SITE INFORMATION

Report Type: Deferment Report 2RP-4030

General Site Information:						
Site:	**Marquardt 12H**					
Company:	**Cimarex Energy**					
Section, Township and Range	**Unit P**	**Sec. 12**	**T 25S**	**R 26E**		
Lease Number:	**API No. 30-015-41850**					
County:	**Eddy County**					
GPS:	**32.137178º N**			**104.238935º W**		
Surface Owner:	**Federal**					
Mineral Owner:						
Directions:	From the intersection of Lovington Hwy and CR 211 in rural Eddy county, travel north on CR 211 for 1.4 mi, to northeast onto a lease road for 0.45 mi to the location on the north side of the lease road.					

Release Data:	
Date Released:	10/12/2016
Type Release:	Produced Water
Source of Contamination:	Valve
Fluid Released:	50 bbls
Fluids Recovered:	35 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) 682-4559
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	
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:	***20***	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	100

TETRA TECH

September 29, 2017

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

Re: Deferment Report for the Cimarex Energy, Marquardt 12H, Unit P, Section 12, Township 25 South, Range 26 East, Eddy County, New Mexico. 2RP-4030

Ms. Alderman:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cimarex Energy (Cimarex) to assess a spill that occurred at the Marquardt 12H, Unit P, Section 12, Township 25 South, Range 26 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.137178º, W 104.238935. The spill originated in Section 12, Township 25 South, Range 26 East, and migrated into Section 7, Township 25 South, Range 27 East. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on October 12, 2016, and released approximately fifty (50) barrels of produced water due to a failed check valve on a poly flowline. Approximately thirty-five (35) barrels of produced water was recovered. Due to two (2) underground gas lines in the vicinity, Cimarex used a hydrovac truck to remove approximately 6" to 1.0' of the soil in selected areas of the release. The spill occurred along the south edge of the lease road and a pipeline right-of-way measuring approximately 10' x 1550'. The initial C-141 form is included in Appendix A. The release area is shown on Figure 3.

Groundwater

No water wells were listed within Section 12, Township 25 South, Range 26 East or in Section 7, Township 25 South, Range 27 East on the New Mexico Office of the State Engineer's website. However, one (1) well is listed in Section 22 and has a reported depth to groundwater of 118' below surface. Two (2) water wells in Section 3 and 9 reported a depth to water of 45'elow surface for both wells. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is less than 50' 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 100 mg/kg.

Spill Inspection

Initial Sampling

On November 14, 2016, Tetra Tech was onsite to collect soil samples from the release area to evaluate the soils. A total of thirteen (13) auger holes (AH-1 through AH-13) were installed to depths of ranging from 6" to 2.5' in the release area, as well as one (1) background auger hole (Background), using a stainless steel hand auger. Deeper samples were not collected due to a dense caliche formation in the area. Cimarex performed an initial emergency response and removed the shallow impacted soils using a hydrovac truck, prior to the sampling event. The area of auger hole (AH-3) was hydrovaced to a depth of 6" below surface and the areas of auger holes (AH-1, AH-2, AH-4, AH-5, AH-6, AH-7, AH-9, and AH-11) was hydrovaced to 1.0' 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 in Appendix C. The sampling results are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, none of the samples analyzed for TPH, benzene or total BTEX showed concentrations above the RRAL's or above the laboratory reporting limits. Additionally, the samples collected at auger holes (AH-1, AH-2, AH-3, AH-9, AH-10, and AH-11) did not show any significant chloride impact to the shallow soils, with concentrations ranging from <104 mg/kg to 388 mg/kg.

However, the areas of auger holes (AH-4, AH-5, and AH-12) did show elevated chloride concentrations at 0-1', however the areas were vertically defined at 1-1.5', with concentrations of 680 mg/kg, 874 mg/kg, and 487 mg/kg, respectively. These areas declined with depth but were not defined below 250 mg/kg.

Auger holes (AH-8 and AH-13) showed elevated chlorides in the shallow soils at 0-1' of 4,330 mg/kg and 4,870 mg/kg, respectively. However, the chlorides declined with depth and vertically defined at 1-1.5' (146 mg/kg) and 2-.2.5' (<104 mg/kg). The areas of auger holes (AH-6 and AH-7) were not vertically defined showing bottom samples of 1,650 mg/kg (AH-6) and 1,660 mg/kg (AH-7) at 0-1'.

The background sample collected 0-1' below surface did not detect any TPH, benzene or BTEX above the laboratory reporting limits and showed a chloride concentration of 146 mg/kg in the soils.

Additional Sampling

Due to the recent heavy rains, Tetra Tech returned to the site on March 29, 2017, to collect additional samples to re-evaluate and attempt define the areas of auger holes (AH-4, AH-5, AH-6, AH-7, AH-8, AH-12, and AH-13). Selected samples were analyzed for 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 on Figure 3.

Referring to Table 1, the samples collected at auger holes (AH-4, AH-8, and AH-13) showed concentrations that declined from the initial sampling results with concentrations from 3,200 mg/kg to 1,470 mg/kg, 4,330 mg/kg to 123 mg/kg, and 7,510 mg/kg to 4,870 mg/kg at 0-1', respectively. The sample collected at auger hole (AH-5) showed a slight increase with a concentration from 1,450 mg/kg to 2,060 mg/kg at 0-1' below excavation bottom. Additionally, the area of auger hole (AH-12) was resampled at 0-1' and 1-1.5' below surface, which showed a decline in chloride concentrations from 3,700 mg/kg to 3,040 mg/kg (0-1') and 3,600 mg/kg to 1,750 mg/kg (1-1.5').

The areas of auger holes (AH-6 and AH-7) were resampled to a total depth of 1-1.5' below surface to re-evaluate and define the impact in these areas. The area of auger hole (AH-7) showed a chloride spike of 5,110 mg/kg at 0-1' which then declined with depth to 497 mg/kg at 1-1.5' below the 1.0' excavation bottom, and the area was vertically defined. However, the samples collected at auger hole (AH-6) showed chloride concentrations of 1,420 mg/kg (0-1') and 3,330 mg/kg (1-1.5') and the area was not vertically defined.

Conclusion

The release areas showed shallow chloride impact to the soils. Majority of the impacted areas either declined significantly with depth or were vertically defined, with the exception of auger hole (AH-6). Deeper samples could not be collected due to a dense caliche formation in the release area. Two active underground lines run along the release area; one high pressure flex poly gas line and one low pressure steel gas line. Due to the proximity of the underground gas pipelines, which run along the length of the release, the impacted areas are not accessible and cannot be remediated or assessed safely using a backhoe or an air rotary rig.

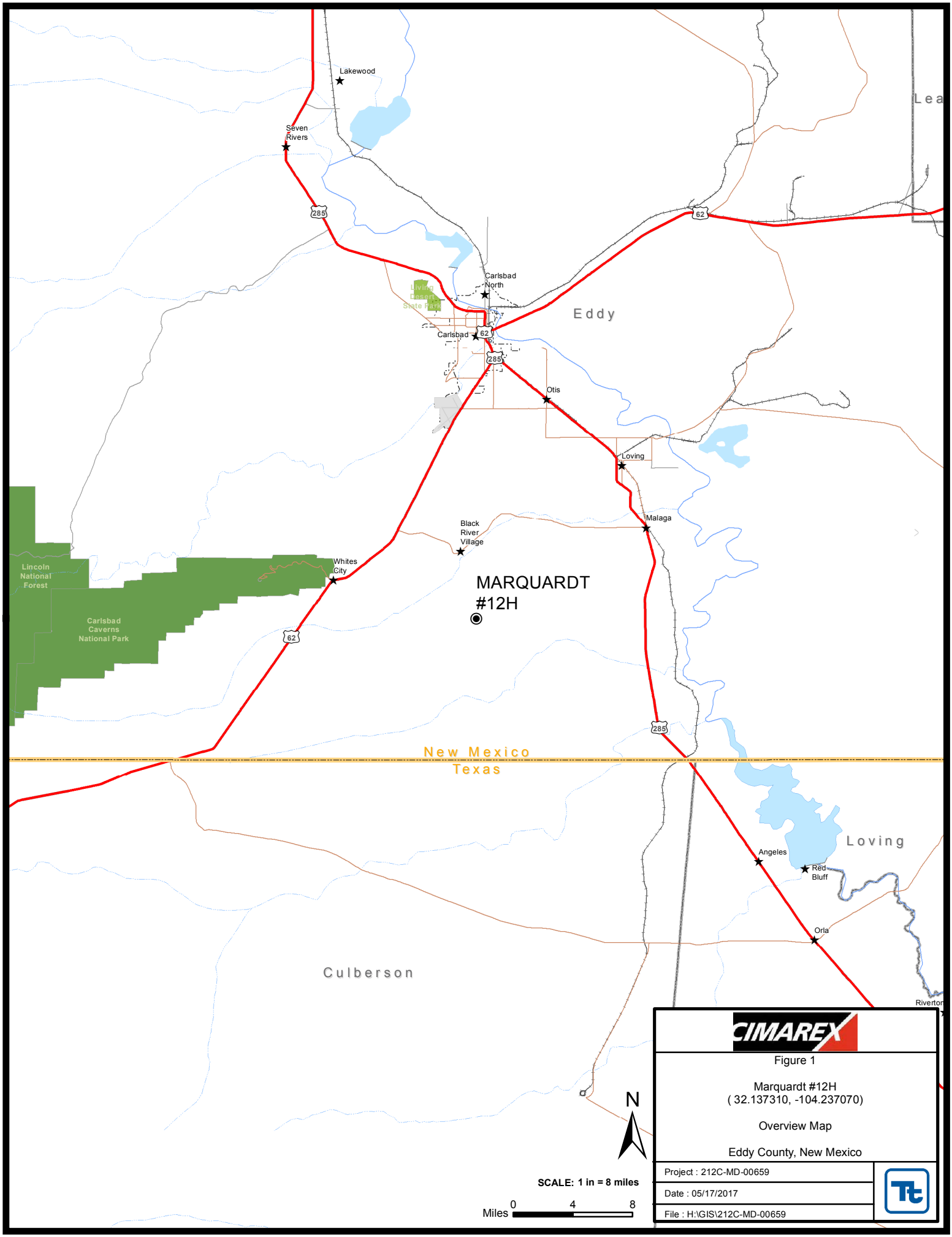
Due to the safety issues and the limited chloride impact, Cimarex proposes to defer the impacted areas until abandonment. If you have any questions or comments concerning the assessment activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

