SITE INFORMATION

Report Type: Work Plan 1RP-4812

General Site Information:						
Site:	**Gunner 16 State SWD #1**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit D**	**Sec. 16**	**T 26S**	**R 34E**		
County:	**Lea County**					
GPS:	**32.0497322º N**			**103.4822998º W**		
Surface Owner:	State/Federal					
Mineral Owner:						
Directions:	From the intersection of Hwy 285 and Whites City Rd, go west on Whites City Rd for 3 miles. Turn south onto unmarked lease road and drive 2 miles. Turn east onto unmarked lease road and drive 0.10 miles to location.					

Release Data:	
Date Released:	9/15/2017
Type Release:	Oil and Produced Water
Source of Contamination:	Lighting Strike
Fluid Released:	1000 bbls water and 20 bbls oil
Fluids Recovered:	200 bbls water and 5 bbls oil

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***	*125'*
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 5, 2018

APPROVED

Includes NMSLO approved revegetation & noxious weed plan for 1RP-4812.

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

Re: Revised Work Plan for the COG Operating LLC., Gunner 16 State SWD #1, Unit D, Section 16, Township 26 South, Range 34 East, Lea County, New Mexico. 1RP-4812.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess and evaluate a release that occurred at Gunner 16 State SWD #1, Unit D, Section 16, Township 26 South, Range 34 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.0497322º, W 103.4822998º. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on September 15, 2017, and released approximately 1,000 barrels of produced water and 20 barrels of oil, due to a lightning strike. The facility and equipment at the site were a total loss. Once the fire was extinguished, vacuum trucks were dispatched to remove all of the freestanding fluids, recovering approximately 200 barrels of produced water and 5 barrels of oil. The release impacted an area on the pad area measuring approximately 140' x 280' and migrated into the pasture impacting areas measuring approximately 65' x 150', 10'x10', and 15' x 20'. Additionally, the release migrated along an existing pipeline right-of-way and migrated into Section 17, measuring approximately 40' x 125'. Prior to the soil assessment, COG obtained a Right-of-Entry Permit (Permit No. RE-3481) from the New Mexico State Land Office. A copy of the Right-of-Entry permit is included in Appendix C. The Initial C-141 Form is included in Appendix A.

Groundwater

No wells are listed within Sections 16 or 17 in the New Mexico Office of the State Engineers database, the USGS National Water Information System, or the Geology and Groundwater Conditions in Southern Lea County, NM (Report 6). However, the State Engineers database reported a well in Section 06, approximately 2.5 miles northwest of the site, with a reported depth to water of 160' below surface, respectively. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is

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

approximately 125' below surface. The groundwater data is shown in Appendix B.

Regulatory

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

Soil Assessment and Analytical Results

On December 18-19, 2017, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of six (6) boreholes were installed in the impacted areas. Three (3) boreholes (BH-1, BH-2 and BH-3) were installed on the pad area and three (3) boreholes (BH-4, BH-5 and BH-6) were installed in the pasture area using an air rotary rig in order to define the extents. Due to safety concerns, a portion along the pipeline right-of-way was not sampled. Additionally, surface flowlines restricted access to the area southwest of the pad corner as well as the area southwest of the pipeline right-of-way. 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 E. The sampling results are summarized in Table 1. The borehole locations are shown in Figure 3.

<u>Pad Area</u>

Referring to Table 1, the areas of boreholes (BH-2 and BH-3) did not show any benzene, total BTEX, or TPH concentrations above the laboratory reporting limits. However, the area of borehole (BH-1) showed total BTEX concentrations below the RRALs, with concentrations of 0.179 mg/kg (0-1') and 0.740 mg/kg (2-3'). Additionally, elevated TPH concentrations were detected at borehole (BH-1) with a TPH high of 11,400 mg/kg at 2-3', which declined with depth to below the laboratory reporting limits at 4-5' below surface.

The areas of boreholes (BH-1, BH-2, and BH-3) showed chloride concentrations above the 600 mg/kg threshold in the shallow soils. The area of borehole (BH-1) showed chlorides that increased with depth to 7,120 mg/kg at 4-5', before declining with depth to 1,610 mg/kg at 6-7.0' and 29.0 mg/kg at 9-10' below surface. The areas of boreholes (BH-2 and BH-3) showed chloride highs of 891 mg/kg and 5,060 mg/kg at 2-3', before declining with depth to 466 mg/kg and 113 mg/kg at 4-5.0' below surface, respectively.

Pasture Area

Referring to Table 1, none of the samples analyzed from boreholes (BH-4, BH-5, and BH-6) showed benzene, total BTEX, or TPH concentrations above the RRALs or the laboratory reporting limits. However, the areas of boreholes (BH-5 and BH-6) showed elevated chloride concentrations in the shallow soils. The chloride concentrations increased with depth to 6,380 mg/kg at 2-3' (BH-5) and 3,890 mg/kg at 4-5' (BH-6). The chloride concentrations then declined to <4.99 mg/kg (BH-5) and 5.52 mg/kg (BH-6) at 6-7' below surface. The area of borehole (BH-4) showed insignificant chloride concentrations at 0-1' and 2-3', however a chloride spike of 813 mg/kg at 4-5' below surface was detected. The deeper samples in the area of borehole (BH-4) showed chloride concentrations of 5.60 mg/kg at 6-7', 43.4 mg/kg at 9.0-10' and 69.3 mg/kg at 14-15' below surface.

Work Plan

Based on the laboratory results, COG proposes to remove the impacted soils as shown on Figure 4 and highlighted (green) on Table 1. The area of borehole (BH-1) will be excavated to 6-7', the areas of boreholes (BH-5 and BH-6) will be excavated to 4-5', and the areas of boreholes (BH-2 and BH-3) will be excavated to 2-3' below surface. For the impacted area west of BH-6 along the pipeline ROW, EOG will be contacted to determine if any of the impacted soils can either be assessed or removed from the ROW. The excavated areas will then 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.

Revegetation Plan

The backfilled areas will be seeded in June 2018 in order to coincide with the rainy season in Southeastern New Mexico to aid in revegetation. Based on the soils at the site, the NMSLO Loamy (L) Sites Seed Mixture will be used for seeding and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a drill equipped with a depth regulator or a hand-held broadcaster and raked. If a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled.

Site inspections will be performed to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the NMSLO will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The NMSLO seed mixture details and corresponding pounds pure live seed per acre are included in Appendix D.

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.

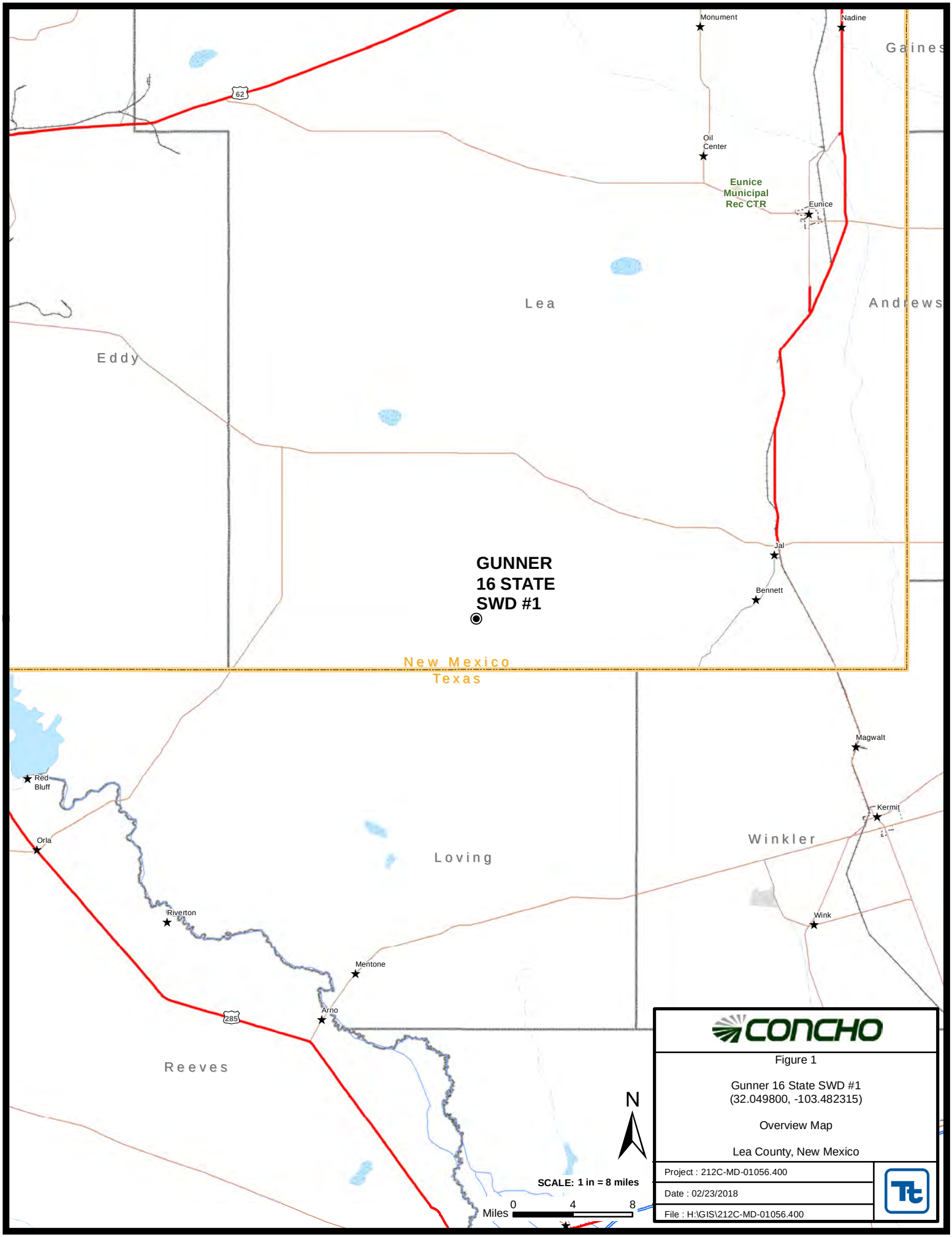
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

