

SITE INFORMATION

Report Type: Work Plan 2RP-4276 and 2RP-4277

General Site Information:

Site:	Copperhead 31 Federal Com #001H					
Company:	COG Operating LLC					
Section, Township and Range	Unit G	Sec. 30	T 26S	R 29E		
Lease Number:	API No. 30-015-38532					
County:	Eddy County					
GPS:	32.015107			104.022121		
Surface Owner:	Private					
Mineral Owner:	Federal					
Directions:	From Malaga, New Mexico. Go south 16 miles on Highway 285, turn left (east) onto CR 726 and go 1.6 miles, turn left (north) and go 1.4 miles, turn left (west) and follow road 0.5 miles to facility.					

Release Data:

2 RP Number	4276	4277
Date Released:	6/26/2017	6/27/2017
Type Release:	Produced Water	Produced Water
Source of Contamination:	Poly Flow line	Poly Flow line
Fluid Released:	10 bbls	50 bbls
Fluids Recovered:	0 bbls.	0 bbls.

Official Communication:

Name:	Robert McNeil	Ike Tavarez
Company:	COG Operating, LLC	Tetra Tech
Address:	One Concho Center 600 W. Illinois Ave.	4000 N. Big Spring 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@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	
<50 ft	20	
50-99 ft	10	50-75'
>100 ft.	0	
WellHead Protection:	Ranking Score	
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	
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:		10

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	1,000



TETRA TECH

September 22, 2017

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

Re: Work Plan for the COG Operating LLC., Copperhead 31 Federal Com 001H Tank Battery, Unit G, Section 30, Township 26 South, Range 29 East, Eddy County, New Mexico. 2RP-4276 and 2 RP-4277

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to a work plan for the Copperhead 31 Federal Com #001H Tank Battery, Unit G, Section 30, Township 26 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.015107, W 104.022121. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141s Initial Reports, the first release was discovered on June 26, 2017, and released approximately ten (10) barrels of produced water due to a power loss at the Schmitt SWD, causing the flow line to pressure up and split. None of the fluids were recovered from the release. The second release overlapped the footprint of the first release and occurred the following day on June 27, 2017, due to a weld failure on the flowline that was recently repaired. The second spill released approximately fifty (50) barrels of produced water and none was recovered. Both of the releases occurred in the pasture to the southwest of the tank battery and measured approximately 35' x 425'. The initial C-141 form is included in Appendix A. The release area is shown on Figure 3.

Groundwater

No water wells were listed within Section 30 on the New Mexico Office of the State Engineer's website. However, one (1) well is listed in Section 05 and has a reported depth to groundwater of 78' below surface. One (1) water well is listed in Section 16, Township 26 South, Range 29 East in to the Geology and Groundwater Resources of Eddy County, NM (Report 3), with a reported depth to groundwater of 125' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the

Tetra Tech

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

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



area of Section 30 is between 50' to 75' 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 1,000 mg/kg.

Site Remediation and Soil Sampling

On July 13, 2017, COG personnel were onsite to evaluate and assess the spill area. A total of three (3) sample trenches (T-1, T-2 and T-3) were installed to depths of 18.0', 9.0' and 8.0' below surface, respectively. Selected samples were analyzed for TPH by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3.

Referring to Table 1, all of the samples showed total TPH, benzene, and total BTEX concentrations below the laboratory reporting limits. Trenches (T-1 and T-2) showed elevated chloride concentrations in the shallow soils (from surface to 1.0' below surface) ranging from 4,140 mg/kg to 19,800 mg/kg, which both significantly declined with depth. Trench (T-1) declined to 257 mg/kg at 2.0', then increased to 650 mg/kg at 3.0', 805 mg/kg at 4.0', and 794 mg/kg at 6.0' below surface. Trench (T-2) also spiked at 2.0', 3.0' and 4.0' with chloride concentrations of 1,840 mg/kg, 1,000 mg/kg and 703 mg/kg, respectively. The chloride concentrations in the areas of trenches (T-1 and T-2) then declined with depth to 520 mg/kg at 8.0' and 112 mg/kg at 6.0', respectively, and showed bottom trench concentrations of 274 mg/kg (T-1) and 242 mg/kg (T-2).

Trench (T-3) did not show a significant chloride impact to the area with a chloride high of 1,270 mg/kg at surface which declined with depth. A chloride spike was also detected at trench (T-3) at depths of 2.0' of 867 mg/kg and 3.0' of 960 mg/kg, which then declined with depth. However, the bottom sample at 8.0' below surface showed a chloride spike of 755 mg/kg. The spike appears to be due to either lab error or the sample was cross-contaminated from the upper soils.

Work Plan

Based on the laboratory results, COG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. The area of trench (T-1) will be excavated to a depth of 2.0' and area the trench (T-2) to a depth of 3.0'-4.0' below surface. Additionally, the area of trench (T-3) will be excavated to a depth of 1.0' below surface.



TETRA TECH

Once the areas are excavated to the appropriate depths, the 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.

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.

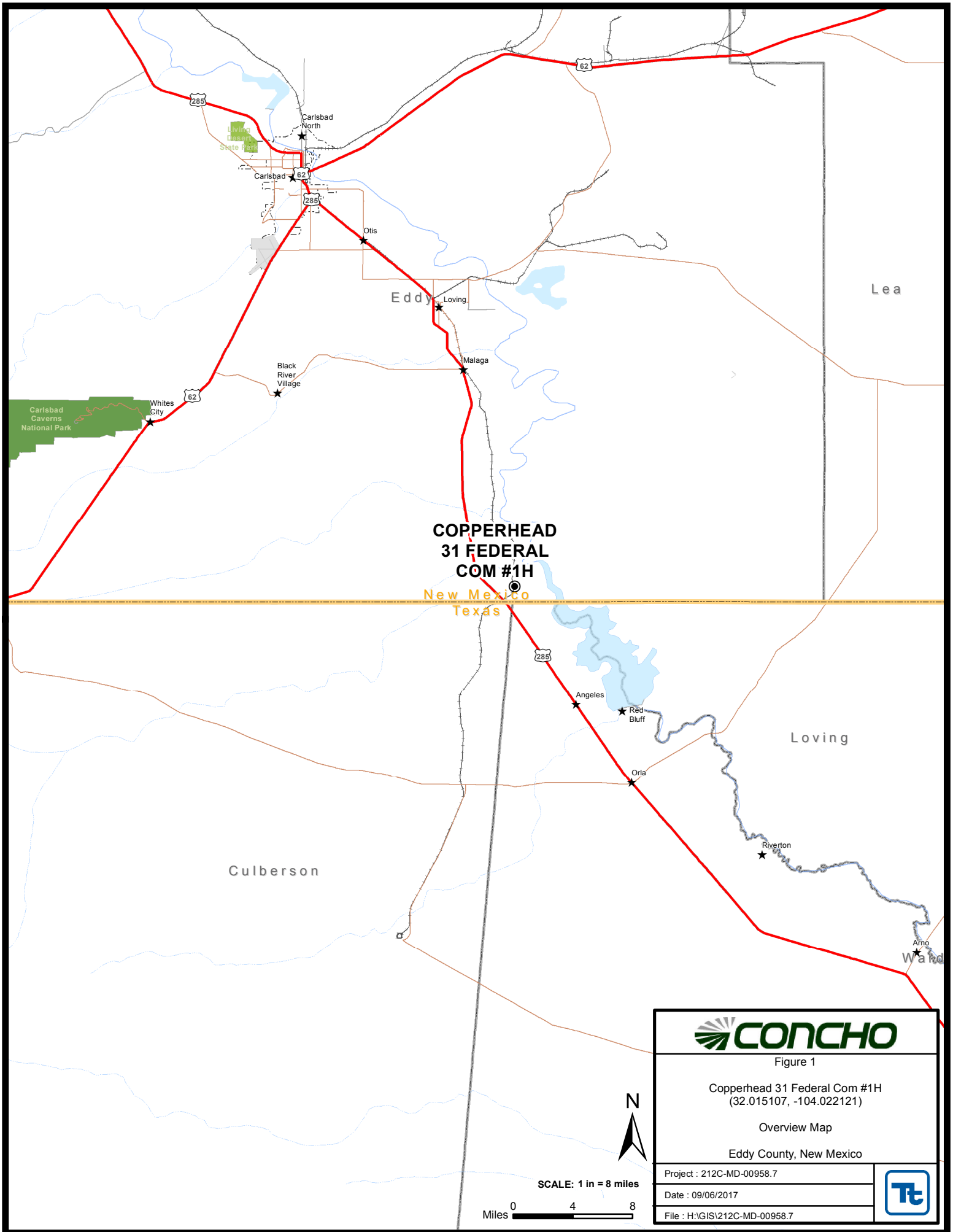
Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Senior Project Manager

