SITE INFORMATION

Report Type: Closure Report 1RP-4296

General Site Information:						
Site:	**Double X 25 Federal #4H**					
Company:	**Cimarex Energy**					
Section, Township and Range	**Unit C**	**Sec. 25**	**T 24S**	**R 32E**		
Lease Number:	**API No. 30-025-40690**					
County:	**Lea County**					
GPS:	**32.195124º N**			**103.630256º W**		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of HWY 128 & CR 1 (J-1), travel EAST on HWY 128 for approximately 3.0 miles, turn SOUTH onto lease road for 1.10 mi, turn WEST onto lease road for 0.60 mi to location on north side of lease road					

Release Data:	
Date Released:	5/28/2016
Type Release:	Produced Water
Source of Contamination:	Well
Fluid Released:	10 bbls
Fluids Recovered:	5 bbls

Official Communication:			
Name:	Christine Alderman		Ike Tavarez
Company:	Cimarex Energy		Tetra Tech
Address:	600 N. Marienfield St.		4000 N. Big Spring
	Ste 600		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 853-7059		(432) 687-8110
Fax:			
Email:	calderman@cimarex.com		Ike.Tavarez@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	***0***	*100'*
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	***0***	*0*
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	***0***	*0*
Total Ranking Score:	***0***	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

PRELIMINARY RESULTS

April 25, 2018

Christine Alderman
ESH Supervisor – Permian Basin
Cimarex Energy
600 N. Marienfeld St.
Midland, Texas 79701

Re: Closure Report for the Cimarex Energy, Double X 25 Federal #4H, Unit C, Section 25, Township 24 South, Range 32 East, Lea County, New Mexico. 1RP-4296.

Ms. Alderman:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cimarex Energy (Cimarex) to prepare a closure report for a spill at the Double X 25 Federal #4H, Unit C, Section 25, Township 24 South, Range 32 East, Lea County, New Mexico (site). The spill site coordinates are N 32.195124 º, W 103.630256 º. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on May 28, 2016, and released approximately ten (10) barrels of produced water due to a failed float switch causing a release at the stuffing box. Approximately five (5) barrels of produced water was recovered. The release occurred and remained on the pad area measuring approximately 70'x75'. The initial C-141 Form is included in Appendix A.

Groundwater

No water wells were listed within Section 25 on the New Mexico Office of the State Engineer's website, the USGS National Water Information System, or the Geology and Ground-Water Conditions in Southern Lea County, New Mexico (Report 6). The nearest well is listed on the USGS National Water Information System in Township 24 South, Range 33 East, Section 33, approximately 3.6 miles southeast of the site, and has a reported depth to groundwater of 93.2 feet below ground surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is approximately 100' 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, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On June 19, 2017, Tetra Tech personnel were onsite to evaluate and sample the release area. Two (2) auger holes (AH-1 and AH-2) were installed in the spill foot print to total depths of 2.0'-2.5' and 0'-1.0' below surface, respectively. Deeper samples were not collected due to a dense caliche formation in the area. A stainless steel hand auger was used to manually collect discrete soil samples from selected depth intervals. 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 in Appendix C. The results of the sampling are summarized in Table 1. The sample locations are shown in Figure 3.

Referring to Table 1, the samples collected at 0-1' below surface in the areas of auger holes (AH-1 and AH-2) showed benzene and total BTEX concentrations below the laboratory reporting limits and total TPH concentrations of <15.0 mg/kg and 196 mg/kg, respectively. Minimal chloride concentrations were detected in the shallow soils, with chloride highs of 24.1 mg/kg at 2.0'-2.5' (AH-1) and 18.2 mg/kg at 0'-1' (AH-2).

Based on the laboratory data, Tetra Tech personnel returned to the site to collect deeper samples in order to vertically define the release to the NMOCD directives. Two (2) sample trenches, T-1 (AH-1) and T-2 (AH-2), were installed in the release area to total depths of 5.0' and 4.0' below surface, respectively. Deeper samples were not collected due to a dense caliche formation in the area. Selected samples were analyzed for TPH analysis by EPA Method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The sample locations are shown in Figure 3.

Referring to Table 1, the bottom trench samples in the areas of trenches (T-1 and T-2) showed TPH, benzene, and total BTEX concentrations below the laboratory reporting limits. Additionally, the area of trench (T-1) did not show any significant chloride concentrations, with a chloride high of 331 mg/kg at 5.0' below surface. The area of trench (T-2) showed a chloride high of 717 mg/kg at 2.0', which declined with depth and showed a bottom trench concentration of 506 mg/kg.

Conclusion and Recommendations

All of the soil samples were below the RRAL's for TPH, benzene, and total BTEX. Additionally, the chloride concentration were not significant in the subsurface soils. Based on the results, Cimarex requests closure of this spill issue. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment activities for this site, please call at (432) 682-4559.