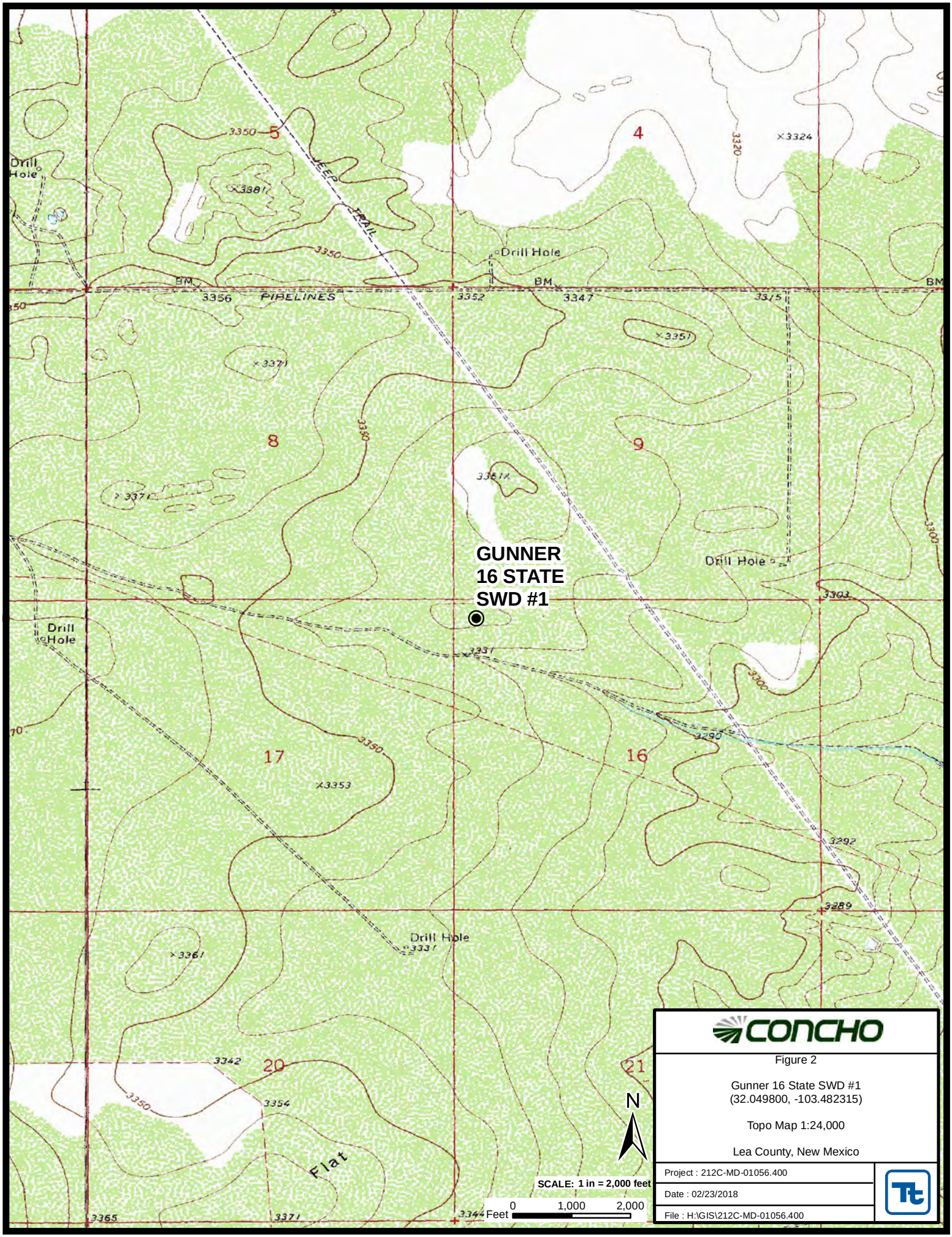
Ike Tavarez,
Senior Project Manager, P.G.

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

Figures



Mapped By: Isabel Marmolejo



CONCHO

Figure 2

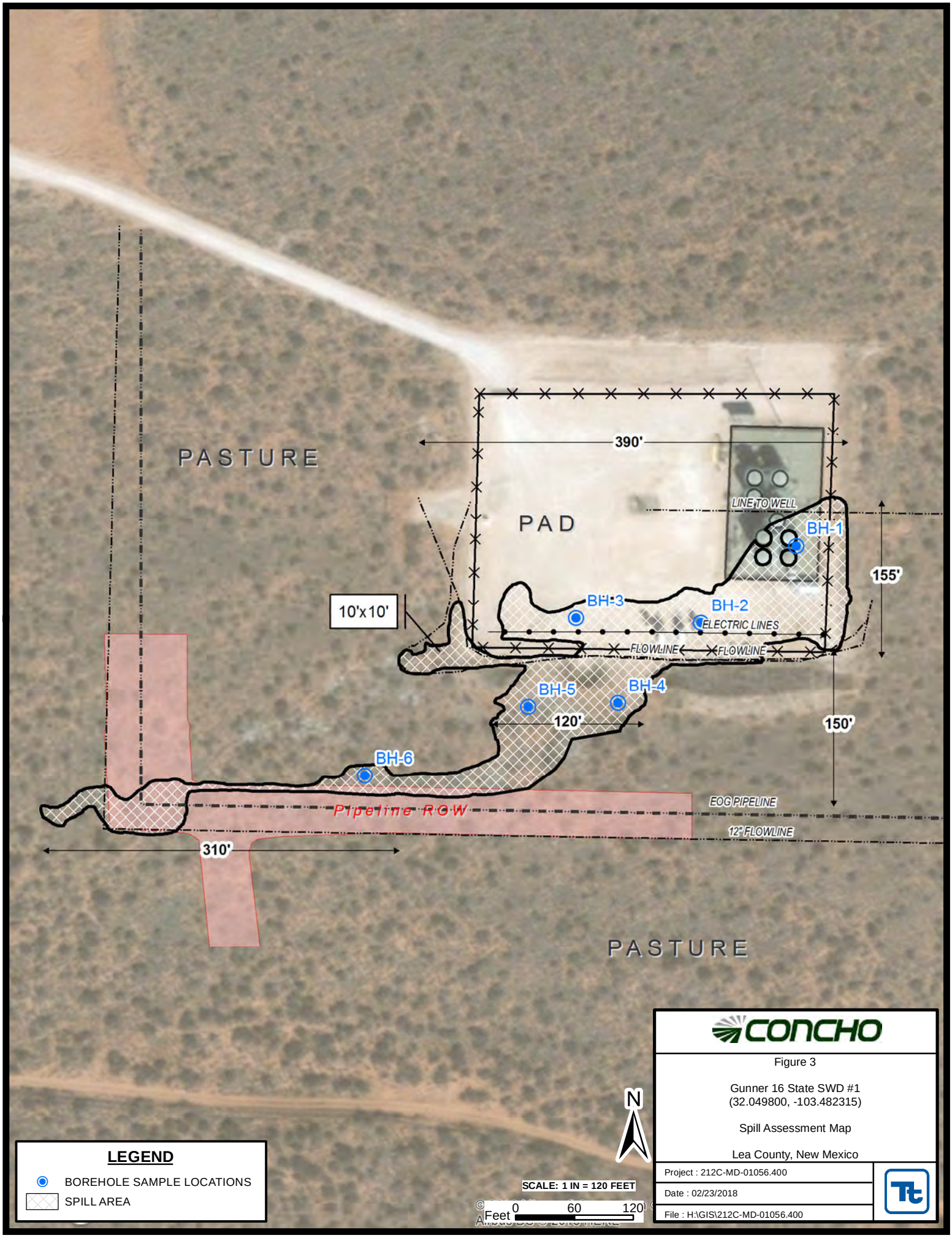
Gunner 16 State SWD #1
(32.049800, -103.482315)

Topo Map 1:24,000

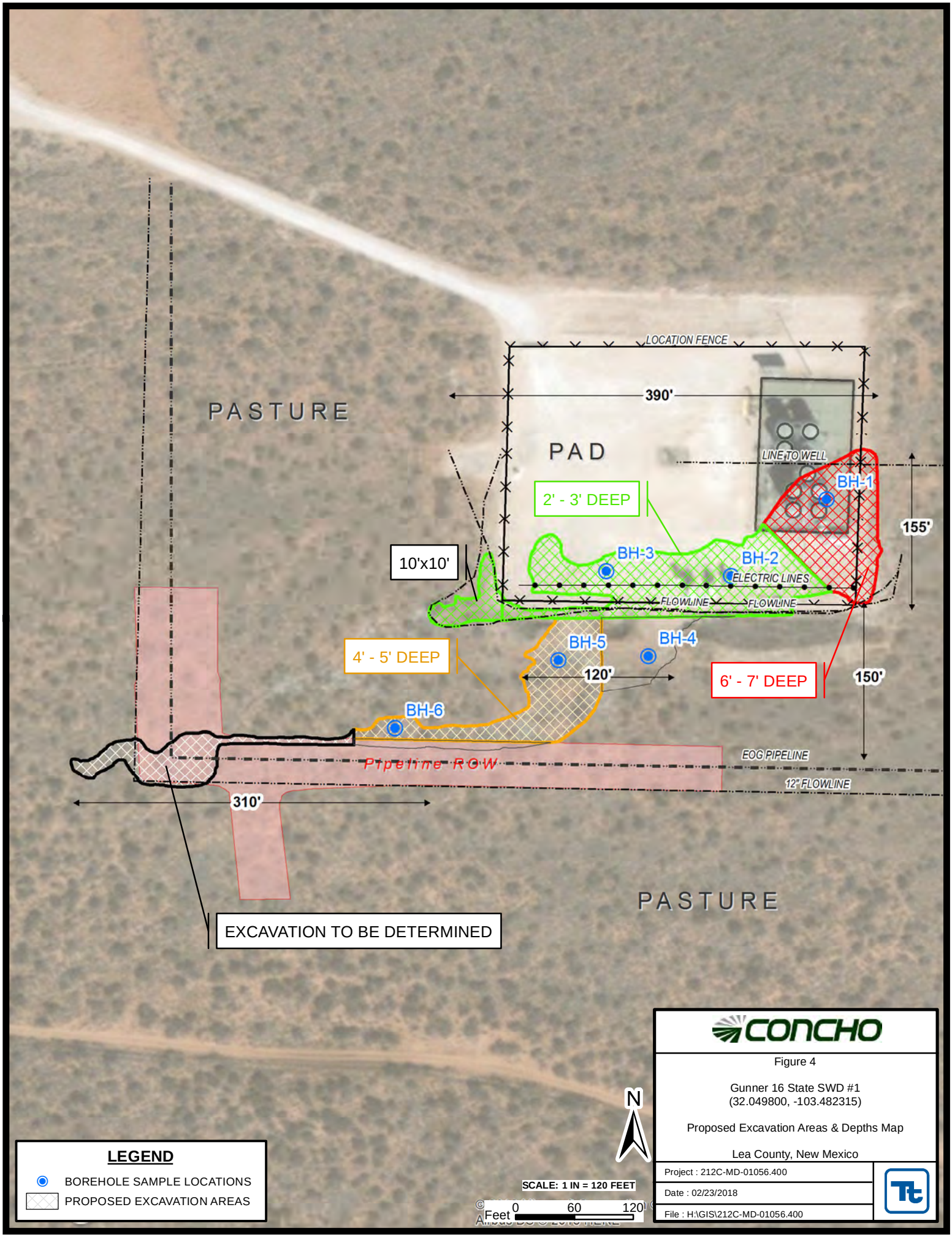
Lea County, New Mexico

Project : 212C-MD-01056.400	
Date : 02/23/2018	
File : H:\GIS\212C-MD-01056.400	

Mapped By: Isabel Marmolejo



Mapped By: Isabel Marmolejo


LOCATION FENCE
390'
PASTURE
PAD
LINE TO WELL
BH-1
2' - 3' DEEP
155'
10'x10'
BH-3
BH-2
ELECTRIC LINES
FLOWLINE
FLOWLINE
BH-5
BH-4
4' - 5' DEEP
120'
6' - 7' DEEP
150'
BH-6
Pipeline ROW
EOG PIPELINE
12" FLOWLINE
310'
PASTURE
EXCAVATION TO BE DETERMINED
N
SCALE: 1 IN = 120 FEET
Feet 0 60 120
LEGEND
BOREHOLE SAMPLE LOCATIONS
PROPOSED EXCAVATION AREAS
CONCHO
Figure 4
Gunner 16 State SWD #1
(32.049800, -103.482315)
Proposed Excavation Areas & Depths Map
Lea County, New Mexico
Project : 212C-MD-01056.400
Date : 02/23/2018
File : H:\GIS\212C-MD-01056.400
Mapped By: Isabel Marmolejo