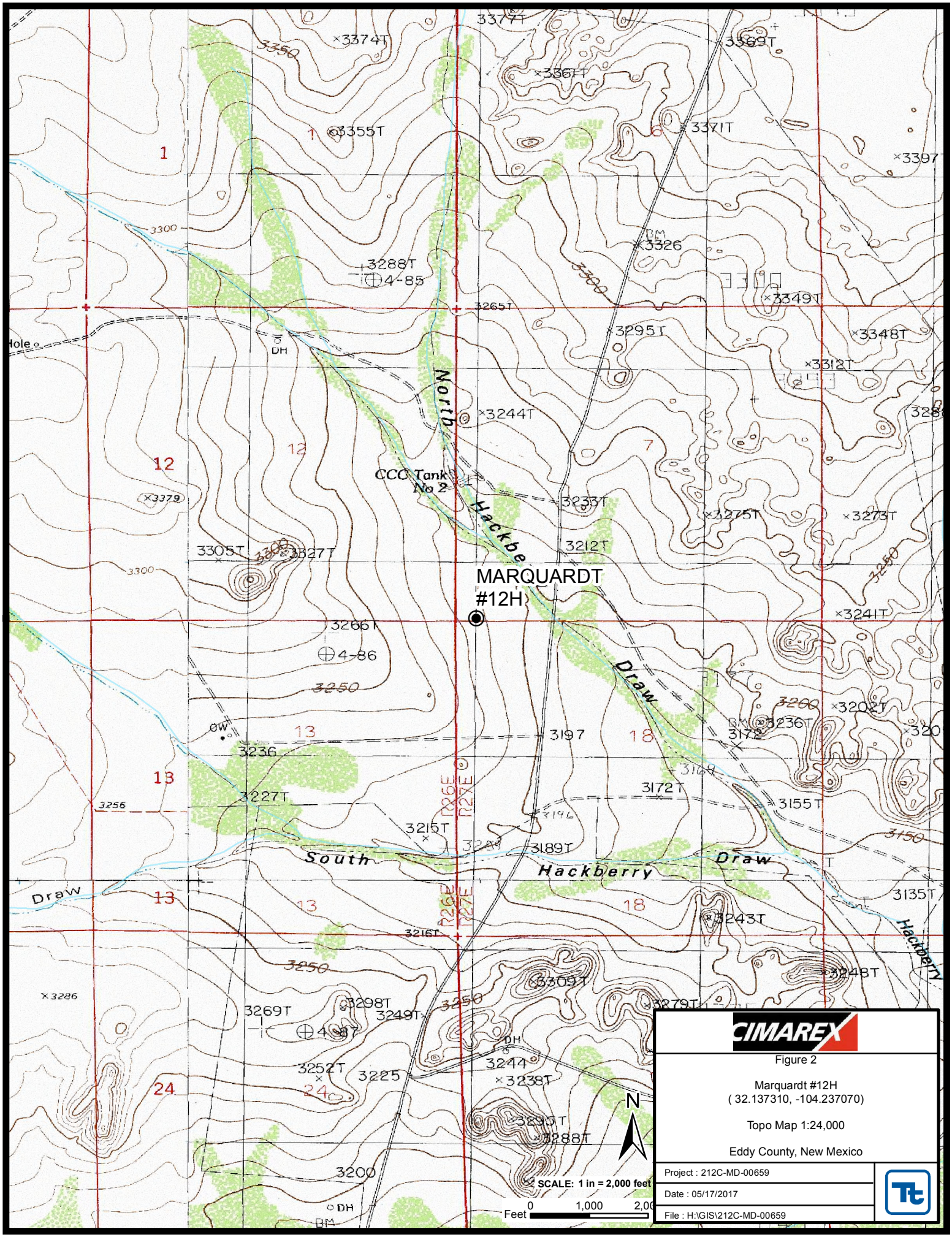
Ike Tavarez, PG
Senior Project Manager

Clair Gonzales,
Geologist I

Figures



Mapped By: Isabel Marmolejo



Mapped By: Isabel Marmolejo

Mapped By: Isabel Marmolejo

Tables

Table 1
Cimarex
Marquardt 12H
Eddy 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	Total						
AH-1	11/14/2016	0-0.5	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	<104
AH-2	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	388 J
	"	1-1.5	1	X		-	-	-	-	-	-	-	-	146 J
	"	2-2.5	1	X		-	-	-	-	-	-	-	-	146 J
AH-3	11/14/2016	0-0.5	0.5	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	291 J
AH-4	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**3,200**
	"	1-1.5	1	X		-	-	-	-	-	-	-	-	680
Resampled	3/29/2017	0-1	1	X		-	-	-	-	-	-	-	-	**1,470**
AH-5	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**1,070**
	"	1-1.5	1	X		-	-	-	-	-	-	-	-	874
Resampled	3/29/2017	0-1	1	X		-	-	-	-	-	-	-	-	**2,060**
AH-6	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**1,650**
Resampled	3/29/2017	0-1	1	X		-	-	-	-	-	-	-	-	**1,420**
	"	1-1.5	1	X		-	-	-	-	-	-	-	-	**3,330**
AH-7	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**1,660**
Resampled	3/29/2017	0-1	1	X		-	-	-	-	-	-	-	-	**5,110**
	"	1-1.5	1	X		-	-	-	-	-	-	-	-	497

Table 1
Cimarex
Marquardt 12H
Eddy 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	Total						
AH-8	11/14/2016	0-1	-	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**4,330**
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	146 J
Resampled	3/29/2017	0-1	-	X		-	-	-	-	-	-	-	-	123
AH-9	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	146 J

212C-MD-00659
Trace Analysis
Xenco Labs

Table 1
Cimarex
Marquardt 12H
Eddy County, New Mexico

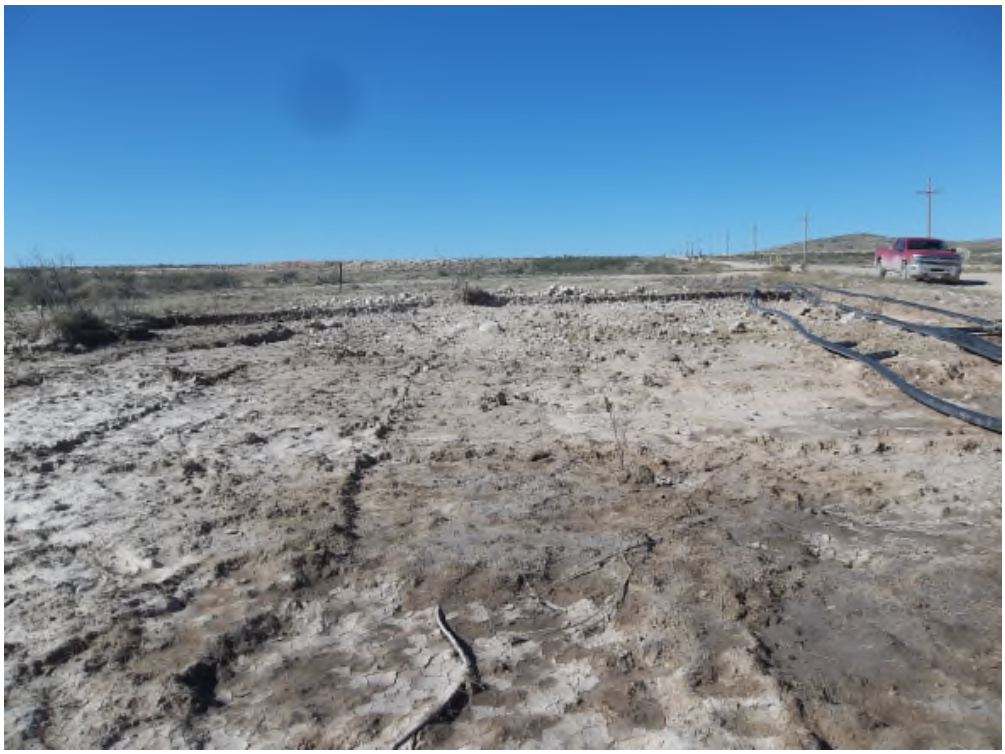
Sample ID	Sample Date	Sample Depth (ft)	BEB Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
AH-10	11/14/2016	0-1	-	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	292
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	<104
AH-11	11/14/2016	0-1	1	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	341
AH-12	11/14/2016	0-1	-	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**3,700**
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	**3,600**
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	487 J
Resampled	3/29/2017	0-1	-	X		-	-	-	-	-	-	-	-	**3,040**
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	**1,750**
AH-13	11/14/2016	0-1	-	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	**7,010**
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	487 J
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	<104
Resampled	3/29/2017	0-1	-	X		-	-	-	-	-	-	-	-	**4,870**
Background	11/14/2016	0-1	-	X		<4.24	<50.0	<50.0	<0.0212	<0.0212	<0.0212	<0.0212	<0.0212	146 J