Clair Gonzales,
Geologist I

cc: Robert McNeill – COG
Dakota Neel
Shelly Tucker – BLM

Figures



**COPPERHEAD
31 FEDERAL
COM #1H**

New Mexico
Texas



Figure 1

Copperhead 31 Federal Com #1H
(32.015107, -104.022121)

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00958.7

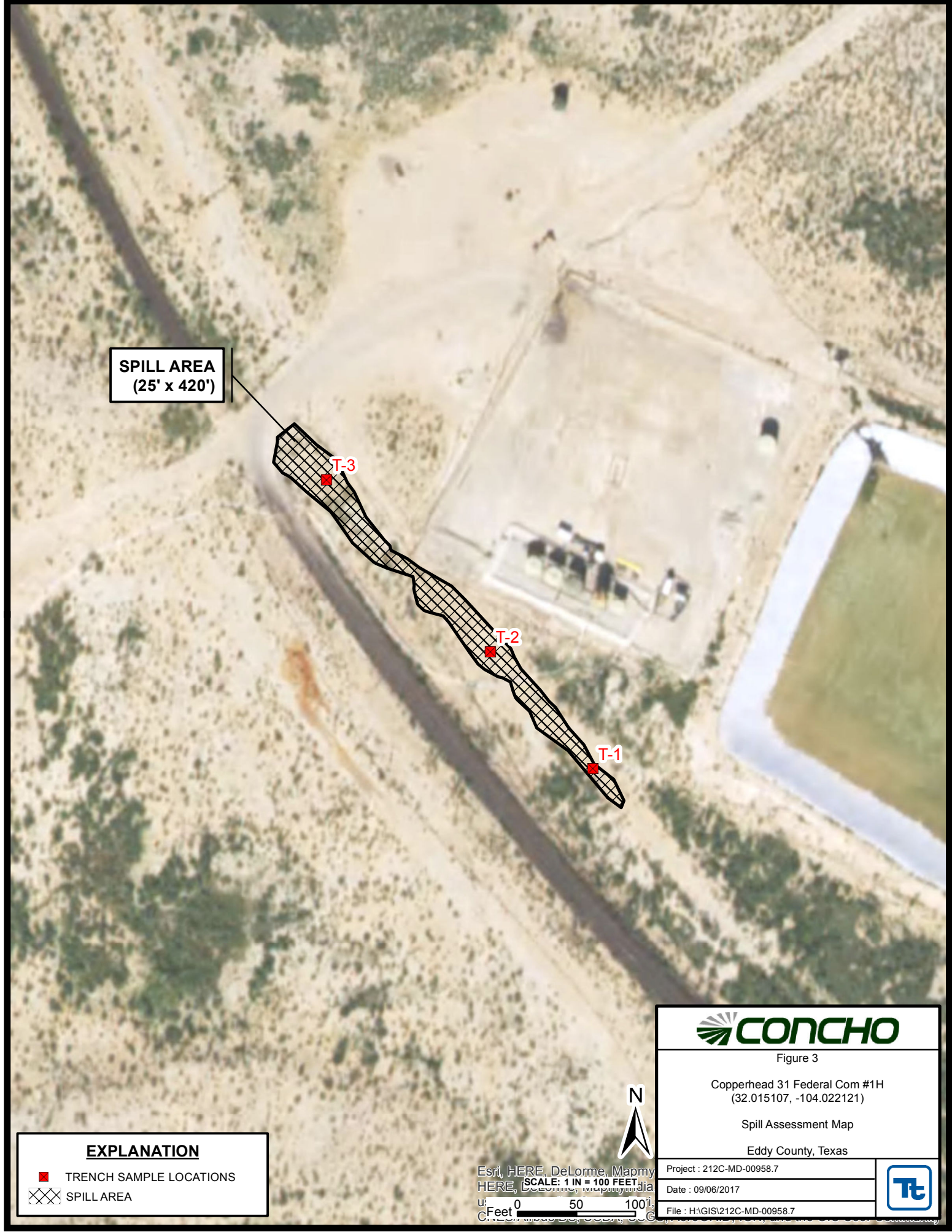
Date : 09/06/2017

File : H:\GIS\212C-MD-00958.7



SCALE: 1 in = 8 miles





SPILL AREA
(25' x 420')

T-3

T-2

T-1

EXPLANATION

- TRENCH SAMPLE LOCATIONS
- XXXX SPILL AREA



Esri, HERE, DeLorme, Mapmy
HERE, DeLorme, MapmyIndia
U: Feet 0 50 100
C: 212C-MD-00958.7



Figure 3

Copperhead 31 Federal Com #1H
(32.015107, -104.022121)

Spill Assessment Map

Eddy County, Texas

Project : 212C-MD-00958.7

Date : 09/06/2017

File : H:\GIS\212C-MD-00958.7



1' DEEP
(25' x 150')

T-3

3' - 4' DEEP
(25' x 160')

T-2

2' DEEP
(25' x 110')

T-1

EXPLANATION

- TRENCH SAMPLE LOCATIONS
- PROPOSED EXCAVATION AREAS



Figure 4

Copperhead 31 Federal Com #1H
(32.015107, -104.022121)

Proposed Excavation Areas & Depths Map

Eddy County, Texas

Project : 212C-MD-00958.7

Date : 09/06/2017

File : H:\GIS\212C-MD-00958.7



Esri, HERE, DeLorme, Mapmy
SCALE: 1 IN = 100 FEET
HERE, DeLorme, Mapmy
U: Feet 0 50 100

Tables

Table 1
COG Operating LLC.
Copperhead 31 Fed Com #6H
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	C6-C10	C10-C28	C28-C35	Total						
T-1	7/13/2017	Surface	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	9850
	"	1	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	4140
	"	2	X		<15.0	<15.0	<15.0	<15.0	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	257
	"	3	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	650
	"	4	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	805
	"	6	X		-	-	-	-	-	-	-	-	-	794
	"	8	X		-	-	-	-	-	-	-	-	-	520
	"	10	X		-	-	-	-	-	-	-	-	-	250
	"	12	X		-	-	-	-	-	-	-	-	-	575
	"	14	X		-	-	-	-	-	-	-	-	-	59.3
	"	16	X		-	-	-	-	-	-	-	-	-	128
	"	18	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	274
T-2	7/13/2017	Surface	X		<15.0	<15.0	<15.0	<15.0	<0.00347	<0.00347	<0.00347	<0.00347	<0.00347	19800
	"	1	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	11900
	"	2	X		<14.9	<14.9	<14.9	<14.9	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	1840
	"	3	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	1000
	"	4	X		<14.9	<14.9	<14.9	<14.9	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	703
	"	6	X		-	-	-	-	-	-	-	-	-	112
	"	8	X		-	-	-	-	-	-	-	-	-	81.5
	"	9	X		<15.0	<15.0	<15.0	<15.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	242
T-3	7/13/2017	Surface	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	1270
	"	1	X		<15.0	<15.0	<15.0	<15.0	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	158
	"	2	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	867
	"	3	X		<15.0	<15.0	<15.0	<15.0	<0.00338	<0.00338	<0.00338	<0.00338	<0.00338	960
	"	4	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	159
	"	6	X		-	-	-	-	-	-	-	-	-	125
	"	8	X		-	-	-	-	-	-	-	-	-	755

(-)

Not Analyzed
Proposed Excavation Depth

Appendix A

NM OIL CONSERVATION
ARTESIA DISTRICT

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

JUN 29 2017

Form C-141
Revised August 8, 2011

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

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

Release Notification and Corrective Action

NAB1718640510

217955 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. 432-683-7443
Facility Name: Copperhead 31 Federal Com #001H	Facility Type: Flowline
Surface Owner: Private	Mineral Owner: Federal
API No. 30-015-38532	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	30	26S	29E	1980	North	1980	East	Eddy

Latitude 32.015107 Longitude -104.022121

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 10 bbl.	Volume Recovered: 0 bbl.
Source of Release: Poly Flowline	Date and Hour of Occurrence: June 26, 2017 3:00 pm	Date and Hour of Discovery: June 26, 2017 3:00 pm
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was due to a power loss resulting in the Schmitt SWD shutting in. The line pressured up and split. The section of flowline that failed was cut and the line was fused back together.