Tables

Table 1
COG Operating LLC.
Gunner 16 State SWD #1
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	C6-C10	C10-C28	C28-C35	Total						
Pad Area														
BH-1	12/18/2017	0-1	X		**608**	**6,970**	**1,900**	**9,480**	<0.00199	0.0101	0.0183	0.150	0.179	**1,270**
	"	2-3	X		**553**	**8,340**	**2,460**	**11,400**	<0.00201	0.00937	0.0214	0.143	0.740	**3,500**
	"	4-5	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-	**7,120**
	"	6-7	X		-	-	-	-	-	-	-	-	-	**1,610**
	"	9-10	X		-	-	-	-	-	-	-	-	-	29.0
	"	14-15	X		-	-	-	-	-	-	-	-	-	168
	"	19-20	X		-	-	-	-	-	-	-	-	-	102
	"	24-25	X		-	-	-	-	-	-	-	-	-	116
BH-2	12/18/2017	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	**866**
	"	2-3	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	**891**
	"	4-5	X		-	-	-	-	-	-	-	-	-	466
	"	6-7	X		-	-	-	-	-	-	-	-	-	335
	"	9-10	X		-	-	-	-	-	-	-	-	-	8.96
	"	14-15	X		-	-	-	-	-	-	-	-	-	45.1
BH-3	12/18/2017	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	**4,500**
	"	2-3	X		-	-	-	-	-	-	-	-	-	**5,060**
	"	4-5	X		-	-	-	-	-	-	-	-	-	113
	"	6-7	X		-	-	-	-	-	-	-	-	-	22.5
	"	9-10	X		-	-	-	-	-	-	-	-	-	16.6
	"	14-15	X		-	-	-	-	-	-	-	-	-	186
Pasture Area														
BH-4	12/19/2017	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	10.0
	"	2-3	X		<14.9	<14.9	<14.9	<14.9	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	40.2
	"	4-5	X		-	-	-	-	-	-	-	-	-	**813**
	"	6-7	X		-	-	-	-	-	-	-	-	-	5.60
	"	9-10	X		-	-	-	-	-	-	-	-	-	43.4
	"	14-15	X		-	-	-	-	-	-	-	-	-	69.3
BH-5	12/19/2017	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	**2,850**
	"	2-3	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	**6,380**
	"	4-5	X		-	-	-	-	-	-	-	-	-	**864**
	"	6-7	X		-	-	-	-	-	-	-	-	-	<4.99
	"	9-10	X		-	-	-	-	-	-	-	-	-	8.35
	"	14-15	X		-	-	-	-	-	-	-	-	-	67.1
BH-6	12/19/2017	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	39.2
	"	2-3	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	**3,390**
	"	4-5	X		-	-	-	-	-	-	-	-	-	**3,890**
	"	6-7	X		-	-	-	-	-	-	-	-	-	5.52
	"	9-10	X		-	-	-	-	-	-	-	-	-	85.6
	"	14-15	X		-	-	-	-	-	-	-	-	-	209

(-) Not Analyzed

Proposed Excavation Depths

Photos

COG Operating LLC
Gunner 16 State SWD #1
Lea County, New Mexico

View South – Area of BH-1

View East – Area of BH-2

COG Operating LLC
Gunner 16 State SWD #1
Lea County, New Mexico

View East – Area of BH-3

View North – Area of BH-4

COG Operating LLC
Gunner 16 State SWD #1
Lea County, New Mexico

View West – Area of BH-5

View North – Area of BH-6

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 [OGRID] 229137	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: Gunner 16 State SWD #1	Facility Type: SWD

Surface Owner: State/Federal	Mineral Owner: State	API No. 30-025-40890

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	16	26S	34E	330'	North	330'	West	Lea

Latitude 32.0497322 **Longitude** -103.4822998

NATURE OF RELEASE

Type of Release: Oil & Produced Water	Volume of Release: 1000 bbls pw; 20 bbls oil	Volume Recovered: 200 bbls pw; 5 bbls oil
Source of Release: Lightning Strike	Date and Hour of Occurrence: 9-15-2017 05:00 am	Date and Hour of Discovery: 9-15-2017 05:00 am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu – NMOCD, Amber Groves-NMSLO	
By Whom? Rebecca Haskell	Date and Hour: 9-15-2017 12:57 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

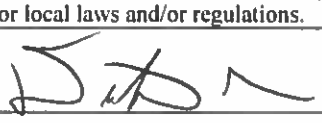
If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
This release was caused by a lightning strike.

Describe Area Affected and Cleanup Action Taken.*

The facility and equipment were a total loss. The flow lines coming into the facility were isolated immediately to reduce further fluid loss. Once the fire was extinguished, vacuum trucks were dispatched to recover all standing fluid. The release impacted the location as well as the adjacent pasture and pipeline ROW.

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: Dakota Neel	Approved by Environmental Specialist:	
Title: Environmental Coordinator	Approval Date:	Expiration Date:
E-mail Address: dneel2@concho.com	Conditions of Approval:	Attached ☐
Date: September 18, 2017 Phone: 575-746-2010		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Gunner 16 SWD #1
Lea County, New Mexico

25 South 33 East

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

25 South 34 East

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

25 South 35 East

6	5 165	4	3 108	2	1
7	8	9	10	11	12
18 230	17	16	15	14	13
19	20	21 218	22	23	24
30 80	29	28	27	26	25
31	32	33	34	35	36

26 South 33 East

6	5	4	3 175	2	1
7	8	9	10	11 145	12 200
18	17	16	15	14 135	13
19	20	21 120	22	23	24
30	29	28	27 125	26	25
31	32	33	34	35	36

26 South 34 East

6 160 175	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South 35 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13 230
19	20	21	22	23	24 250
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	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02291		CUB	LE	1	1	2	06	26S	34E	640825	3550140*	220	160	60
C 02292 POD1		C	LE	4	1	2	06	26S	34E	640992	3549987	200	140	60
C 03441 POD1		C	LE	4	1	2	06	26S	34E	640971	3550039	250		
C 03442 POD1		C	LE	4	1	2	06	26S	34E	641056	3550028	251		

Average Depth to Water: **150 feet**

Minimum Depth: **140 feet**

Maximum Depth: **160 feet**

Record Count: 4

PLSS Search:

Township: 26S **Range:** 34E

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

2/20/18 9:39 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

Aubrey Dunn
COMMISSIONER

State of New Mexico
Commissioner of Public Lands
310 OLD SANTA FE TRAIL
P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

COMMISSIONER'S OFFICE
Phone (505) 827-5760
Fax (505) 827-5766
www.nmstatelands.org

November 29, 2017

COG Operating LLC
600 West Illinois Ave.
Midland, Texas 79701

Attn: Sheldon Hitchock

Re: Right-of-Entry Permit No.: RE-3481 (Gunner 16 SWD #1)

Dear Mr. Hitchock:

Enclosed is the completed captioned Right-of-Entry permit. If any corrections are necessary, please let us know and we will retype or amend this permit as necessary.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact Anthony Vigil at 505-827-5710.

Sincerely,

Aubrey Dunn
Commissioner of Public Lands

AD/av

Enclosures

NEW MEXICO STATE LAND OFFICE
Commissioner of Public Lands
Aubrey Dunn
New Mexico State Land Office Building
P.O. Box 1148, Santa Fe, NM 87504-1148

RIGHT OF ENTRY PERMIT
CONTRACT NO. RE - 3481

1. RIGHT OF ENTRY PERMIT

This permit is issued under the authority of NMSA 1978, Section 19-1-2. Therefore, and in consideration of and subject to the terms, covenants, conditions, agreements, obligations and reservations contained in the permit and all other existing rights, the Commissioner of Public Lands, New Mexico State Land Office, State Of New Mexico, hereinafter called "COMMISSIONER," grants to **COG OPERATING LLC**. State of Incorporation (if applicable) , whose address is **ONE CONCHO CENTER, 600 W. ILLINOIS AVE, MIDLAND, TX, 79701** called "PERMITTEE," authorized use of a specific tract(s) of State Trust Land only for the term, and only for the permitted use, described in this permit.

2. TERM AND LAND DESCRIPTION

Right of entry is granted for a term of **180 days**, commencing on the execution date of this document by the Commissioner of Public Lands, to the following State Trust Lands.

Section	Township	Range	Subdivision	County
16	26S	34E	NW4NW4	Lea

3. APPLICATION and PROCESSING FEE

$ 50.00 Application Fee
$ 500.00 Permit Fee
$ 550.00 Total Fee

4. PERMITTED USE, PERSONNEL, EQUIPMENT AND MATERIALS

Permitted use is for the purpose of: **conduct soil sampling, delineation and remediation of an oil produced water release (Please note that this permit does not allow for any off road traffic)**

Personnel present on State Trust Land: **COG and contract personnel**

Equipment & Materials present on State Trust Land: **excavator, backhoe, loader and air rotary drill rig**

Prior to execution of project company must contact the Surface Lessees.

The granting of this permit does not allow access across private lands.

5. IMPROVEMENTS

No improvements shall be placed on the premises without the prior written consent of the Commissioner.

6. RESERVATIONS

Commissioner reserves the right to execute leases, rights of way, easements, permits, exchange agreements, sale agreements, permits and other lawful rights on or across the land covered by this permit, including but not limited to any such rights for mining purposes and for the extraction of oil, gas, salt, geothermal resources, and other mineral deposits there from and the right to go upon, explore for, mine, remove and sell same.

