	01.18.19 22:01	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	129		129		70-135	%	01.18.19 22:01
o-Terphenyl	122		125		70-135	%	01.18.19 22:01

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Tetra Tech- Midland
Cimarex Red Hills Unit 16

Analytical Method: BTEX by EPA 8021B

Seq Number: 3076360

MB Sample Id: 7670054-1-BLK

Matrix: Solid

LCS Sample Id: 7670054-1-BKS

Prep Method: SW5030B

Date Prep: 01.18.19

LCSD Sample Id: 7670054-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.105	105	0.111	111	70-130	6	35	mg/kg	01.18.19 14:31	
Toluene	<0.00200	0.100	0.0943	94	0.0957	96	70-130	1	35	mg/kg	01.18.19 14:31	
Ethylbenzene	<0.00200	0.100	0.121	121	0.115	115	70-130	5	35	mg/kg	01.18.19 14:31	
m,p-Xylenes	<0.00400	0.200	0.240	120	0.229	114	70-130	5	35	mg/kg	01.18.19 14:31	
o-Xylene	<0.00200	0.100	0.113	113	0.108	108	70-130	5	35	mg/kg	01.18.19 14:31	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	93		109		115		70-130	%	01.18.19 14:31
4-Bromofluorobenzene	100		112		104		70-130	%	01.18.19 14:31

Analytical Method: BTEX by EPA 8021B

Seq Number: 3076361

MB Sample Id: 7670055-1-BLK

Matrix: Solid

LCS Sample Id: 7670055-1-BKS

Prep Method: SW5030B

Date Prep: 01.18.19

LCSD Sample Id: 7670055-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000386	0.100	0.119	119	0.125	125	70-130	5	35	mg/kg	01.18.19 19:37	
Toluene	<0.000457	0.100	0.101	101	0.107	107	70-130	6	35	mg/kg	01.18.19 19:37	
Ethylbenzene	<0.000567	0.100	0.0924	92	0.0976	98	70-130	5	35	mg/kg	01.18.19 19:37	
m,p-Xylenes	<0.00102	0.201	0.184	92	0.194	97	70-130	5	35	mg/kg	01.18.19 19:37	
o-Xylene	<0.000346	0.100	0.0915	92	0.0963	96	70-130	5	35	mg/kg	01.18.19 19:37	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	109		111		110		70-130	%	01.18.19 19:37
4-Bromofluorobenzene	93		111		109		70-130	%	01.18.19 19:37

Analytical Method: BTEX by EPA 8021B

Seq Number: 3076360

Parent Sample Id: 611308-001

Matrix: Soil

MS Sample Id: 611308-001 S

Prep Method: SW5030B

Date Prep: 01.18.19

MSD Sample Id: 611308-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00199	0.0996	0.0834	84	0.0971	97	70-130	15	35	mg/kg	01.18.19 15:14	
Toluene	<0.00199	0.0996	0.0713	72	0.0846	85	70-130	17	35	mg/kg	01.18.19 15:14	
Ethylbenzene	<0.00199	0.0996	0.0853	86	0.0972	97	70-130	13	35	mg/kg	01.18.19 15:14	
m,p-Xylenes	<0.00398	0.199	0.164	82	0.189	95	70-130	14	35	mg/kg	01.18.19 15:14	
o-Xylene	<0.00199	0.0996	0.0801	80	0.0921	92	70-130	14	35	mg/kg	01.18.19 15:14	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	113		121		70-130	%	01.18.19 15:14
4-Bromofluorobenzene	107		111		70-130	%	01.18.19 15:14

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Tetra Tech- Midland
Cimarex Red Hills Unit 16

Analytical Method: BTEX by EPA 8021B

Seq Number: 3076361

Parent Sample Id: 611308-017

Matrix: Soil

MS Sample Id: 611308-017 S

Prep Method: SW5030B

Date Prep: 01.18.19

MSD Sample Id: 611308-017 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000383	0.0996	0.110	110	0.114	114	70-130	4	35	mg/kg	01.18.19 20:15	
Toluene	<0.000454	0.0996	0.0877	88	0.0922	92	70-130	5	35	mg/kg	01.18.19 20:15	
Ethylbenzene	<0.000563	0.0996	0.0696	70	0.0758	76	70-130	9	35	mg/kg	01.18.19 20:15	
m,p-Xylenes	<0.00101	0.199	0.133	67	0.142	71	70-130	7	35	mg/kg	01.18.19 20:15	X
o-Xylene	<0.000343	0.0996	0.0685	69	0.0744	74	70-130	8	35	mg/kg	01.18.19 20:15	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	111		111		70-130	%	01.18.19 20:15
4-Bromofluorobenzene	110		110		70-130	%	01.18.19 20:15