	Areas Resampled and Results
(BEB)	Below Excavation Bottom
(-)	Not Analyzed
(J)	Estimated Concentration

212C-MD-00659
Trace Analysis
Xenco Labs

Photos

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico



View West – Area of AH-1 and AH-2

View East – Area of AH-3

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico

View East – Area of AH-4

View East – Area of AH-5

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico

View East – Area of AH-6

View East – Area of AH-7

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico

View East – Area of AH-8

View East – Area of AH-9

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico

View North – Area of AH-10

View West – Area of AH-11

Cimarex Energy
Marquardt 12H
Eddy County, New Mexico

View West – Area of AH-12

View East – Area of AH-13

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 Christine Alderman
Address 600 N Marienfeld Ste 600 Midland TX	Telephone No. 432-853-7059
Facility Name Marquardt 12H	Facility Type Production

Surface Owner fed	Mineral Owner	API No. 30-015-41850

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	12	25S	26E	330	S	400	E	Eddy

Latitude_32.13807_**Longitude**-104.23923

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 50 bbls	Volume Recovered 35 bbls
Source of Release valve	Date and Hour of Occurrence 10/12/2016	Date and Hour of Discovery 10/12/2016
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Shelly Tucker/Heather Patterson	
By Whom? Christine Alderman	Date and Hour 10/13/2016	
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.
A check valve failed on a poly water transfer line on the ROW. All standing fluids were picked up with a vacuum truck.

Describe Area Affected and Cleanup Action Taken.
We will hydro vac the impacted area to try to get the heavily contaminated areas removed and then we will sample.

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: Christine Alderman	Approved by Environmental Specialist:	
Title: ESH Supervisor	Approval Date:	Expiration Date:
E-mail Address: calderman@cimarex.com	Conditions of Approval:	Attached ☐
Date: 10/13/2016 Phone: 432-853-7059		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Cimarex - Marquardt 12H
Eddy County, New Mexico

24 South 25 East

6	5 14 209	4 440 44	3	2	1
7	8	9	10	11	12 27
18	17	16	15	14	13 7 163
19	20	21	22	23	24
30	29	28	27	26	25 540 57
31	32	33	34 150	35 500	36

24 South 26 East

6 63	5	4	3	2	1
7 250	8 450	9	10	11	12
18 650	17	16	15	14 30	13
19	20	21	22	23 38 37	24 28 30
30 70	29 46	28	27 30	26	25
31	32 111 109	33	34 52	35	36

24 South 27 East

6	5	4	3	2	1
7	8 17 26	9 43	10	11	12 27
18 30 34	17	16	15	14	13 30 31
19	20	21	22 70	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 25 East

6	5 30	4 46	3 20	2	1
7	8	9	10	11 43	12 39
18	17	16	15	14	13
19	20	21	22	23	24 70
30	29	28	27	26	25
31	32	33	34	35	36

25 South 26 East

6 125	5	4	3 45	2	1
7 60	8	9 45	10	11	12 SITE
18	17	16	15	14	13
19 70	20	21	22 118	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 27 East

6	5	4	3	2	1
7 SITE	8	9	10	11	12 92
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25 12
31	32	33 19	34	35	36

26 South 25 East

6	5	4	3	2	1
7	8	9	10	11	12 150
18 10	17 29	16 6	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South 26 East

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

26 South 27 East

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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

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

34 NMOCD - Groundwater Data

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01013		C	ED			4	25	25S	26E	571505	3551456*	245		
C 01089		C	ED	3	4	1	03	25S	26E	567505	3558398*	96	45	51
C 01368		C	ED		1	1	22	25S	26E	567261	3554059*	143	118	25
C 02220		CUB	ED	3	1	2	26	25S	26E	569598	3552352*	35		
C 02221		CUB	ED	4	3	2	25	25S	26E	571412	3551961*	35		
C 02675		C	ED	1	4	1	09	25S	26E	565907	3556978*	180	45	135
C 03285		C	ED	4	4	2	07	25S	26E	563713	3556658	84	60	24
C 03569 POD1		CUB	ED	2	1	1	14	25S	26E	568862	3555746	30	0	30
C 03654 POD1		CUB	ED	2	3	1	24	25S	26E	570654	3553773			
C 03654 POD2		CUB	ED	2	3	1	24	25S	26E	554766	3562304			
C 03655 POD1		CUB	ED			4	22	25S	26E	550692	3561324			
C 03655 POD2		CUB	ED			4	22	25S	26E	550732	3561337			
C 03655 POD3		CUB	ED	1	4	4	22	25S	26E	568458	3553019			
C 03655 POD4		CUB	ED			4	22	25S	26E	550684	3561362			
C 04036 POD1		C	ED	1	4	3	06	25S	26E	562745	3557733	160	125	35
C 04049 POD1			ED	3	2	3	06	25S	26E	562592	3557864	165		
C 04050 POD1		CUB	ED	1	4	3	06	25S	26E	562695	3557776	165		

Average Depth to Water: **65 feet**

Minimum Depth: **0 feet**

Maximum Depth: **125 feet**

Record Count: 17

PLSS Search:

Township: 25S **Range:** 26E

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

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02588		C	ED	3	4	3	33	25S	27E	575645	3549575*	81	19	62
C 03261 POD1			ED	3	2	1	20	25S	27E	574007	3554006*	351		
C 03262 POD1		C	ED	2	1	2	22	25S	27E	577837	3554244*	75		
C 03264 POD1		C	ED	2	1	2	02	25S	27E	579391	3559099*			
C 03938 POD1		CUB	ED	2	2	2	25	25S	27E	581482	3552616	21	12	9

Average Depth to Water: **15 feet**

Minimum Depth: **12 feet**

Maximum Depth: **19 feet**

Record Count: 5

PLSS Search:

Township: 25S **Range:** 27E

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

5/17/17 8:37 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP Kansas Oklahoma

Analytical and Quality Control Report

Ike Tavarez
Tetra Tech
4000 N. Big Spring
Ste. 401
Midland, TX, 79705

Report Date: November 28, 2016

Work Order: 16111601

Project Location: Eddy Co, NM
Project Name: Cimarex- Marquardt 12H
Project Number: 212C-MD-00659

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
432013	AH-1 (0-6")	soil	2016-11-14	00:00	2016-11-15
432014	AH-2 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432015	AH-2 (1-1.5') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432016	AH-2 (2-2.5') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432017	AH-3 (0-1') (6" BEB)	soil	2016-11-14	00:00	2016-11-15
432018	AH-4 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432019	AH-4 (0-1.5') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432020	AH-5 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432021	AH-5 (1-1.5') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432022	AH-6 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432023	AH-7(0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432024	AH-8 (0-1')	soil	2016-11-14	00:00	2016-11-15
432025	AH-8 (1-1.5')	soil	2016-11-14	00:00	2016-11-15
432026	AH-9 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432027	AH-10 (0-1')	soil	2016-11-14	00:00	2016-11-15
432028	AH-10 (1-1.5')	soil	2016-11-14	00:00	2016-11-15
432029	AH-11 (0-1') (1' BEB)	soil	2016-11-14	00:00	2016-11-15
432030	AH-12 (0-1')	soil	2016-11-14	00:00	2016-11-15
432031	AH-12 (1-1.5')	soil	2016-11-14	00:00	2016-11-15

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
432032	AH-12 (2-2.5')	soil	2016-11-14	00:00	2016-11-15
432033	AH-13 (0-1')	soil	2016-11-14	00:00	2016-11-15
432034	AH-13 (1-1.5')	soil	2016-11-14	00:00	2016-11-15
432035	AH-13 (2-2.5')	soil	2016-11-14	00:00	2016-11-15
432036	Background (0-1)	soil	2016-11-14	00:00	2016-11-15

Notes

• **Work Order 16111601:** Run deeper samples if benzene exceeds 10mg/kg, total BTEX exceeds 50mg/kg, or TPH exceeds 100mg/kg. Shipping 11/16

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 43 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Notes:

For inorganic analyses, the term MQL should actually read PQL.