Describe Area Affected and Cleanup Action Taken.*

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

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist: <i>Crystal W...</i>	
Title: Senior HSE Coordinator	Approval Date: <i>6/3/17</i>	Expiration Date: <i>N/A</i>
E-mail Address: rhaskell@concho.com	Conditions of Approval: <i>see attached</i>	Attached ☒
Date: June 29, 2017 Phone: 432-683-7443		

* Attach Additional Sheets If Necessary

Please refer to the New Mexico Oil Conservation Division Website for updated form(s) at:
<http://www.emnrd.state.nm.us/OCD/forms.html>
Thank you

2RP-4277

NM OIL CONSERVATION

ARTESIA DISTRICT

NM OIL CONSERVATION

ARTESIA DISTRICT

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
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1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

JUN 29 2017

State of New Mexico
Energy Minerals and Natural Resources

JUN 29 2017

Form C-141
Revised August 8, 2011

RECEIVED

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

RECEIVED

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

Release Notification and Corrective Action

NAB 1718639055

217955 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. 432-683-7443
Facility Name: Copperhead 31 Federal Com #001H	Facility Type: Flowline

Surface Owner: Private	Mineral Owner: Federal	API No. 30-015-38532
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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
G	30	26S	29E	1980	North	1980	East	Eddy

Latitude 32.015107 Longitude -104.022121

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 50 bbl.	Volume Recovered: 0 bbl.
Source of Release: Poly Flowline	Date and Hour of Occurrence: June 27, 2017 1:30 pm	Date and Hour of Discovery: June 27, 2017 1:30 pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Ms. Weaver - NMOCD / Ms. Tucker - BLM	
By Whom? Rebecca Haskell	Date and Hour: June 27, 2017 3:47 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.*

The release was due to a failure in a fuse in the polyline which was recently repaired. The fuse was repaired.

Describe Area Affected and Cleanup Action Taken.*

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

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist: <i>C. A. Weaver</i>	
Title: Senior HSE Coordinator	Approval Date: 7/3/17	Expiration Date: N/A
E-mail Address: rhaskell@concho.com	Conditions of Approval: see attached	Attached ☒
Date: June 29, 2017 Phone: 432-683-7443		

* Attach Additional Sheets If Necessary

Please refer to the New Mexico Oil Conservation Division Website for updated form(s) at:
<http://www.emnrd.state.nm.us/OCD/forms.html>
Thank you

2RP-4276

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Copperhead 31 Federal Com #001H
Eddy County, New Mexico

25 South			28 East		
6	5	4	35	3	2
	59			32	1
7	Artesia	9	10	11	12
18	17	16	15	48	14
67	20	21	22	49	24
19	96	28	27	26	40
30	15	90	34	35	36
31	32	33	34	35	40

25 South			29 East		
6	5	4	3	2	1
40			10	11	12
18	17	16	15	40	14
19	20	21	22	60	24
30	29	28	27	26	25
30	32	115	34	35	36
31	32	33	34	35	36

25 South			30 East		
6	5	4	3	2	295
7	264	8	9	295	12
18	17	16	15	14	390
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
31	32	33	34	35	36

26 South			28 East		
6	5	4	3	2	120
				21	
7	8	9	10	11	100
18	17	16	15	14	13
19	20	21	22	23	56
30	29	28	27	26	25
31	32	33	34	35	36

26 South			29 East		
6	5	78	4	3	2
7	8		9	10	11
18	17	16	15	14	13
19	20	21	22	57	24
30	29	28	27	26	25
31	32	33	34	35	36
31	32	33	34	35	36

26 South			30 East		
6	5	179	4	3	2
7	180	8	9	10	11
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
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

Appendix C



Certificate of Analysis Summary 557801

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1H



Project Id:

Contact: Aaron Lieb

Project Location: Copperhead 31 Fed

Date Received in Lab: Tue Jul-18-17 11:15 am

Report Date: 27-JUL-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	557801-001	557801-002	557801-003	557801-004	557801-005	557801-006
	Field Id:	T1-Surf	T1-1'	T1-2'	T1-3'	T1-4'	T1-6'
	Depth:		1- ft	2- ft	3- ft	4- ft	6- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00
BTEX by EPA 8021B	Extracted:	Jul-20-17 09:00	Jul-20-17 09:00	Jul-20-17 09:00	Jul-20-17 09:00	Jul-20-17 09:00	
	Analyzed:	Jul-20-17 16:04	Jul-24-17 12:55	Jul-20-17 17:02	Jul-20-17 16:23	Jul-24-17 12:55	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
	Benzene	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
	Toluene	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
Ethylbenzene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
m,p-Xylenes		<0.00398 0.00398	<0.00398 0.00398	<0.00396 0.00396	<0.00399 0.00399	<0.00402 0.00402	
o-Xylene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
Total Xylenes		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
Total BTEX		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00201 0.00201	
Inorganic Anions by EPA 300/300.1	Extracted:	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30
	Analyzed:	Jul-25-17 10:23	Jul-25-17 10:30	Jul-25-17 10:00	Jul-25-17 10:38	Jul-25-17 10:46	Jul-25-17 11:47
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Chloride	9850 98.2	4140 25.0	257 4.99	650 4.99	805 4.85	794 4.92
TPH By SW8015 Mod	Extracted:	Jul-19-17 14:00	Jul-19-17 14:00	Jul-19-17 14:00	Jul-19-17 14:00	Jul-19-17 14:00	
	Analyzed:	Jul-20-17 00:21	Jul-20-17 00:42	Jul-20-17 01:03	Jul-20-17 01:24	Jul-20-17 01:45	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
	Gasoline Range Hydrocarbons (GRO)	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	
	Diesel Range Organics (DRO)	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	
Oil Range Hydrocarbons (ORO)		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	
Total TPH		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	

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Version: 1.9%

Kelsey Brooks
Project Manager



Certificate of Analysis Summary 557801

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1H



Project Id:

Contact: Aaron Lieb

Project Location: Copperhead 31 Fed

Date Received in Lab: Tue Jul-18-17 11:15 am

Report Date: 27-JUL-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	557801-007	557801-008	557801-009	557801-010	557801-011	557801-012
	Field Id:	T1-8'	T1-10'	T1-12'	T1-14'	T1-16'	T1-18'
	Depth:	8- ft	10- ft	12- ft	14- ft	16- ft	18- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:00	Jul-13-17 09:30	Jul-13-17 09:30
BTEX by EPA 8021B	Extracted:						Jul-20-17 13:30
	Analyzed:						Jul-21-17 00:33
	Units/RL:						mg/kg RL
							<0.00201 0.00201
							<0.00201 0.00201
							<0.00201 0.00201
							<0.00402 0.00402
							<0.00201 0.00201
							<0.00201 0.00201
							<0.00201 0.00201
							<0.00201 0.00201
							<0.00201 0.00201
Inorganic Anions by EPA 300/300.1	Extracted:	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30
	Analyzed:	Jul-25-17 11:09	Jul-25-17 11:17	Jul-25-17 11:24	Jul-25-17 11:32	Jul-25-17 11:40	Jul-25-17 12:10
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		520 24.7	250 50.1	575 50.5	59.3 49.1	128 48.9	274 50.0
TPH By SW8015 Mod	Extracted:						Jul-19-17 14:00
	Analyzed:						Jul-20-17 02:05
	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

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Version: 1.0%

Kelsey Brooks
Project Manager



Certificate of Analysis Summary 557801

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1H



Project Id:

Contact: Aaron Lieb

Project Location: Copperhead 31 Fed

Date Received in Lab: Tue Jul-18-17 11:15 am

Report Date: 27-JUL-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	557801-013	557801-014	557801-015	557801-016	557801-017	557801-018
	Field Id:	T2-Surf	T2-1'	T2-2'	T2-3'	T2-4'	T2-6'
	Depth:		1- ft	2- ft	3- ft	4- ft	6- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Jul-13-17 09:30	Jul-13-17 09:30	Jul-13-17 09:30	Jul-13-17 09:30	Jul-13-17 09:30	Jul-13-17 09:30
BTEX by EPA 8021B	Extracted:	Jul-24-17 08:00	Jul-20-17 09:00	Jul-20-17 13:30	Jul-20-17 09:00	Jul-20-17 13:30	
	Analyzed:	Jul-24-17 12:04	Jul-20-17 18:20	Jul-21-17 01:29	Jul-20-17 15:21	Jul-20-17 23:18	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Benzene		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
Toluene		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
Ethylbenzene		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
m,p-Xylenes		<0.00694 0.00694	<0.00401 0.00401	<0.00401 0.00401	<0.00398 0.00398	<0.00398 0.00398	
o-Xylene		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
Total Xylenes		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
Total BTEX		<0.00347 0.00347	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	
Inorganic Anions by EPA 300/300.1	Extracted:	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30	Jul-25-17 09:30
	Analyzed:	Jul-25-17 12:18	Jul-25-17 12:41	Jul-25-17 12:49	Jul-25-17 12:56	Jul-25-17 13:04	Jul-25-17 13:12
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		19800 246	11900 96.7	1840 24.7	1000 24.5	703 24.5	112 49.6
TPH By SW8015 Mod	Extracted:	Jul-19-17 14:00	Jul-20-17 16:00	Jul-20-17 16:00	Jul-20-17 16:00	Jul-20-17 16:00	
	Analyzed:	Jul-20-17 02:26	Jul-20-17 20:48	Jul-20-17 21:48	Jul-20-17 22:07	Jul-20-17 22:27	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0	<14.9 14.9	<15.0 15.0	<14.9 14.9	
Diesel Range Organics (DRO)		<15.0 15.0	<15.0 15.0	<14.9 14.9	<15.0 15.0	<14.9 14.9	
Oil Range Hydrocarbons (ORO)		<15.0 15.0	<15.0 15.0	<14.9 14.9	<15.0 15.0	<14.9 14.9	
Total TPH		<15.0 15.0	<15.0 15.0	<14.9 14.9	<15.0 15.0	<14.9 14.9	