7. COMPLIANCE WITH LAWS

Permittee shall at its own expense comply fully with and be subject to all applicable regulations, rules, ordinances, and requirements of law or of the Commissioner, including but not limited to the regulations of the State Land Office; Chapter 19 NMSA governing State Trust Lands; federal and state environmental laws and regulations; and the New Mexico Cultural Properties Act, NMSA 1978 Sections 18-6-1 through 18-6-23. It is illegal for any person or his agent to appropriate, excavate, injure, or destroy any historic, or prehistoric ruin or monument, or any object of historical, archaeological, architectural, or scientific value situated on lands owned or controlled by the State Land Office without a valid permit issued by the Cultural Properties Review Committee and approved by the Commissioner of Public Lands.

8. HOLD HARMLESS AND IMDEMNIFICATION

Permittee shall save, hold harmless, indemnify and defend Commissioner, the State Land Office, the State of New Mexico, and any of their officers, employees or agents, in their official and individual capacities, of and from any and all liability, claims, losses, damages, costs, and fees arising out of or alleged to arise out of, or directly or indirectly connected with, the operations of Permittee under this permit on or off State Trust Lands or arising out of the presence on State Trust Lands of any equipment, material, agent, invitee, contractor or subcontractor of Permittee. This Hold Harmless and Indemnification clause covers any claim, including any brought in any court or before any administrative agency, of any loss or alleged loss, and any damages or alleged damages asserted with respect to any violation or alleged violation of any state, federal or local law or regulation, including but not limited to any environmental law or regulation, any cultural properties law (including the New Mexico Cultural Properties Act, cited above) or regulation, and any alleged damage to the property, rights or interests of any State Land Office lessee, right-of-way holder, or other permittee.

9. AMENDMENT

This permit shall not be altered, changed, or amended except by an instrument in writing executed by Commissioner and Permittee.

10. WITHDRAWAL

Commissioner reserves the right to withdraw any or all of the land authorized for use under this permit. If applicable, Permittee shall vacate the acreage specified within 30 days after receipt of written notification of withdrawal from the Commissioner.

11. CANCELLATION

The violation by Permittee of any of the terms, conditions, or covenants of this permit or the nonpayment by Permittee of the fees due under this permit shall at the option of the Commissioner be considered a default and shall cause the cancellation of this permit 30 days after Permittee has been sent written notice of such.

12. PRESERVE AND PROTECT

The Permittee agrees to preserve and protect the natural environmental conditions of the land encompassed in this permit, and to take those reclamation or corrective actions that are accepted soil and water conservation practices and that are deemed necessary by the Commissioner to protect the land from pollution, erosion, or other environmental degradation. The Permittee further agrees not to injure the property of, or interfere with the operations or rights of, any State Land Office lessee, right-of-way holder, easement holder or other permittee who has rights to use the State Trust Land subject to this permit.

13. PIPELINE IDENTIFICATION AND SPACING REQUIREMENTS

The Permittee shall label each aboveground pipeline crossing State Trust Lands with the Permittee's name, and contact information. Such information shall be placed at both the inlet and outlet of the pipeline, and every 2,500 feet between the two points. Pipelines must be spaced a minimum of 12" apart from existing surface pipelines to allow for livestock to cross. If the minimum line spacing cannot be met to allow livestock to cross, berms 3 feet in width must be placed in areas where established cattle trails exist, but no less than every tenth of a mile.

14. RECLAMATION, REMOVAL OF EQUIPMENT, MATERIALS, AND WASTE

The Permittee agrees to reclaim those areas that may be damaged by activities conducted thereon.

The Permittee agrees to remove from the State Trust Lands, no later than the end of the term of this permit, all equipment, and materials it has placed or brought upon the land and to clean up and remove from the land any trash, waste, effluent, or other products used or brought upon the land in connection with this permit.

15. SPECIAL INSTRUCTIONS AND/OR RESTRICTIONS

1. No off road traffic allowed.

2. No wood collection or tree cutting allowed.

3. Disturbing, dislodging, damaging, defacing, destroying or removing historical archaeological, paleontological or cultural sites or artifacts in a manner inconsistent with the provisions of the granted permit is prohibited.

4. Disturbing, dislodging, damaging, defacing, destroying any improvement, fixture, item, object or thing placed or located in, under or upon the land is prohibited.

5. This permit does not grant a right to enter State Trust Lands to which there is no public access.

6. Any uses or activities not within the scope of this permit are not allowed unless prior written approval from the Commissioner of Public Lands is granted.

7. Line pressure not to exceed 125 psi.

By: _____
Clay Bateman, Vice-President of New Mexico

ACKNOWLEDGMENT

STATE OF TEXAS)
) ss.
COUNTY OF MIDLAND)

The foregoing instrument was acknowledged before me this 27th day of November, 20 17, by Clay Bateman, of COG Operating LLC, a Delaware LLC corporation, on behalf of said corporation.

My Commission Expires:

1-29-2021

_____
NOTARY PUBLIC

Jana Asebedo
Notary Public, State of Texas
Notary ID 1075101-9
My Commission Exp. 01-29-2021