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Johnny Grindstaff, Operations Manager

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Case Narrative

Samples for project Cimarex- Marquardt 12H were received by TraceAnalysis, Inc. on 2016-11-15 and assigned to work order 16111601. Samples for work order 16111601 were received intact at a temperature of 4.4 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	113525	2016-11-16 at 08:09	133915	2016-11-18 at 08:09
Chloride (Titration)	SM 4500-Cl B	113592	2016-11-20 at 10:50	133991	2016-11-22 at 12:00
Chloride (Titration)	SM 4500-Cl B	113596	2016-11-20 at 10:50	133996	2016-11-22 at 12:30
Chloride (Titration)	SM 4500-Cl B	113598	2016-11-20 at 10:50	133999	2016-11-22 at 13:00
TPH DRO	S 8015 D	113536	2016-11-17 at 16:00	133927	2016-11-18 at 11:21
TPH GRO	S 8015 D	113525	2016-11-16 at 08:09	133916	2016-11-18 at 08:12

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16111601 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 432013 - AH-1 (0-6")

Laboratory:	Midland					
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035	
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	1.06	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	mg/Kg	1.06	2.00	100	70 - 130

Sample: 432013 - AH-1 (0-6")

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<104	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432013 - AH-1 (0-6")

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			18.9	mg/Kg	1	20.0	94	70 - 130

Sample: 432013 - AH-1 (0-6")

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.09	mg/Kg	1.06	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.89	mg/Kg	1.06	2.00	94	70 - 130

Sample: 432014 - AH-2 (0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.98	mg/Kg	1.06	2.00	99	70 - 130
4-Bromofluorobenzene (4-BFB)			2.03	mg/Kg	1.06	2.00	102	70 - 130

Sample: 432014 - AH-2 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A

QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**388**	<500	<208	mg/Kg	10	208	50	20.8

Sample: 432014 - AH-2 (0-1') (1' BEB)

Laboratory: Lubbock
Analysis: TPH DRO | Analytical Method: S 8015 D | Prep Method: N/A
QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | Sample Preparation: 2016-11-17 | Prepared By: HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			19.7	mg/Kg	1	20.0	98	70 - 130

Sample: 432014 - AH-2 (0-1') (1' BEB)

Laboratory: Midland
Analysis: TPH GRO | Analytical Method: S 8015 D | Prep Method: S 5035
QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.07	mg/Kg	1.06	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.86	mg/Kg	1.06	2.00	93	70 - 130

Sample: 432015 - AH-2 (1-1.5') (1' BEB)

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A

QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**146**	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432016 - AH-2 (2-2.5') (1' BEB)

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**146**	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432017 - AH-3 (0-1') (6" BEB)

Laboratory: Midland
Analysis: BTEX | Analytical Method: S 8021B | Prep Method: S 5035
QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.02	mg/Kg	1.06	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)			2.00	mg/Kg	1.06	2.00	100	70 - 130

Sample: 432017 - AH-3 (0-1') (6" BEB)

Laboratory: Lubbock

Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**291**	<500	<208	mg/Kg	10	208	50	20.8

Sample: 432017 - AH-3 (0-1') (6" BEB)

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			19.2	mg/Kg	1	20.0	96	70 - 130

Sample: 432017 - AH-3 (0-1') (6" BEB)

Laboratory:	Midland					
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.14	mg/Kg	1.06	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.89	mg/Kg	1.06	2.00	94	70 - 130

Sample: 432018 - AH-4 (0-1') (1' BEB)

Laboratory: Midland

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.05	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			2.08	mg/Kg	1.06	2.00	104	70 - 130

Sample: 432018 - AH-4 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**3200**	**3200**	<208	mg/Kg	10	208	50	20.8

Sample: 432018 - AH-4 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			21.3	mg/Kg	1	20.0	106	70 - 130

Sample: 432018 - AH-4 (0-1') (1' BEB)

Laboratory: Midland
Analysis: TPH GRO | Analytical Method: S 8015 D | Prep Method: S 5035
QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.14	mg/Kg	1.06	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.89	mg/Kg	1.06	2.00	94	70 - 130

Sample: 432019 - AH-4 (0-1.5') (1' BEB)

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**680**	**680**	<208	mg/Kg	10	208	50	20.8

Sample: 432020 - AH-5 (0-1') (1' BEB)

Laboratory: Midland
Analysis: BTEX | Analytical Method: S 8021B | Prep Method: S 5035
QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	1.06	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.95	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432020 - AH-5 (0-1') (1' BEB)

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**1070**	**1070**	<208	mg/Kg	10	208	50	20.8

Sample: 432020 - AH-5 (0-1') (1' BEB)

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			19.1	mg/Kg	1	20.0	96	70 - 130

Sample: 432020 - AH-5 (0-1') (1' BEB)

Laboratory:	Midland					
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035	
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.01	mg/Kg	1.06	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.78	mg/Kg	1.06	2.00	89	70 - 130

Sample: 432021 - AH-5 (1-1.5') (1' BEB)

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**874**	**874**	<208	mg/Kg	10	208	50	20.8

Sample: 432022 - AH-6 (0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.96	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.95	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432022 - AH-6 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133991	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113592	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**1650**	**1650**	<208	mg/Kg	10	208	50	20.8

Sample: 432022 - AH-6 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			18.8	mg/Kg	1	20.0	94	70 - 130

Sample: 432022 - AH-6 (0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.03	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.78	mg/Kg	1.06	2.00	89	70 - 130

Sample: 432023 - AH-7(0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1.06	2.00	96	70 - 130

Sample: 432023 - AH-7(0-1') (1' BEB)

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**1660**	**1660**	<208	mg/Kg	10	208	50	20.8

Sample: 432023 - AH-7(0-1') (1' BEB)

Laboratory: Lubbock
Analysis: TPH DRO | Analytical Method: S 8015 D | Prep Method: N/A
QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | Sample Preparation: 2016-11-17 | Prepared By: HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			18.1	mg/Kg	1	20.0	90	70 - 130

Sample: 432023 - AH-7(0-1') (1' BEB)

Laboratory: Midland
Analysis: TPH GRO | Analytical Method: S 8015 D | Prep Method: S 5035
QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK

Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.04	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.77	mg/Kg	1.06	2.00	88	70 - 130

Sample: 432024 - AH-8 (0-1')

Laboratory: Midland
Analysis: BTEX | Analytical Method: S 8021B | Prep Method: S 5035
QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.96	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432024 - AH-8 (0-1')

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**4430**	**4430**	<104	mg/Kg	5	104	50	20.8

Sample: 432024 - AH-8 (0-1')

Laboratory: Lubbock
Analysis: TPH DRO | Analytical Method: S 8015 D | Prep Method: N/A
QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | Sample Preparation: 2016-11-17 | Prepared By: HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			19.0	mg/Kg	1	20.0	95	70 - 130

Sample: 432024 - AH-8 (0-1')

Laboratory: Midland
Analysis: TPH GRO | Analytical Method: S 8015 D | Prep Method: S 5035
QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | Sample Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.02	mg/Kg	1.06	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.79	mg/Kg	1.06	2.00	90	70 - 130

Sample: 432025 - AH-8 (1-1.5')

Laboratory: Lubbock
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | Sample Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**146**	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432026 - AH-9 (0-1') (1' BEB)

Laboratory:	Midland					
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035	
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.01	mg/Kg	1.06	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)			1.97	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432026 - AH-9 (0-1') (1' BEB)

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**146**	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432026 - AH-9 (0-1') (1' BEB)

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			19.3	mg/Kg	1	20.0	96	70 - 130

Sample: 432026 - AH-9 (0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.07	mg/Kg	1.06	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.80	mg/Kg	1.06	2.00	90	70 - 130

Sample: 432027 - AH-10 (0-1')

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.96	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.97	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432027 - AH-10 (0-1')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**292**	**292**	<104	mg/Kg	5	104	50	20.8

Sample: 432027 - AH-10 (0-1')

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			20.2	mg/Kg	1	20.0	101	70 - 130

Sample: 432027 - AH-10 (0-1')

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.05	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.80	mg/Kg	1.06	2.00	90	70 - 130

Sample: 432028 - AH-10 (1-1.5')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<104	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432029 - AH-11 (0-1') (1' BEB)

Laboratory:	Midland					
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035	
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.94	mg/Kg	1.06	2.00	97	70 - 130

Sample: 432029 - AH-11 (0-1') (1' BEB)

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**341**	**341**	<104	mg/Kg	5	104	50	20.8

Sample: 432029 - AH-11 (0-1') (1' BEB)

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			21.5	mg/Kg	1	20.0	108	70 - 130

Sample: 432029 - AH-11 (0-1') (1' BEB)

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.06	mg/Kg	1.06	2.00	103	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.80	mg/Kg	1.06	2.00	90	70 - 130

Sample: 432030 - AH-12 (0-1')

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1.06	2.00	100	70 - 130

Sample: 432030 - AH-12 (0-1')

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**3700**	**3700**	<208	mg/Kg	10	208	50	20.8

Sample: 432030 - AH-12 (0-1')

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			20.2	mg/Kg	1	20.0	101	70 - 130

Sample: 432030 - AH-12 (0-1')

Laboratory:	Midland					
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035	
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.10	mg/Kg	1.06	2.00	105	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.83	mg/Kg	1.06	2.00	92	70 - 130

Sample: 432031 - AH-12 (1-1.5')

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**3600**	**3600**	<208	mg/Kg	10	208	50	20.8

Sample: 432032 - AH-12 (2-2.5')

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133996	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113596	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**487**	<500	<208	mg/Kg	10	208	50	20.8

Sample: 432033 - AH-13 (0-1')

Laboratory:	Midland					
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035	
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1.06	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1.06	2.00	94	70 - 130

Sample: 432033 - AH-13 (0-1')

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133999	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113598	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**7010**	**7010**	<208	mg/Kg	10	208	50	20.8

Sample: 432033 - AH-13 (0-1')

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			20.3	mg/Kg	1	20.0	102	70 - 130

Sample: 432033 - AH-13 (0-1')

Laboratory:	Midland					
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035	
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		1.96	mg/Kg	1.06	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.74	mg/Kg	1.06	2.00	87	70 - 130

Sample: 432034 - AH-13 (1-1.5')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133999	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113598	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**487**	<500	<208	mg/Kg	10	208	50	20.8