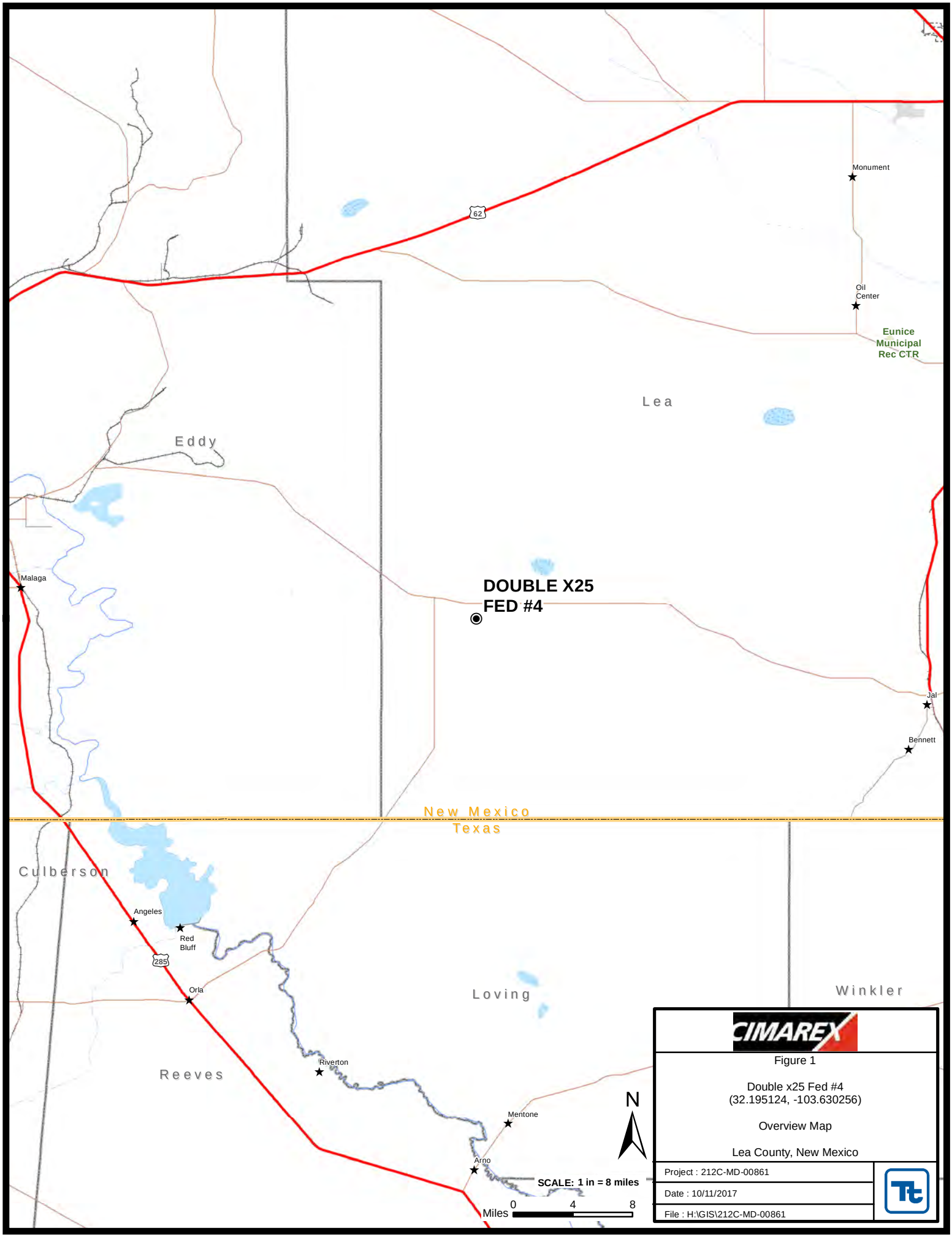
Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Senior Project Manager

Clair Gonzales,
Geologist I

cc: Shelly Tucker – BLM

Figures



CIMAREX

Figure 1

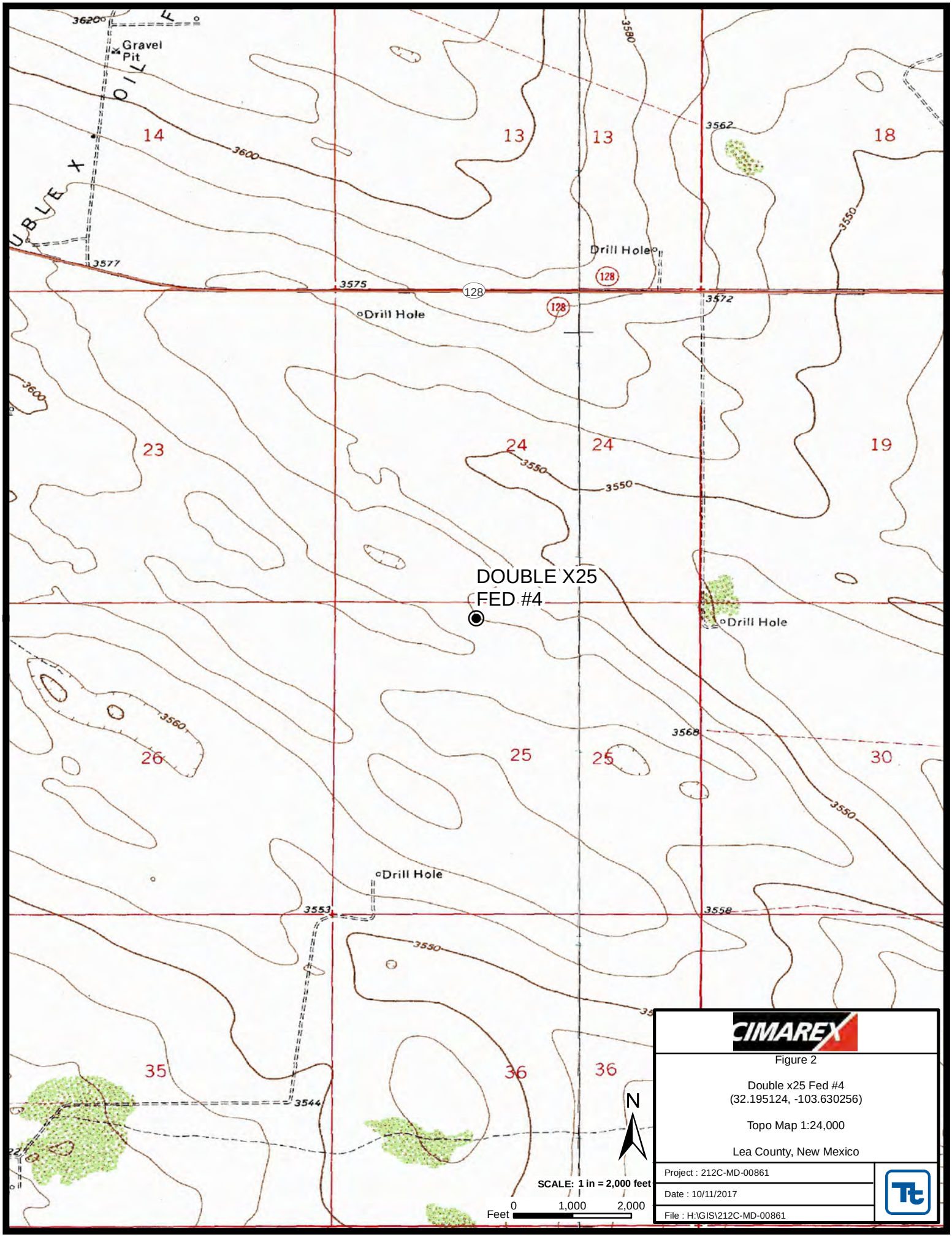
Double x25 Fed #4
(32.195124, -103.630256)