STATE OF NEW MEXICO

BY: _____
AUBREY DUNN
COMMISSIONER OF PUBLIC LANDS

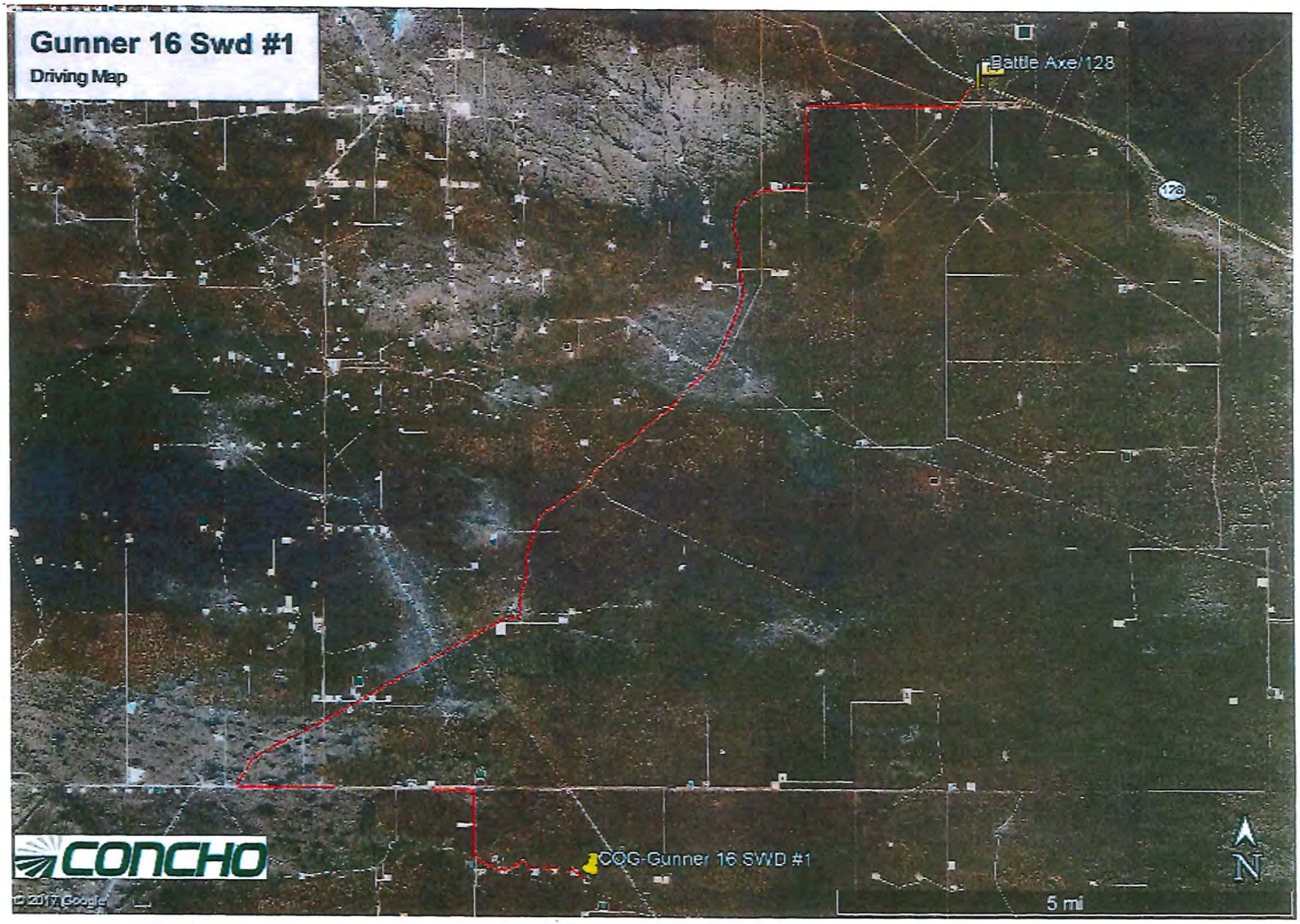
DATE: 12-4-17

SEAL

RE - 3481

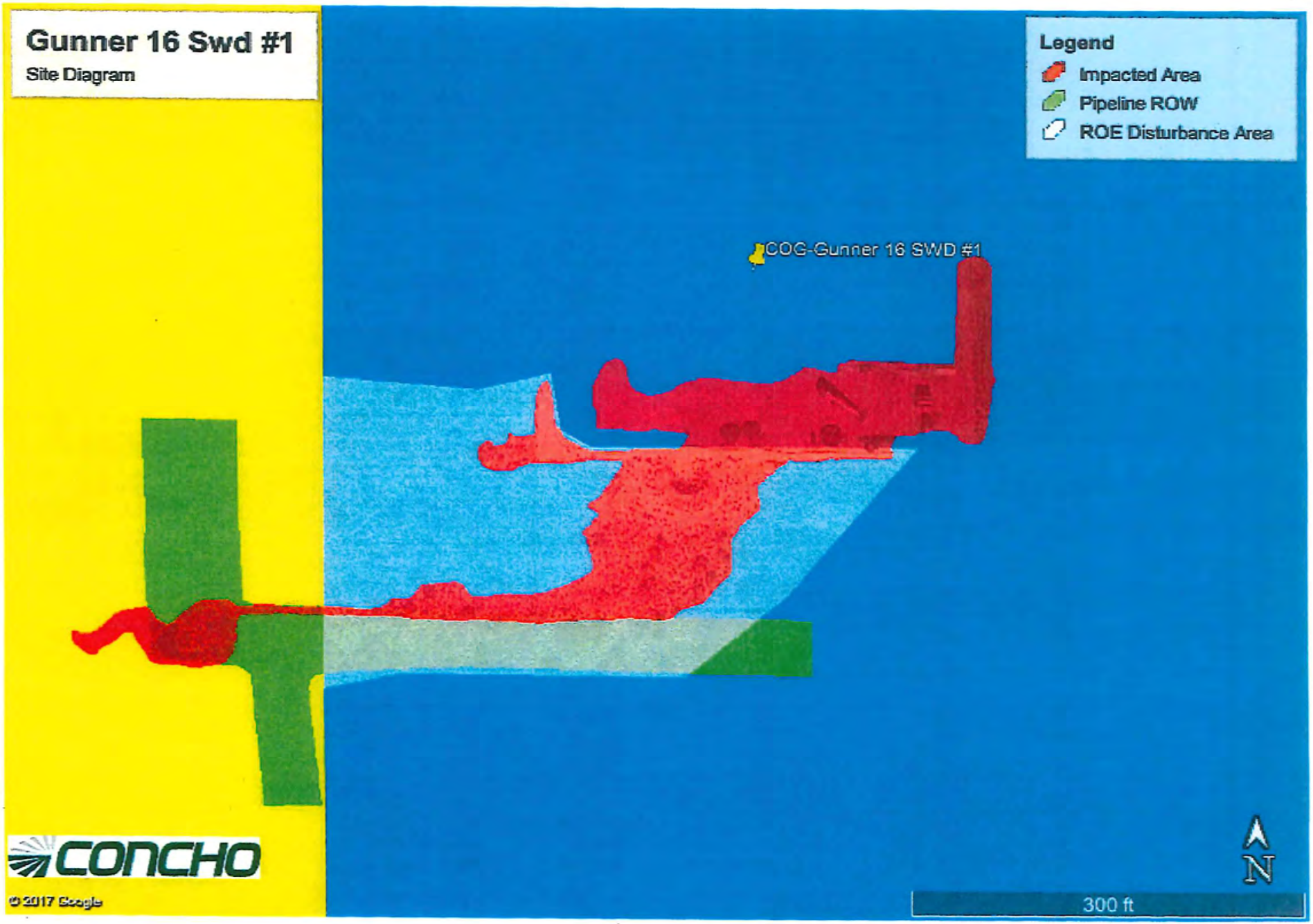
October 13, 2017

Gunner 16 SWD #1



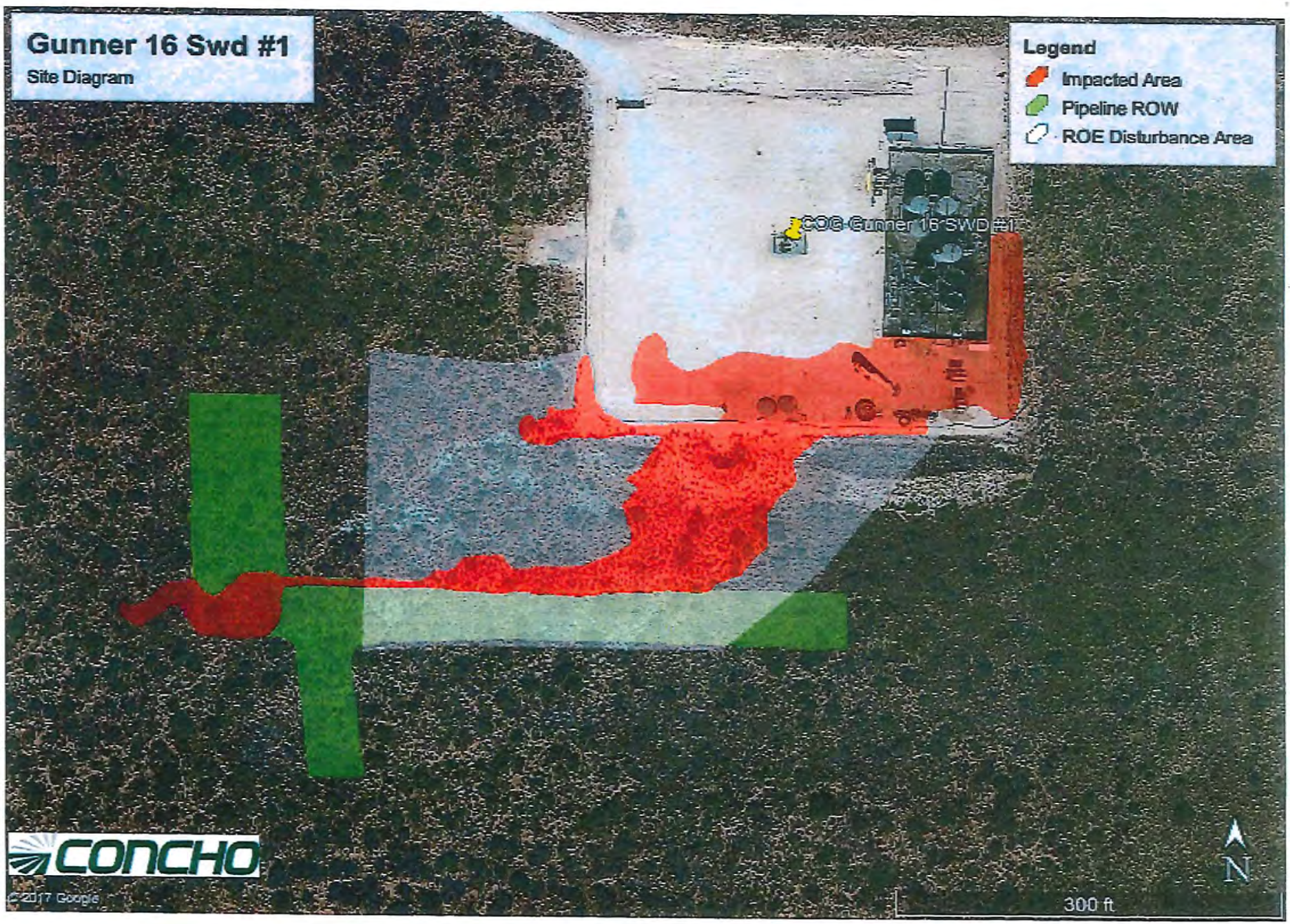
October 13, 2017

Gunner 16 SWD #1



October 13, 2017

Gunner 16 SWD #1



Surface Lessee Contact Information

Please notify all lessee's provided below prior to the start of your project.

- GT-2459- Dinwiddie Cattle Company, LLC
  P.O. Box 374, Roswell, New Mexico 88202-0374

Appendix D

NMSLO Seed Mix — Loamy (L)

LOAMY (L) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Black grama	VNS, Southern	1.0	D
Blue grama	Lovington	1.0	D
Sideoats grama	Vaughn, El Reno	4.0	F
Sand dropseed	VNS, Southern	2.0	S
Alkali sacaton	VNS, Southern	1.0	
Little bluestem	Cimarron, Pastura	1.5	F
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	18.0	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

Lea County, New Mexico

PU—Pyote and maljamar fine sands

Map Unit Setting

National map unit symbol: dmqq
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Pyote and similar soils: 45 percent
Maljamar and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pyote

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 30 inches: fine sand
Bt - 30 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Description of Maljamar

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 24 inches: fine sand
Bt - 24 to 50 inches: sandy clay loam
Bkm - 50 to 60 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 10 percent
Ecological site: Sandhills (R042XC022NM)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 14, Sep 10, 2017

Appendix E

Analytical Report 571798

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

COG-Gunner 16 SWD #1 (Pad Area)

29-DEC-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

29-DEC-17

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

Reference: XENCO Report No(s): **571798**
COG-Gunner 16 SWD #1 (Pad Area)
Project Address: Lea County 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) 571798. 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. 571798 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 571798

Tetra Tech- Midland, Midland, TX

COG-Gunner 16 SWD #1 (Pad Area)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH-1 0-1	S	12-18-17 00:00	0 - 1	571798-001
BH-1 2-3	S	12-18-17 00:00	2 - 3	571798-002
BH-1 4-5	S	12-18-17 00:00	4 - 5	571798-003
BH-1 6-7	S	12-18-17 00:00	6 - 7	571798-004
BH-1 9-10	S	12-18-17 00:00	9 - 10	571798-005
BH-1 14-15	S	12-18-17 00:00	14 - 15	571798-006
BH-1 19-20	S	12-18-17 00:00	19 - 20	571798-007
BH-1 24-25	S	12-18-17 00:00	24 - 25	571798-008
BH-2 0-1	S	12-18-17 00:00	0 - 1	571798-009
BH-2 2-3	S	12-18-17 00:00	2 - 3	571798-010
BH-2 4-5	S	12-18-17 00:00	4 - 5	571798-011
BH-2 6-7	S	12-18-17 00:00	6 - 7	571798-012
BH-2 9-10	S	12-18-17 00:00	9 - 10	571798-013
BH-2 14-15	S	12-18-17 00:00	14 - 15	571798-014
BH-3 0-1	S	12-18-17 00:00	0 - 1	571798-015
BH-3 2-3	S	12-18-17 00:00	2 - 3	571798-016
BH-3 4-5	S	12-18-17 00:00	4 - 5	571798-017
BH-3 6-7	S	12-18-17 00:00	6 - 7	571798-018
BH-3 9-10	S	12-18-17 00:00	9 - 10	571798-019
BH-3 14-15	S	12-18-17 00:00	14 - 15	571798-020

Client Name: Tetra Tech- Midland

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Project ID:
Work Order Number(s): *571798*

Report Date: *29-DEC-17*
Date Received: *12/19/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3036624 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3036675 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.
Lab Sample ID 571798-009 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).
o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 571798-002, -009, -010, -015.
The Laboratory Control Sample for o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analysis Summary 571798

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 29-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571798-001		571798-002		571798-003		571798-004		571798-005		571798-006	
	Field Id:	BH-1 0-1		BH-1 2-3		BH-1 4-5		BH-1 6-7		BH-1 9-10		BH-1 14-15	
	Depth:	0-1		2-3		4-5		6-7		9-10		14-15	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Dec-21-17 13:00		Dec-21-17 17:00									
	Analyzed:	Dec-21-17 23:12		Dec-22-17 05:10									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Benzene		<0.00199	0.00199	<0.00201	0.00201								
Toluene		0.0101	0.00199	0.00937	0.00201								
Ethylbenzene		0.0183	0.00199	0.0214	0.00201								
m,p-Xylenes		0.0874	0.00398	0.0821	0.00402								
o-Xylene		0.0628	0.00199	0.0611	0.00201								
Total Xylenes		0.150	0.00199	0.143	0.00201								
Total BTEX		0.179	0.00199	0.174	0.00201								
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 10:30		Dec-26-17 10:30		Dec-26-17 10:30		Dec-26-17 10:30		Dec-26-17 12:06		Dec-26-17 12:06	
	Analyzed:	Dec-26-17 19:15		Dec-26-17 19:22		Dec-26-17 19:29		Dec-26-17 19:36		Dec-27-17 10:38		Dec-27-17 10:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1270	24.9	3500	24.9	7120	49.1	1610	24.8	29.0	4.99	168	4.97
TPH By SW8015 Mod	***Extracted:***	Dec-21-17 07:00		Dec-21-17 07:00		Dec-28-17 10:00							
	Analyzed:	Dec-21-17 23:25		Dec-21-17 23:44		Dec-28-17 13:17							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Gasoline Range Hydrocarbons (GRO)		608	74.8	553	74.9	<15.0	15.0						
Diesel Range Organics (DRO)		6970	74.8	8340	74.9	<15.0	15.0						
Oil Range Hydrocarbons (ORO)		1900	74.8	2460	74.9	<15.0	15.0						
Total TPH		9480	74.8	11400	74.9	<15.0	15.0						