Sample: 432035 - AH-13 (2-2.5')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	133999	Date Analyzed:	2016-11-22	Analyzed By:	RL
Prep Batch:	113598	Sample Preparation:	2016-11-20	Prepared By:	RL

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<104	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432036 - Background (0-1)

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Benzene	U	3	<0.0106	<0.0212	<0.0106	mg/Kg	1.06	0.0106	0.02	0.01
Toluene	U	3	<0.0165	<0.0212	<0.0165	mg/Kg	1.06	0.0165	0.02	0.0156
Ethylbenzene	U	3	<0.0160	<0.0212	<0.0160	mg/Kg	1.06	0.0160	0.02	0.0151
Xylene	U	3	<0.00456	<0.0212	<0.00456	mg/Kg	1.06	0.00456	0.02	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.98	mg/Kg	1.06	2.00	99	70 - 130
4-Bromofluorobenzene (4-BFB)			1.96	mg/Kg	1.06	2.00	98	70 - 130

Sample: 432036 - Background (0-1)

Laboratory:	Lubbock					
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A	
QC Batch:	133999	Date Analyzed:	2016-11-22	Analyzed By:	RL	
Prep Batch:	113598	Sample Preparation:	2016-11-20	Prepared By:	RL	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	J		**146**	<250	<104	mg/Kg	5	104	50	20.8

Sample: 432036 - Background (0-1)

Laboratory:	Lubbock					
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A	
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ	
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
DRO	U	1,2	<8.47	<50.0	<8.47	mg/Kg	1	8.47	50	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			20.4	mg/Kg	1	20.0	102	70 - 130

Sample: 432036 - Background (0-1)

Laboratory:	Midland					
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035	
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK	
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK	

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
GRO	Qr,U	3	<1.86	<4.24	<1.86	mg/Kg	1.06	1.86	4	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	J		2.08	mg/Kg	1.06	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)	J		1.80	mg/Kg	1.06	2.00	90	70 - 130

Method Blanks

Method Blank (1)

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	Result	Units	Reporting Limits
Benzene		3	<0.0106	mg/Kg	0.01
Toluene		3	<0.0165	mg/Kg	0.0156
Ethylbenzene		3	<0.0160	mg/Kg	0.0151
Xylene		3	<0.00456	mg/Kg	0.0043

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1.06	2.00	94	70 - 130

Method Blank (1)

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Parameter	F	C	Result	Units	Reporting Limits
GRO		3	<1.86	mg/Kg	1.76

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.17	mg/Kg	1.06	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			1.79	mg/Kg	1.06	2.00	90	70 - 130

Method Blank (1)

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Parameter	F	C	Result	Units	Reporting Limits
DRO		1,2	<8.47	mg/Kg	8.47

Surrogate	F	C	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			16.6	mg/Kg	1	20.0	83	70 - 130

Method Blank (1)

QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | QC Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<20.8	mg/Kg	20.8

Method Blank (1)

QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | QC Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<20.8	mg/Kg	20.8

Method Blank (1)

QC Batch: 133999 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113598 | QC Preparation: 2016-11-20 | Prepared By: RL

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<20.8	mg/Kg	20.8

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		3	1.86	mg/Kg	1.06	2.00	<0.0106	93	70 - 130
Toluene		3	1.95	mg/Kg	1.06	2.00	<0.0165	98	70 - 130
Ethylbenzene		3	1.99	mg/Kg	1.06	2.00	<0.0160	100	70 - 130
Xylene		3	6.00	mg/Kg	1.06	6.00	<0.00456	100	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		3	1.98	mg/Kg	1.06	2.00	<0.0106	99	70 - 130	6	20
Toluene		3	1.86	mg/Kg	1.06	2.00	<0.0165	93	70 - 130	5	20
Ethylbenzene		3	1.85	mg/Kg	1.06	2.00	<0.0160	92	70 - 130	7	20
Xylene		3	5.57	mg/Kg	1.06	6.00	<0.00456	93	70 - 130	7	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			2.02	1.92	mg/Kg	1.06	2.00	101	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.05	1.96	mg/Kg	1.06	2.00	102	98	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		3	20.7	mg/Kg	1	20.0	<1.76	104	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		3	22.0	mg/Kg	1	20.0	<1.76	110	70 - 130	6	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			2.05	2.03	mg/Kg	1	2.00	102	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.86	1.88	mg/Kg	1	2.00	93	94	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1,2	116	mg/Kg	1	100	<8.47	116	68.5 - 136

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1,2	109	mg/Kg	1	100	<8.47	109	68.5 - 136	6	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane			20.9	20.0	mg/Kg	1	20.0	104	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2720	mg/Kg	5	2500	<104	109	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2620	mg/Kg	5	2500	<104	105	85 - 115	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2630	mg/Kg	5	2500	<104	105	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2630	mg/Kg	5	2500	<104	105	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 133999 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113598 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2680	mg/Kg	5	2500	<104	107	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2680	mg/Kg	5	2500	<104	107	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		3	1.81	mg/Kg	1.06	2.00	<0.0106	90	70 - 130
Toluene		3	1.80	mg/Kg	1.06	2.00	<0.0165	90	70 - 130
Ethylbenzene		3	1.88	mg/Kg	1.06	2.00	<0.0160	94	70 - 130
Xylene		3	5.63	mg/Kg	1.06	6.00	<0.00456	94	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		3	1.75	mg/Kg	1.06	2.00	<0.0106	88	70 - 130	3	20
Toluene		3	1.76	mg/Kg	1.06	2.00	<0.0165	88	70 - 130	2	20
Ethylbenzene		3	1.91	mg/Kg	1.06	2.00	<0.0160	96	70 - 130	2	20
Xylene		3	5.84	mg/Kg	1.06	6.00	<0.00456	97	70 - 130	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			2.09	1.99	mg/Kg	1.06	2	104	100	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	2.08	mg/Kg	1.06	2	100	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		3	17.0	mg/Kg	1	20.0	<1.76	85	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	Qr	3	20.8	mg/Kg	1	20.0	<1.76	104	70 - 130	20	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			1.97	2.02	mg/Kg	1	2	98	101	70 - 130
4-Bromofluorobenzene (4-BFB)			1.85	1.88	mg/Kg	1	2	92	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1,2	125	mg/Kg	1	100	<8.47	125	49.3 - 138

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1,2	125	mg/Kg	1	100	<8.47	125	49.3 - 138	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane			23.0	23.2	mg/Kg	1	20	115	116	70 - 130

Matrix Spike (MS-1) Spiked Sample: 432022

QC Batch: 133991 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113592 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			4370	mg/Kg	10	2500	1650	109	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			4370	mg/Kg	10	2500	1650	109	80 - 120	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 432032

QC Batch: 133996 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113596 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3020	mg/Kg	10	2500	487	101	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2920	mg/Kg	10	2500	487	97	80 - 120	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 432150

QC Batch: 133999 | Date Analyzed: 2016-11-22 | Analyzed By: RL
Prep Batch: 113598 | QC Preparation: 2016-11-20 | Prepared By: RL

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2920	mg/Kg	5	2500	389	101	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2870	mg/Kg	5	2500	389	99	80 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Calibration Standards

Standard (CCV-1)

QC Batch: 133915 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		3	mg/kg	0.100	0.0894	89	80 - 120	2016-11-18
Toluene		3	mg/kg	0.100	0.0894	89	80 - 120	2016-11-18
Ethylbenzene		3	mg/kg	0.100	0.0922	92	80 - 120	2016-11-18
Xylene		3	mg/kg	0.300	0.277	92	80 - 120	2016-11-18

Standard (CCV-2)

QC Batch: 133915 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		3	mg/kg	0.100	0.105	105	80 - 120	2016-11-18
Toluene		3	mg/kg	0.100	0.0991	99	80 - 120	2016-11-18
Ethylbenzene		3	mg/kg	0.100	0.0982	98	80 - 120	2016-11-18
Xylene		3	mg/kg	0.300	0.295	98	80 - 120	2016-11-18

Standard (CCV-3)

QC Batch: 133915 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		3	mg/kg	0.100	0.103	103	80 - 120	2016-11-18
Toluene		3	mg/kg	0.100	0.104	104	80 - 120	2016-11-18
Ethylbenzene		3	mg/kg	0.100	0.0994	99	80 - 120	2016-11-18
Xylene		3	mg/kg	0.300	0.296	99	80 - 120	2016-11-18

Standard (CCV-1)

QC Batch: 133916 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		[3]	mg/Kg	1.00	1.04	104	80 - 120	2016-11-18

Standard (CCV-2)

QC Batch: 133916 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		[3]	mg/Kg	1.00	0.990	99	80 - 120	2016-11-18

Standard (CCV-3)

QC Batch: 133916 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		[3]	mg/Kg	1.00	1.17	117	80 - 120	2016-11-18

Standard (CCV-1)

QC Batch: 133927 Date Analyzed: 2016-11-18 Analyzed By: HJ

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		[1,2]	mg/Kg	100	84.4	84	80 - 120	2016-11-18

Standard (CCV-2)

QC Batch: 133927 Date Analyzed: 2016-11-18 Analyzed By: HJ

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		[1,2]	mg/Kg	100	95.3	95	80 - 120	2016-11-18

Standard (ICV-1)

QC Batch: 133991 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2016-11-22

Standard (CCV-1)

QC Batch: 133991 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2016-11-22

Standard (ICV-1)

QC Batch: 133996 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2016-11-22

Standard (CCV-1)

QC Batch: 133996 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2016-11-22

Standard (ICV-1)

