

## SITE INFORMATION

**Report Type: Work Plan      2RP-3932**

### General Site Information:

Site:	State S19 #20					
Company:	COG Operating LLC					
Section, Township and Range	Unit M	Sec. 19	T 17S	R 29E		
County:	Eddy County					
GPS:	32.8155899° N			104.1203995° W		
Surface Owner:	State					
Mineral Owner:						
Directions:	From the intersection of Lovington Hwy & CR 211(Old Loco Rd N) travel north on CR 211 for 0.50 mi, turn west onto lease road for 1.0 mi to the lease road intersection (location).					

### Release Data:

<b>Date Released:</b>	10/6/2016
<b>Type Release:</b>	Oil & Produced Water
<b>Source of Contamination:</b>	Flowline
<b>Fluid Released:</b>	0.5 bbl oil & 7 bbl PW
<b>Fluids Recovered:</b>	0 bbl oil & 2 bbl PW

### Official Communication:

<b>Name:</b>	Robert McNeil		Ike Tavarez
<b>Company:</b>	COG Operating, LLC		Tetra Tech
<b>Address:</b>	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Ste 401
<b>City:</b>	Midland Texas, 79701		Midland, Texas
<b>Phone number:</b>	(432) 686-3023		(432) 687-8110
<b>Fax:</b>	(432) 684-7137		
<b>Email:</b>	<a href="mailto:rmcneil@conchoresources.com">rmcneil@conchoresources.com</a>		<a href="mailto:Ike.Tavarez@tetrattech.com">Ike.Tavarez@tetrattech.com</a>

### Ranking Criteria

<b>Depth to Groundwater:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<50 ft	20	
50-99 ft	10	
>100 ft.	0	125'-150'
<b>WellHead Protection:</b>	<b>Ranking Score</b>	<b>Site Data</b>
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
<b>Surface Body of Water:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
<b>Total Ranking Score:</b>		0

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



**TETRA TECH**

February 13, 2018

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

**Re: Work Plan for the COG Operating LLC., State S19 #20, Unit M, Section 19, Township 17 South, Range 29 East, Eddy County, New Mexico. 2RP-3932.**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess and evaluate a release that occurred at State S19 #20, Unit M, Section 19, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.8155899°, W 104.1203995°. The site location is shown on Figures 1 and 2.

## **Background**

According to the State of New Mexico C-141 Initial Report, the leak was discovered on October 6, 2016, and released approximately 0.5 bbls of oil and 7 bbls of produced water due a corroded steel flowline. Approximately 2 bbls of produced water was recovered. The release occurred in the pasture impacting an area measuring approximately 25'x 35' and migrated onto the lease road impacting an area measuring approximately 40' x 165. The Initial C-141 Form is included in Appendix A.

## **Groundwater**

No wells are listed within Section 19 in the New Mexico Office of the State Engineers database. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 125' and 150' 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,

**Tetra Tech**

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

Tel 432.682.4559 Fax 432.682.3946 [www.tetratech.com](http://www.tetratech.com)



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**

### **Trench Installation**

On December 21, 2016, COG personnel were onsite to evaluate and sample the release area in the pasture. One (1) sample trench was installed to 14.0' below surface in order to evaluate the soils. Due to heavy traffic in the area and corresponding safety concerns, no samples were collected in the release area on the hard packed lease road. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B, and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1.

Referring to Table 1, the area of trench (T-1) showed elevated chloride concentrations in the shallow soils, with a chloride high of 3,040 mg/kg at 3.0' below surface. The chloride concentrations declined with depth to 32.0 mg/kg at 6.0' and 8.0' below surface. However, chloride concentrations spiked at 12.0' (720 mg/kg) and 14.0' (1,230 mg/kg) below surface, respectively. Additionally, the surface sample at trench (T-1) showed benzene, total BTEX, and TPH concentrations below the RRALs.

Based on the laboratory results, ASSI personnel were onsite on October 20, 2017, to install one (1) sample trench (T-1A) in the area of trench (T-1). Samples were collected at 10.0', 11.0' and 12.0' below surface in order to confirm the deeper chloride concentrations detected at trench (T-1). The samples were analyzed for chloride by EPA method 300.0. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1.

