SITE INFORMATION

Report Type: Work Plan 2RP-4073

General Site Information:						
Site:	**Puckett 13 Federal Tank Battery**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit P**	**Sec. 12**	**T 17S**	**R 31E**		
Lease Number:	**API No. 30-015-40737**					
County:	**Eddy County**					
GPS:	**32.842045º N**			**103.816429º W**		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of NM 529 & HWY 82 in rural Eddy County, Travel east on HWY 82 for approximatey 3.9 miles, turn north onto a lease road for approximately 0.10 mi, turn northeast onto lease road for 0.20 mi to location on south side of the lease road.					

Release Data:		
Date Released:	1/6/2017	
Type Release:	Oil & Produced Water	
Source of Contamination:	Portable Tester	
Fluid Released:	2 bbls oil & 3 bbls water	
Fluids Recovered:	1 bbl oil & 2 bbls water	

Official Communication:			
Name:	Robert McNeil		Ike Tavarez
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.Tavarez@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	***0***	*175'-200'*
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

April 25, 2017

Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

Re: Work Plan for the COG Operating LLC., Puckett 13 Federal Tank Battery, Unit P, Section 12, Township 17 South, Range 31 East, Eddy County, New Mexico. 2RP-4073

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to prepare a work plan for the release assessed by COG at the Puckett 13 Federal Tank Battery, Unit P, Section 12, Township 17 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.842045º, W 103.816429º. 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 January 6, 2017, and released approximately two (2) barrels of oil and three (3) barrels of produced water due to a failed pop off valve on a portable tester. Approximately one (1) barrel of oil and two (2) barrels of produced water were recovered using a vacuum truck. The spill is located on the pad area and measured approximately 140' x 140'. The initial C-141 form is included in Appendix A.

Groundwater

No water wells were listed within Section 12 on the New Mexico Office of the State Engineer's (NMOSE) database. The nearest well listed on the NMOSE database is located in Section 10, Township 17 South, Range 32 East, with a reported depth of approximately 132' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is between 175' and 200' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On February 7, 2017, COG personnel were onsite to evaluate and sample the release area. Using a backhoe, two (2) trenches (T-1 and T-2) were installed to a total depths of 4.0' 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 the laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The trench locations are shown in Figure 3.

Referring to Table 1, none of the samples collected in the areas of trenches (T-1 and T-2) showed TPH, benzene, or total BTEX concentrations above the laboratory reporting limits or the RRAL's. However, the area of trench (T-1) showed elevated chloride concentrations in the shallow soils of 6,240 mg/kg (surface) and 1,020 mg/kg (1.0'). The chloride concentrations then declined with depth at 2.0' to 32.0 mg/kg with a bottom trench concentration of <16.0 mg/kg at 4.0' below surface. The area of trench (T-2) did not show a significant chloride impact to the soils with a chloride high of 368 mg/kg at surface, which declined with depth to 16.0 mg/kg at 2.0' below surface.

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 areas of trench (T-1) will be excavated to a depth of approximately 1.0' below surface to remove the elevated chloride concentrations in the shallow soils. Once excavated to the appropriate depth, 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 safely concerns for onsite personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.

TETRA TECH

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 me at (432) 682-4559.