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Version: 1.9%

Kelsey Brooks
Project Manager



Certificate of Analysis Summary 557801

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1H



Project Id:

Contact: Aaron Lieb

Project Location: Copperhead 31 Fed

Date Received in Lab: Tue Jul-18-17 11:15 am

Report Date: 27-JUL-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	557801-019	557801-020	557801-021	557801-022	557801-023	557801-024
	Field Id:	T2-8'	T2-9'	T3-Surf	T3-1'	T3-2'	T3-3'
	Depth:	8- ft	9- ft		1- ft	2- ft	3- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Jul-13-17 09:30	Jul-13-17 09:45	Jul-13-17 10:00	Jul-13-17 10:00	Jul-13-17 10:00	Jul-13-17 10:00
BTEX by EPA 8021B	Extracted:		Jul-20-17 13:30	Jul-20-17 13:30	Jul-20-17 09:00	Jul-20-17 13:30	Jul-24-17 08:00
	Analyzed:		Jul-20-17 21:44	Jul-21-17 02:06	Jul-20-17 16:01	Jul-20-17 23:37	Jul-24-17 10:51
	Units/RL:		mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Benzene		<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
	Toluene		<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
Ethylbenzene			<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
m,p-Xylenes			<0.00404 0.00404	<0.00402 0.00402	<0.00396 0.00396	<0.00399 0.00399	<0.00676 0.00676
o-Xylene			<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
Total Xylenes			<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
Total BTEX			<0.00202 0.00202	<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00338 0.00338
Inorganic Anions by EPA 300/300.1	Extracted:	Jul-26-17 13:30	Jul-25-17 09:30	Jul-25-17 11:00	Jul-25-17 11:00	Jul-25-17 11:00	Jul-25-17 11:00
	Analyzed:	Jul-26-17 16:20	Jul-25-17 13:27	Jul-25-17 14:57	Jul-25-17 14:34	Jul-25-17 15:05	Jul-25-17 15:13
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Chloride	81.5 4.93	242 48.6	1270 24.9	158 4.96	867 4.88	960 4.88
TPH By SW8015 Mod	Extracted:		Jul-20-17 16:00	Jul-20-17 16:00	Jul-20-17 16:00	Jul-20-17 16:00	Jul-20-17 16:00
	Analyzed:		Jul-20-17 22:47	Jul-20-17 23:07	Jul-20-17 23:27	Jul-20-17 23:48	Jul-21-17 00:08
	Units/RL:		mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
	Diesel Range Organics (DRO)		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Oil Range Hydrocarbons (ORO)			<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Total TPH			<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 557801

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1H



Project Id:

Contact: Aaron Lieb

Project Location: Copperhead 31 Fed

Date Received in Lab: Tue Jul-18-17 11:15 am

Report Date: 27-JUL-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	557801-025	557801-026	557801-027			
	Field Id:	T3-4'	T3-6'	T3-8'			
	Depth:	4- ft	6- ft	8- ft			
	Matrix:	SOIL	SOIL	SOIL			
	Sampled:	Jul-13-17 10:00	Jul-13-17 10:00	Jul-13-17 10:00			
BTEX by EPA 8021B	Extracted:	Jul-20-17 09:00					
	Analyzed:	Jul-20-17 18:02					
	Units/RL:	mg/kg RL					
	Benzene	<0.00200 0.00200					
	Toluene	<0.00200 0.00200					
Ethylbenzene		<0.00200 0.00200					
m,p-Xylenes		<0.00399 0.00399					
o-Xylene		<0.00200 0.00200					
Total Xylenes		<0.00200 0.00200					
Total BTEX		<0.00200 0.00200					
Inorganic Anions by EPA 300/300.1	Extracted:	Jul-25-17 11:00	Jul-25-17 11:00	Jul-25-17 11:00			
	Analyzed:	Jul-25-17 15:20	Jul-25-17 15:43	Jul-25-17 15:51			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
	Chloride	159 5.04	125 4.91	755 24.6			
TPH By SW8015 Mod	Extracted:	Jul-20-17 16:00					
	Analyzed:	Jul-21-17 00:28					
	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					

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Kelsey Brooks
Project Manager

Analytical Report 557801

**for
COG Operating LLC**

Project Manager: Aaron Lieb

Copperhead 31 Fed #1H

27-JUL-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



27-JUL-17

Project Manager: **Aaron Lieb**

COG Operating LLC

2407 Pecos Avenue

Artesia, NM 88210

Reference: XENCO Report No(s): **557801**

Copperhead 31 Fed #1H

Project Address: Copperhead 31 Fed

Aaron Lieb:

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) 557801. 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. 557801 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1-Surf	S	07-13-17 09:00		557801-001
T1-1'	S	07-13-17 09:00	1 ft	557801-002
T1-2'	S	07-13-17 09:00	2 ft	557801-003
T1-3'	S	07-13-17 09:00	3 ft	557801-004
T1-4'	S	07-13-17 09:00	4 ft	557801-005
T1-6'	S	07-13-17 09:00	6 ft	557801-006
T1-8'	S	07-13-17 09:00	8 ft	557801-007
T1-10'	S	07-13-17 09:00	10 ft	557801-008
T1-12'	S	07-13-17 09:00	12 ft	557801-009
T1-14'	S	07-13-17 09:00	14 ft	557801-010
T1-16'	S	07-13-17 09:30	16 ft	557801-011
T1-18'	S	07-13-17 09:30	18 ft	557801-012
T2-Surf	S	07-13-17 09:30		557801-013
T2-1'	S	07-13-17 09:30	1 ft	557801-014
T2-2'	S	07-13-17 09:30	2 ft	557801-015
T2-3'	S	07-13-17 09:30	3 ft	557801-016
T2-4'	S	07-13-17 09:30	4 ft	557801-017
T2-6'	S	07-13-17 09:30	6 ft	557801-018
T2-8'	S	07-13-17 09:30	8 ft	557801-019
T2-9'	S	07-13-17 09:45	9 ft	557801-020
T3-Surf	S	07-13-17 10:00		557801-021
T3-1'	S	07-13-17 10:00	1 ft	557801-022
T3-2'	S	07-13-17 10:00	2 ft	557801-023
T3-3'	S	07-13-17 10:00	3 ft	557801-024
T3-4'	S	07-13-17 10:00	4 ft	557801-025
T3-6'	S	07-13-17 10:00	6 ft	557801-026
T3-8'	S	07-13-17 10:00	8 ft	557801-027



CASE NARRATIVE

Client Name: COG Operating LLC

Project Name: Copperhead 31 Fed #1H

Project ID:

Work Order Number(s): 557801

Report Date: 27-JUL-17

Date Received: 07/18/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3022715 BTEX by EPA 8021B

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

Batch: LBA-3022824 BTEX by EPA 8021B

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

Batch: LBA-3022826 BTEX by EPA 8021B

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

Batch: LBA-3023055 BTEX by EPA 8021B

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



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T1-Surf**
Lab Sample Id: 557801-001

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Date Prep: 07.25.17 09.30

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9850	98.2	mg/kg	07.25.17 10.23		20

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Date Prep: 07.19.17 14.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 00.21	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 00.21	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 00.21	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 00.21	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	105	%	70-135	07.20.17 00.21		
o-Terphenyl	84-15-1	113	%	70-135	07.20.17 00.21		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T1-Surf**
Lab Sample Id: 557801-001

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022824

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	07.20.17 16.04	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
Total BTEX		<0.00199	0.00199	mg/kg	07.20.17 16.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	80-120	07.20.17 16.04		
4-Bromofluorobenzene	460-00-4	113	%	80-120	07.20.17 16.04		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-1'
Lab Sample Id: 557801-002

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4140	25.0	mg/kg	07.25.17 10.30		5