Referring to Table 1, the area of trench (T-1A) showed chloride concentrations of 559 mg/kg (10'), 470 mg/kg (11'), and 654 mg/kg (12'). The chloride impact was not vertically defined to below 600 mg/kg.

### **Borehole Installation**

Based on the laboratory results, Tetra Tech personnel returned to the site on December 13, 2017, to install one borehole (BH-1) in the area of trench (T-1) to a total depth of 19'-20' below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B, and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The borehole location is shown in Figure 3. The sampling results are summarized in Table 1.

Referring to Table 1, the area of borehole (BH-1) showed a chloride concentration of 40.2 mg/kg at 9-10', which further declined with depth and showed a bottom hole concentration of 14.2 mg/kg at 19'-20' below surface.



## **Work Plan**

Based on the laboratory results, COG proposes to remove the chloride impacted soils as shown on Figure 4 and highlighted (green) on Table 1. The area of borehole (BH-1) will be excavated to approximately 3.0-4.0' below surface to remove the chloride impacted soils. Due to safety concerns and the heavy traffic, the area on the lease road will not be excavated. The excavated areas will be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

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

## **Conclusion**

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

Respectfully submitted,  
TETRA TECH

Clair Gonzales,  
Geologist I

Ike Tavarez,  
Senior Project Manager, P.G.

cc: Robert McNeill – COG  
Dakota Neel – COG  
Rebecca Haskell – COG  
Crystal Weaver - NMOCD  
Mark Naranjo - SLO