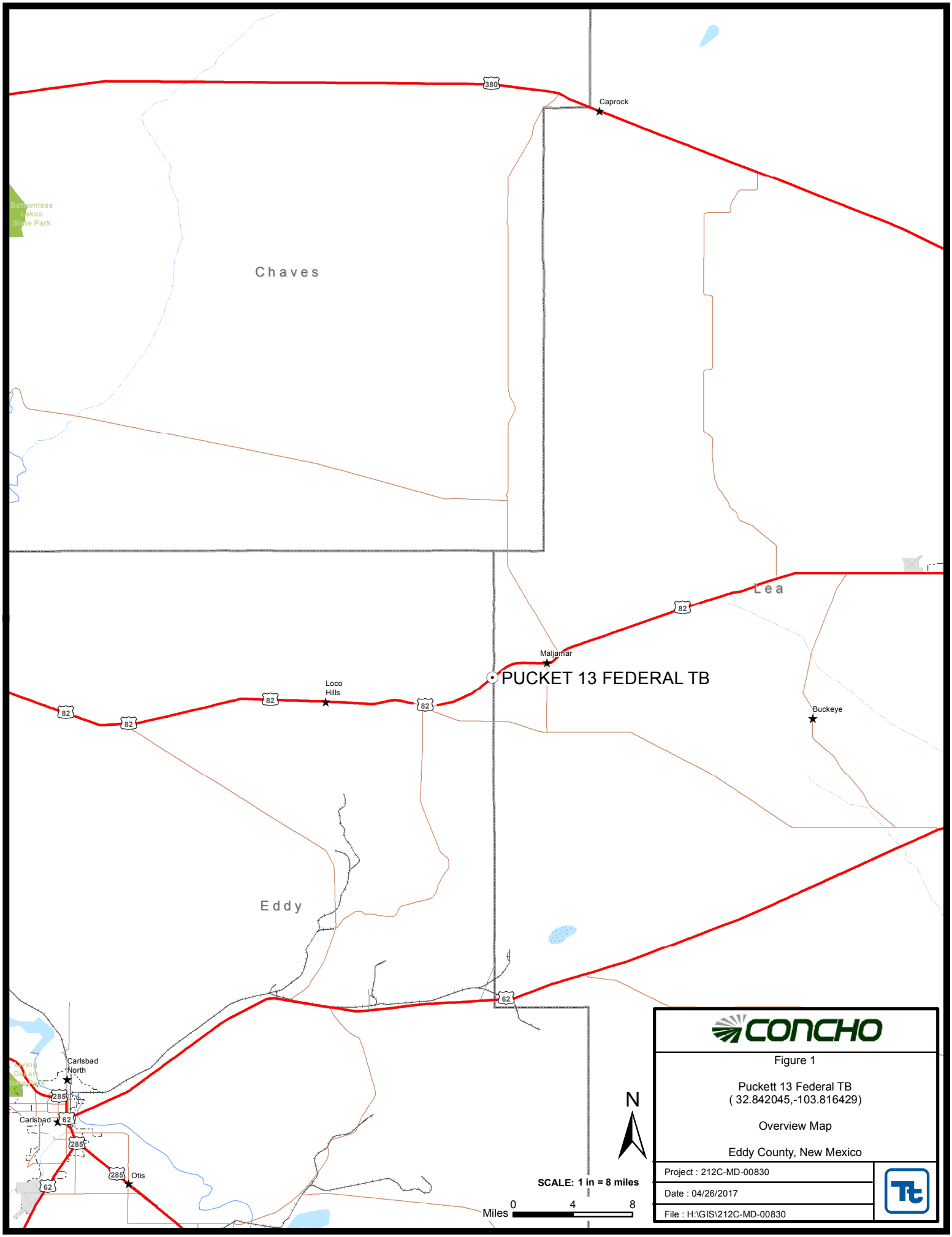
Respectfully submitted,
TETRA TECH

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



CONCHO

Figure 1

Puckett 13 Federal TB
(32.842045,-103.816429)