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Date Prep: 07.19.17 14.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 00.42	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 00.42	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 00.42	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 00.42	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	07.20.17 00.42		
o-Terphenyl	84-15-1	112	%	70-135	07.20.17 00.42		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-1'
Lab Sample Id: 557801-002

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 1 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	07.24.17 12.55	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
Total BTEX		<0.00199	0.00199	mg/kg	07.24.17 12.55	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	81	%	80-120	07.24.17 12.55		
4-Bromofluorobenzene	460-00-4	88	%	80-120	07.24.17 12.55		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-2'
Lab Sample Id: 557801-003

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 2 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	257	4.99	mg/kg	07.25.17 10.00		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Date Prep: 07.19.17 14.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 01.03	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 01.03	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 01.03	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 01.03	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	07.20.17 01.03		
o-Terphenyl	84-15-1	112	%	70-135	07.20.17 01.03		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-2'
Lab Sample Id: 557801-003

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	07.20.17 17.02	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
Total BTEX		<0.00198	0.00198	mg/kg	07.20.17 17.02	U	1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	106		%	80-120	07.20.17 17.02	
1,4-Difluorobenzene	540-36-3	94		%	80-120	07.20.17 17.02	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-3'
Lab Sample Id: 557801-004

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	650	4.99	mg/kg	07.25.17 10.38		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Date Prep: 07.19.17 14.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 01.24	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 01.24	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 01.24	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 01.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	07.20.17 01.24		
o-Terphenyl	84-15-1	110	%	70-135	07.20.17 01.24		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-3'
Lab Sample Id: 557801-004

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022824

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	07.20.17 16.23	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
Total BTEX		<0.00200	0.00200	mg/kg	07.20.17 16.23	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	80-120	07.20.17 16.23		
1,4-Difluorobenzene	540-36-3	93	%	80-120	07.20.17 16.23		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-4'
Lab Sample Id: 557801-005

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	805	4.85	mg/kg	07.25.17 10.46		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Date Prep: 07.19.17 14.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 01.45	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 01.45	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 01.45	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 01.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	07.20.17 01.45		
o-Terphenyl	84-15-1	112	%	70-135	07.20.17 01.45		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-4'
Lab Sample Id: 557801-005

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	07.24.17 12.55	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
Total BTEX		<0.00201	0.00201	mg/kg	07.24.17 12.55	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	99	%	80-120	07.24.17 12.55		
1,4-Difluorobenzene	540-36-3	91	%	80-120	07.24.17 12.55		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-6'
Lab Sample Id: 557801-006

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 6 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	794	4.92	mg/kg	07.25.17 11.47		1



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-8'
Lab Sample Id: 557801-007

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 8 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	520	24.7	mg/kg	07.25.17 11.09		5



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-10'
Lab Sample Id: 557801-008

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 10 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	250	50.1	mg/kg	07.25.17 11.17		10



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-12'
Lab Sample Id: 557801-009

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 12 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	575	50.5	mg/kg	07.25.17 11.24		10



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-14'
Lab Sample Id: 557801-010

Matrix: Soil
Date Collected: 07.13.17 09.00

Date Received: 07.18.17 11.15
Sample Depth: 14 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	59.3	49.1	mg/kg	07.25.17 11.32		10



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T1-16'**
Lab Sample Id: 557801-011

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 16 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	128	48.9	mg/kg	07.25.17 11.40		10



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T1-18'
Lab Sample Id: 557801-012

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 18 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	274	50.0	mg/kg	07.25.17 12.10		10

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3022909

Date Prep: 07.19.17 14.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 02.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 02.05	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 02.05	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 02.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	101	%	70-135	07.20.17 02.05		
o-Terphenyl	84-15-1	109	%	70-135	07.20.17 02.05		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T1-18'**
Lab Sample Id: 557801-012

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 18 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	07.21.17 00.33	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
Total BTEX		<0.00201	0.00201	mg/kg	07.21.17 00.33	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	80-120	07.21.17 00.33		
4-Bromofluorobenzene	460-00-4	115	%	80-120	07.21.17 00.33		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-Surf
Lab Sample Id: 557801-013

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 09.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	19800	246	mg/kg	07.25.17 12.18		50

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 07.19.17 14.00

Basis: Wet Weight

Seq Number: 3022909

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 02.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 02.26	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 02.26	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 02.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	07.20.17 02.26		
o-Terphenyl	84-15-1	109	%	70-135	07.20.17 02.26		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T2-Surf**
Lab Sample Id: 557801-013

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.24.17 08.00

Basis: Wet Weight

Seq Number: 3023055

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
Toluene	108-88-3	<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
Ethylbenzene	100-41-4	<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
m,p-Xylenes	179601-23-1	<0.00694	0.00694	mg/kg	07.24.17 12.04	U	1
o-Xylene	95-47-6	<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
Total Xylenes	1330-20-7	<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
Total BTEX		<0.00347	0.00347	mg/kg	07.24.17 12.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	80-120	07.24.17 12.04		
4-Bromofluorobenzene	460-00-4	119	%	80-120	07.24.17 12.04		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-1' Matrix: Soil Date Received: 07.18.17 11.15
Lab Sample Id: 557801-014 Date Collected: 07.13.17 09.30 Sample Depth: 1 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MGO % Moisture:
Analyst: MGO Date Prep: 07.25.17 09.30 Basis: Wet Weight
Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	11900	96.7	mg/kg	07.25.17 12.41		20

Analytical Method: TPH By SW8015 Mod Prep Method: TX1005P
Tech: ARM % Moisture:
Analyst: ARM Date Prep: 07.20.17 16.00 Basis: Wet Weight
Seq Number: 3023018

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 20.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 20.48	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 20.48	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 20.48	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	95	%	70-135	07.20.17 20.48	
o-Terphenyl	84-15-1	97	%	70-135	07.20.17 20.48	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-1'
Lab Sample Id: 557801-014

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 1 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	07.20.17 18.20	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
Total BTEX		<0.00200	0.00200	mg/kg	07.20.17 18.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	104	%	80-120	07.20.17 18.20		
1,4-Difluorobenzene	540-36-3	92	%	80-120	07.20.17 18.20		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-2'
Lab Sample Id: 557801-015

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 2 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1840	24.7	mg/kg	07.25.17 12.49		5

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	07.20.17 21.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<14.9	14.9	mg/kg	07.20.17 21.48	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<14.9	14.9	mg/kg	07.20.17 21.48	U	1
Total TPH	PHC635	<14.9	14.9	mg/kg	07.20.17 21.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	94	%	70-135	07.20.17 21.48		
o-Terphenyl	84-15-1	96	%	70-135	07.20.17 21.48		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-2'
Lab Sample Id: 557801-015

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	07.21.17 01.29	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
Total BTEX		<0.00200	0.00200	mg/kg	07.21.17 01.29	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	80-120	07.21.17 01.29		
4-Bromofluorobenzene	460-00-4	117	%	80-120	07.21.17 01.29		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-3'
Lab Sample Id: 557801-016

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1000	24.5	mg/kg	07.25.17 12.56		5

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 22.07	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 22.07	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 22.07	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 22.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	100	%	70-135	07.20.17 22.07		
o-Terphenyl	84-15-1	104	%	70-135	07.20.17 22.07		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-3'
Lab Sample Id: 557801-016

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	07.20.17 15.21	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
Total BTEX		<0.00199	0.00199	mg/kg	07.20.17 15.21	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	118	%	80-120	07.20.17 15.21		
4-Bromofluorobenzene	460-00-4	112	%	80-120	07.20.17 15.21		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-4'
Lab Sample Id: 557801-017

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	703	24.5	mg/kg	07.25.17 13.04		5

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	07.20.17 22.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	<14.9	14.9	mg/kg	07.20.17 22.27	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<14.9	14.9	mg/kg	07.20.17 22.27	U	1
Total TPH	PHC635	<14.9	14.9	mg/kg	07.20.17 22.27	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	07.20.17 22.27	
o-Terphenyl	84-15-1	95	%	70-135	07.20.17 22.27	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-4'
Lab Sample Id: 557801-017

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	07.20.17 23.18	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
Total BTEX		<0.00199	0.00199	mg/kg	07.20.17 23.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	80-120	07.20.17 23.18		
4-Bromofluorobenzene	460-00-4	118	%	80-120	07.20.17 23.18		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-6' Matrix: Soil Date Received: 07.18.17 11.15
Lab Sample Id: 557801-018 Date Collected: 07.13.17 09.30 Sample Depth: 6 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MGO % Moisture:
Analyst: MGO Date Prep: 07.25.17 09.30 Basis: Wet Weight
Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	112	49.6	mg/kg	07.25.17 13.12		10