## Figures

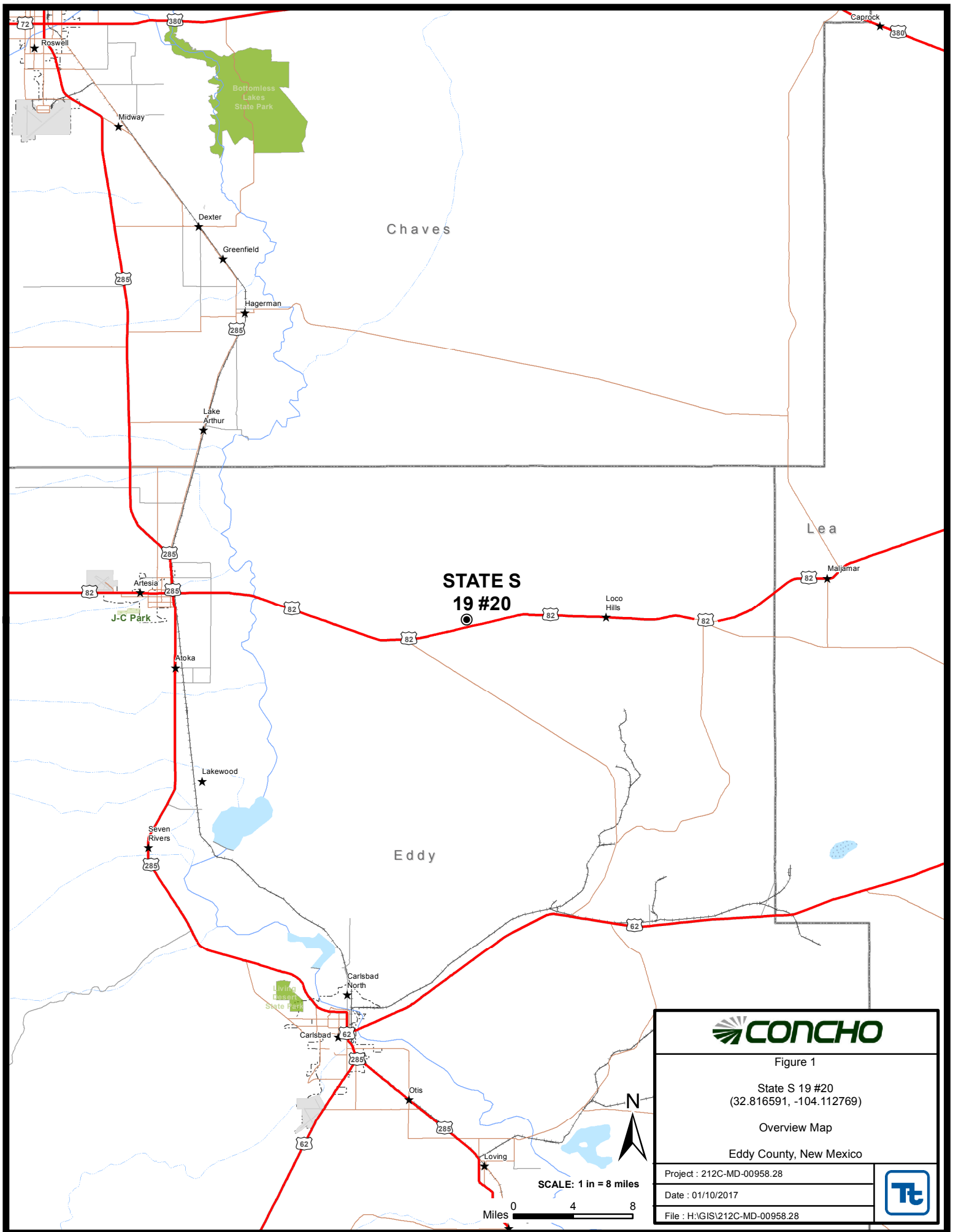


Figure 1

State S 19 #20  
(32.816591, -104.112769)