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

Analysis Request of Chain of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3846

1011358

Page 1 of 3

Client Name: Cimarex		Site Manager: Clair Gonzales										
Project Name: Red Hills Unit 16												
Project Location: Lea Co, NM		Project #: 212C-MD-01557										
Invoice to: Cimarex - Christine Alderman		Sampler Signature: Conner Moehring										
Comments: Run deeper samples if GRO + DRO exceeds 1000 mg/Kg. Run deeper sample if benzene exceeds 10 mg/Kg or total BTEX exceeds 50 mg/Kg.												
LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX	PRESERVATIVE METHOD					# CONTAINERS	FILTERED (Y/N)	
		DATE	TIME		WATER	SOIL	HCL	HNO ₃	ICE			None
	AH #1 (0-1')	1/14/2019		X				X			1 N	
	AH #1 (1-1.5')	1/14/2019		X				X			1 N	
	AH #1 (2-2.5')	1/14/2019		X				X			1 N	
	AH #1 (3-3.5')	1/14/2019		X				X			1 N	
	AH #1 (4-4.5')	1/14/2019		X				X			1 N	
	AH #1 (5-5.5')	1/14/2019		X				X			1 N	
	AH #2 (0-1')	1/14/2019		X				X			1 N	
	AH #2 (1-1.5')	1/14/2019		X				X			1 N	
	AH #2 (2-2.5')	1/14/2019		X				X			1 N	
	AH #2 (3-3.5')	1/14/2019		X				X			1 N	
Relinquished by: <i>Ben Myrdal</i> 1/15/17		Date: 1/15/17	Time:	Received by: <i>Ben</i> 1/15/19	Date: 1/15/19	Time:						
Relinquished by:		Date:	Time:	Received by:	Date:	Time:						
Relinquished by:		Date:	Time:	Received by:	Date:	Time:						

LAB USE ONLY	REMARKS:	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	
☒ STANDARD		X	X	X	X																
☐ RUSH: Same Day 24 hr 48 hr 72 hr																					
☐ Rush Charges Authorized																					
☐ Special Report Limits or TRRP Report																					

ORIGINAL COPY

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

Analysis Request of Chain of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Page 2 of 3

Client Name: Cimarex		Site Manager: Clair Gonzales	
Project Name: Red Hills Unit 16			
Project Location: Lea Co, NM		Project #: 212C-MD-01557	
Invoice to: Cimarex - Christine Alderman		Sampler Signature: Conner Moehring	
Comments: Run deeper samples if GRO + DRO exceeds 1000 mg/Kg. Run deeper sample if benzene exceeds 10 mg/Kg or total BTEX exceeds 50 mg/Kg.			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD					# CONTAINERS	FILTERED (Y/N)	LAB USE ONLY	REMARKS:
		DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE	None					
										YEAR: 2019				
AH #2 (4-4.5)		1/14/2019		X		X						1 N		
AH #3 (0-1')		1/14/2019		X		X						1 N	X	
AH #3 (1-1.5')		1/14/2019		X		X						1 N	X	
AH #3 (2-2.5')		1/14/2019		X		X						1 N		
AH #3 (3-3.5')		1/14/2019		X		X						1 N		
AH #3 (4-4.5')		1/14/2019		X		X						1 N		
AH #4 (0-1')		1/14/2019		X		X						1 N	X	
AH #4 (1-1.5')		1/14/2019		X		X						1 N	X	
AH #4 (2-2.5')		1/14/2019		X		X						1 N		
AH #4 (3-3.5')		1/14/2019		X		X						1 N		

LAB USE ONLY		REMARKS:
Relinquished by: <i>Caern Wepel</i>	Date: 1/15/19	Time: 1010
Relinquished by: <i>Moehring</i>	Date: 1/15/19	Time: 1010
Relinquished by:	Date:	Time:
Relinquished by:	Date:	Time:

LAB USE ONLY		REMARKS:
Sample Temperature	24/23	
Relinquished by: <i>Moehring</i>	Date: 2-1/18	Time:
Relinquished by:	Date:	Time:

ORIGINAL COPY

Analysis Request of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Page 3 of 3

Client Name: Cimarex Site Manager: Clair Gonzales

Project Name: Red Hills Unit 16

Project Location: Lea Co, NM Project #: 212C-MD-01557

Invoice to: Cimarex - Christine Alderman

Receiving Laboratory: Xenco Sampler Signature: Conner Moehring

Comments: Run deeper samples if GRO + DRO exceeds 1000 mg/Kg. Run deeper sample if benzene exceeds 10 mg/Kg or total BTEX exceeds 50 mg/Kg.

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		DATE	TIME	MATRIX		PRESERVATIVE METHOD				# CONTAINERS	FILTERED (Y/N)
		YEAR: 2019				WATER	SOIL	HCL	HNO ₃	ICE	None		
	AH #5 (0-1')			1/14/2019			X			X			1 N
	AH #5 (1-1.5')			1/14/2019			X			X			1 N
	AH #5 (2-2.5')			1/14/2019			X			X			1 N
	AH #5 (3-3.5')			1/14/2019			X			X			1 N
	AH #6 (0-1')			1/14/2019			X			X			1 N
	AH #6 (1-1.5')			1/14/2019			X			X			1 N
	AH #6 (2-2.5')			1/14/2019			X			X			1 N
	AH #6 (3-3.5')			1/14/2019			X			X			1 N

Relinquished by: <i>Conner Moehring</i> 1/15/19	Received by: <i>Clair Gonzales</i> 1/15/19	Date: 1/15/19	Time: 1010
Relinquished by:	Received by:	Date:	Time:
Relinquished by:	Received by:	Date:	Time:

LAB USE ONLY

Sample Temperature: 2.4/10.3

REMARKS: ☒ STANDARD

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

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

ORIGINAL COPY



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 01/15/2019 10:10:00 AM

Work Order #: 611308

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist**Comments**

#1 *Temperature of cooler(s)?	2.3
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6* Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Date: 01/15/2019

Checklist reviewed by:

Jessica Kramer

Date: 01/15/2019

Photos

Cimarex Energy
Red Hills Unit #16H
Lea County, New Mexico



TETRA TECH



Area of AH-1 – View to Northwest



Area of AH-2 – View Northeast

Cimarex Energy
Red Hills Unit #16H
Lea County, New Mexico



TETRA TECH



Area of AH-3 – View to East



Area of AH-4 – View West

Cimarex Energy
Red Hills Unit #16H
Lea County, New Mexico



TETRA TECH



Area of AH-5 – View to North



Area of AH-6 – View West

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	
District RP	
Facility ID	
Application ID	

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 32.0911154 Longitude -103.5808688
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Red Hills Unit 16H	Site Type well pad
Date Release Discovered 12/5/2018	API# (if applicable) 30-025-42324

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) 90	Volume Recovered (bbls) 60
	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

Approximately 90 bbls of produced water were released onto the pad due to the failure of both the automatic sand dump valves and the high level kill switch on the sand trap pit.

State of New Mexico
Oil Conservation Division

Incident ID	Page 73 of 82
District RP	
Facility ID	
Application ID	

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? >25 bbls spilled.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Yes Christine Alderman Email – Olivia Yu, Christina Hernandez, Shelly Tucker, Jim Griswold	

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: 12/6/2018
email: calderman@cimarex.com Telephone: 432-853-7059

OCD Only

Received by: _____ Date: _____

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.

State of New Mexico
Oil Conservation Division

Page 4

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: _____

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 #16H

24 South			32 East		
6	5	4	3	2	1
	380				
7	8	9	10	11	12
			20		
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
		290			

24 South			33 East		
6	5	4	3	2	1
7	8	9	10	11	12
			24.6		
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
				208	16.9
31	32	33	34	35	36
		93.2			

24 South			34 East		
6	5	4	3	2	1
7	8	9	10	11	12
				40	
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	33	34	35	36
	290				

25 South			33 East		
6	5	4	3	2	1
	90				
7	8	9	10	11	12
18	17	16	15	14	13
					185
19	20	21	22	23	24
	212				
30	29	28	27	26	25
				110	
31	32	33	34	35	36
190					