QC Batch: 133999 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2016-11-22

Standard (CCV-1)

QC Batch: 133999 Date Analyzed: 2016-11-22 Analyzed By: RL

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2016-11-22

Limits of Detection (LOD)

Test	Method	Matrix	Instrument	Analyte	Spike Amount	Pass
BTEX	S 8021B	soil	BTEX-2	Benzene	0.0128	Pass
BTEX	S 8021B	soil	BTEX-2	Toluene	0.0128	Pass
BTEX	S 8021B	soil	BTEX-2	Ethylbenzene	0.0128	Pass
BTEX	S 8021B	soil	BTEX-2	Xylene	0.0128	Pass
Chloride (Titration)	SM 4500-Cl B	soil	N/A	Chloride	50.0	Pass
TPH DRO	S 8015 D	soil	TPH-3	DRO	15.0	Pass
TPH GRO	S 8015 D	soil	BTEX-2	GRO	5.00	Pass

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	Kansas	Kansas E-10317	Lubbock
2	NELAP	T104704219-16-13	Lubbock
3	NELAP	T104704392-14-8	Midland

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

16111601

Analysis Request of Chain of Custody Record

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

CLIENT NAME: Cimarex
SITE MANAGER: Ike Tavarez
PROJECT NO.:
PROJECT NAME: Cimarex - Marquardt 12 H Eddy Co, NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2016	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD (Ext. to C35) TX1005	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
432013	11.14		S		X	AH-1 (0-6")	1	N			X	X	X	X											X				
014	11.14		S		X	AH-2 (0-1') (1' BEB)	1	N			X	X	X	X											X				
015	11.14		S		X	AH-2 (1'-1.5') (1' BEB)	1	N			X	X													X				
016	11.14		S		X	AH-2 (2-2.5) (1' BEB)	1	N			X	X													X				
017	11.14		S		X	AH-3 (0-1) (6" BEB)	1	N			X	X	X	X											X				
018	11.14		S		X	AH-4 (0-1') (1' BEB)	1	N			X	X	X	X											X				
019	11.14		S		X	AH-4 (1-1.5') (1' BEB)	1	N			X	X													X				
020	11.14		S		X	AH-5 (0-1) (1' BEB)	1	N			X	X	X	X											X				
021	11.14		S		X	AH-5 (1-1.5') (1' BEB)	1	N			X	X													X				
022	11.14		S		X	AH-6 (0-1') (1' BEB)	1	N			X	X	X	X											X				

RELINQUISHED BY: (Signature) Date: 11.15 Time:
RECEIVED BY: (Signature) Date: 11/15/16 Time: 16:53
SAMPLED BY: (Print & Initial) Clair Gonzales Date: 11.14 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: Trace
ADDRESS:
CITY: Midland STATE: Tx ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: 11/15/16 TIME: 16:53
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: Brenda Ward 11/17/16 9:40
REMARKS: Run deeper samples if benzene exceeds 10 mg/kg, total BTEX exceeds 50 mg/kg or TPH exceeds 100 mg/kg Temp: 4.4 525 399 086

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

Duplicate jars for AH12 1-1.5 and AH12 2-2.5. Clair identified those intended to be AH13 1-1.5 and AH13 2-2.5. Asked to disregard AH12-3-3.5 jar since not listed on COC. 11/16/16 AJ

16111601

Analysis Request of Chain of Custody Record

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

CLIENT NAME: Cimarex
SITE MANAGER: Ike Tavarez
PROJECT NO.:
PROJECT NAME: Cimarex - Marquardt 12 H Eddy Co, NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2016	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	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
432023	11.14					AH-7 (0'-1') (1'BEB)	1	N			X	X	X	X										X				
024	11.14					AH-8 (0-1')	1	N			X	X	X	X										X				
025	11.14					AH-8 (1-1.5)	1	N			X	X												X				
026	11.14					AH-9 (0-1) (1'BEB)	1	N			X	X	X	X										X				
027	11.14					AH-10 (0-1)	1	N			X	X	X	X										X				
028	11.14					AH-10 (1-1.5)	1	N			X	X												X				
029	11.14					AH-11 (0-1) (1'BEB)	1	N			X	X	X	X										X				
030	11.14					AH-12 (0-1)	1	N			X	X	X	X										X				
031	11.14					AH-12 (1-1.5)	1	N			X	X												X				
032	11.14					AH-12 (2-2.5)	1	N			X	X												X				

RELINQUISHED BY: (Signature) Clint Merritt Date: 11.15 Time:
RECEIVED BY: (Signature) Tracy Beckett Date: 11/18/16 Time: 16:53
SAMPLED BY: (Print & Initial) Clace Gonzales Date: 11.14 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: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature) Tracy Beckett
DATE: 11/18/16 TIME: 16:53
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:
REMARKS: Brenda Ward 11/17/16 9:40 2.8/2.9

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

16111601

Analysis Request of Chain of Custody Record

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

CLIENT NAME: Cimarex
SITE MANAGER: Ike Tavarez
PROJECT NO.:
PROJECT NAME: Cimarex - Marquardt 12H Eddy Co, NM

LAB I.D. NUMBER	DATE 2016	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD (Ext. to C35)	TX1005	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
432033	11.14		S		X	AH-13 (0-1)	1	N			X	X	X	X												X				
034	11.14		S		X	AH-13 (1-1.5)	1	N			X	X														X				
035	11.14		S		X	AH-13 (2-2.5)	1	N			X	X														X				
036	11.14		S		X	Background (0-1)	1	N			X	X	X	X												X				

ANALYSIS REQUEST (Circle or Specify Method No.)

RELINQUISHED BY: (Signature) Clint Merritt	Date: 11.15 Time:	RECEIVED BY: (Signature) [signature]	Date: 11/10/16 Time: 16:53
SAMPLED BY: (Print & Initial) Clair Gonzalez	Date: 11.14 Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature) [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: ADDRESS: CITY: STATE: ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) [signature] DATE: 11/10/16 TIME: 16:53		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED:	REMARKS: 11/7/16 Brenda Ward ZU 399086 2.8/2.9		

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

TEXAS A&M AGRILIFE EXTENSION

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
2478 TAMU
College Station, TX 77843-2478
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471335
Customer Sample ID: AH-1 0-6 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	8.0	(5.8)	-	Mod. Alkaline	
Conductivity	1,420	(-)	umho/cm	Moderate	
Nitrate-N	3	(-)	ppm**		30 lbs N/acre
Phosphorus	4	(50)	ppm		95 lbs P2O5/acre
Potassium	46	(125)	ppm		60 lbs K20/acre
Calcium	38,057	(180)	ppm		0 lbs Ca/acre
Magnesium	517	(50)	ppm		0 lbs Mg/acre
Sulfur	4,321	(13)	ppm		0 lbs S/acre
Sodium	80	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)				
pH	7.4			
Conductivity	3.20	mmhos/cm		
Sodium	112	ppm	4.867	meq/L
Potassium	16	ppm	0.413	meq/L
Calcium	558	ppm	27.865	meq/L
Magnesium	80	ppm	6.597	meq/L
SAR	1.17			
SSP	12.25			

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates. http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

ProAnalysisVer. 2.19i

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Cimarex Energy- Marquardt 12H
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Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471336
Customer Sample ID: AH-2 1-1.5 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.
pH	**8.1**	(5.8)	-	**Mod. Alkaline**						
Conductivity	**1,750**	(-)	umho/cm	**High**				CL*		**Fertilizer Recommended**
Nitrate-N	**3**	(-)	ppm**							**30** lbs N/acre
Phosphorus	**1**	(50)	ppm							**100** lbs P2O5/acre
Potassium	**137**	(125)	ppm							**0** lbs K20/acre
Calcium	**26,772**	(180)	ppm							**0** lbs Ca/acre
Magnesium	**1,083**	(50)	ppm							**0** lbs Mg/acre
Sulfur	**4,656**	(13)	ppm							**0** lbs S/acre
Sodium	**96**	(-)	ppm							
Iron										
Zinc										
Manganese										
Copper										
Boron										
Limestone Requirement										**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.7**		
Conductivity	**4.64**	mmhos/cm	
Sodium	**130**	ppm	**5.664** meq/L
Potassium	**76**	ppm	**1.941** meq/L
Calcium	**491**	ppm	**24.489** meq/L
Magnesium	**364**	ppm	**29.924** meq/L
SAR	**1.09**		
SSP	**9.13**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471337
Customer Sample ID: AH-3 0-1 (6"BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	7.9	(5.8)	-	Mod. Alkaline	
Conductivity	183	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm**		30 lbs N/acre
Phosphorus	3	(50)	ppm		100 lbs P2O5/acre
Potassium	54	(125)	ppm		55 lbs K20/acre
Calcium	21,300	(180)	ppm		0 lbs Ca/acre
Magnesium	133	(50)	ppm		0 lbs Mg/acre
Sulfur	5,161	(13)	ppm		0 lbs S/acre
Sodium	272	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	7.2		
Conductivity	8.07 mmhos/cm		
Sodium	522 ppm	22.698 meq/L	
Potassium	26 ppm	0.658 meq/L	
Calcium	1103 ppm	55.042 meq/L	
Magnesium	10 ppm	0.804 meq/L	
SAR	4.30		
SSP	28.66		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