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00958.28

Date : 01/10/2017

File : H:\GIS\212C-MD-00958.28





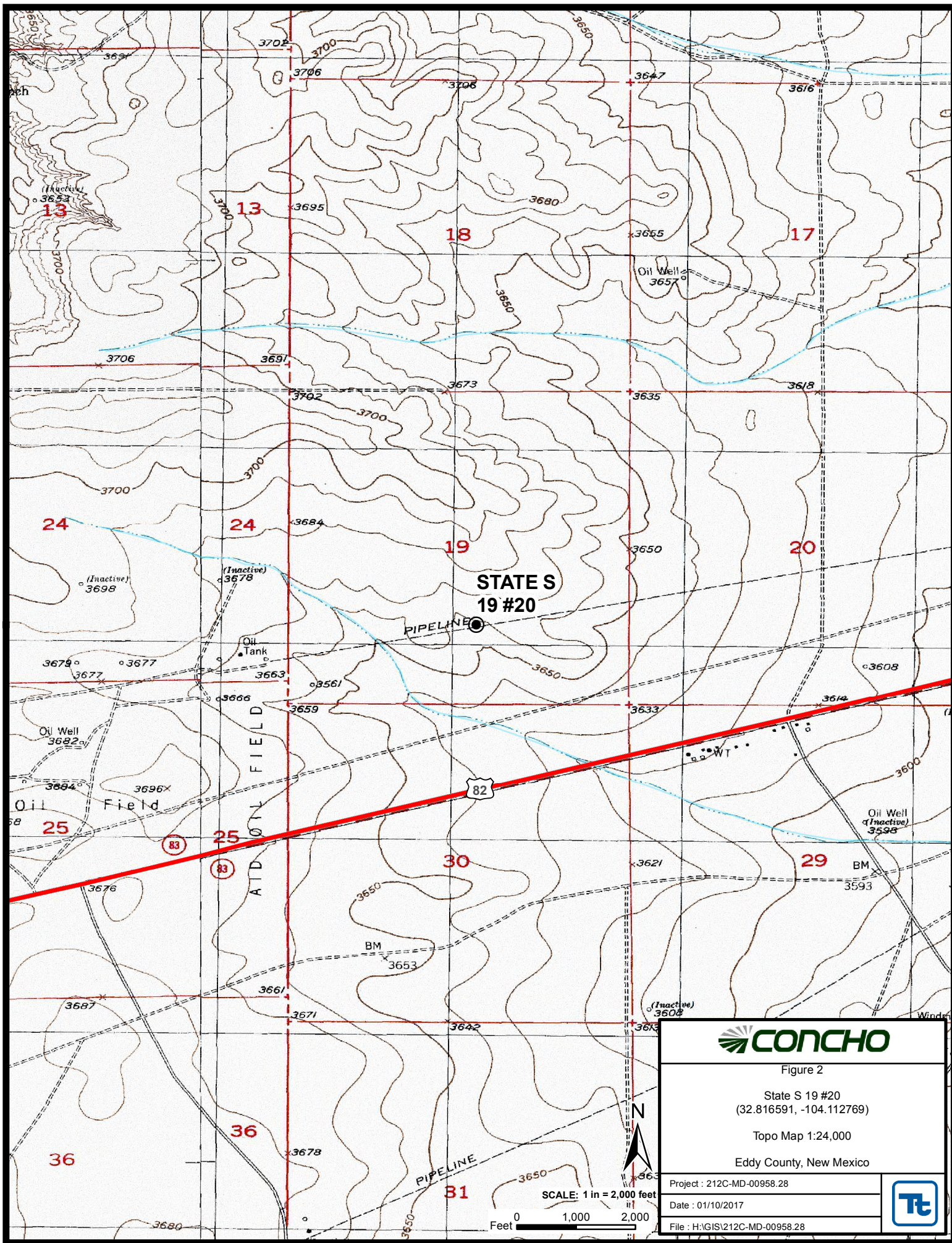


Figure 2

State S 19 #20  
(32.816591, -104.112769)

Topo Map 1:24,000

Eddy County, New Mexico

Project : 212C-MD-00958.28

Date : 01/10/2017

File : H:\GIS\212C-MD-00958.28











PAD

3' - 4' DEEP

BH-1

SPILL AREA  
35'x25'

SPILL AREA  
165'x40'

LEASE ROAD

PASTURE

**EXPLANATION**

- BOREHOLE SAMPLE LOCATION
- PROPOSED EXCAVATION AREA



Figure 4

State S 19 #20  
(32.816591, -104.112769)

Proposed Excavation Area & Depth Map

Eddy County, New Mexico

Project : 212C-MD-00958.28

Date : 01/10/2017

File : H:\GIS\212C-MD-00958.28



Esri, HERE, DeLorme, Mapmy  
HERE, DeLorme, Mapmy  
U: Feet 0 50 100  
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## Tables

**Table 1**  
**COG Operating LLC.**  
**State S 19 #20**  
**Eddy County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
<b>T-1</b>	12/21/2016	Surface	X		<10.0	<10.0	<10.0	<0.0500	0.0570	<0.0500	<0.150	<0.300	<b>2,160</b>
	"	1	X		-	-	-	-	-	-	-	-	592
	"	2	X		-	-	-	-	-	-	-	-	<b>1,140</b>
	"	3	X		-	-	-	-	-	-	-	-	<b>3,040</b>
	"	4	X		-	-	-	-	-	-	-	-	<b>1,680</b>
	"	6	X		-	-	-	-	-	-	-	-	32.0
	"	8	X		-	-	-	-	-	-	-	-	32.0
	"	10	X		-	-	-	-	-	-	-	-	144
	"	12	X		-	-	-	-	-	-	-	-	<b>720</b>
	"	14	X		-	-	-	-	-	-	-	-	<b>1,230</b>
<b>T-1A</b>	10/20/2017	10	X		-	-	-	-	-	-	-	-	559
	"	11	X		-	-	-	-	-	-	-	-	470
	"	12	X		-	-	-	-	-	-	-	-	<b>654</b>
<b>BH-1</b>	12/13/2017	9-10	X		-	-	-	-	-	-	-	-	40.2
	"	14-15	X		-	-	-	-	-	-	-	-	28.4
	"	19-20	X		-	-	-	-	-	-	-	-	14.2

( - ) Not Analyzed



Photos



View North – Area of BH-1



View North – Area of BH-1

## 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

Form C-141  
Revised August 8, 2011

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

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

**Release Notification and Corrective Action**

**OPERATOR**

☒ Initial Report ☐ Final Report

Name of Company:	COG Operating LLC	Contact:	Robert McNeill
Address:	600 West Illinois Avenue, Midland TX 79701	Telephone No.	432-683-7443
Facility Name:	STATE S 19 #020	Facility Type:	Flowline

