

SITE INFORMATION

Report Type: Work Plan

General Site Information:

Site:	Lusk Deep Unit A #22H					
Company:	COG Operating LLC					
Section, Township and Range	Unit C	Sec. 17	T 19S	R 32E		
Lease Number:	API No. 30-025-40705					
County:	Lea County					
GPS:	32.6668205° N			103.7912445° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From intersection of 126A & Dry Lake Rd travel EAST on Dry Lake for 0.25 mi to location on south side of the road.					

Release Data:

Date Released:	11/29/2016
Type Release:	Produced Water
Source of Contamination:	Water Line
Fluid Released:	12 bbls
Fluids Recovered:	6 bbls

Official Communication:

Name:	Robert McNeil		Ike Tavaréz
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	rmcneil@conchoresources.com		Ike.Tavaréz@tetratech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	345'
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:		0

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



TETRA TECH

APPROVED

By Olivia Yu at 3:13 pm, Aug 10, 2017

June 29, 2017

Ms. Olivia Yu
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

NMOCD approves of the delineation and proposed remediation plan with two conditions for 1RP-4783:

1. Bottom and sidewall confirmation samples of the proposed 3 ft. excavation. If bottom samples are ≥ 600 mg/kg, proceed to excavate 4 ft.
2. Properly key in a 20 mil liner at 3 or 4 ft. bgs (bottom of the excavation).

Re: Work Plan for the COG Operating LLC., Lusk Deep Unit A #19, Unit N, Section 17, Township 19 South, Range 32 East, Lea County, New Mexico.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess a release that occurred at the Lusk Deep Unit A #22H, Unit C, Section 17, Township 19 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.6668205°, W 103.7912445°. 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 November 29, 2016, and released approximately twelve (12) barrels of produced water due to a pinhole leak that developed in a poly water transfer line. Approximately six (6) barrels of produced water was recovered. The release occurred in the pasture and measured approximately 20' x 55'. The initial C-141 Form is included in Appendix A.

Groundwater

No water wells were listed within Section 17 on the New Mexico Office of the State Engineer's database. The nearest well is located in Section 20 with a reported depth to water of approximately 345' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is greater than 300' 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

Tetra Tech

4000 North Big Spring, Suite 401, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On February 22, 2017, COG personnel were onsite to evaluate and sample the release area. Using a backhoe, one (1) Trench (T-1) was installed in the release area. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The trench location is shown on Figure 3.

Referring to Table 1, the benzene, total BTEX and TPH concentrations were all below the laboratory reporting limits. However, the area of Trench (T-1) showed elevated chloride concentrations with a chloride high of 7,060 mg/kg at 2.0' below surface. The concentrations then declined with depth to 560 mg/kg at 4.0' below surface. A slight chloride increase was detected at 7.0' (704 mg/kg) and 8.0' (688 mg/kg), before declining to 368 mg/kg at 9.0' below surface. Deeper samples were not collected due to the backhoe limitations.

Work Plan

Based on the laboratory results, COG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. The area of Trench (T-1) will be excavated to 3.0' below surface to remove the elevated chloride in the subsurface soils. Once completed, the area will be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns for onsite personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.



TETRA TECH

Conclusion

Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Clair Gonzales,
Geologist I

Ike Tavarez,
Senior Project Manager, P.G.

cc: Robert McNeill – COG
Dakota Neel – COG
Rebecca Haskell – COG
Shelly Tucker - BLM