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-8'
Lab Sample Id: 557801-019

Matrix: Soil
Date Collected: 07.13.17 09.30

Date Received: 07.18.17 11.15
Sample Depth: 8 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 07.26.17 13.30

Basis: Wet Weight

Seq Number: 3023210

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	81.5	4.93	mg/kg	07.26.17 16.20		1



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-9'
Lab Sample Id: 557801-020

Matrix: Soil
Date Collected: 07.13.17 09.45

Date Received: 07.18.17 11.15
Sample Depth: 9 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: MGO

Analyst: MGO

Seq Number: 3023210

Date Prep: 07.25.17 09.30

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	242	48.6	mg/kg	07.25.17 13.27		10

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 22.47	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 22.47	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 22.47	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 22.47	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	94	%	70-135	07.20.17 22.47	
o-Terphenyl	84-15-1	94	%	70-135	07.20.17 22.47	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T2-9'
Lab Sample Id: 557801-020

Matrix: Soil
Date Collected: 07.13.17 09.45

Date Received: 07.18.17 11.15
Sample Depth: 9 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	07.20.17 21.44	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
Total BTEX		<0.00202	0.00202	mg/kg	07.20.17 21.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	95	%	80-120	07.20.17 21.44		
4-Bromofluorobenzene	460-00-4	112	%	80-120	07.20.17 21.44		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-Surf
Lab Sample Id: 557801-021

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: RHE

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 11.00

Basis: Wet Weight

Seq Number: 3023212

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1270	24.9	mg/kg	07.25.17 14.57		5

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 07.20.17 16.00

Basis: Wet Weight

Seq Number: 3023018

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 23.07	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 23.07	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 23.07	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 23.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	93	%	70-135	07.20.17 23.07		
o-Terphenyl	84-15-1	95	%	70-135	07.20.17 23.07		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: **T3-Surf**
Lab Sample Id: 557801-021

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	07.21.17 02.06	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
Total BTEX		<0.00201	0.00201	mg/kg	07.21.17 02.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	80-120	07.21.17 02.06		
1,4-Difluorobenzene	540-36-3	99	%	80-120	07.21.17 02.06		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-1'
Lab Sample Id: 557801-022

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: RHE

Analyst: MGO

Seq Number: 3023212

Date Prep: 07.25.17 11.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	158	4.96	mg/kg	07.25.17 14.34		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 23.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 23.27	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 23.27	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 23.27	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	92	%	70-135	07.20.17 23.27	
o-Terphenyl	84-15-1	93	%	70-135	07.20.17 23.27	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-1'
Lab Sample Id: 557801-022

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 1 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	07.20.17 16.01	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
Total BTEX		<0.00198	0.00198	mg/kg	07.20.17 16.01	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	80-120	07.20.17 16.01		
1,4-Difluorobenzene	540-36-3	93	%	80-120	07.20.17 16.01		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-2' Matrix: Soil Date Received: 07.18.17 11.15
Lab Sample Id: 557801-023 Date Collected: 07.13.17 10.00 Sample Depth: 2 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: RHE % Moisture:
Analyst: MGO Date Prep: 07.25.17 11.00 Basis: Wet Weight
Seq Number: 3023212

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	867	4.88	mg/kg	07.25.17 15.05		1

Analytical Method: TPH By SW8015 Mod Prep Method: TX1005P
Tech: ARM % Moisture:
Analyst: ARM Date Prep: 07.20.17 16.00 Basis: Wet Weight
Seq Number: 3023018

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.20.17 23.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.20.17 23.48	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.20.17 23.48	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.20.17 23.48	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	07.20.17 23.48	
o-Terphenyl	84-15-1	94	%	70-135	07.20.17 23.48	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-2'
Lab Sample Id: 557801-023

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 13.30

Basis: Wet Weight

Seq Number: 3022826

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	07.20.17 23.37	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
Total BTEX		<0.00200	0.00200	mg/kg	07.20.17 23.37	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	80-120	07.20.17 23.37		
1,4-Difluorobenzene	540-36-3	98	%	80-120	07.20.17 23.37		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-3'
Lab Sample Id: 557801-024

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: RHE

Analyst: MGO

Seq Number: 3023212

Date Prep: 07.25.17 11.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	960	4.88	mg/kg	07.25.17 15.13		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.21.17 00.08	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.21.17 00.08	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.21.17 00.08	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.21.17 00.08	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	103	%	70-135	07.21.17 00.08	
o-Terphenyl	84-15-1	97	%	70-135	07.21.17 00.08	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-3'
Lab Sample Id: 557801-024

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 3 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.24.17 08.00

Basis: Wet Weight

Seq Number: 3023055

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
Toluene	108-88-3	<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
Ethylbenzene	100-41-4	<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
m,p-Xylenes	179601-23-1	<0.00676	0.00676	mg/kg	07.24.17 10.51	U	1
o-Xylene	95-47-6	<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
Total Xylenes	1330-20-7	<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
Total BTEX		<0.00338	0.00338	mg/kg	07.24.17 10.51	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	80-120	07.24.17 10.51		
1,4-Difluorobenzene	540-36-3	99	%	80-120	07.24.17 10.51		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-4'
Lab Sample Id: 557801-025

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: RHE

Analyst: MGO

Seq Number: 3023212

Date Prep: 07.25.17 11.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	159	5.04	mg/kg	07.25.17 15.20		1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3023018

Date Prep: 07.20.17 16.00

Prep Method: TX1005P

% Moisture:

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	07.21.17 00.28	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	07.21.17 00.28	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	07.21.17 00.28	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	07.21.17 00.28	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	91	%	70-135	07.21.17 00.28	
o-Terphenyl	84-15-1	92	%	70-135	07.21.17 00.28	



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-4'
Lab Sample Id: 557801-025

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 07.20.17 09.00

Basis: Wet Weight

Seq Number: 3022715

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	07.20.17 18.02	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
Total BTEX		<0.00200	0.00200	mg/kg	07.20.17 18.02	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	102	%	80-120	07.20.17 18.02		
1,4-Difluorobenzene	540-36-3	92	%	80-120	07.20.17 18.02		



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-6'
Lab Sample Id: 557801-026

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 6 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: RHE

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 11.00

Basis: Wet Weight

Seq Number: 3023212

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	125	4.91	mg/kg	07.25.17 15.43		1



Certificate of Analytical Results 557801



COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1H

Sample Id: T3-8'
Lab Sample Id: 557801-027

Matrix: Soil
Date Collected: 07.13.17 10.00

Date Received: 07.18.17 11.15
Sample Depth: 8 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: RHE

% Moisture:

Analyst: MGO

Date Prep: 07.25.17 11.00

Basis: Wet Weight

Seq Number: 3023212

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	755	24.6	mg/kg	07.25.17 15.51		5

- 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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COG Operating LLC
Copperhead 31 Fed #1H**Analytical Method: Inorganic Anions by EPA 300/300.1**

Seq Number: 3023210

Matrix: Solid

Prep Method: E300P

MB Sample Id: 728137-1-BLK

LCS Sample Id: 728137-1-BKS

Date Prep: 07.25.17

LCSD Sample Id: 728137-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	249	100	252	101	90-110	1	20	mg/kg	07.25.17 09:44	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3023212

Matrix: Solid

Prep Method: E300P

MB Sample Id: 728188-1-BLK

LCS Sample Id: 728188-1-BKS

Date Prep: 07.25.17

LCSD Sample Id: 728188-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	247	99	247	99	90-110	0	20	mg/kg	07.25.17 14:19	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3023210

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 557801-003

MS Sample Id: 557801-003 S

Date Prep: 07.25.17

MSD Sample Id: 557801-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	257	250	509	101	510	101	90-110	0	20	mg/kg	07.25.17 10:07	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3023210

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 557801-006

MS Sample Id: 557801-006 S

Date Prep: 07.25.17

MSD Sample Id: 557801-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	794	246	1030	96	1020	92	90-110	1	20	mg/kg	07.25.17 11:55	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3023212

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 557801-022

MS Sample Id: 557801-022 S

Date Prep: 07.25.17

MSD Sample Id: 557801-022 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	158	248	415	104	416	104	90-110	0	20	mg/kg	07.25.17 14:42	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3023212

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 558271-005

MS Sample Id: 558271-005 S

Date Prep: 07.25.17

MSD Sample Id: 558271-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	247	249	505	104	506	104	90-110	0	20	mg/kg	07.25.17 16:29	