Overview Map

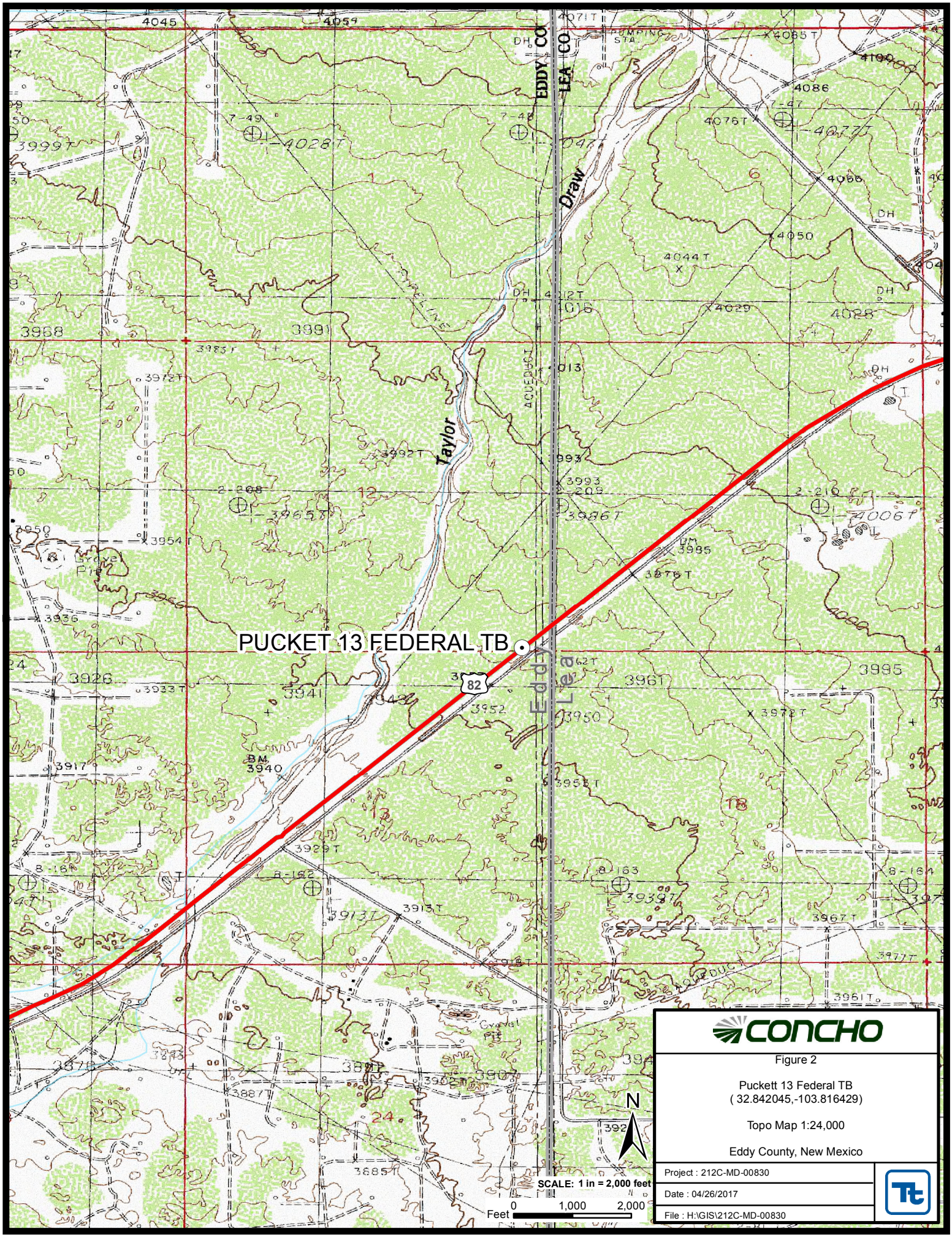
Eddy County, New Mexico

Project : 212C-MD-00830

Date : 04/26/2017

File : H:\GIS\212C-MD-00830

Mapped By: Isabel Marmolejo



CONCHO

Figure 2

Puckett 13 Federal TB
(32.842045,-103.816429)

Topo Map 1:24,000

Eddy County, New Mexico

Project : 212C-MD-00830

Date : 04/26/2017

File : H:\GIS\212C-MD-00830

Mapped By: Isabel Marmolejo

EXPLANATION

- TRENCH SAMPLE LOCATIONS
- SPILL AREA

CONCHO

Figure 3

Puckett 13 Federal TB
(32.842045,-103.816429)

Spill Assessment Map

Eddy County, New Mexico

Project : 212C-MD-00830

Date : 04/26/2017

File : H:\GIS\212C-MD-00830

Mapped By: Isabel Marmolejo

Mapped By: Isabel Marmolejo

Tables

Table 1
COG Operating LLC.
Pucket 13 Federal Tank Battery
Eddy 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	2/7/2017	Surface	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	**6,240**
	"	1	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	**1,020**
	"	2	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0
	"	3	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	<16.0
	"	4	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	<16.0
T-2	2/7/2017	Surface	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	368
	"	1	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	160
	"	2	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	16.0
	"	3	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0
	"	4	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0