Figures

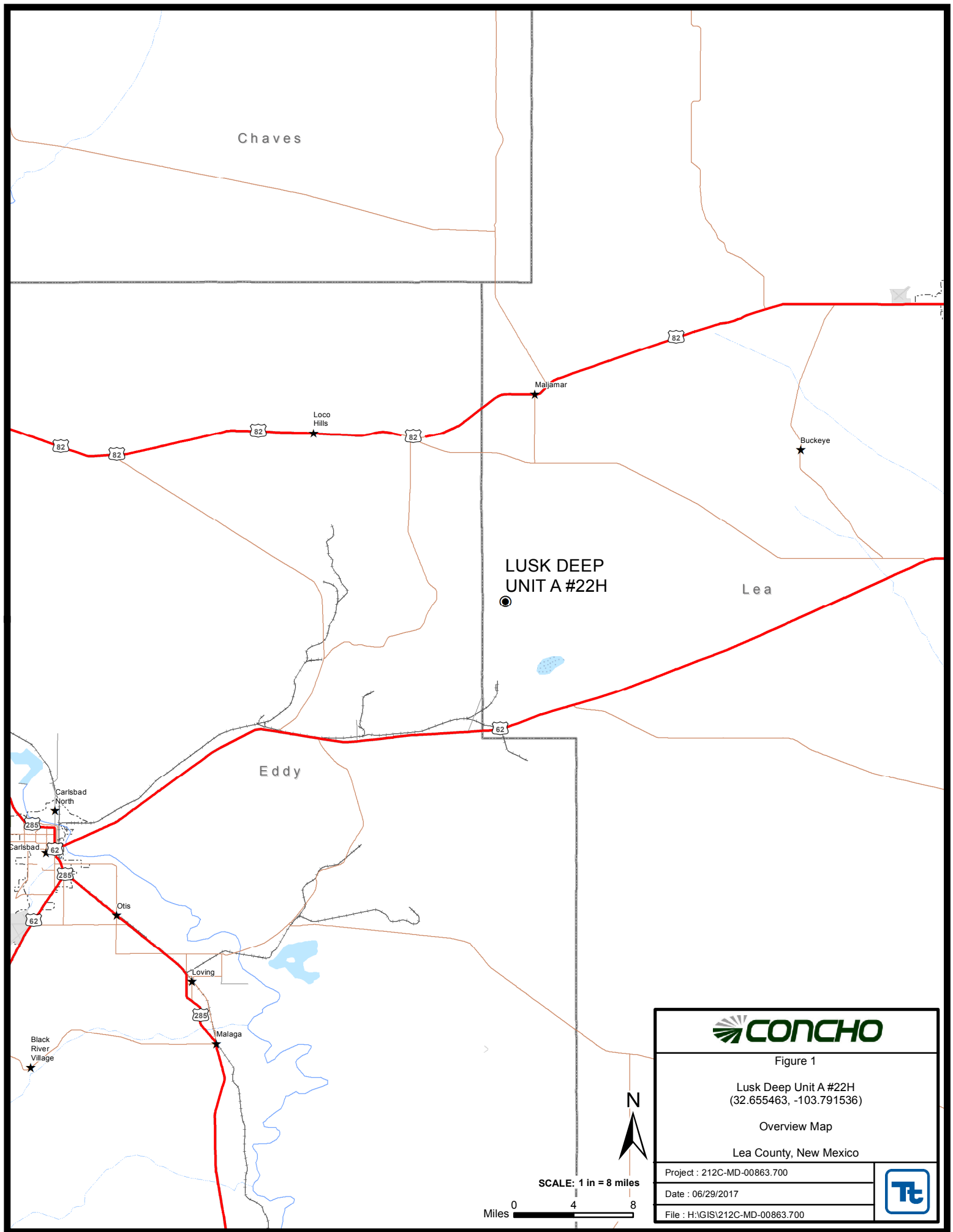


Figure 1

Lusk Deep Unit A #22H
(32.655463, -103.791536)