Overview Map

Lea County, New Mexico

Project : 212C-MD-00861	
Date : 10/11/2017	
File : H:\GIS\212C-MD-00861	

Mapped By: Isabel Marmolejo



CIMAREX

Figure 2

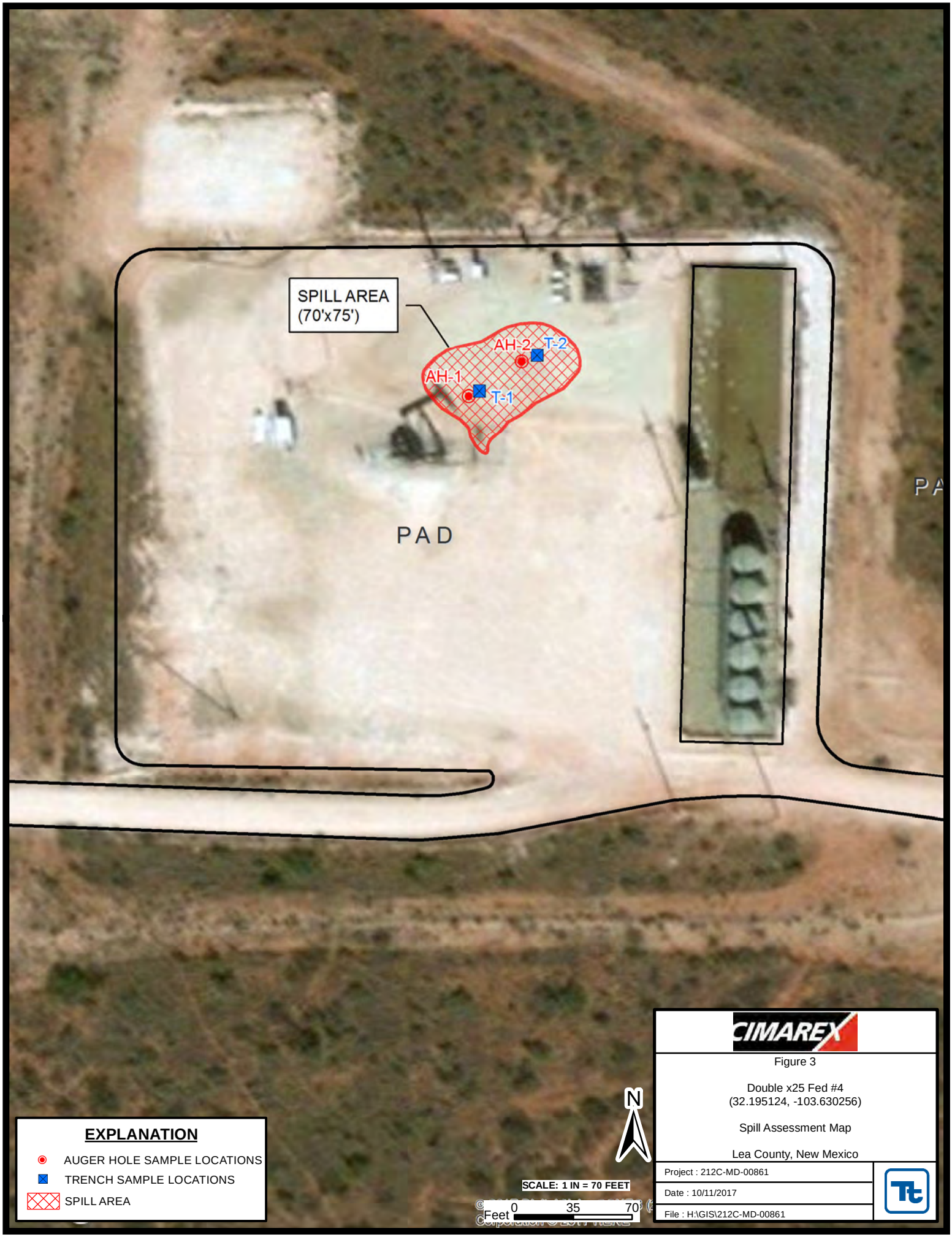
Double x25 Fed #4
(32.195124, -103.630256)

Topo Map 1:24,000

Lea County, New Mexico

Project : 212C-MD-00861	
Date : 10/11/2017	
File : H:\GIS\212C-MD-00861	

Mapped By: Isabel Marmolejo



CIMAREX

Figure 3

Double x25 Fed #4
(32.195124, -103.630256)

Spill Assessment Map

Lea County, New Mexico

Project : 212C-MD-00861

Date : 10/11/2017

File : H:\GIS\212C-MD-00861

Mapped By: Isabel Marmolejo

Tables

Table 1
Cimarex
Double X25 Federal #4H
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	6/19/2017	0-1	-	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	8.51
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	-	7.12
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	-	24.1
T-1	8/31/2017	0-1	-	X		-	-	-	-	-	-	-	-	-	<4.99
	"	1	-	X		-	-	-	-	-	-	-	-	-	<4.93
	"	2	-	X		-	-	-	-	-	-	-	-	-	81.7
	"	3	-	X		-	-	-	-	-	-	-	-	-	102
	"	4	-	X		-	-	-	-	-	-	-	-	-	292
	"	5	-	X		<14.9	<14.9	<14.9	<14.9	<0.00344	<0.00344	<0.00344	<0.00344	<0.00344	331
AH-2	6/19/2017	0-1	-	X		<15.0	168	27.5	196	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	18.2
T-2	8/31/2017	0-1	-	X		-	-	-	-	-	-	-	-	-	24.5
	"	1	-	X		-	-	-	-	-	-	-	-	-	<4.96
	"	2	-	X		-	-	-	-	-	-	-	-	-	717
	"	3	-	X		-	-	-	-	-	-	-	-	-	305
	"	4	-	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	506

Appendix A

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

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

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Cimarex Energy	Contact: Gloria Garza
Address: 600 N Marienfeld Ste 600 Midland TX	Telephone No. 432-234-3204
Facility Name: Double X 25 Federal No. 4H	Facility Type: Well

Surface Owner: Federal	Mineral Owner	API No.: 30-025-40690

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	25	24S	32E	330	FNL	2055	FWL	Lea

Latitude: 32.11' 42" N __Longitude: -103. 37' 48" W __

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 10 BBLS	Volume Recovered: 5 BBLS
Source of Release: Well	Date and Hour of Occurrence: 5/28/2016 8:30 AM	Date and Hour of Discovery: 5/28/2016 8:30 AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Shelly Tucker/Jamie Keyes	
By Whom? Gloria Garza	Date and Hour: 5/29/2016 4:00 PM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
We were having issues at the well, the float switch did kill the well but the unit kept flowing causing the stuffing box to burn up releasing fluid out of stuffing box containment.