(-) 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:	Puckett 13 Federal Tank Battery	Facility Type:	Tank Battery

Surface Owner: Federal	Mineral Owner:	API No. 30-015-40737

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	12	17S	31E	43	South	590	East	Eddy

Latitude 32.8420105 **Longitude** 103.8164825

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 2 bbls Oil & 3 bbls PW	Volume Recovered: 1 bbls Oil & 2 bbls PW
Source of Release: Portable Tester	Date and Hour of Occurrence: January 6, 2017 7:00 pm	Date and Hour of Discovery: January 6, 2017 7:00 pm
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
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.*

The release was due to a pop off valve on a portable tester. The portable tester was removed from service.

Describe Area Affected and Cleanup Action Taken.*

The release occurred on the pad and into the adjacent pasture. A vacuum truck was dispatched to remove all freestanding fluids. 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: Rebecca Haskell		OIL CONSERVATION DIVISION	
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 ☐
Date: January 17, 2017	Phone: 432-683-7443		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Puckett 13 Federal Tank Battery
Eddy County, New Mexico

16 South 30 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

16 South 31 East

6	5	4	3	2 290	1
7	8	9	10	11	12 288
18	17	16	15	14 113 314	13 299
19	20	21	22	23	24
30	29	28	27	26	25
31 290	32	33	34	35	36

16 South 32 East

6	5	4	3 65	2 265	1 265
7	8	9	10	11	12 215
18	17	16 221	15	14	13 215
19 220	20	21 210	22	23 210	24
30	29	28	27	26 243	25
31	32	33	34	35 192	36 260

17 South 30 East

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

17 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 SITE
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 271	35	36

17 South 32 East

6	5	4	3 175	2 60	1 225
7	8 Maljamar		10 132	11 70 88	12 120
18	17	16	15	14	13
19	20	21	22	23	24
30 180 dry	29	28	27	26	25
31	32	33	34	35	36

18 South 30 East

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

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 400
18	17	16	15 98	14 317	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35 261	36

18 South 32 East

6	5	4 65	3	2	1
7 460 82	8	9	10	11	12
18	17	16 84	15	14	13
19	20 164	21	22 429	23	24
30	29	28	27	26	25
31	32	33	34 117	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

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

34 NMOCD - Groundwater Data

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	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
RA 11590 POD1			ED	2	1	3	32	17S	31E	603315	3628545	158		
RA 11590 POD3			ED	3	1	2	32	17S	31E	603932	3629260	60		
RA 11590 POD4			ED	4	1	1	32	17S	31E	603308	3629253	55		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 3

PLSS Search:

Township: 17S **Range:** 31E

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	Twns	Rng	X	Y	Depth Well	Depth Water	Water Column
L 04021 POD3		L	LE		3	4	03	17S	32E	616761	3636252*	247		
L 04021 S		L	LE	2	4	4	03	17S	32E	617262	3636354*	260		
L 13050 POD1		L	LE	2	2	1	10	17S	32E	616463	3635945*	156	132	24
RA 08855			LE	4	1	1	10	17S	32E	616061	3635742*	158		
RA 09505			LE	2	2	1	10	17S	32E	616462	3635944	147		
RA 09505 S			LE	2	2	1	10	17S	32E	616463	3635945*	144		
RA 11734 POD1			LE	2	2	1	10	17S	32E	616556	3635929	165		

Average Depth to Water: **132 feet**

Minimum Depth: **132 feet**

Maximum Depth: **132 feet**

Record Count: 7

PLSS Search:

Section(s): 3-10 **Township:** 17S **Range:** 32E

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

Appendix C

CARDINAL Laboratories

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

February 22, 2017

AARON LIEB

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: PUCKETT 13 FEDERAL TANK BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 02/15/17 12:00.