Overview Map

Lea County, New Mexico

Project : 212C-MD-00863.700

Date : 06/29/2017

File : H:\GIS\212C-MD-00863.700



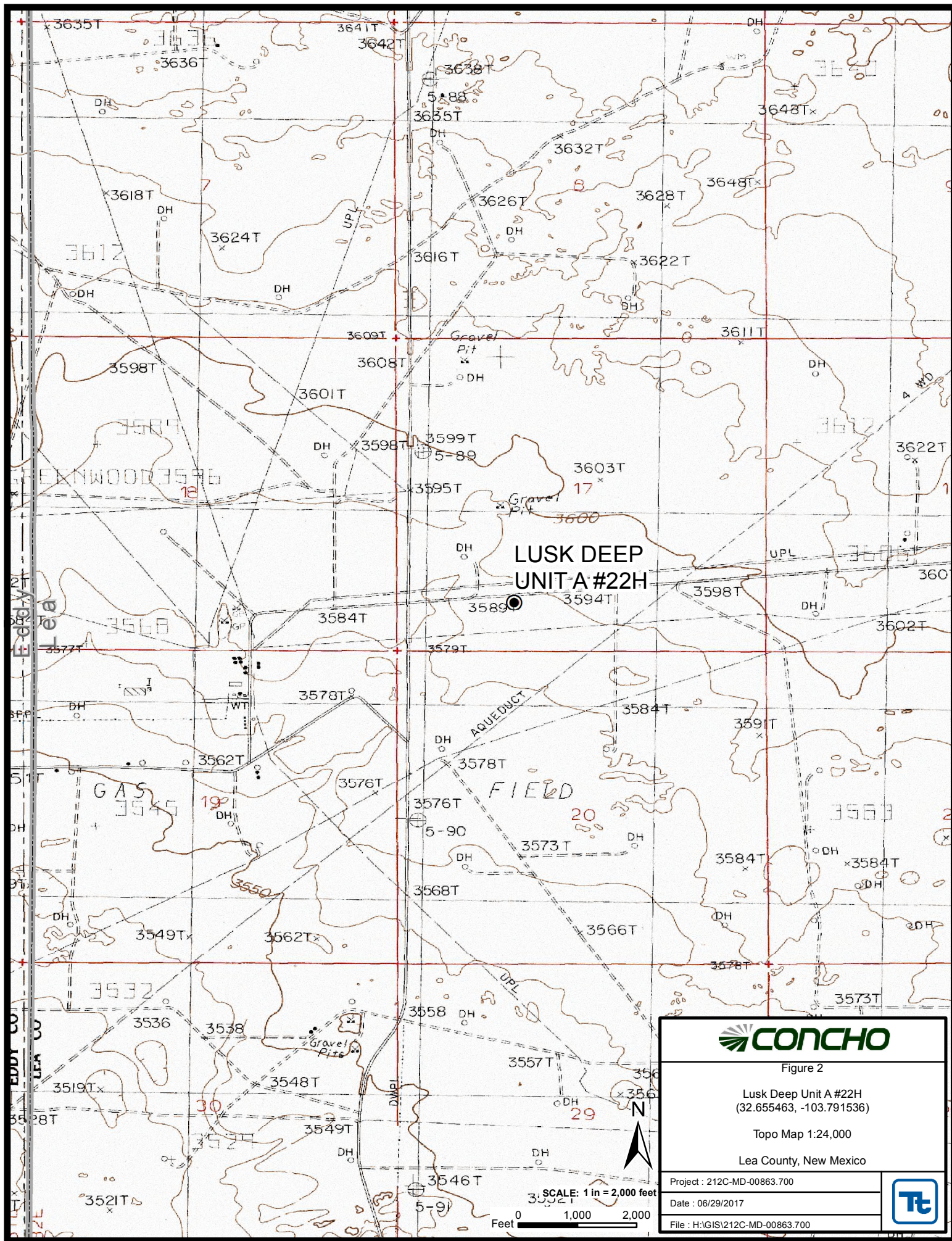


Figure 2

Lusk Deep Unit A #22H
(32.655463, -103.791536)

Topo Map 1:24,000

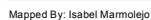
Lea County, New Mexico

Project : 212C-MD-00863.700

Date : 06/29/2017

File : H:\GIS\212C-MD-00863.700





Tables

Table 1
COG Operating LLC.
Lusk Deep Unit A #22H
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
T-1	2/22/2017	Surface	X		<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	3,000
	"	1	X		-	-	-	-	-	-	-	-	5,040
	"	2	X		-	-	-	-	-	-	-	-	7,060
	"	3	X		-	-	-	-	-	-	-	-	5,600
	"	4	X		-	-	-	-	-	-	-	-	560
	"	5	X		-	-	-	-	-	-	-	-	384
	"	6	X		-	-	-	-	-	-	-	-	320
	"	7	X		-	-	-	-	-	-	-	-	704
	"	8	X		-	-	-	-	-	-	-	-	688
	"	9	X		-	-	-	-	-	-	-	-	368

(-) Not Analyzed

 Proposed Excavation Depths

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:	COG Operating LLC	Contact:	Robert McNeill
Address:	600 West Illinois Avenue, Midland TX 79701	Telephone No.	432-683-7443
Facility Name:	Lusk Deep Unit A #22H	Facility Type:	Flow Line
Surface Owner:	Federal	Mineral Owner:	API No. 30-025-40705

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	17	19S	32E	330	North	1770	West	Lea

Latitude 32.6668205 Longitude 103.7912445

NATURE OF RELEASE

Type of Release:	Produced Water	Volume of Release:	12bbls	Volume Recovered:	6bbls
Source of Release:	Water Line	Date and Hour of Occurrence:	November 29, 2016 3:45 pm	Date and Hour of Discovery:	November 29, 2016 3:45 pm
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?	Date and Hour:				
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

A pinhole developed in the transition on a poly water transfer line. The transition was repaired.