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 571798

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 29-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571798-007		571798-008		571798-009		571798-010		571798-011		571798-012	
	Field Id:	BH-1 19-20		BH-1 24-25		BH-2 0-1		BH-2 2-3		BH-2 4-5		BH-2 6-7	
	Depth:	19-20		24-25		0-1		2-3		4-5		6-7	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00	
BTEX by EPA 8021B	***Extracted:***					Dec-21-17 17:00		Dec-21-17 17:00					
	Analyzed:					Dec-22-17 02:22		Dec-22-17 02:40					
	Units/RL:					mg/kg	RL	mg/kg	RL				
Benzene						<0.00199	0.00199	<0.00200	0.00200				
Toluene						<0.00199	0.00199	<0.00200	0.00200				
Ethylbenzene						<0.00199	0.00199	<0.00200	0.00200				
m,p-Xylenes						<0.00398	0.00398	<0.00399	0.00399				
o-Xylene						<0.00199	0.00199	<0.00200	0.00200				
Total Xylenes						<0.00199	0.00199	<0.00200	0.00200				
Total BTEX						<0.00199	0.00199	<0.00200	0.00200				
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06	
	Analyzed:	Dec-27-17 11:06		Dec-27-17 11:13		Dec-27-17 11:20		Dec-27-17 11:41		Dec-27-17 11:48		Dec-27-17 11:55	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		102	4.93	116	4.93	866	4.96	891	4.93	466	4.93	335	4.99
TPH By SW8015 Mod	***Extracted:***					Dec-21-17 07:00		Dec-21-17 07:00					
	Analyzed:					Dec-22-17 00:07		Dec-22-17 00:27					
	Units/RL:					mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)						<15.0	15.0	<15.0	15.0				
Diesel Range Organics (DRO)						<15.0	15.0	<15.0	15.0				
Oil Range Hydrocarbons (ORO)						<15.0	15.0	<15.0	15.0				
Total TPH						<15.0	15.0	<15.0	15.0				

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 571798

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 29-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571798-013		571798-014		571798-015		571798-016		571798-017		571798-018	
	Field Id:	BH-2 9-10		BH-2 14-15		BH-3 0-1		BH-3 2-3		BH-3 4-5		BH-3 6-7	
	Depth:	9-10		14-15		0-1		2-3		4-5		6-7	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00		Dec-18-17 00:00	
BTEX by EPA 8021B	***Extracted:***					Dec-21-17 17:00							
	Analyzed:					Dec-22-17 02:59							
	Units/RL:					mg/kg	RL						
Benzene						<0.00202	0.00202						
Toluene						<0.00202	0.00202						
Ethylbenzene						<0.00202	0.00202						
m,p-Xylenes						<0.00403	0.00403						
o-Xylene						<0.00202	0.00202						
Total Xylenes						<0.00202	0.00202						
Total BTEX						<0.00202	0.00202						
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06	
	Analyzed:	Dec-27-17 12:02		Dec-27-17 12:16		Dec-27-17 12:09		Dec-27-17 12:37		Dec-27-17 12:44		Dec-27-17 13:05	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		8.96	4.98	45.1	4.90	4500	24.8	5060	49.4	113	4.96	22.5	4.94
TPH By SW8015 Mod	***Extracted:***					Dec-21-17 07:00							
	Analyzed:					Dec-22-17 00:47							
	Units/RL:					mg/kg	RL						
Gasoline Range Hydrocarbons (GRO)						<15.0	15.0						
Diesel Range Organics (DRO)						<15.0	15.0						
Oil Range Hydrocarbons (ORO)						<15.0	15.0						
Total TPH						<15.0	15.0						

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 571798

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 29-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested									
	Lab Id:	571798-019		571798-020					
	Field Id:	BH-3 9-10		BH-3 14-15					
	Depth:	9-10		14-15					
	Matrix:	SOIL		SOIL					
	Sampled:	Dec-18-17 00:00		Dec-18-17 00:00					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:06		Dec-26-17 12:06					
	Analyzed:	Dec-27-17 13:12		Dec-27-17 13:19					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Chloride		16.6	4.92	186	4.96				

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3036624 **Sample:** 571798-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 23:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 3036672 **Sample:** 571798-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 23:25

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.5	99.7	98	70-135	
o-Terphenyl	43.4	49.9	87	70-135	

Lab Batch #: 3036672 **Sample:** 571798-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 23:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.7	99.8	96	70-135	
o-Terphenyl	44.1	49.9	88	70-135	

Lab Batch #: 3036672 **Sample:** 571798-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	81.8	99.9	82	70-135	
o-Terphenyl	42.8	50.0	86	70-135	

Lab Batch #: 3036672 **Sample:** 571798-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.6	100	86	70-135	
o-Terphenyl	43.9	50.0	88	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3036672 **Sample:** 571798-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:47

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.9	99.7	87	70-135	
o-Terphenyl	44.4	49.9	89	70-135	

Lab Batch #: 3036675 **Sample:** 571798-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 02:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3036675 **Sample:** 571798-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 02:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 3036675 **Sample:** 571798-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 02:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 3036675 **Sample:** 571798-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 05:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0297	0.0300	99	80-120	
4-Bromofluorobenzene	0.0347	0.0300	116	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3037188 **Sample:** 571798-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 13:17

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.0	100	82	70-135	
o-Terphenyl	42.4	50.0	85	70-135	

Lab Batch #: 3036624 **Sample:** 7636429-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 16:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0248	0.0300	83	80-120	

Lab Batch #: 3036672 **Sample:** 7636449-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.4	100	83	70-135	
o-Terphenyl	43.3	50.0	87	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 02:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3037188 **Sample:** 7636777-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 12:16

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	81.7	100	82	70-135	
o-Terphenyl	42.9	50.0	86	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3036624 **Sample:** 7636429-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 13:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0335	0.0300	112	80-120	
4-Bromofluorobenzene	0.0331	0.0300	110	80-120	

Lab Batch #: 3036672 **Sample:** 7636449-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.1	100	84	70-135	
o-Terphenyl	45.3	50.0	91	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 3037188 **Sample:** 7636777-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 12:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.6	100	90	70-135	
o-Terphenyl	53.1	50.0	106	70-135	

Lab Batch #: 3036624 **Sample:** 7636429-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 14:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0329	0.0300	110	80-120	
4-Bromofluorobenzene	0.0357	0.0300	119	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3036672 **Sample:** 7636449-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.7	100	84	70-135	
o-Terphenyl	45.4	50.0	91	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3037188 **Sample:** 7636777-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 12:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.4	100	85	70-135	
o-Terphenyl	50.7	50.0	101	70-135	

Lab Batch #: 3036672 **Sample:** 571792-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 18:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.7	99.8	83	70-135	
o-Terphenyl	44.6	49.9	89	70-135	

Lab Batch #: 3036624 **Sample:** 571522-005 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 23:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3036675 **Sample:** 571798-009 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3037188 **Sample:** 572153-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 17:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	76.9	100	77	70-135	
o-Terphenyl	41.2	50.0	82	70-135	

Lab Batch #: 3036624 **Sample:** 571522-005 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 15:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 3036672 **Sample:** 571792-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 18:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.3	100	80	70-135	
o-Terphenyl	42.9	50.0	86	70-135	

Lab Batch #: 3036675 **Sample:** 571798-009 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Orders : 571798,

Project ID:

Lab Batch #: 3037188 **Sample:** 572153-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 18:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.4	100	88	70-135	
o-Terphenyl	43.9	50.0	88	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

BS / BSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order #: 571798 **Project ID:**

Analyst: ALJ **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/21/2017

Lab Batch ID: 3036624 **Sample:** 7636429-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0826	82	0.100	0.0851	85	3	70-130	35	
Toluene	<0.00202	0.101	0.0764	76	0.100	0.0786	79	3	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0828	82	0.100	0.0850	85	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.165	82	0.201	0.169	84	2	70-135	35	
o-Xylene	<0.00202	0.101	0.0770	76	0.100	0.0785	79	2	71-133	35	

Analyst: ALJ **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036675 **Sample:** 7636472-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0872	87	0.100	0.0854	85	2	70-130	35	
Toluene	<0.00200	0.0998	0.0805	81	0.100	0.0788	79	2	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0871	87	0.100	0.0848	85	3	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.172	86	0.201	0.167	83	3	70-135	35	
o-Xylene	<0.00200	0.0998	0.0824	83	0.100	0.0798	80	3	71-133	35	

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

BS / BSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order #: 571798 **Project ID:**

Analyst: LRI **Date Prepared:** 12/26/2017 **Date Analyzed:** 12/26/2017

Lab Batch ID: 3036899 **Sample:** 7636590-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	244	98	250	241	96	1	90-110	20	

Analyst: LRI **Date Prepared:** 12/26/2017 **Date Analyzed:** 12/27/2017

Lab Batch ID: 3036946 **Sample:** 7636593-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	253	101	250	250	100	1	90-110	20	

Analyst: ARM **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/21/2017

Lab Batch ID: 3036672 **Sample:** 7636449-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	881	88	1000	882	88	0	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	914	91	1000	919	92	1	70-135	35	

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

BS / BSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order #: 571798 **Project ID:**

Analyst: JUM **Date Prepared:** 12/28/2017 **Date Analyzed:** 12/28/2017

Lab Batch ID: 3037188 **Sample:** 7636777-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	939	94	1000	866	87	8	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	975	98	1000	920	92	6	70-135	35	

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

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order # : 571798 **Project ID:**

Lab Batch ID: 3036624 **QC- Sample ID:** 571522-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/21/2017 **Date Prepared:** 12/21/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00199	0.0994	0.0734	74	0.0998	0.0880	88	18	70-130	35	
Toluene	<0.00199	0.0994	0.0689	69	0.0998	0.0833	83	19	70-130	35	X
Ethylbenzene	<0.00199	0.0994	0.0721	73	0.0998	0.0767	77	6	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.142	71	0.200	0.138	69	3	70-135	35	X
o-Xylene	<0.00199	0.0994	0.0675	68	0.0998	0.0685	69	1	71-133	35	X

Lab Batch ID: 3036675 **QC- Sample ID:** 571798-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/21/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.100	0.0767	77	0.101	0.0767	76	0	70-130	35	
Toluene	<0.00201	0.100	0.0707	71	0.101	0.0702	70	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0745	75	0.101	0.0747	74	0	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.146	73	0.202	0.147	73	1	70-135	35	
o-Xylene	<0.00201	0.100	0.0694	69	0.101	0.0702	70	1	71-133	35	X

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order # : 571798 **Project ID:**

Lab Batch ID: 3036899 **QC- Sample ID:** 571456-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/26/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	1050	245	1210	65	245	1210	65	0	90-110	20	X

Lab Batch ID: 3036899 **QC- Sample ID:** 572053-007 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/26/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	292	246	551	105	246	550	105	0	90-110	20	

Lab Batch ID: 3036946 **QC- Sample ID:** 571798-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/27/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	29.0	250	289	104	250	290	104	0	90-110	20	

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

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

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pad Area)

Work Order # : 571798 **Project ID:**

Lab Batch ID: 3036946 **QC- Sample ID:** 571798-014 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/27/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	45.1	245	295	102	245	295	102	0	90-110	20	

Lab Batch ID: 3036672 **QC- Sample ID:** 571792-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/21/2017 **Date Prepared:** 12/21/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	858	86	1000	841	84	2	70-135	35	
Diesel Range Organics (DRO)	<15.0	998	869	87	1000	857	86	1	70-135	35	

Lab Batch ID: 3037188 **QC- Sample ID:** 572153-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/28/2017 **Date Prepared:** 12/28/2017 **Analyst:** JUM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	798	80	1000	916	92	14	70-135	35	
Diesel Range Organics (DRO)	18.0	1000	771	75	1000	755	74	2	70-135	35	

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

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

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

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

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

Analysis Request of Chain of Custody Record

571798 Page 1 of 2

Tetra Tech, Inc.