Surface Owner:	State	Mineral Owner:		API No.	30-015-32060
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**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
M	19	17S	29E	990'	South	330'	West	Eddy

Latitude 32.8155899 Longitude 104.1203995

**NATURE OF RELEASE**

Type of Release:	Oil & Produced Water	Volume of Release:	0.5bbls of Oil & 7bbls of Produced Water	Volume Recovered:	0bbls of Oil & 2bbls of Produced Water
Source of Release:	Flowline	Date and Hour of Occurrence:	10-06-2016 09:00 am	Date and Hour of Discovery:	10-06-2016 09:00 am
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?		Date and Hour:			
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.\*


Describe Cause of Problem and Remedial Action Taken.\*

A steel flowline corroded due to age. Placed a clap on the damaged area until the line can be replaced with a polyline.

Describe Area Affected and Cleanup Action Taken.\*

This release occurred within the pasture, alongside the road. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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:		<b>OIL CONSERVATION DIVISION</b>	
Printed Name:	Robert Grubbs Jr.	Approved by Environmental Specialist:	
Title:	Senior Environmental Coordinator	Approval Date:	Expiration Date:
E-mail Address:	<a href="mailto:rgrubbs@concho.com">rgrubbs@concho.com</a>	Conditions of Approval:	
Date:	October 7, 2016	Phone:	432-683-7443
		Attached <input type="checkbox"/>	

\* Attach Additional Sheets If Necessary

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - State S19 #20**  
**Eddy County, New Mexico**

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

16 South			29 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 220	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

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

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

17 South			29 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22 76	23	24
30	29 210	28	27	26	25
31	32	33	34	35	36

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

18 South			28 East		
6	5	4	3	2 55	1
7	8 81	9	10	11	12
18	17	16	15 80	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

18 South			29 East		
6	5	4	3	2	1
7	8	9	10 95	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

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

**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	Sub-basin	County	Q Q Q	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
<a href="#">RA 11807 POD1</a>			ED	1 2 3	22	17S	29E	587360	3631585	131	76	55

Average Depth to Water: **76 feet**

Minimum Depth: **76 feet**

Maximum Depth: **76 feet**

**Record Count:** 1

**PLSS Search:**

**Township:** 17S

**Range:** 29E

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

12/29/17 8:33 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

## Appendix C



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

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January 05, 2017

DAKOTA NEEL

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: STATE 19 #20

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

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

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

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

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: STATE 19 #20  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 12/21/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T1 - SURFACE (H602893-01)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/30/2016	ND	1.82	91.1	2.00	2.19	
<b>Toluene*</b>	<b>0.057</b>	0.050	12/30/2016	ND	1.85	92.3	2.00	2.27	
Ethylbenzene*	<0.050	0.050	12/30/2016	ND	1.90	95.0	2.00	2.67	
Total Xylenes*	<0.150	0.150	12/30/2016	ND	5.54	92.3	6.00	2.61	
Total BTEX	<0.300	0.300	12/30/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 100 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2160	16.0	01/03/2017	ND	400	100	400	0.00		

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

Surrogate: 1-Chlorooctane 101 % 35-147

Surrogate: 1-Chlorooctadecane 115 % 28-171

**Sample ID: T1 - 1' (H602893-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	592	16.0	01/03/2017	ND	400	100	400	0.00		

Cardinal Laboratories

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

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

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: STATE 19 #20  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 12/21/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T1 - 2' (H602893-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1140	16.0	01/03/2017	ND	400	100	400	0.00	

**Sample ID: T1 - 3' (H602893-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3040	16.0	01/03/2017	ND	400	100	400	0.00	

**Sample ID: T1 - 4' (H602893-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1680	16.0	01/03/2017	ND	400	100	400	0.00	

**Sample ID: T1 - 6' (H602893-06)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	01/03/2017	ND	400	100	400	0.00	

**Sample ID: T1 - 8' (H602893-07)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	01/03/2017	ND	400	100	400	0.00	

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

 Received: 12/29/2016  
 Reported: 01/05/2017  
 Project Name: STATE 19 #20  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 12/21/2016  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Angela Cabrera