Describe Area Affected and Cleanup Action Taken.*
We will remediate the impacted soil.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: Gloria Garza	OIL CONSERVATION DIVISION	
Printed Name: Gloria Garza	Approved by Environmental Specialist:	
Title: ESH Specialist	Approval Date:	Expiration Date:
E-mail Address: ggarza@cimarex.com	Conditions of Approval:	Attached ☐
Date: 5/29/16 Phone: 432-234-3204		

* Attach Additional Sheets If Necessary

Site- 19002100
Lab- 6000
Reporting $1600

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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

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

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company **Cimarex Energy**	Contact **Gloria Garza**
Address **600 N. Marienfeld Ste 600, Midland, TX**	Telephone No. **(432) 234-3204**
Facility Name: **Double X 25 Federal #4H**	Facility Type **Well**

Surface Owner: Federal	Mineral Owner:	API No. 30-025-40690

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	25	24S	32E	330	FNL	2055	FWL	Lea

Latitude N 32.195124° **Longitude** W 103.630256°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 10 bbls	Volume Recovered: 5 bbls
Source of Release: Well	Date and Hour of Occurrence 05/28/16 8:30AM	Date and Hour of Discovery 05/28/16 8:30AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Shelly Tucker / Jamie Keyes	
By Whom? Gloria Garza	Date and Hour 05/29/16 4:00 PM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

The float switch at the well killed the well, however the unit continued to flow causing the stuffing box to burn up and released fluid outside of the stuffing box containment.

Describe Area Affected and Cleanup Action Taken.*

The site was inspected and soil samples were collected to define the spills extent. None of the samples collected showed elevated benzene, total BTEX, TPH or chloride concentrations. Tetra Tech prepared a closure report and submitted to NMOCD for review.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 10/05//17 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Cimarex - Double X 25 Federal $4H
Lea County, New Mexico

23 South 31 East

6 85	5 354	4 168	3	2	1
7 140	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

23 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 400	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

23 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

24 South 31 East

6	5	4	3	2 192	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

24 South 32 East

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

24 South 33 East

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

25 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 390 290	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 32 East

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

25 South 33 East

6	5	4	3 172	2	1
7	8	9	10	11 140	12 200
18	17	16	15	14	13
19	20 200	21 120	22	23	24
30	29	28	27 125	26	25
31 257	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

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

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01932		C	ED		3	1	12	24S	32E	628633	3567188*	492		
C 02350			ED		4	3	10	24S	32E	625826	3566333*	60		
C 03527 POD1		C	LE	1	2	3	03	24S	32E	625770	3568487	500		
C 03528 POD1		C	LE	1	1	2	15	24S	32E	626040	3566129	541		
C 03530 POD1		C	LE	3	4	3	07	24S	32E	620886	3566156	550		
C 03555 POD1		C	LE	2	2	1	05	24S	32E	622709	3569231	600	380	220

Average Depth to Water: **380 feet**

Minimum Depth: **380 feet**

Maximum Depth: **380 feet**

Record Count: 6

PLSS Search:

Township: 24S **Range:** 32E

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

National Water Information System: Web Interface

Click to hideNews Bulletins

- Please see news on new formats
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

site_no list =

- 321017103343201

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

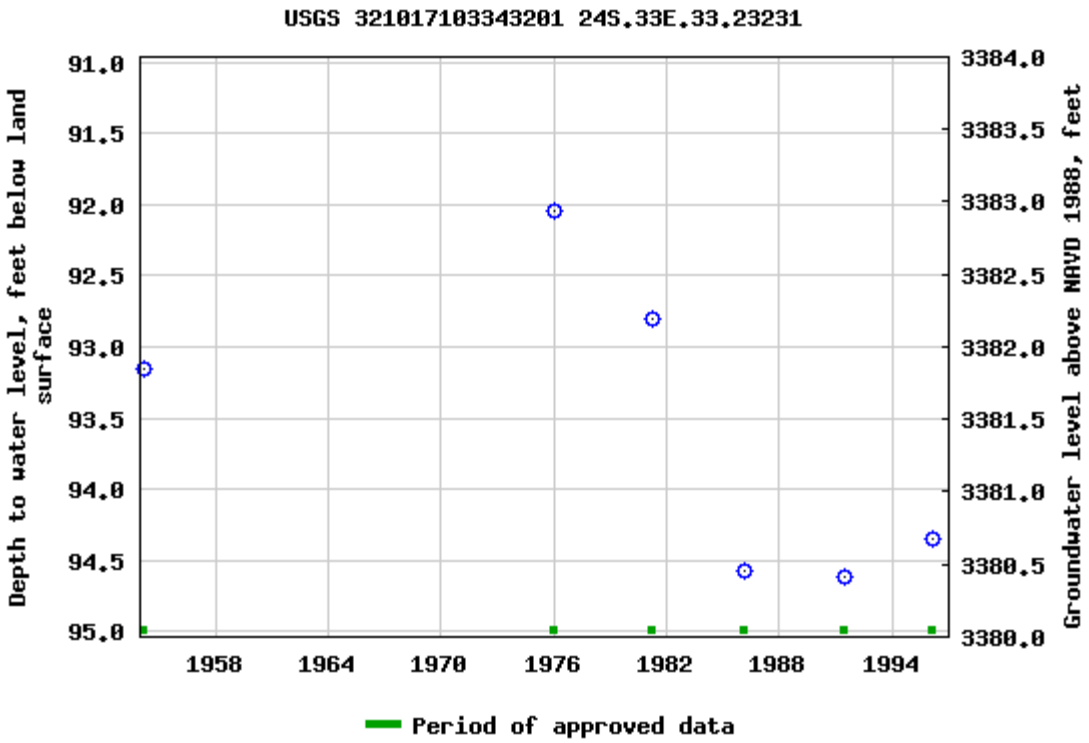
USGS 321017103343201 24S.33E.33.23231

Available data for this site Groundwater: Field measurements GO

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°10'17", Longitude 103°34'32" NAD27
Land-surface elevation 3,475 feet above NAVD88
This well is completed in the Ogallala Formation (121OGLL) local aquifer.