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

Client Name: COG

Site Manager: Ike Tavarez

Project Name: Gunner 16 SWD #1 (Pad Area)

Project Location (county, state): Lea Co. NM

Project #:

Invoice to: COG

Receiving Laboratory: Xenco

Sampler Signature: Juan Cinzalez

Comments: Run deeper samples if benzene exceeds 10 mg/kg, total BTEX exceeds 50 mg/kg, or TPH exceeds 5,000 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE HCL	PRESERVATIVE HNO_3	PRESERVATIVE ICE	# CONTAINERS	FILTERED (Y/N)
	BH-1 0-1	12/18/17			X			X		
	" 2-3				X			X		
	" 4-5				X			X		
	" 6-7				X			X		
	" 9-10				X			X		
	" 14-15				X			X		
	" 19-20				X			X		
	" 24-25				X			X		
	BH-2 0-1				X			X		
	2-3				X			X		

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
X														X				
X		X												X				
														X				
														X				
														X				
														X				
														X				
														X				
														X				
														X				
														X				

Relinquished by: Date: 12/19/17 Time: 2:35

Received by: Jasmine Hreaves Date: 12/19 Time: 2:35

Relinquished by: Date: 12-19-17 Time: 1605

Received by: KRAMER Date: 12.20.17 Time: 1522

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature: 0.1

(Circle) HAND DEL

REMARKS:

RUSH: Same Day 24 hr

Temp: 1.2 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 1.0

ORIGINAL COPY

Final 1.001

Page 23 of 25

Analysis Request of Chain of Custody Record

571798 Page 2 of 2

Tetra Tech, Inc.

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

Client Name: COG

Site Manager: Ike Tavarez

Project Name: Gunner 16 SWD #1 (Pad Area)

Project Location: (county, state) Lea Co NM

Project #:

Invoice to: COG

Receiving Laboratory: Xenco

Sampler Signature: Dan Cinzals

Comments: see page 1 of 2

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE HCL	PRESERVATIVE HNO_3	PRESERVATIVE ICE	# CONTAINERS	FILTERED (Y/N)
	BH-2 4-5	12/18/17			X			X		
	" 6-7				X			X		
	" 9-10				X			X		
	" 14-15				X			X		
	BH-3 0-1				X			X		
	" 2-3				X			X		
	" 4-5				X			X		
	" 6-7				X			X		
	" 9-10				X			X		
	" 14-15				X			X		

ANALYSIS REQUEST
(Circle or Specify Method No.)

BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Sulfate	TDS	General Water Chemistry (see attached list)	Anion/Cation Balance					Hold
X		X													X									

Relinquished by: Date: 12/19/17 Time: 236

Received by: Jennifer Stevens Date: 12/19 Time: 2:35

Relinquished by: Date: 12-19-17 Time: 1605

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

REMARKS:

RUSH: Same Day 24 hr 48 hr 72 hr

Sample Temper

0.1

Temp: 1.7 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 1.0

(Circle) HAND

ORIGINAL COPY

Final 1.001

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 12/19/2017 04:05:00 PM

Work Order #: 571798

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

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

Analyst: PH Device/Lot#:

Checklist completed by: Jessica Kramer Date: 12/20/2017
Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 12/26/2017
Kelsey Brooks

Analytical Report 571800

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

COG-Gunner 16 SWD #1 (Pasture)

28-DEC-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

28-DEC-17

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

Reference: XENCO Report No(s): **571800**
COG-Gunner 16 SWD #1 (Pasture)
Project Address: Lea County 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) 571800. 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. 571800 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Mike Kimmel
Client Services Manager

Sample Cross Reference 571800

Tetra Tech- Midland, Midland, TX

COG-Gunner 16 SWD #1 (Pasture)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH-4 0-1	S	12-19-17 00:00	0 - 1	571800-001
BH-4 2-3	S	12-19-17 00:00	2 - 3	571800-002
BH-4 4-5	S	12-19-17 00:00	4 - 5	571800-003
BH-4 6-7	S	12-19-17 00:00	6 - 7	571800-004
BH-4 9-10	S	12-19-17 00:00	9 - 10	571800-005
BH-4 14-15	S	12-19-17 00:00	14 - 15	571800-006
BH-5 0-1	S	12-19-17 00:00	0 - 1	571800-007
BH-5 2-3	S	12-19-17 00:00	2 - 3	571800-008
BH-5 4-5	S	12-19-17 00:00	4 - 5	571800-009
BH-5 6-7	S	12-19-17 00:00	6 - 7	571800-010
BH-5 9-10	S	12-19-17 00:00	9 - 10	571800-011
BH-5 14-15	S	12-19-17 00:00	14 - 15	571800-012
BH-6 0-1	S	12-19-17 00:00	0 - 1	571800-013
BH-6 2-3	S	12-19-17 00:00	2 - 3	571800-014
BH-6 4-6	S	12-19-17 00:00	4 - 6	571800-015
BH-6 6-7	S	12-19-17 00:00	6 - 7	571800-016
BH-6 9-10	S	12-19-17 00:00	9 - 10	571800-017
BH-6 14-15	S	12-19-17 00:00	14 - 15	571800-018

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3036675 BTEX by EPA 8021B

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

Certificate of Analysis Summary 571800

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 28-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571800-001		571800-002		571800-003		571800-004		571800-005		571800-006	
	Field Id:	BH-4 0-1		BH-4 2-3		BH-4 4-5		BH-4 6-7		BH-4 9-10		BH-4 14-15	
	Depth:	0-1		2-3		4-5		6-7		9-10		14-15	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Dec-21-17 17:00		Dec-21-17 17:00									
	Analyzed:	Dec-22-17 03:18		Dec-22-17 03:37									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Benzene		<0.00202	0.00202	<0.00200	0.00200								
Toluene		<0.00202	0.00202	<0.00200	0.00200								
Ethylbenzene		<0.00202	0.00202	<0.00200	0.00200								
m,p-Xylenes		<0.00404	0.00404	<0.00401	0.00401								
o-Xylene		<0.00202	0.00202	<0.00200	0.00200								
Total Xylenes		<0.00202	0.00202	<0.00200	0.00200								
Total BTEX		<0.00202	0.00202	<0.00200	0.00200								
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:06		Dec-26-17 12:50		Dec-26-17 12:50	
	Analyzed:	Dec-27-17 13:26		Dec-27-17 13:33		Dec-27-17 13:40		Dec-27-17 13:47		Dec-28-17 10:10		Dec-27-17 15:03	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		10.0	4.97	40.2	4.99	813	4.98	5.60	4.93	43.4	4.91	69.3	4.95
TPH By SW8015 Mod	***Extracted:***	Dec-21-17 07:00		Dec-21-17 07:00									
	Analyzed:	Dec-22-17 01:07		Dec-22-17 01:29									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<14.9	14.9								
Diesel Range Organics (DRO)		<15.0	15.0	<14.9	14.9								
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<14.9	14.9								
Total TPH		<15.0	15.0	<14.9	14.9								

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 571800

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 28-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571800-007		571800-008		571800-009		571800-010		571800-011		571800-012	
	Field Id:	BH-5 0-1		BH-5 2-3		BH-5 4-5		BH-5 6-7		BH-5 9-10		BH-5 14-15	
	Depth:	0-1		2-3		4-5		6-7		9-10		14-15	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Dec-21-17 17:00		Dec-21-17 17:00									
	Analyzed:	Dec-22-17 03:56		Dec-22-17 04:14									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Benzene		<0.00200	0.00200	<0.00200	0.00200								
Toluene		<0.00200	0.00200	<0.00200	0.00200								
Ethylbenzene		<0.00200	0.00200	<0.00200	0.00200								
m,p-Xylenes		<0.00399	0.00399	<0.00400	0.00400								
o-Xylene		<0.00200	0.00200	<0.00200	0.00200								
Total Xylenes		<0.00200	0.00200	<0.00200	0.00200								
Total BTEX		<0.00200	0.00200	<0.00200	0.00200								
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50	
	Analyzed:	Dec-27-17 15:10		Dec-27-17 15:17		Dec-27-17 15:24		Dec-27-17 15:44		Dec-27-17 15:51		Dec-27-17 15:58	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		2850	24.7	6380	49.2	864	4.92	<4.99	4.99	8.35	4.96	67.1	5.00
TPH By SW8015 Mod	***Extracted:***	Dec-21-17 07:00		Dec-21-17 07:00									
	Analyzed:	Dec-22-17 01:49		Dec-22-17 02:09									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0								
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0								
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0								
Total TPH		<15.0	15.0	<15.0	15.0								

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 571800

Tetra Tech- Midland, Midland, TX

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Project Id:
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Tue Dec-19-17 04:05 pm
Report Date: 28-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571800-013		571800-014		571800-015		571800-016		571800-017		571800-018	
	Field Id:	BH-6 0-1		BH-6 2-3		BH-6 4-6		BH-6 6-7		BH-6 9-10		BH-6 14-15	
	Depth:	0-1		2-3		4-6		6-7		9-10		14-15	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00		Dec-19-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Dec-21-17 17:00		Dec-21-17 17:00									
	Analyzed:	Dec-22-17 04:33		Dec-22-17 04:52									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Benzene		<0.00201	0.00201	<0.00199	0.00199								
Toluene		<0.00201	0.00201	<0.00199	0.00199								
Ethylbenzene		<0.00201	0.00201	<0.00199	0.00199								
m,p-Xylenes		<0.00402	0.00402	<0.00398	0.00398								
o-Xylene		<0.00201	0.00201	<0.00199	0.00199								
Total Xylenes		<0.00201	0.00201	<0.00199	0.00199								
Total BTEX		<0.00201	0.00201	<0.00199	0.00199								
Inorganic Anions by EPA 300/300.1	***Extracted:***	Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50		Dec-26-17 12:50	
	Analyzed:	Dec-27-17 16:05		Dec-27-17 16:12		Dec-27-17 16:40		Dec-28-17 10:45		Dec-27-17 16:47		Dec-27-17 17:08	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		39.2	4.97	3390	24.6	3890	24.9	5.52	4.90	85.6	4.99	209	4.92
TPH By SW8015 Mod	***Extracted:***	Dec-21-17 16:00		Dec-21-17 16:00									
	Analyzed:	Dec-22-17 03:54		Dec-22-17 04:54									
	Units/RL:	mg/kg	RL	mg/kg	RL								
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0								
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0								
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0								
Total TPH		<15.0	15.0	<15.0	15.0								