ProAnalysisVer. 2.19i

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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471338
Customer Sample ID: AH-4 1-1.5 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	2,100	(-)	umho/cm	High	
Nitrate-N	3	(-)	ppm**		30 lbs N/acre
Phosphorus	2	(50)	ppm		100 lbs P2O5/acre
Potassium	253	(125)	ppm		0 lbs K20/acre
Calcium	21,084	(180)	ppm		0 lbs Ca/acre
Magnesium	961	(50)	ppm		0 lbs Mg/acre
Sulfur	5,250	(13)	ppm		0 lbs S/acre
Sodium	463	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.2		
Conductivity	9.23 mmhos/cm		
Sodium	803 ppm	34.954 meq/L	
Potassium	100 ppm	2.565 meq/L	
Calcium	495 ppm	24.704 meq/L	
Magnesium	37 ppm	3.030 meq/L	
SAR	9.39		
SSP	53.57		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471339
Customer Sample ID: AH-5 1-1.5 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.
pH	**7.7**	(5.8)	-	**Mod. Alkaline**						
Conductivity	**2,120**	(-)	umho/cm	**High**				CL*		**Fertilizer Recommended**
Nitrate-N	**3**	(-)	ppm**							**30** lbs N/acre
Phosphorus	**4**	(50)	ppm							**95** lbs P2O5/acre
Potassium	**61**	(125)	ppm							**50** lbs K20/acre
Calcium	**25,581**	(180)	ppm							**0** lbs Ca/acre
Magnesium	**164**	(50)	ppm							**0** lbs Mg/acre
Sulfur	**5,009**	(13)	ppm							**0** lbs S/acre
Sodium	**154**	(-)	ppm							
Iron										
Zinc										
Manganese										
Copper										
Boron										
Limestone Requirement										**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.3**		
Conductivity	**7.08**	mmhos/cm	
Sodium	**316**	ppm	**13.758** meq/L
Potassium	**11**	ppm	**0.293** meq/L
Calcium	**1149**	ppm	**57.340** meq/L
Magnesium	**48**	ppm	**3.985** meq/L
SAR	**2.48**		
SSP	**18.25**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471340
Customer Sample ID: AH-6 0-1 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.
pH	**7.6**	(5.8)	-	**Slightly Alkaline**						
Conductivity	**3,240**	(-)	umho/cm	**V. High**				CL*		**Fertilizer Recommended**
Nitrate-N	**1**	(-)	ppm**							**35** lbs N/acre
Phosphorus	**4**	(50)	ppm							**95** lbs P2O5/acre
Potassium	**63**	(125)	ppm							**45** lbs K20/acre
Calcium	**26,870**	(180)	ppm							**0** lbs Ca/acre
Magnesium	**102**	(50)	ppm							**0** lbs Mg/acre
Sulfur	**4,902**	(13)	ppm							**0** lbs S/acre
Sodium	**310**	(-)	ppm							
Iron										
Zinc										
Manganese										
Copper										
Boron										
Limestone Requirement										**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.0**		
Conductivity	**14.14**	mmhos/cm	
Sodium	**578**	ppm	**25.134** meq/L
Potassium	**11**	ppm	**0.288** meq/L
Calcium	**2484**	ppm	**123.954** meq/L
Magnesium	**51**	ppm	**4.221** meq/L
SAR	**3.14**		
SSP	**16.36**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

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Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

TEXAS A&M AGRILIFE EXTENSION

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Report generated for:
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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471341
Customer Sample ID: AH-7 0-1 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	7.6	(5.8)	-	Mod. Alkaline	
Conductivity	2,680	(-)	umho/cm	V. High	
Nitrate-N	2	(-)	ppm**		35 lbs N/acre
Phosphorus	2	(50)	ppm		100 lbs P2O5/acre
Potassium	46	(125)	ppm		60 lbs K20/acre
Calcium	40,778	(180)	ppm		0 lbs Ca/acre
Magnesium	266	(50)	ppm		0 lbs Mg/acre
Sulfur	4,490	(13)	ppm		0 lbs S/acre
Sodium	739	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	7.4		
Conductivity	15.75 mmhos/cm		
Sodium	1638 ppm	71.279	meq/L
Potassium	18 ppm	0.468	meq/L
Calcium	1659 ppm	82.774	meq/L
Magnesium	73 ppm	5.962	meq/L
SAR	10.70		
SSP	44.42		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Cimarex Energy- Marquardt 12H
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Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471342
Customer Sample ID: AH-8 1-1.5
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	Rating	Fertilizer Recommended
pH	7.6	(5.8)	-	Mod. Alkaline	
Conductivity	1,520	(-)	umho/cm	Moderate	
Nitrate-N	3	(-)	ppm**		30 lbs N/acre
Phosphorus	1	(50)	ppm		100 lbs P2O5/acre
Potassium	123	(125)	ppm		0 lbs K20/acre
Calcium	36,728	(180)	ppm		0 lbs Ca/acre
Magnesium	379	(50)	ppm		0 lbs Mg/acre
Sulfur	1,072	(13)	ppm		0 lbs S/acre
Sodium	73	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Rating scale: ExLow, VLow, Low, Mod, High, VHigh, Excess.

Detailed Salinity Test (Saturated Paste Extract)

pH	7.5			
Conductivity	3.03	mmhos/cm		
Sodium	86	ppm	3.746	meq/L
Potassium	7	ppm	0.187	meq/L
Calcium	558	ppm	27.865	meq/L
Magnesium	52	ppm	4.289	meq/L
SAR	0.93			
SSP	10.38			

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

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Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471343
Customer Sample ID: AH-9 0-1 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	7.8	(5.8)	-	Mod. Alkaline	
Conductivity	1,840	(-)	umho/cm	High	
Nitrate-N	5	(-)	ppm**		30 lbs N/acre
Phosphorus	1	(50)	ppm		100 lbs P2O5/acre
Potassium	132	(125)	ppm		0 lbs K20/acre
Calcium	36,309	(180)	ppm		0 lbs Ca/acre
Magnesium	260	(50)	ppm		0 lbs Mg/acre
Sulfur	954	(13)	ppm		0 lbs S/acre
Sodium	651	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	7.4		
Conductivity	6.09	mmhos/cm	
Sodium	692	ppm	30.108 meq/L
Potassium	8	ppm	0.214 meq/L
Calcium	615	ppm	30.695 meq/L
Magnesium	31	ppm	2.560 meq/L
SAR	7.38		
SSP	47.36		

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Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates.
http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
2478 TAMU
College Station, TX 77843-2478
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471344
Customer Sample ID: AH-10 1-1.5 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.	
pH	**7.7**	(5.8)	-	**Mod. Alkaline**							
Conductivity	**1,120**	(-)	umho/cm	**Moderate**				CL*			**Fertilizer Recommended**
Nitrate-N	**6**	(-)	ppm**							**25**	lbs N/acre
Phosphorus	**7**	(50)	ppm							**90**	lbs P2O5/acre
Potassium	**172**	(125)	ppm							**0**	lbs K20/acre
Calcium	**26,671**	(180)	ppm							**0**	lbs Ca/acre
Magnesium	**208**	(50)	ppm							**0**	lbs Mg/acre
Sulfur	**590**	(13)	ppm							**0**	lbs S/acre
Sodium	**27**	(-)	ppm								
Iron											
Zinc											
Manganese											
Copper											
Boron											
Limestone Requirement										**0.00**	tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.4**		
Conductivity	**2.34**	mmhos/cm	
Sodium	**46**	ppm	**2.020** meq/L
Potassium	**9**	ppm	**0.230** meq/L
Calcium	**551**	ppm	**27.511** meq/L
Magnesium	**23**	ppm	**1.908** meq/L
SAR	**0.53**		
SSP	**6.38**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates.
http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471345
Customer Sample ID: AH-11 0-1 (1'BEB)
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.
pH	**7.9**	(5.8)	-	**Mod. Alkaline**						
Conductivity	**1,520**	(-)	umho/cm	**Moderate**				CL*		**Fertilizer Recommended**
Nitrate-N	**1**	(-)	ppm**							**35** lbs N/acre
Phosphorus	**3**	(50)	ppm							**95** lbs P2O5/acre
Potassium	**90**	(125)	ppm							**25** lbs K20/acre
Calcium	**32,484**	(180)	ppm							**0** lbs Ca/acre
Magnesium	**170**	(50)	ppm							**0** lbs Mg/acre
Sulfur	**4,539**	(13)	ppm							**0** lbs S/acre
Sodium	**394**	(-)	ppm							
Iron										
Zinc										
Manganese										
Copper										
Boron										
Limestone Requirement										**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.5**		
Conductivity	**4.74**	mmhos/cm	
Sodium	**619**	ppm	**26.922** meq/L
Potassium	**16**	ppm	**0.401** meq/L
Calcium	**483**	ppm	**24.113** meq/L
Magnesium	**11**	ppm	**0.927** meq/L
SAR	**7.61**		
SSP	**51.41**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates.
http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

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Report generated for:
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Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471346
Customer Sample ID: AH-12 2-2.5
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.
pH	**8.0**	(5.8)	-	**Mod. Alkaline**						
Conductivity	**2,520**	(-)	umho/cm	**V. High**				CL*		**Fertilizer Recommended**
Nitrate-N	**39**	(-)	ppm**							**0** lbs N/acre
Phosphorus	**5**	(50)	ppm							**90** lbs P2O5/acre
Potassium	**545**	(125)	ppm							**0** lbs K20/acre
Calcium	**17,910**	(180)	ppm							**0** lbs Ca/acre
Magnesium	**1,660**	(50)	ppm							**0** lbs Mg/acre
Sulfur	**5,157**	(13)	ppm							**0** lbs S/acre
Sodium	**578**	(-)	ppm							
Iron										
Zinc										
Manganese										
Copper										
Boron										
Limestone Requirement										**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.9**		
Conductivity	**7.56**	mmhos/cm	
Sodium	**571**	ppm	**24.864** meq/L
Potassium	**67**	ppm	**1.712** meq/L
Calcium	**523**	ppm	**26.074** meq/L
Magnesium	**494**	ppm	**40.592** meq/L
SAR	**4.31**		
SSP	**26.67**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates. http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