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 accreditated 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,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - SURFACE (H700395-01)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.1 %* *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	**6240**	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane *89.3 %* *35-147*

Surrogate: 1-Chlorooctadecane *88.1 %* *28-171*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 1' (H700395-02)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.6 %* *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	**1020**	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane *88.3 %* *35-147*

Surrogate: 1-Chlorooctadecane *98.7 %* *28-171*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 2' (H700395-03)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.3 %* *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	**32.0**	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane *83.3 %* *35-147*

Surrogate: 1-Chlorooctadecane *97.8 %* *28-171*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 3' (H700395-04)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *97.6 %* *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	<16.0	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane *83.6 %* *35-147*

Surrogate: 1-Chlorooctadecane *102 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 4' (H700395-05)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.7 %* *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	<16.0	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane *86.6 %* *35-147*

Surrogate: 1-Chlorooctadecane *101 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - SURFACE (H700395-06)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.0 %* *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	**368**	16.0	02/20/2017	ND	432	108	400	3.64	

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	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane *83.8 %* *35-147*

Surrogate: 1-Chlorooctadecane *88.4 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 1' (H700395-07)

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	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.8 %* *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	**160**	16.0	02/20/2017	ND	448	112	400	0.00	QM-07

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	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane *82.5 %* *35-147*

Surrogate: 1-Chlorooctadecane *91.7 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 2' (H700395-08)

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	02/19/2017	ND	2.02	101	2.00	7.72	
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17	
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1	
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0	
Total BTEX	<0.300	0.300	02/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *97.7 %* *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	**16.0**	16.0	02/20/2017	ND	448	112	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	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane *85.6 %* *35-147*

Surrogate: 1-Chlorooctadecane *93.0 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 3' (H700395-09)

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	02/19/2017	ND	2.02	101	2.00	7.72	
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17	
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1	
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0	
Total BTEX	<0.300	0.300	02/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.9 %* *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	**32.0**	16.0	02/20/2017	ND	448	112	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	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane *77.5 %* *35-147*

Surrogate: 1-Chlorooctadecane *87.8 %* *28-171*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

COG OPERATING
AARON LIEB
P. O. BOX 1630
ARTESIA NM, 88210
Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 4' (H700395-10)

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	02/19/2017	ND	2.02	101	2.00	7.72	
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17	
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1	
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0	
Total BTEX	<0.300	0.300	02/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.7 %* *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	**32.0**	16.0	02/20/2017	ND	448	112	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	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane *83.6 %* *35-147*

Surrogate: 1-Chlorooctadecane *93.5 %* *28-171*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Notes and Definitions

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
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

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories
101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	COG Operating LLC
Project Manager:	Aaron Lieb
Address:	2407 Pecos Avenue
City:	Artesia
State:	NM
Zip	88210
Phone #:	575-748-1553
Fax #:	
Project #:	
Project Owner:	
Project Name:	Puckett 13 Federal Tank Battery
Project Location:	
Sampler Name:	Aaron Lieb

BILL TO

P.O. #:	
Company:	COG Operating LLC
Attn:	Robert McNeill
Address:	600 W Illinois
City:	Midland
State:	TX
Zip:	79701
Phone #:	(432) 221-0388
Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX	TPH	Chloride
H700395																	
1	T1-Surface	G	1			X					X		2/7/17	11:00AM	X	X	X
2	T1-1'					X					X		2/7/17	11:00AM	X	X	X
3	T1-2'					X					X		2/7/17	11:00AM	X	X	X
4	T1-3'					X					X		2/7/17	11:00AM	X	X	X
5	T1-4'					X					X		2/7/17	11:00AM	X	X	X
6	T2-Surface					X					X		2/7/17	11:00AM	X	X	X
7	T2-1'					X					X		2/7/17	11:30 Am	X	X	X
8	T2-2'					X					X		2/7/17	11:30 Am	X	X	X
9	T2-3'					X					X		2/7/17	11:30 Am	X	X	X
10	T2-4'	C	1			X					X		2/7/17	11:30 Am	X	X	X

Relinquished By:	Date: 2-15-17	Received By:	
	Time:		
Relinquished By:	Date: 2-15-17	Received By: Jodi Henson	
	Time: 12:00		
Delivered By: (Circle One)		Sample Condition: Cool ☒ Yes ☐ No; Intact ☒ Yes ☐ No	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other: #75	2.5°C		

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:

REMARKS:
dneel2@concho.com
alieb@concho.com
rgrubbs@concho.com
rhaskell@concho.com