25 South			34 East		
6	5	4	3	2	1
					260
7	8	9	10	11	12
18	17	16	15	14	13
			135		
19	20	21	22	23	24
					300
30	29	128	28	27	26
	50				
31	32	33	34	35	36

26 South			32 East		
6	350	5	4	3	2
					1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	333	22	23
		180			24
30	29	28	27	26	25
31	32	33	34	35	36
295					

26 South			33 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

26 South			34 East		
6	160	5	4	3	2
	175				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)

90 Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

121 Abandoned Waterwell (recently measured)



[USGS Home](#)
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[Search USGS](#)

National Water Information System: Web Interface

[USGS Water Resources](#)

Data Category:

Groundwater

Geographic Area:

New Mexico

GO

Click to hideNews Bulletins

- Due to a lapse in appropriations, the majority of USGS websites may not be up to date and may not reflect current conditions. Websites displaying real-time data, such as Earthquake and Water and information needed for public health and safety will be updated with limited support. Additionally, USGS will not be able to respond to inquiries until appropriations are enacted. For more information, please see www.doi.gov/shutdown.
- [Please see news on new formats](#)
- [Full News](#) 

Groundwater levels for New Mexico

Click for state-specific text

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.

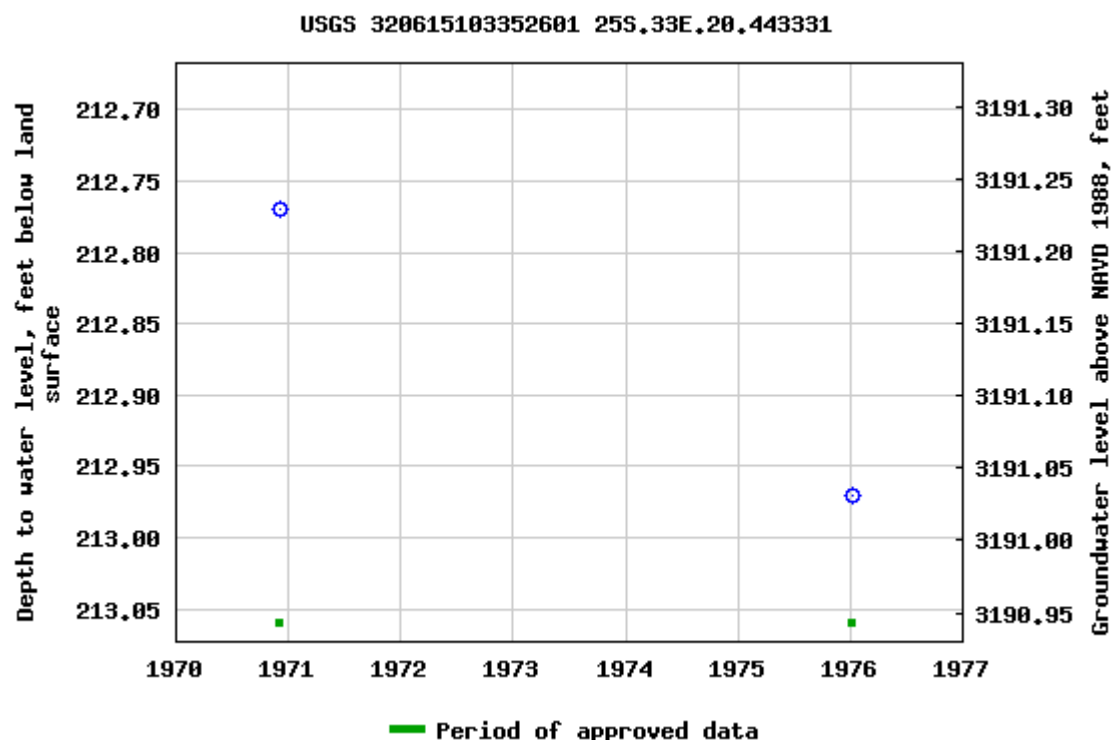
Output formats

[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.