Describe Area Affected and Cleanup Action Taken.*

The release was within a pasture. Concho will have the spill area sampled to delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to 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: <i>Rebecca Haskell</i>	<u>OIL CONSERVATION DIVISION</u>		
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:		
Title: Senior HSE Coordinator	Approval Date:	Expiration Date:	
E-mail Address: rhaskell@concho.com	Conditions of Approval:		Attached <input type="checkbox"/>
Date: 12/2/16	Phone: 432-683-7443		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Lusk Deep Unit A #22H

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

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

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

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

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

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

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

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

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

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



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	DepthWell	DepthWater	Water Column
CP 00075	O	CP	LE	2	4	34	19S	32E		617502	3609301	575		
CP 00563 POD1		CP	LE	1	1	2	19S	32E		612118	3613376*	300		
CP 00639 POD1		CP	LE	3	1	20	19S	32E		613029	3612880*	350	345	5
CP 00640 POD1		CP	LE	2	2	19	19S	32E		612621	3613280*	260	102	158
CP 00812 POD1		CP	LE	4	4	01	19S	32E		620623	3616973*	200		
CP 01656 POD1		CP	LE	3	4	3	17	19S	32E	613368	3613646	70		

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

Record Count: 6

PLSS Search:

Township: 19S **Range:** 32E

*UTM location was derived from PLSS - see Help

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

6/29/17 8:07 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

January 05, 2017

DAKOTA NEEL

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: LUSK 22

Enclosed are the results of analyses for samples received by the laboratory on 12/29/16 12:05.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

COG OPERATING
DAKOTA NEEL
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received: 12/29/2016
Reported: 01/05/2017
Project Name: LUSK 22
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 12/19/2016
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Angela Cabrera

Sample ID: T1 - SURFACE (H602891-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/30/2016	ND	1.82	91.1	2.00	2.19	
Toluene*	<0.050	0.050	12/30/2016	ND	1.85	92.3	2.00	2.27	
Ethylbenzene*	<0.050	0.050	12/30/2016	ND	1.90	95.0	2.00	2.67	
Total Xylenes*	<0.150	0.150	12/30/2016	ND	5.54	92.3	6.00	2.61	
Total BTEX	<0.300	0.300	12/30/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 102 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3000	16.0	12/31/2016	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	12/30/2016	ND	184	92.0	200	3.90	
DRO >C10-C28	<10.0	10.0	12/30/2016	ND	190	95.0	200	1.29	

Surrogate: 1-Chlorooctane 101 % 35-147

Surrogate: 1-Chlorooctadecane 112 % 28-171

Sample ID: T1 - 1' (H602891-02)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	5040	16.0	12/31/2016	ND	416	104	400	0.00		

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

COG OPERATING
DAKOTA NEEL
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received: 12/29/2016
Reported: 01/05/2017
Project Name: LUSK 22
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 12/19/2016
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Angela Cabrera

Sample ID: T1 - 2' (H602891-03)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7060	16.0	12/31/2016	ND	416	104	400	0.00	

Sample ID: T1 - 3' (H602891-04)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	5600	16.0	12/31/2016	ND	416	104	400	0.00	

Sample ID: T1 - 4' (H602891-05)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	560	16.0	12/31/2016	ND	416	104	400	0.00	

Sample ID: T1 - 5' (H602891-06)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	384	16.0	12/31/2016	ND	416	104	400	0.00	

Sample ID: T1 - 6' (H602891-07)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	320	16.0	01/03/2017	ND	416	104	400	0.00	

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 COG OPERATING
 DAKOTA NEEL
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

 Received: 12/29/2016
 Reported: 01/05/2017
 Project Name: LUSK 22
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 12/19/2016
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Angela Cabrera

Sample ID: T1 - 7' (H602891-08)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	704	16.0	01/03/2017	ND	416	104	400	0.00		

Sample ID: T1 - 8' (H602891-09)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	688	16.0	01/03/2017	ND	416	104	400	0.00	

Sample ID: T1 - 9' (H602891-10)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	368	16.0	01/03/2017	ND	416	104	400	0.00		

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Please only run deeper horizons for BTEX AND TPH if Benzene exceeds 10ppm, BTEX exceeds 500ppm, and TPH exceeds 5000ppm.