QC Summary 557801

COG Operating LLC

Copperhead 31 Fed #1H

Analytical Method: TPH By SW8015 Mod

Seq Number: 3022909

MB Sample Id: 727920-1-BLK

Matrix: Solid

LCS Sample Id: 727920-1-BKS

Prep Method: TX1005P

Date Prep: 07.19.17

LCSD Sample Id: 727920-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1120	112	1070	107	70-135	5	35	mg/kg	07.19.17 16:17	
Diesel Range Organics (DRO)	<15.0	1000	1120	112	1060	106	70-135	6	35	mg/kg	07.19.17 16:17	
Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane	107		122		117		70-135	%	07.19.17 16:17			
o-Terphenyl	115		123		122		70-135	%	07.19.17 16:17			

Analytical Method: TPH By SW8015 Mod

Seq Number: 3023018

MB Sample Id: 728048-1-BLK

Matrix: Solid

LCS Sample Id: 728048-1-BKS

Prep Method: TX1005P

Date Prep: 07.20.17

LCSD Sample Id: 728048-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	897	90	859	86	70-135	4	35	mg/kg	07.20.17 20:08	
Diesel Range Organics (DRO)	<15.0	1000	1130	113	1130	113	70-135	0	35	mg/kg	07.20.17 20:08	
Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane	111		105		97		70-135	%	07.20.17 20:08			
o-Terphenyl	115		104		95		70-135	%	07.20.17 20:08			

Analytical Method: TPH By SW8015 Mod

Seq Number: 3023018

Parent Sample Id: 557801-014

Matrix: Soil

MS Sample Id: 557801-014 S

Prep Method: TX1005P

Date Prep: 07.20.17

MSD Sample Id: 557801-014 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	875	88	932	93	70-135	6	35	mg/kg	07.20.17 21:08	
Diesel Range Organics (DRO)	<15.0	999	1040	104	1030	103	70-135	1	35	mg/kg	07.20.17 21:08	
Surrogate			MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane			91		90		70-135	%	07.20.17 21:08			
o-Terphenyl			84		84		70-135	%	07.20.17 21:08			



QC Summary 557801

COG Operating LLC

Copperhead 31 Fed #1H

Analytical Method: TPH By SW8015 Mod

Seq Number: 3022909

Parent Sample Id: 557797-044

Matrix: Soil

MS Sample Id: 557797-044 S

Prep Method: TX1005P

Date Prep: 07.19.17

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1080	108	70-135	mg/kg	07.19.17 18:33	
Diesel Range Organics (DRO)	<15.0	1000	1110	111	70-135	mg/kg	07.19.17 18:33	

Surrogate

	MS %Rec	MS Flag	Limits	Units	Analysis Date
1-Chlorooctane	104		70-135	%	07.19.17 18:33
o-Terphenyl	107		70-135	%	07.19.17 18:33

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022715

MB Sample Id: 727928-1-BLK

Matrix: Solid

LCS Sample Id: 727928-1-BKS

Prep Method: SW5030B

Date Prep: 07.20.17

LCSD Sample Id: 727928-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.101	101	0.115	115	70-130	13	35	mg/kg	07.20.17 20:44	
Toluene	<0.00200	0.0998	0.114	114	0.123	123	70-130	8	35	mg/kg	07.20.17 20:44	
Ethylbenzene	<0.00200	0.0998	0.110	110	0.121	121	71-129	10	35	mg/kg	07.20.17 20:44	
m,p-Xylenes	<0.00399	0.200	0.219	110	0.237	119	70-135	8	35	mg/kg	07.20.17 20:44	
o-Xylene	<0.00200	0.0998	0.111	111	0.119	119	71-133	7	35	mg/kg	07.20.17 20:44	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	89		104		103		80-120	%	07.20.17 20:44
4-Bromofluorobenzene	100		100		96		80-120	%	07.20.17 20:44

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022824

MB Sample Id: 727966-1-BLK

Matrix: Solid

LCS Sample Id: 727966-1-BKS

Prep Method: SW5030B

Date Prep: 07.20.17

LCSD Sample Id: 727966-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.115	115	0.107	107	70-130	7	35	mg/kg	07.20.17 10:02	
Toluene	<0.00200	0.100	0.110	110	0.109	109	70-130	1	35	mg/kg	07.20.17 10:02	
Ethylbenzene	<0.00200	0.100	0.109	109	0.114	114	71-129	4	35	mg/kg	07.20.17 10:02	
m,p-Xylenes	<0.00401	0.200	0.249	125	0.224	113	70-135	11	35	mg/kg	07.20.17 10:02	
o-Xylene	<0.00200	0.100	0.113	113	0.112	112	71-133	1	35	mg/kg	07.20.17 10:02	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		87		100		80-120	%	07.20.17 10:02
4-Bromofluorobenzene	107		93		110		80-120	%	07.20.17 10:02

COG Operating LLC
Copperhead 31 Fed #1H

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022826

MB Sample Id: 727982-1-BLK

Matrix: Solid

LCS Sample Id: 727982-1-BKS

Prep Method: SW5030B

Date Prep: 07.20.17

LCSD Sample Id: 727982-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.113	112	0.112	112	70-130	1	35	mg/kg	07.20.17 19:34	
Toluene	<0.00202	0.101	0.115	114	0.114	114	70-130	1	35	mg/kg	07.20.17 19:34	
Ethylbenzene	<0.00202	0.101	0.120	119	0.119	119	71-129	1	35	mg/kg	07.20.17 19:34	
m,p-Xylenes	<0.00404	0.202	0.237	117	0.234	116	70-135	1	35	mg/kg	07.20.17 19:34	
o-Xylene	<0.00202	0.101	0.120	119	0.119	119	71-133	1	35	mg/kg	07.20.17 19:34	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	99		94		93		80-120	%	07.20.17 19:34
4-Bromofluorobenzene	105		109		109		80-120	%	07.20.17 19:34

Analytical Method: BTEX by EPA 8021B

Seq Number: 3023055

MB Sample Id: 728128-1-BLK

Matrix: Solid

LCS Sample Id: 728128-1-BKS

Prep Method: SW5030B

Date Prep: 07.24.17

LCSD Sample Id: 728128-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.101	0.113	112	0.112	112	70-130	1	35	mg/kg	07.24.17 08:39	
Toluene	<0.00201	0.101	0.114	113	0.114	114	70-130	0	35	mg/kg	07.24.17 08:39	
Ethylbenzene	<0.00201	0.101	0.119	118	0.120	120	71-129	1	35	mg/kg	07.24.17 08:39	
m,p-Xylenes	<0.00402	0.201	0.232	115	0.232	115	70-135	0	35	mg/kg	07.24.17 08:39	
o-Xylene	<0.00201	0.101	0.116	115	0.116	116	71-133	0	35	mg/kg	07.24.17 08:39	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	98		102		101		80-120	%	07.24.17 08:39
4-Bromofluorobenzene	112		112		112		80-120	%	07.24.17 08:39

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022715

Parent Sample Id: 557878-001

Matrix: Soil

MS Sample Id: 557878-001 S

Prep Method: SW5030B

Date Prep: 07.20.17

MSD Sample Id: 557878-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.0795	79	0.0840	83	70-130	6	35	mg/kg	07.20.17 21:25	
Toluene	<0.00202	0.101	0.100	99	0.0912	90	70-130	9	35	mg/kg	07.20.17 21:25	
Ethylbenzene	<0.00202	0.101	0.0947	94	0.0842	83	71-129	12	35	mg/kg	07.20.17 21:25	
m,p-Xylenes	<0.00404	0.202	0.188	93	0.167	83	70-135	12	35	mg/kg	07.20.17 21:25	
o-Xylene	<0.00202	0.101	0.0909	90	0.0830	82	71-133	9	35	mg/kg	07.20.17 21:25	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	110		112		80-120	%	07.20.17 21:25
4-Bromofluorobenzene	106		105		80-120	%	07.20.17 21:25



QC Summary 557801

COG Operating LLC Copperhead 31 Fed #1H

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022824

Parent Sample Id: 557713-001

Matrix: Soil

MS Sample Id: 557713-001 S

Prep Method: SW5030B

Date Prep: 07.20.17

MSD Sample Id: 557713-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0866	87	0.0941	94	70-130	8	35	mg/kg	07.20.17 10:40	
Toluene	<0.00200	0.100	0.0850	85	0.0919	92	70-130	8	35	mg/kg	07.20.17 10:40	
Ethylbenzene	<0.00200	0.100	0.0833	83	0.0933	94	71-129	11	35	mg/kg	07.20.17 10:40	
m,p-Xylenes	<0.00401	0.200	0.163	82	0.182	91	70-135	11	35	mg/kg	07.20.17 10:40	
o-Xylene	<0.00200	0.100	0.0826	83	0.0931	93	71-133	12	35	mg/kg	07.20.17 10:40	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	107		106		80-120	%	07.20.17 10:40
4-Bromofluorobenzene	120		117		80-120	%	07.20.17 10:40