Mike Kimmel
Client Services Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036672 **Sample:** 571800-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	76.1	99.8	76	70-135	
o-Terphenyl	39.9	49.9	80	70-135	

Lab Batch #: 3036672 **Sample:** 571800-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:29

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.7	99.6	81	70-135	
o-Terphenyl	41.8	49.8	84	70-135	

Lab Batch #: 3036672 **Sample:** 571800-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.5	99.8	84	70-135	
o-Terphenyl	43.2	49.9	87	70-135	

Lab Batch #: 3036672 **Sample:** 571800-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 02:09

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.0	99.8	89	70-135	
o-Terphenyl	45.5	49.9	91	70-135	

Lab Batch #: 3036675 **Sample:** 571800-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 03:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	80-120	
4-Bromofluorobenzene	0.0270	0.0300	90	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036675 **Sample:** 571800-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 03:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0289	0.0300	96	80-120	
4-Bromofluorobenzene	0.0261	0.0300	87	80-120	

Lab Batch #: 3036677 **Sample:** 571800-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 03:54

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	73.5	99.9	74	70-135	
o-Terphenyl	39.6	50.0	79	70-135	

Lab Batch #: 3036675 **Sample:** 571800-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 03:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0261	0.0300	87	80-120	

Lab Batch #: 3036675 **Sample:** 571800-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

Lab Batch #: 3036675 **Sample:** 571800-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0260	0.0300	87	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036675 **Sample:** 571800-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0287	0.0300	96	80-120	
4-Bromofluorobenzene	0.0279	0.0300	93	80-120	

Lab Batch #: 3036677 **Sample:** 571800-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:54

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.3	99.7	84	70-135	
o-Terphenyl	43.6	49.9	87	70-135	

Lab Batch #: 3036672 **Sample:** 7636449-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.4	100	83	70-135	
o-Terphenyl	43.3	50.0	87	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 02:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3036677 **Sample:** 7636450-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 02:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.3	100	80	70-135	
o-Terphenyl	41.5	50.0	83	70-135	

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036672 **Sample:** 7636449-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.1	100	84	70-135	
o-Terphenyl	45.3	50.0	91	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 3036677 **Sample:** 7636450-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 03:10

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.3	100	77	70-135	
o-Terphenyl	40.7	50.0	81	70-135	

Lab Batch #: 3036672 **Sample:** 7636449-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/21/17 17:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.7	100	84	70-135	
o-Terphenyl	45.4	50.0	91	70-135	

Lab Batch #: 3036675 **Sample:** 7636472-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036677 **Sample:** 7636450-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 03:32

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.2	100	79	70-135	
o-Terphenyl	41.8	50.0	84	70-135	

Lab Batch #: 3036672 **Sample:** 571792-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 18:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.7	99.8	83	70-135	
o-Terphenyl	44.6	49.9	89	70-135	

Lab Batch #: 3036675 **Sample:** 571798-009 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3036677 **Sample:** 571800-013 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	74.4	99.8	75	70-135	
o-Terphenyl	40.5	49.9	81	70-135	

Lab Batch #: 3036672 **Sample:** 571792-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/21/17 18:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.3	100	80	70-135	
o-Terphenyl	42.9	50.0	86	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Orders : 571800,

Project ID:

Lab Batch #: 3036675 **Sample:** 571798-009 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:06

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 3036677 **Sample:** 571800-013 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:34

TPH By SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.6	99.9	83	70-135	
o-Terphenyl	43.6	50.0	87	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

BS / BSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Order #: 571800 **Project ID:**

Analyst: ALJ **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036675 **Sample:** 7636472-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0872	87	0.100	0.0854	85	2	70-130	35	
Toluene	<0.00200	0.0998	0.0805	81	0.100	0.0788	79	2	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0871	87	0.100	0.0848	85	3	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.172	86	0.201	0.167	83	3	70-135	35	
o-Xylene	<0.00200	0.0998	0.0824	83	0.100	0.0798	80	3	71-133	35	

Analyst: LRI **Date Prepared:** 12/26/2017 **Date Analyzed:** 12/27/2017

Lab Batch ID: 3036946 **Sample:** 7636593-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	253	101	250	250	100	1	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

Version: 1.%

BS / BSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Order #: 571800 **Project ID:**

Analyst: LRI **Date Prepared:** 12/26/2017 **Date Analyzed:** 12/27/2017

Lab Batch ID: 3037043 **Sample:** 7636594-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	254	102	250	252	101	1	90-110	20	

Analyst: ARM **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/21/2017

Lab Batch ID: 3036672 **Sample:** 7636449-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	881	88	1000	882	88	0	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	914	91	1000	919	92	1	70-135	35	

Analyst: ARM **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036677 **Sample:** 7636450-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	813	81	1000	851	85	5	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	845	85	1000	866	87	2	70-135	35	

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

Version: 1.%

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Order # : 571800 **Project ID:**

Lab Batch ID: 3036675 **QC- Sample ID:** 571798-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/21/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.100	0.0767	77	0.101	0.0767	76	0	70-130	35	
Toluene	<0.00201	0.100	0.0707	71	0.101	0.0702	70	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0745	75	0.101	0.0747	74	0	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.146	73	0.202	0.147	73	1	70-135	35	
o-Xylene	<0.00201	0.100	0.0694	69	0.101	0.0702	70	1	71-133	35	X

Lab Batch ID: 3036946 **QC- Sample ID:** 571798-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/27/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	29.0	250	289	104	250	290	104	0	90-110	20	

Lab Batch ID: 3036946 **QC- Sample ID:** 571798-014 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/27/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	45.1	245	295	102	245	295	102	0	90-110	20	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Order # : 571800 **Project ID:**

Lab Batch ID: 3037043 **QC- Sample ID:** 571800-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/28/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	43.4	246	287	99	246	288	99	0	90-110	20	

Lab Batch ID: 3037043 **QC- Sample ID:** 571800-016 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/28/2017 **Date Prepared:** 12/26/2017 **Analyst:** LRI

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	5.52	245	242	97	245	251	100	4	90-110	20	

Lab Batch ID: 3036672 **QC- Sample ID:** 571792-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/21/2017 **Date Prepared:** 12/21/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	858	86	1000	841	84	2	70-135	35	
Diesel Range Organics (DRO)	<15.0	998	869	87	1000	857	86	1	70-135	35	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: COG-Gunner 16 SWD #1 (Pasture)

Work Order # : 571800 **Project ID:**

Lab Batch ID: 3036677 **QC- Sample ID:** 571800-013 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/21/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	823	82	999	830	83	1	70-135	35	
Diesel Range Organics (DRO)	<15.0	998	851	85	999	853	85	0	70-135	35	

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

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

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

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

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

Analysis Request of Chain of Custody Record

571800 Page 1 of 2

Tetra Tech, Inc.

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

Client Name: COG

Site Manager: Ike Tavarez

Project Name: Gunner 16 SWD #1 (Pasture)

Project Location: (county, state) Lea Co. NM

Project #:

Invoice to: COG

Receiving Laboratory: Xenco

Sampler Signature: Alan Gonzales

Comments: Run deeper samples if benzene exceeds 10 mg/kg, total BTEX exceeds 50mg/kg or TPH exceeds 5,000 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX:	PRESERVATIVE METHOD: HCL	PRESERVATIVE METHOD: HNO_3	PRESERVATIVE METHOD: ICE	PRESERVATIVE METHOD:	PRESERVATIVE METHOD:	# CONTAINERS	FILTERED (Y/N)
	BH-4 0-1	12/19/17			X				X				
	" 2-3				X				X				
	" 4-5				X				X				
	" 6-7				X				X				
	" 9-10				X				X				
	" 14-15				X				X				
	BH-5 0-1				X				X				
	" 2-3				X				X				
	" 4-5				X				X				
	" 6-7				X				X				

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride	Sulfate	TDS	General Water Chemistry (see attached list)	Anion/Cation Balance					Hold
X		X	X												X										
X		X	X												X										
															X										
															X										
															X										
															X										
															X										
X		X	X												X										
X		X	X												X										
															X										
															X										

Relinquished by: Date: 12/19/17 Time: 23:5

Received by: Jasmine Shearer Date: 12/19 Time: 7:35

Relinquished by: J Shearer Date: 12-19-17 Time: 1605

Received by: [illegible] Date: 12.20.17 Time: 1520

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature 0.1

(Circle) HAND DELIV

REMARKS:

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

Temp: 1.2 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 1.0

ORIGINAL COPY

Final 1.000

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Analysis Request of Chain of Custody Record

571800 Page 2 of 2

Tetra Tech, Inc.

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

Client Name: COG

Site Manager: Ike Tavarez

Project Name: Gunner 16 SWD #1 (Pasture)

Project Location: (county, state) Lea Co NM

Project #:

Invoice to: COG

Receiving Laboratory: Xeno

Sampler Signature: Dan Gonzales

Comments: See page 1 of 2

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)
	BH-5 9-10	12/11/17			X				X				
	" 14-15				X				X				
	BH-6 0-1				X				X				
	" 2-3				X				X				
	" 4-5				X				X				
	" 6-7				X				X				
	" 9-10				X				X				
	" 14-15				X				X				

ANALYSIS REQUEST
(Circle or Specify Method No.)

BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ~~GRO~~ MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
X		X	X												X				
X		X	X												X				
															X				
															X				
															X				
															X				
															X				
															X				

Relinquished by: Date: Time: 12/19/17 2:35

Received by: Jasmine Shearer 12/19 2:35

Relinquished by: J Shearer Date: 12-19-17 Time: 1605

Received by: DRAMOS Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

ORIGINAL COPY

LAB USE ONLY

Sample Temperature

REMARKS:

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

Temp: 1.2 IR ID:R-8

(Circle) CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 1.0

Final 1.000

Page 21 of 22

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 12/19/2017 04:05:00 PM

Work Order #: 571800

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

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

Analyst: PH Device/Lot#:

Checklist completed by: Jessica Kramer Date: 12/20/2017
Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 12/26/2017
Kelsey Brooks