TEXAS A&M AGRILIFE EXTENSION

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
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Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471347
Customer Sample ID: AH-13 2-2.5
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess.	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	1,710	(-)	umho/cm	High	
Nitrate-N	7	(-)	ppm**		25 lbs N/acre
Phosphorus	2	(50)	ppm		100 lbs P2O5/acre
Potassium	47	(125)	ppm		60 lbs K20/acre
Calcium	17,631	(180)	ppm		0 lbs Ca/acre
Magnesium	286	(50)	ppm		0 lbs Mg/acre
Sulfur	5,297	(13)	ppm		0 lbs S/acre
Sodium	221	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.4		
Conductivity	7.25 mmhos/cm		
Sodium	345 ppm	15.009 meq/L	
Potassium	36 ppm	0.911 meq/L	
Calcium	500 ppm	24.944 meq/L	
Magnesium	155 ppm	12.747 meq/L	
SAR	3.46		
SSP	28.00		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates. http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

ProAnalysisVer. 2.19i

Soil Analysis Report

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Report generated for:
Tetra Tech - Clair Gonzales
Cimarex Energy- Marquardt 12H
4000 N Big Spring St., Ste 401
Midland, TX 79705

Sample received on: 11/29/2016
Printed on: 12/14/2016
Area Represented: not provided

Outside County
Laboratory Number: 471348
Customer Sample ID: Background 0-1
Crop Grown: IMPROVED AND HYBRID BERMUDA GRASS (ESTABLISHMENT)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess.	
pH	**7.9**	(5.8)	-	**Mod. Alkaline**							
Conductivity	**1,330**	(-)	umho/cm	**Moderate**				CL*			**Fertilizer Recommended**
Nitrate-N	**2**	(-)	ppm**								**35** lbs N/acre
Phosphorus	**7**	(50)	ppm								**90** lbs P2O5/acre
Potassium	**31**	(125)	ppm								**75** lbs K20/acre
Calcium	**33,156**	(180)	ppm								**0** lbs Ca/acre
Magnesium	**97**	(50)	ppm								**0** lbs Mg/acre
Sulfur	**5,057**	(13)	ppm								**0** lbs S/acre
Sodium	**20**	(-)	ppm								
Iron											
Zinc											
Manganese											
Copper											
Boron											
Limestone Requirement											**0.00** tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	**7.4**		
Conductivity	**2.04**	mmhos/cm	
Sodium	**54**	ppm	**2.349** meq/L
Potassium	**13**	ppm	**0.343** meq/L
Calcium	**511**	ppm	**25.524** meq/L
Magnesium	**19**	ppm	**1.528** meq/L
SAR	**0.64**		
SSP	**7.90**		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended. **ppm=mg/kg

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen: Apply an additional 40 lbs/A of nitrogen upon 75% vegetative cover.

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

New online fertilizer calculators have been placed on the laboratory's website to determine appropriate fertilizers to purchase and determine their application rates. http://soiltesting.tamu.edu/webpages/calculator.html

Methods: pH and conductivity/ 2:1; nitrate-N/Cd-red.; P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP; Fe, Zn, Mn, and Cu/DTPA by ICP; and B/hot water by ICP.

Analytical Report 549844

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Cimarex-Marquardt 12H ROW

212C-MD-00659

07-APR-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)

07-APR-17

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

Reference: XENCO Report No(s): **549844**
Cimarex-Marquardt 12H ROW
Project Address: Eddy 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) 549844. 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. 549844 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 549844

Tetra Tech- Midland, Midland, TX

Cimarex-Marquardt 12H ROW

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH-4 0-1	S	03-29-17 00:00		549844-001
AH-5 0-1	S	03-29-17 00:00		549844-002
AH-6 0-1	S	03-29-17 00:00		549844-003
AH-6 1-1.5	S	03-29-17 00:00		549844-004
AH-7 0-1	S	03-29-17 00:00		549844-005
AH-7 1-1.5	S	03-29-17 00:00		549844-006
AH-8 0-1	S	03-29-17 00:00		549844-007
AH-12 0-1	S	03-29-17 00:00		549844-008
AH-12 1-1.5	S	03-29-17 00:00		549844-009
AH-13 0-1	S	03-29-17 00:00		549844-010

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3014353 Inorganic Anions by EPA 300/300.1

Lab Sample ID 549845-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 549844-001, -002, -003, -004, -005, -006, -007, -008, -009, -010.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analysis Summary 549844

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex-Marquardt 12H ROW

Project Id: 212C-MD-00659
Contact: Ike Tavarez
Project Location: Eddy Co NM

Date Received in Lab: Thu Mar-30-17 04:29 pm
Report Date: 07-APR-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	549844-001		549844-002		549844-003		549844-004		549844-005		549844-006	
	Field Id:	AH-4 0-1		AH-5 0-1		AH-6 0-1		AH-6 1-1.5		AH-7 0-1		AH-7 1-1.5	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02	
	Analyzed:	Apr-06-17 17:32		Apr-06-17 17:40		Apr-06-17 17:48		Apr-06-17 17:56		Apr-06-17 18:21		Apr-06-17 17:08	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1470	49.8	2060	48.8	1420	49.8	3330	100	5110	48.7	497	4.88

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 549844

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex-Marquardt 12H ROW

Project Id: 212C-MD-00659
Contact: Ike Tavarez
Project Location: Eddy Co NM

Date Received in Lab: Thu Mar-30-17 04:29 pm
Report Date: 07-APR-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	549844-007		549844-008		549844-009		549844-010			
	Field Id:	AH-8 0-1		AH-12 0-1		AH-12 1-1.5		AH-13 0-1			
	Depth:										
	Matrix:	SOIL		SOIL		SOIL		SOIL			
	Sampled:	Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00		Mar-29-17 00:00			
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02		Apr-06-17 16:02			
	Analyzed:	Apr-06-17 18:29		Apr-06-17 18:37		Apr-06-17 18:45		Apr-06-17 18:53			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Chloride		123	24.8	3040	98.2	1750	49.9	4870	98.8		

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

BS / BSD Recoveries

Project Name: Cimarex-Marquardt 12H ROW

Work Order #: 549844 **Project ID:** 212C-MD-00659

Analyst: MGO **Date Prepared:** 04/06/2017 **Date Analyzed:** 04/06/2017

Lab Batch ID: 3014353 **Sample:** 722686-1-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	<4.99	250	239	96	250	234	94	2	90-110	20	

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-Marquardt 12H ROW

Work Order # : 549844 **Project ID:** 212C-MD-00659

Lab Batch ID: 3014353 **QC- Sample ID:** 549844-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/06/2017 **Date Prepared:** 04/06/2017 **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	497	244	727	94	244	711	88	2	90-110	20	X

Lab Batch ID: 3014353 **QC- Sample ID:** 549845-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/06/2017 **Date Prepared:** 04/06/2017 **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	1120	249	1280	64	249	1320	80	3	90-110	20	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.

Analysis Request of Chain of Custody Record

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

5499844

PAGE: 1 OF: 1

CLIENT NAME: Cimarex

SITE MANAGER: Ike Tavarez

PROJECT NO.: 212C-MD-00659

PROJECT NAME: Marquardt 12H ROW

LAB I.D. NUMBER	DATE 2017	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION Eddy Co. NM	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	ANALYSIS REQUEST (Circle or Specify Method No.): BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	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
	3/29		S		X	AH-4 0-1	1																	X				
						AH-5 0-1	1																	X				
						AH-6 0-1	1																	X				
						" 1-1.5'	1																	X				
						AH-7 0-1	1																	X				
						" 1-1.5'	1																	X				
						AH-8 0-1	1																	X				
						AH-12 0-1	1																	X				
						" 1-1.5'	1																	X				
			↓		↓	AH-13 0-1	1																	X				

RELINQUISHED BY: (Signature) Date: 3/30/17 Time: 1630

RECEIVED BY: (Signature) Date: 3/30/17 Time: 1629

SAMPLED BY: (Print & Initial) JG Date: 3/29/17 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:

RECEIVING LABORATORY: Xenco

ADDRESS:

CITY: STATE: ZIP:

CONTACT: PHONE: DATE: TIME:

RECEIVED BY: (Signature)

TETRA TECH CONTACT PERSON: Jeann Fitch

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:

REMARKS:

Temp: 20.4 IR ID:R-8

CF: +0.1

Corrected Temp: 20.5

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager reta ves Gold copy.

Final 1.000

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XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 03/30/2017 04:29:00 PM

Work Order #: 549844

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)?	20.5	
#2 *Shipping container in good condition?	**N/A**	
#3 *Samples received on ice?	**No**	
#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)?	**Yes**	Houston
#21 VOC samples have zero headspace?	**N/A**	
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**	
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**	

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

Analyst: PH Device/Lot#:

Checklist completed by: Jessica Kramer Date: 03/31/2017

Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 03/31/2017

Kelsey Brooks