Analytical Method: BTEX by EPA 8021B

Seq Number: 3022826

Parent Sample Id: 557801-020

Matrix: Soil

MS Sample Id: 557801-020 S

Prep Method: SW5030B

Date Prep: 07.20.17

MSD Sample Id: 557801-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0992	0.0792	80	0.0879	88	70-130	10	35	mg/kg	07.20.17 20:12	
Toluene	<0.00198	0.0992	0.0785	79	0.0888	89	70-130	12	35	mg/kg	07.20.17 20:12	
Ethylbenzene	<0.00198	0.0992	0.0912	92	0.0947	95	71-129	4	35	mg/kg	07.20.17 20:12	
m,p-Xylenes	<0.00397	0.198	0.183	92	0.187	94	70-135	2	35	mg/kg	07.20.17 20:12	
o-Xylene	<0.00198	0.0992	0.0969	98	0.0963	96	71-133	1	35	mg/kg	07.20.17 20:12	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	113		104		80-120	%	07.20.17 20:12
4-Bromofluorobenzene	114		118		80-120	%	07.20.17 20:12

Analytical Method: BTEX by EPA 8021B

Seq Number: 3023055

Parent Sample Id: 557801-024

Matrix: Soil

MS Sample Id: 557801-024 S

Prep Method: SW5030B

Date Prep: 07.24.17

MSD Sample Id: 557801-024 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.0867	86	0.0749	75	70-130	15	35	mg/kg	07.24.17 09:16	
Toluene	<0.00202	0.101	0.0878	87	0.0762	76	70-130	14	35	mg/kg	07.24.17 09:16	
Ethylbenzene	<0.00202	0.101	0.0914	90	0.0782	78	71-129	16	35	mg/kg	07.24.17 09:16	
m,p-Xylenes	<0.00404	0.202	0.178	88	0.152	76	70-135	16	35	mg/kg	07.24.17 09:16	
o-Xylene	<0.00202	0.101	0.0904	90	0.0772	77	71-133	16	35	mg/kg	07.24.17 09:16	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		103		80-120	%	07.24.17 09:16
4-Bromofluorobenzene	118		120		80-120	%	07.24.17 09:16



Page 4 of 7

Dallas Texas (214-902-0300)

Midland, Texas (432-704-5251)

Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

Xenco Quote #	Xenco Job #
	55780

W = Water
S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW = Ocean/Sea Water
WI = Wipe
O = Oil
WW = Waste Water
A = Air



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CHAIN OF CUSTODY

Page 2 of 3

San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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Xenoco Quote #

Xenoco Job #

557801

Client / Reporting Information				Project Information				Analytical Information				Matrix Codes							
Company Name / Branch: COG Operating LLC				Project Name/Number: Copperhead 31 Fed #1H															
Company Address: 2407 PECOS Avenue Artesia NM 88210				Project Location: Copperhead 31 Fed															
Email: alieb@concho.com dneel2@concho.com rheskel@concho.com				Phone No: 575-748-1553				Invoice To: COG Operating LLC Attn: Robert McNeill 600 W. Illinois Midland TX 79701											
Project Contact: Aaron Lieb				PO Number:															
Sampler's Name: Aaron Lieb																			
No.	Field ID / Point of Collection	Sample Depth	Collection Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MeOH	NONE	TPH/ EXTENDED	BTEX	Chloride	Field Comments	
1	T1-16	16'	7/13/17	9:30am	S	1													
2	T1-18	18'																	
3																			
4	T2-Surf	1'				1													
5	T2-2'	2'				1													
6	T2-3'	3'				1													
7	T2-4'	4'				1													
8	T2-6'	6'				1													
9	T2-8'	8'				1													
10																			
Turnaround Time (Business days)				Data Deliverable Information															
☐ Same Day TAT				☐ 5 Day TAT				☐ Level II Std QC				☐ Level IV (Full Data Pkg /raw data)							
☐ Next Day EMERGENCY				☐ 7 Day TAT				☐ Level III Std QC+ Forms				☐ TRRP Level IV							
☐ 2 Day EMERGENCY				☐ Contract TAT				☐ Level 3 (CLP Forms)				☐ UST / RG-411							
☐ 3 Day EMERGENCY								☐ TRRP Checklist											
TAT Starts Day received by Lab, if received by 5:00 pm																			
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																			
Relinquished by Sampler:				Date Time:				Received By:				Date Time:				Received By:			
1								1								2			
Relinquished by:				Date Time:				Received By:				Date Time:				Received By:			
3								3								4			
Relinquished by:				Date Time:				Received By:				Date Time:				Received By:			
5								5								6			

Temp: 1.4
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 1.2

IR ID: R-8

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenoco. Its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenoco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenoco. A minimum charge of \$75 will be applied to each project. Xenoco's liability will be limited to the cost of samples. Any samples received by Xenoco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.



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Page 2 of 3

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Phoenix, Arizona (480-355-0900)

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Xenco Quote #

Xenco Job #

557801

Client / Reporting Information				Project Information				Analytical Information				Matrix Codes						
Company Name / Branch: COG Operating LLC				Project Name/Number: Copperhead 31 Fed #1H														
Company Address: 2407 PECOS Avenue Artesia NM 88210				Project Location: Copperhead 31 Fed														
Email: alieb@concho.com Phone No: 575-748-1553 dnee2@concho.com thaskell@concho.com				Invoice To: COG Operating LLC Attn: Robert McNeill 600 W. Illinois Midland TX 79701														
Project Contact: Aaron Lieb				PO Number:														
Sampler's Name: Aaron Lieb																		
No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH/ EXTENDED	BTEX	Chloride	Field Comments
1	12-91	9	7/17/17	9:45am	S	1									X	X	X	
2															X	X	X	
3	13-51.25			10:00am		1									X	X	X	
4	13-21					1									X	X	X	
5	13-21					1									X	X	X	
6	13-31					1									X	X	X	
7	13-41					1									X	X	X	
8	13-61					1									X	X	X	
9	13-81					1									X	X	X	
10	13-10					1									X	X	X	
Turnaround Time (Business days)																		
Data Deliverable Information																		
Same Day TAT ☐ 5 Day TAT ☐ Level II Std QC ☐ Level IV (Full Data Pkg raw data) ☐																		
Next Day EMERGENCY ☐ 7 Day TAT ☐ Level III Std QC+ Forms ☐ TRRP Level IV ☐																		
2 Day EMERGENCY ☐ Contract TAT ☐ Level 3 (CLP Forms) ☐ UST / RG-411 ☐																		
3 Day EMERGENCY ☐ TRRP Checklist ☐																		
TAT Starts Day received by Lab, if received by 5:00 pm																		
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																		
FED-EX / UPS: Tracking #																		
Relinquished by Sampler:																		
Date Time: 1 Received By: 1																		
Relinquished by: 1 Date Time: 7-17-17 Received By: 2																		
Relinquished by: 2 Date Time: 7-17-17 Received By: 3																		
Relinquished by: 3 Date Time: 7-17-17 Received By: 4																		
Relinquished by: 4 Date Time: 7-18-17 Received By: 5																		
Custody Seal # 1 Preserved where applicable																		
On Ice 55°C Cooler Temp. 7-18-17/193 Thermo. Corr. Factor																		

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco. Its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating LLC

Date/ Time Received: 07/18/2017 11:15:28 AM

Work Order #: 557801

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	
#2 *Shipping container in good condition?	Yes	
#3 *Samples received on ice?	Yes	
#4 *Custody Seal present on shipping container/ cooler?	Yes	
#5 *Custody Seals intact on shipping container/ cooler?	Yes	
#6 Custody Seals intact on sample bottles?	Yes	
#7 *Custody Seals Signed and dated?	Yes	
#8 *Chain of Custody present?	Yes	
#9 Sample instructions complete on Chain of Custody?	Yes	
#10 Any missing/extra samples?	Yes	Missing Sample 28 T3-10' They have it on the COC
#11 Chain of Custody signed when relinquished/ received?	Yes	
#12 Chain of Custody agrees with sample label(s)?	Yes	
#13 Container label(s) legible and intact?	Yes	
#14 Sample matrix/ properties agree with Chain of Custody?	Yes	
#15 Samples in proper container/ bottle?	Yes	
#16 Samples properly preserved?	Yes	
#17 Sample container(s) intact?	Yes	
#18 Sufficient sample amount for indicated test(s)?	Yes	
#19 All samples received within hold time?	Yes	
#20 Subcontract of sample(s)?	No	
#21 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:

Shawnee Smith

Date: 07/18/2017

Checklist reviewed by:

Kelsey Brooks

Date: 07/18/2017