Output formats

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



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

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

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: 2018-04-25 12:25:25 EDT
1.15 1.02 nadww01

Appendix C

Analytical Report 555866

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Cimarex- Double X25 Fed #4H

212C-MD-00861

29-JUN-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

29-JUN-17

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **555866**
Cimarex- Double X25 Fed #4H
Project Address: Lea Co, NM

Ike Tavarez:

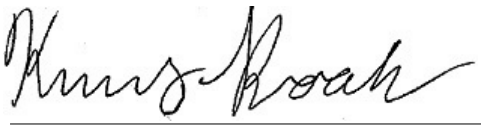
We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 555866. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory 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. 555866 will be filed for 60 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,



Kelsey Brooks
Project Manager

Sample Cross Reference 555866

Tetra Tech- Midland, Midland, TX

Cimarex- Double X25 Fed #4H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH #1 (0-1')	S	06-19-17 00:00	0 - 1 ft	555866-001
AH #1 (1-1.5')	S	06-19-17 00:00	1 - 1.5 ft	555866-002
AH #1 (2-2.5')	S	06-19-17 00:00	2 - 2.5 ft	555866-003
AH #2 (0-1')	S	06-19-17 00:00	0 - 1 ft	555866-004

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3020665 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3021020 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 555866

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex- Double X25 Fed #4H

Project Id: 212C-MD-00861
Contact: Ike Tavarez
Project Location: Lea Co, NM

Date Received in Lab: Wed Jun-21-17 12:00 pm
Report Date: 29-JUN-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	555866-001		555866-002		555866-003		555866-004					
	Field Id:	AH #1 (0-1')		AH #1 (1-1.5')		AH #1 (2-2.5')		AH #2 (0-1')					
	Depth:	0-1 ft		1-1.5 ft		2-2.5 ft		0-1 ft					
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Jun-19-17 00:00		Jun-19-17 00:00		Jun-19-17 00:00		Jun-19-17 00:00					
BTEX by EPA 8021B	***Extracted:***	Jun-24-17 11:30						Jun-27-17 17:45					
	Analyzed:	Jun-25-17 07:25						Jun-28-17 12:39					
	Units/RL:	mg/kg	RL					mg/kg	RL				
Benzene		<0.00201	0.00201					<0.00199	0.00199				
Toluene		<0.00201	0.00201					<0.00199	0.00199				
Ethylbenzene		<0.00201	0.00201					<0.00199	0.00199				
m,p-Xylenes		<0.00402	0.00402					<0.00398	0.00398				
o-Xylene		<0.00201	0.00201					<0.00199	0.00199				
Total Xylenes		<0.00201	0.00201					<0.00199	0.00199				
Total BTEX		<0.00201	0.00201					<0.00199	0.00199				
Inorganic Anions by EPA 300/300.1	***Extracted:***	Jun-28-17 15:30		Jun-28-17 15:30		Jun-28-17 15:30		Jun-28-17 15:30					
	Analyzed:	Jun-28-17 17:38		Jun-28-17 18:01		Jun-28-17 18:09		Jun-28-17 18:16					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		8.51	4.92	7.12	4.98	24.1	4.96	18.2	4.97				
TPH By SW8015 Mod	***Extracted:***	Jun-24-17 16:00						Jun-24-17 16:00					
	Analyzed:	Jun-25-17 07:58						Jun-25-17 08:18					
	Units/RL:	mg/kg	RL					mg/kg	RL				
Gasoline Range Hydrocarbons		<15.0	15.0					<15.0	15.0				
Diesel Range Organics		<15.0	15.0					168	15.0				
Oil Range Hydrocarbons		<15.0	15.0					27.5	15.0				
Total TPH		<15.0	15.0					196	15.0				

Kelsey Brooks
Project Manager

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

+ NELAC certification not offered for this compound.

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

	Phone	Fax
4147 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(602) 437-0330	

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Orders : 555866, 555866 **Project ID:** 212C-MD-00861

Lab Batch #: 3020665 **Sample:** 555866-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 07:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3020771 **Sample:** 555866-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 07:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.7	101	70-135	
o-Terphenyl	51.5	49.9	103	70-135	

Lab Batch #: 3020771 **Sample:** 555866-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 08:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	100	101	70-135	
o-Terphenyl	51.5	50.0	103	70-135	

Lab Batch #: 3021020 **Sample:** 555866-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/28/17 12:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	80-120	
4-Bromofluorobenzene	0.0328	0.0300	109	80-120	

Lab Batch #: 3020771 **Sample:** 726685-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 00:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	60.9	50.0	122	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Orders : 555866, 555866 **Project ID:** 212C-MD-00861

Lab Batch #: 3020665 **Sample:** 726706-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 05:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

Lab Batch #: 3021020 **Sample:** 726890-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/28/17 07:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0322	0.0300	107	80-120	

Lab Batch #: 3020771 **Sample:** 726685-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 00:55

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	50.1	50.0	100	70-135	

Lab Batch #: 3020665 **Sample:** 726706-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 03:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0280	0.0300	93	80-120	

Lab Batch #: 3021020 **Sample:** 726890-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/28/17 04:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Orders : 555866, 555866 **Project ID:** 212C-MD-00861

Lab Batch #: 3020771 **Sample:** 726685-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 01:16

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	100	114	70-135	
o-Terphenyl	53.7	50.0	107	70-135	

Lab Batch #: 3020665 **Sample:** 726706-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/25/17 04:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3021020 **Sample:** 726890-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 06/28/17 04:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

Lab Batch #: 3020771 **Sample:** 555795-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 01:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.7	107	70-135	
o-Terphenyl	50.3	49.9	101	70-135	

Lab Batch #: 3020665 **Sample:** 556138-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 04:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0336	0.0300	112	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	80-120	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Orders : 555866, 555866 **Project ID:** 212C-MD-00861

Lab Batch #: 3021020 **Sample:** 556211-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/28/17 11:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0346	0.0300	115	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

Lab Batch #: 3020771 **Sample:** 555795-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 02:19

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.4	99.8	100	70-135	
o-Terphenyl	49.0	49.9	98	70-135	

Lab Batch #: 3020665 **Sample:** 556138-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 06/25/17 04:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0335	0.0300	112	80-120	
4-Bromofluorobenzene	0.0335	0.0300	112	80-120	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Order #: 555866, 555866 **Project ID:** 212C-MD-00861

Analyst: ALJ **Date Prepared:** 06/24/2017 **Date Analyzed:** 06/25/2017

Lab Batch ID: 3020665 **Sample:** 726706-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.107	107	0.0994	0.0950	96	12	70-130	35	
Toluene	<0.00200	0.100	0.101	101	0.0994	0.0876	88	14	70-130	35	
Ethylbenzene	<0.00200	0.100	0.111	111	0.0994	0.0966	97	14	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.200	100	0.199	0.173	87	14	70-135	35	
o-Xylene	<0.00200	0.100	0.106	106	0.0994	0.0914	92	15	71-133	35	