**Sample ID: T1 - 10' (H602893-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	144	16.0	01/03/2017	ND	400	100	400	0.00	

**Sample ID: T1 - 12' (H602893-09)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	720	16.0	01/03/2017	ND	416	104	400	0.00	

**Sample ID: T1 - 14' (H602893-10)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1230	16.0	01/03/2017	ND	416	104	400	0.00	

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

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

---

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Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: COG Operating LLC

Project Manager: Dakota Neel

Address: 2208 West Main

City: Artesia

Phone #: 432-215-2783

Project #:

Project Name: STATE 19 #20

Project Location:

Sampler Name: Dakota Neel & Aaron Lieb

FOR LAB USE ONLY

Lab I.D. Sample I.D.

11602883

Lab I.D.	Sample I.D.	T1 - SURFACE	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX	PRESERV.	SAMPLING
1		T1 - 1'			GROUNDWATER		
2		T1 - 2'			WASTEWATER		
3		T1 - 3'			SOIL		
4		T1 - 4'			OIL		
5		T1 - 6'			SLUDGE		
6		T1 - 8'			OTHER :		
7		T1 - 10'			ACID/BASE:		
8		T1 - 12'			ICE / COOL		
9		T1 - 14'			OTHER :		

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: *[Signature]* Date: 12-29-16 Received By: *[Signature]* Date: 12-29-16  
Time: 12:05  
Relinquished By: *[Signature]* Received By: *[Signature]*  
Time: *[Signature]*

Delivered By: (Circle One)

Sampler - UPS - Bus - Other: #75

5.22

Sample Condition

Cool Intact  
☒ Yes ☐ No  
☐ Yes ☐ No

CHECKED BY: *[Signature]*

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

dneel2@concho.com  
rqrubbs@concho.com

Please only run deeper horizons for BTEX AND TPH if Benzene exceeds 10ppm, BTEX exceeds 50ppm, and TPH exceeds 5000ppm.



# **Analytical Report 571335**

## **for Tetra Tech- Midland**

**Project Manager: Ike Tavaréz**

**State S19 # 20**

**212C-MD-00958.28**

**22-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)



22-DEC-17

Project Manager: **Ike Tavaréz**

**Tetra Tech- Midland**

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **571335**

**State S19 # 20**

Project Address: Eddy Co, NM

**Ike Tavaréz:**

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) 571335. 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. 571335 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

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Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



## Sample Cross Reference 571335



### Tetra Tech- Midland, Midland, TX

State S19 # 20

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH-1 9-10	S	12-13-17 00:00		571335-005
BH-1 14-15	S	12-13-17 00:00		571335-006
BH-1 19-20	S	12-13-17 00:00		571335-007
BH-1 0-1	S	12-13-17 00:00		Not Analyzed
BH-1 2-3	S	12-13-17 00:00		Not Analyzed
BH-1 4-5	S	12-13-17 00:00		Not Analyzed
BH-1 6-7	S	12-13-17 00:00		Not Analyzed



## CASE NARRATIVE

*Client Name: Tetra Tech- Midland*

*Project Name: State S19 # 20*

Project ID: 212C-MD-00958.28  
Work Order Number(s): 571335

Report Date: 22-DEC-17  
Date Received: 12/15/2017

---

**Sample receipt non conformances and comments:**

---

**Sample receipt non conformances and comments per sample:**

None





# Certificate of Analysis Summary 571335

Tetra Tech- Midland, Midland, TX

Project Name: State S19 # 20



Project Id: 212C-MD-00958.28

Contact: Ike Tavaréz

Project Location: Eddy Co, NM

Date Received in Lab: Fri Dec-15-17 01:00 pm

Report Date: 22-DEC-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	571335-005	571335-006	571335-007			
	<i>Field Id:</i>	BH-1 9-10	BH-1 14-15	BH-1 19-20			
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL			
	<i>Sampled:</i>	Dec-13-17 00:00	Dec-13-17 00:00	Dec-13-17 00:00			
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Dec-20-17 08:30	Dec-20-17 11:20	Dec-20-17 11:20			
	<i>Analyzed:</i>	Dec-20-17 14:04	Dec-20-17 14:46	Dec-20-17 15:07			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL			
Chloride		40.2 4.97	28.4 4.90	14.2 4.98			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use.  
The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories.  
XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented.  
Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Kelsey Brooks  
Project Manager