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Title: Groundwater for New Mexico: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?>

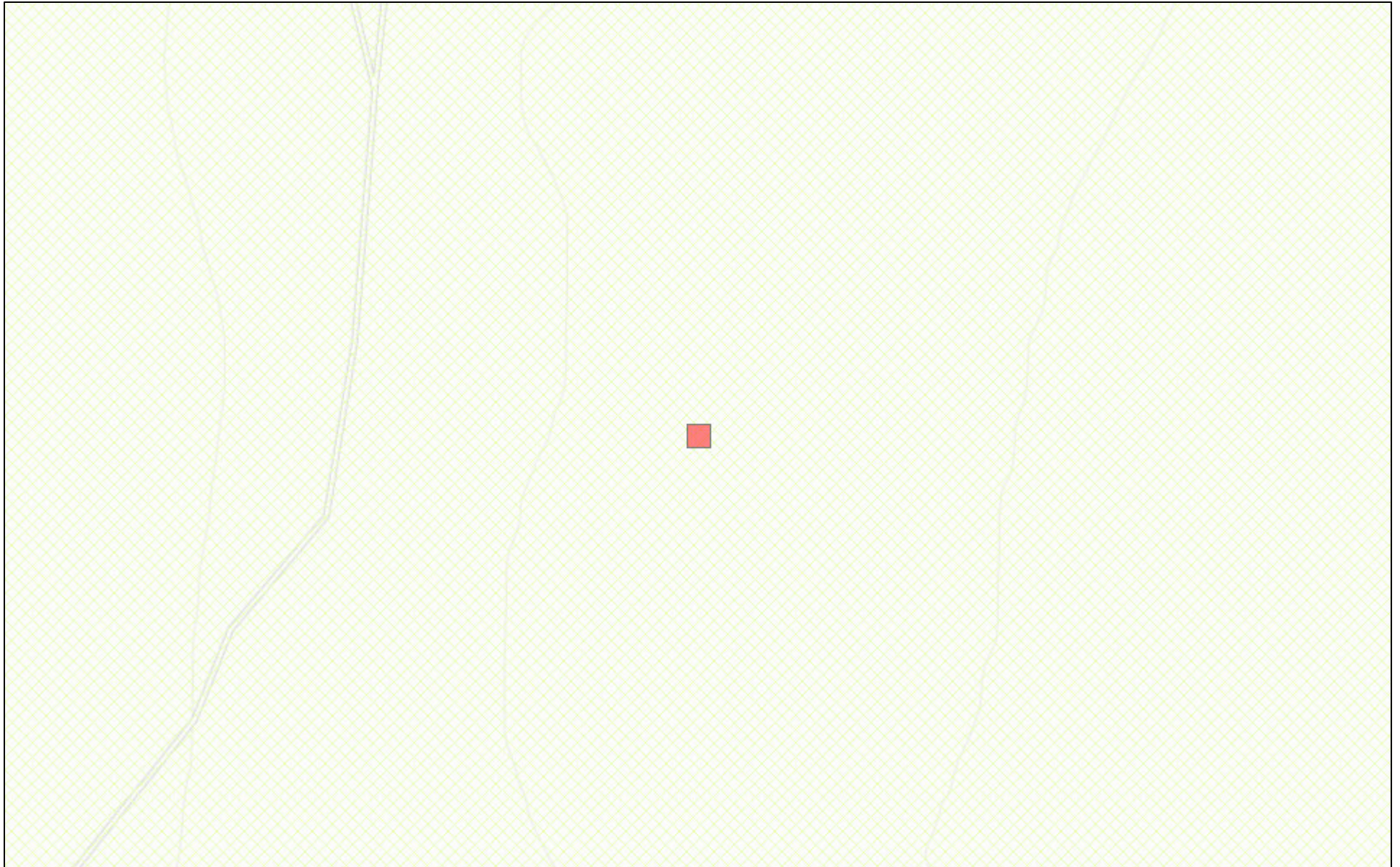


Page Contact Information: [New Mexico Water Data Maintainer](#)

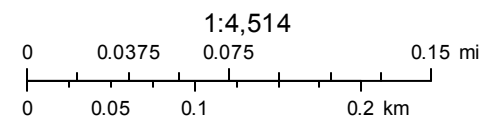
Page Last Modified: 2019-01-10 12:52:37 EST

13.08 1.18 nadww01

New Mexico NFHL Data



January 10, 2019



FEMA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

Cimarex - Red Hills Unit #16H

Karst Potential

Legend

-  High
-  Low
-  Medium
-  Red Hills Unit #16H

 Red Hills Unit #16H

Google Earth



3 mi