Analyst: ALJ **Date Prepared:** 06/27/2017 **Date Analyzed:** 06/28/2017

Lab Batch ID: 3021020 **Sample:** 726890-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.101	0.0952	94	0.101	0.104	103	9	70-130	35	
Toluene	<0.00201	0.101	0.0831	82	0.101	0.0935	93	12	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0885	88	0.101	0.100	99	12	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.151	75	0.201	0.174	87	14	70-135	35	
o-Xylene	<0.00201	0.101	0.0854	85	0.101	0.100	99	16	71-133	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Order #: 555866, 555866 **Project ID:** 212C-MD-00861

Analyst: MGO **Date Prepared:** 06/28/2017 **Date Analyzed:** 06/28/2017

Lab Batch ID: 3021044 **Sample:** 726898-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	245	98	250	243	97	1	90-110	20	

Analyst: ARM **Date Prepared:** 06/24/2017 **Date Analyzed:** 06/25/2017

Lab Batch ID: 3020771 **Sample:** 726685-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons	<15.0	1000	992	99	1000	1020	102	3	70-135	35	
Diesel Range Organics	<15.0	1000	1010	101	1000	979	98	3	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Order #: 555866

Lab Batch #: 3021020 **Project ID:** 212C-MD-00861

Date Analyzed: 06/28/2017 **Date Prepared:** 06/27/2017 **Analyst:** ALJ

QC- Sample ID: 556211-002 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

BTEX by EPA 8021B	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Benzene	<0.00201	0.100	0.0827	83	70-130	
Toluene	<0.00201	0.100	0.0753	75	70-130	
Ethylbenzene	<0.00201	0.100	0.0795	80	71-129	
m,p-Xylenes	<0.00402	0.201	0.143	71	70-135	
o-Xylene	<0.00201	0.100	0.0774	77	71-133	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Double X25 Fed #4H

Work Order # : 555866 **Project ID:** 212C-MD-00861

Lab Batch ID: 3020665 **QC- Sample ID:** 556138-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 06/25/2017 **Date Prepared:** 06/24/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0785	79	0.100	0.0898	90	13	70-130	35	
Toluene	<0.00200	0.100	0.0785	79	0.100	0.0795	80	1	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0770	77	0.100	0.0764	76	1	71-129	35	
m,p-Xylenes	0.00688	0.200	0.144	69	0.200	0.135	64	6	70-135	35	X
o-Xylene	<0.00200	0.100	0.0771	77	0.100	0.0762	76	1	71-133	35	

Lab Batch ID: 3021044 **QC- Sample ID:** 555866-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 06/28/2017 **Date Prepared:** 06/28/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	8.51	246	251	99	246	255	100	2	90-110	20	

Lab Batch ID: 3020771 **QC- Sample ID:** 555795-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 06/25/2017 **Date Prepared:** 06/24/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons	<15.0	997	1060	106	998	974	98	8	70-135	35	
Diesel Range Organics	<15.0	997	998	100	998	987	99	1	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Analysis Request of Chain of Custody Record

PAGE: | OF:

TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

5558246

CLIENT NAME: Cimarex | SITE MANAGER: Ike Tavarez

PROJECT NO.: 212C-MD-00801 | PROJECT NAME: Cimarex Double X 25 Fed. #4H Lea Co, NM

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH TX1005 (Ext. to C35) 8015 MOD.	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
	6/19/17		S		X	AH # 1 (0-1')	1	N			X		X	X											X				
						AH # 1 (1-1.5')	1	N			X														X				
						AH # 1 (2-2.5')	1	N			X														X				
						AH # 2 (0-1')	1	N			X		X	X											X				

Temp: 2.9 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.7

RELINQUISHED BY: (Signature) | Date: 6-21-17 Time: 1200 | RECEIVED BY: (Signature) | Date: 6/21/17 Time: 12:00 | SAMPLED BY: (Print & Initial) NM | Date: 6-19-17 Time:

RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: | SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS | AIRBILL #: OTHER:

RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: | TETRA TECH CONTACT PERSON: Ike Tavarez | Results by:

RECEIVING LABORATORY: XENCO
ADDRESS:
CITY: MIDLAND STATE: TX ZIP:
CONTACT: PHONE: DATE: TIME:
RECEIVED BY: (Signature)

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:

REMARKS: Run deeper Samples; if TPH exceed 1,000 mg/kg and if benzene exceeds 10 mg/kg or total BTEX exceeds 50 mg/kg.

Please fill out all copies - Laboratory retains Yellow copy - Return Original copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 06/21/2017 12:00:00 PM

Work Order #: 555866

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)?	2.7
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**N/A**
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**
#6 Custody Seals intact on sample bottles?	**N/A**
#7 *Custody Seals Signed and dated?	**N/A**
#8 *Chain of Custody present?	**Yes**
#9 Sample instructions complete on Chain of Custody?	**Yes**
#10 Any missing/extra samples?	**No**
#11 Chain of Custody signed when relinquished/ received?	**Yes**
#12 Chain of Custody agrees with sample label(s)?	**Yes**
#13 Container label(s) legible and intact?	**Yes**
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#15 Samples in proper container/ bottle?	**Yes**
#16 Samples properly preserved?	**Yes**
#17 Sample container(s) intact?	**Yes**
#18 Sufficient sample amount for indicated test(s)?	**Yes**
#19 All samples received within hold time?	**Yes**
#20 Subcontract of sample(s)?	**N/A**
#21 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: Marithza Anaya Date: 06/21/2017

Marithza Anaya

Checklist reviewed by: Kelsey Brooks Date: 06/22/2017

Kelsey Brooks

Analytical Report 561984

for

Tetra Tech- Midland

Project Manager: Clair Gonzales

Cimarex- Double X 25 Fed #4H

212C-MD-00861

14-SEP-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

14-SEP-17

Project Manager: **Clair Gonzales**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **561984**
Cimarex- Double X 25 Fed #4H
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) 561984. 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. 561984 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 561984

Tetra Tech- Midland, Midland, TX

Cimarex- Double X 25 Fed #4H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1 (0-1)	S	08-31-17 00:00		561984-001
T1 (1')	S	08-31-17 00:00		561984-002
T1 (2')	S	08-31-17 00:00		561984-003
T1 (3')	S	08-31-17 00:00		561984-004
T1 (4')	S	08-31-17 00:00		561984-005
T1 (5')	S	08-31-17 00:00		561984-006
T2 (0-1)	S	08-31-17 00:00		561984-007
T2 (1')	S	08-31-17 00:00		561984-008
T2 (2')	S	08-31-17 00:00		561984-009
T2 (3')	S	08-31-17 00:00		561984-010
T2 (4')	S	08-31-17 00:00		561984-011