- 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

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 9701 Harry Hines Blvd, Dallas, TX 75220  
 5332 Blackberry Drive, San Antonio TX 78238  
 1211 W Florida Ave, Midland, TX 79701  
 2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282

Phone	Fax
(281) 240-4200	(281) 240-4280
(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



# BS / BSD Recoveries



Project Name: State S19 # 20

Work Order #: 571335

Project ID: 212C-MD-00958.28

Analyst: LRI

Date Prepared: 12/20/2017

Date Analyzed: 12/20/2017

Lab Batch ID: 3036429

Sample: 7636277-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

## BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	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
Analytes											
Chloride	<5.00	250	259	104	250	262	105	1	90-110	20	

Analyst: LRI

Date Prepared: 12/20/2017

Date Analyzed: 12/20/2017

Lab Batch ID: 3036587

Sample: 7636292-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

## BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	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
Analytes											
Chloride	<5.00	250	267	107	250	264	106	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



# Form 3 - MS / MSD Recoveries



Project Name: State S19 # 20

Work Order #: 571335

Project ID: 212C-MD-00958.28

Lab Batch ID: 3036429

QC- Sample ID: 571265-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

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	232	248	485	102	248	484	102	0	90-110	20	

Lab Batch ID: 3036429

QC- Sample ID: 571663-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

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	1010	250	1230	88	250	1240	92	1	90-110	20	X

Lab Batch ID: 3036587

QC- Sample ID: 571335-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

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	28.4	245	295	109	245	289	106	2	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: State S19 # 20

Work Order # : 571335

Project ID: 212C-MD-00958.28

Lab Batch ID: 3036587

QC- Sample ID: 571336-010 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/20/2017

Date Prepared: 12/20/2017

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	1200	248	1400	81	248	1390	77	1	90-110	20	X

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

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

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



# Tetra Tech, Inc.

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

## 571335

Client Name: CCG		Site Manager: Ike Tovar	
Project Name: State 519 # 20		Project #: 212C-MD-0058.28	
Project Location: (county, state) Eddy Co NM		Invoice to: CCG	
Receiving Laboratory: Xenco		Sample Signature: Alan Cargale	
Comments:			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX	PRESERVATIVE METHOD				# CONTAINERS	FILTERED (Y/N)		
		YEAR:	DATE		TIME	WATER	SOIL	HCL			HNO <sub>3</sub>	ICE
BH-1	0-1 H <sub>2</sub> O		12/13/17		X		X	X	X	X		
"	2-3 H <sub>2</sub> O				X		X	X	X	X		
"	4-5 H <sub>2</sub> O				X		X	X	X	X		
"	10-7 H <sub>2</sub> O				X		X	X	X	X		
"	9-10 H <sub>2</sub> O				X		X	X	X	X		
"	14-15 H <sub>2</sub> O				X		X	X	X	X		
"	19-20				X		X	X	X	X		

Relinquished by: [Signature]	Date: 12/15/17	Time: 10c	Received by: [Signature]	Date: 12/15/17	Time: 1:00
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY	Sample Temperature	Temp: 0.30c		IR ID: R-8
		CF: (0.6: -0.2°C)	Corrected Temp: 0.10c	
<input type="checkbox"/> Rush Charges Authorized <input type="checkbox"/> Special Report Limits or TRRP Report		(Circle) HAND DELIVERED FEDEX UPS Tracking #:		

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	

ORIGINAL COPY



**XENCO Laboratories**  
**Prelogin/Nonconformance Report- Sample Log-In**



**Client:** Tetra Tech- Midland

**Date/ Time Received:** 12/15/2017 01:00:00 PM

**Work Order #:** 571335

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

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

Analyst:

PH Device/Lot#:

**Checklist completed by:**

Connie Hernandez

Date: 12/15/2017

**Checklist reviewed by:**

Kelsey Brooks

Date: 12/20/2017