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3027028 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3027189 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 561984

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex- Double X 25 Fed #4H

Project Id: 212C-MD-00861
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Sep-05-17 04:30 pm
Report Date: 14-SEP-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	561984-001		561984-002		561984-003		561984-004		561984-005		561984-006	
	Field Id:	T1 (0-1)		T1 (1')		T1 (2')		T1 (3')		T1 (4')		T1 (5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00	
BTEX by EPA 8021B	***Extracted:***											Sep-08-17 08:30	
	Analyzed:											Sep-08-17 11:24	
	Units/RL:											mg/kg	RL
Benzene												<0.00344	0.00344
Toluene												<0.00344	0.00344
Ethylbenzene												<0.00344	0.00344
m,p-Xylenes												<0.00687	0.00687
o-Xylene												<0.00344	0.00344
Total Xylenes												<0.00344	0.00344
Total BTEX												<0.00344	0.00344
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15	
	Analyzed:	Sep-11-17 18:37		Sep-11-17 19:01		Sep-11-17 19:09		Sep-11-17 19:34		Sep-11-17 19:42		Sep-11-17 19:50	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.99	4.99	<4.93	4.93	81.7	4.90	102	4.95	292	4.96	331	4.95
TPH By SW8015 Mod	***Extracted:***											Sep-09-17 18:00	
	Analyzed:											Sep-10-17 14:26	
	Units/RL:											mg/kg	RL
Gasoline Range Hydrocarbons (GRO)												<14.9	14.9
Diesel Range Organics (DRO)												<14.9	14.9
Oil Range Hydrocarbons (ORO)												<14.9	14.9
Total TPH												<14.9	14.9

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 561984

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex- Double X 25 Fed #4H

Project Id: 212C-MD-00861
Contact: Clair Gonzales
Project Location: Lea Co,NM

Date Received in Lab: Tue Sep-05-17 04:30 pm
Report Date: 14-SEP-17
Project Manager: Kelsey Brooks

Analysis Requested												
	Lab Id:	561984-007		561984-008		561984-009		561984-010		561984-011		
	Field Id:	T2 (0-1)		T2 (1')		T2 (2')		T2 (3')		T2 (4')		
	Depth:											
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	Sampled:	Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		Aug-31-17 00:00		
BTEX by EPA 8021B	***Extracted:***									Sep-07-17 08:00		
	Analyzed:									Sep-07-17 19:14		
	Units/RL:									mg/kg	RL	
Benzene										<0.00201	0.00201	
Toluene										<0.00201	0.00201	
Ethylbenzene										<0.00201	0.00201	
m,p-Xylenes										<0.00402	0.00402	
o-Xylene										<0.00201	0.00201	
Total Xylenes										<0.00201	0.00201	
Total BTEX										<0.00201	0.00201	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15		Sep-11-17 15:15		Sep-12-17 15:30		
	Analyzed:	Sep-11-17 19:58		Sep-11-17 20:07		Sep-11-17 20:15		Sep-11-17 20:23		Sep-12-17 21:13		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	
Chloride		24.5	4.94	<4.96	4.96	717	4.92	305	4.91	506	4.97	
TPH By SW8015 Mod	***Extracted:***									Sep-09-17 18:00		
	Analyzed:									Sep-10-17 14:46		
	Units/RL:									mg/kg	RL	
Gasoline Range Hydrocarbons (GRO)										<15.0	15.0	
Diesel Range Organics (DRO)										<15.0	15.0	
Oil Range Hydrocarbons (ORO)										<15.0	15.0	
Total TPH										<15.0	15.0	

Kelsey Brooks
Project Manager

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

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Orders : 561984,

Project ID: 212C-MD-00861

Lab Batch #: 3027028 **Sample:** 561984-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/07/17 19:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

Lab Batch #: 3027189 **Sample:** 561984-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 11:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0247	0.0300	82	80-120	

Lab Batch #: 3027224 **Sample:** 561984-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/10/17 14:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.6	108	70-135	
o-Terphenyl	54.2	49.8	109	70-135	

Lab Batch #: 3027224 **Sample:** 561984-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/10/17 14:46

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.9	105	70-135	
o-Terphenyl	52.9	50.0	106	70-135	

Lab Batch #: 3027028 **Sample:** 730538-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 10:21

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Orders : 561984,

Project ID: 212C-MD-00861

Lab Batch #: 3027189 **Sample:** 730642-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 09:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3027224 **Sample:** 730691-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/10/17 12:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	100	103	70-135	
o-Terphenyl	53.5	50.0	107	70-135	

Lab Batch #: 3027028 **Sample:** 730538-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 07:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0286	0.0300	95	80-120	

Lab Batch #: 3027189 **Sample:** 730642-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 07:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0249	0.0300	83	80-120	

Lab Batch #: 3027224 **Sample:** 730691-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/10/17 12:47

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	55.6	50.0	111	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Orders : 561984,

Project ID: 212C-MD-00861

Lab Batch #: 3027028 **Sample:** 730538-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 08:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0295	0.0300	98	80-120	

Lab Batch #: 3027189 **Sample:** 730642-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 08:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0263	0.0300	88	80-120	

Lab Batch #: 3027224 **Sample:** 730691-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/10/17 13:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	48.9	50.0	98	70-135	

Lab Batch #: 3027028 **Sample:** 561863-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/07/17 08:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0316	0.0300	105	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3027189 **Sample:** 562130-006 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 08:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Orders : 561984,

Project ID: 212C-MD-00861

Lab Batch #: 3027224 **Sample:** 562162-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/10/17 13:47

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.9	99.7	98	70-135	
o-Terphenyl	44.4	49.9	89	70-135	

Lab Batch #: 3027028 **Sample:** 561863-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/07/17 08:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 3027189 **Sample:** 562130-006 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 08:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3027224 **Sample:** 562162-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/10/17 14:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.9	109	70-135	
o-Terphenyl	43.3	50.0	87	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Order #: 561984 **Project ID:** 212C-MD-00861

Analyst: ALJ **Date Prepared:** 09/07/2017 **Date Analyzed:** 09/07/2017

Lab Batch ID: 3027028 **Sample:** 730538-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.106	105	0.0998	0.106	106	0	70-130	35	
Toluene	<0.00202	0.101	0.102	101	0.0998	0.101	101	1	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0994	98	0.0998	0.0992	99	0	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.194	96	0.200	0.193	97	1	70-135	35	
o-Xylene	<0.00202	0.101	0.0929	92	0.0998	0.0931	93	0	71-133	35	

Analyst: ALJ **Date Prepared:** 09/08/2017 **Date Analyzed:** 09/08/2017

Lab Batch ID: 3027189 **Sample:** 730642-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.119	119	0.101	0.108	107	10	70-130	35	
Toluene	<0.00200	0.100	0.110	110	0.101	0.101	100	9	70-130	35	
Ethylbenzene	<0.00200	0.100	0.107	107	0.101	0.0984	97	8	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.208	104	0.202	0.191	95	9	70-135	35	
o-Xylene	<0.00200	0.100	0.0995	100	0.101	0.0920	91	8	71-133	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Order #: 561984 **Project ID:** 212C-MD-00861

Analyst: MNV **Date Prepared:** 09/11/2017 **Date Analyzed:** 09/11/2017

Lab Batch ID: 3027427 **Sample:** 730722-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	253	101	250	252	101	0	90-110	20	

Analyst: MNV **Date Prepared:** 09/12/2017 **Date Analyzed:** 09/12/2017

Lab Batch ID: 3027515 **Sample:** 730869-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	249	100	250	251	100	1	90-110	20	

Analyst: ARM **Date Prepared:** 09/09/2017 **Date Analyzed:** 09/10/2017

Lab Batch ID: 3027224 **Sample:** 730691-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1110	111	1000	1110	111	0	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1190	119	1000	1180	118	1	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Order # : 561984 **Project ID:** 212C-MD-00861

Lab Batch ID: 3027028 **QC- Sample ID:** 561863-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/07/2017 **Date Prepared:** 09/07/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00351	0.175	0.211	121	0.173	0.148	86	35	70-130	35	
Toluene	<0.00351	0.175	0.166	95	0.173	0.136	79	20	70-130	35	
Ethylbenzene	<0.00351	0.175	0.127	73	0.173	0.129	75	2	71-129	35	
m,p-Xylenes	<0.00702	0.351	0.239	68	0.346	0.251	73	5	70-135	35	X
o-Xylene	<0.00351	0.175	0.134	77	0.173	0.126	73	6	71-133	35	

Lab Batch ID: 3027189 **QC- Sample ID:** 562130-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/08/2017 **Date Prepared:** 09/08/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0668	67	0.0994	0.0830	84	22	70-130	35	X
Toluene	<0.00200	0.0998	0.0614	62	0.0994	0.0756	76	21	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0581	58	0.0994	0.0702	71	19	71-129	35	X
m,p-Xylenes	<0.00399	0.200	0.114	57	0.199	0.137	69	18	70-135	35	X
o-Xylene	<0.00200	0.0998	0.0559	56	0.0994	0.0669	67	18	71-133	35	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Order # : 561984 **Project ID:** 212C-MD-00861

Lab Batch ID: 3027427 **QC- Sample ID:** 561862-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/11/2017 **Date Prepared:** 09/11/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	76.6	249	341	106	249	342	107	0	90-110	20	

Lab Batch ID: 3027427 **QC- Sample ID:** 561984-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/11/2017 **Date Prepared:** 09/11/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.99	250	267	107	250	268	107	0	90-110	20	

Lab Batch ID: 3027515 **QC- Sample ID:** 562132-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/12/2017 **Date Prepared:** 09/12/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	19.8	249	286	107	249	285	107	0	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Double X 25 Fed #4H

Work Order # : 561984 **Project ID:** 212C-MD-00861

Lab Batch ID: 3027224 **QC- Sample ID:** 562162-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/10/2017 **Date Prepared:** 09/09/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	1080	108	999	972	97	11	70-135	35	
Diesel Range Organics (DRO)	<15.0	997	1050	105	999	1050	105	0	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

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

561984

Cimarex | Site Manager: Clair Gonzales

Project Name: Double X25 Fed # 4H

Project Location: (county, state) Lea Co, NM | Project #: 212c-MD-00861

Invoice to: Bill to Cimarex

Receiving Laboratory: XENCO | Sampler Signature: Mathew McDaniel

Comments:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	TIME	MATRIX WATER	SOIL	PRESERVATIVE METHOD HCL	HNO_3	ICE	# CONTAINERS	FILTERED (Y/N)	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
	T1 (0-1)	8/31/2017			x			x	1	n															x				
	T1 (1')	8/31/17			x			x	1	n															x				
	T1 (2')	8/31/17			x			x	1	n															x				
	T1 (3')	8/31/17			x			x	1	n															x				
	T1 (4')	8/31/17			x			x	1	n															x				
	T1 (5')	8/31/17			x			x	1	n															x				
	T2 (0-1)	8/31/17			x			x	1	n	x		x												x				
	T2 (1')	8/31/17			x			x	1	n															x				
	T2 (2')	8/31/17			x			x	1	n															x				
	T2 (3')	8/31/17			x			x	1	n															x				

Relinquished by: Date: 9-5-17 Time: 16:30 | Received by: Date: 9-5-17 Time: 16:30

Relinquished by: Date: Time: | Received by: Date: Time:

Relinquished by: Date: Time: | Received by: Date: Time:

LAB USE ONLY

Sample Temperature

(Circle) HA

REMARKS: Standard

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Special Report

Temp: 5.6 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 5.4

ORIGINAL COPY

Final 1.000

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

561984

Cimarex | Site Manager: Clair Gonzales

Project Name: Double X25 Fed # 4H

Project Location: (county, state) Lea Co, NM | Project #: 212c-MD-00861

Invoice to: Bill to Cimarex

Receiving Laboratory: XENCO | Sampler Signature: Mathew McDaniel

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)	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
	T2 (4')	8/31/2017			x				x			1	n	x		x												x								

ANALYSIS REQUEST
(Circle or Specify Method No.)

Relinquished by: Date: 9-5-17 Time: 1630 | Received by: Date: 9-5-17 Time: 16:30

Relinquished by: Date: Time: | Received by: Date: Time:

Relinquished by: Date: Time: | Received by: Date: Time:

LAB USE ONLY

Sample Temperature

REMARKS: Standard

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

ORIGINAL COPY

Temp: 5.6 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 5.4

Final 1.000

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 09/05/2017 04:30:00 PM

Work Order #: 561984

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)?	5.4
#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)?	**No**
#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: Shawnee Smith Date: 09/06/2017
Shawnee Smith

Checklist reviewed by: Kelsey Brooks Date: 09/06/2017
Kelsey Brooks