



HRL
COMPLIANCE
SOLUTIONS

P.O. Box 1708 • Artesia, NM 88211
www.hrlcomp.com

March 26, 2018

NMOCD District II
Crystal Weaver
811 S 1st Street
Artesia, NM 88210

State Land Office
Mark Naranjo
1001 S Atkinson
Roswell, NM 88230

SUBJECT: SOIL REMEDIATION WORK PLAN FOR THE INCIDENT AT THE SRO State Com #13H Battery, Eddy COUNTY, NEW MEXICO

Ms. Weaver:

On behalf of COG Operating, LLC, HRL Compliance Solutions, Inc (HRL) has prepared this work plan that describes the assessment, initial characterization, and proposed remediation for a release associated with the SRO State Com #013H Battery release. The site is in Unit D, SECTION 15, TOWNSHIP 26S, RANGE 28E, NMPM, Eddy County, New Mexico, on State land. Figure 1 illustrates the location and surrounding area. There were two (2) releases on this location in the same vicinity. The site was characterized on 10/18/2017 to delineate extent of impacts for both spills and one remediation work plan is being submitted that addresses both incidents. Table 1 below, summarizes information regarding the releases.



Table 1: Release Information and Site Ranking

Name	SRO State Com #13H
Company	COG Operating, LLC
RP Number	2RP-4313, 2RP-4328
API Number	30-015-37427
Location	32.048508, -104.082347
Estimated Date of Release	7/31/2017, 8/17/2017
Date Reported to NMOCD	8/1/2017, 8/17/2017
Land Owner	State
Reported to	OCD
Source of Release	Water Tank, Flowline
Released Material	Produced Water
Released Volume	60 bbls produced water, 19 bbls produced water
Recovered Volume	55 bbls produced water, 0 bbls produced water
Net Release Volume	5 bbls water, 19 bbls produced water
Nearest Waterway	3.9 miles to Pecos River
Depth to Groundwater	>100 feet bgs
Nearest Domestic Water Source	> 1 mile
NMOCD Ranking	0
Response Date	3/14/2018

1.0 Background

The initial release at the SRO State Com #13H Battery was caused by a lightning strike to the overflow water tank as outlined in the NMOCD C-141 report (Appendix A). The release impacted soil on location, extending into an adjacent pasture. A vacuum truck was used to recover all freestanding liquid. The second release was caused by corrosion on a steel water line manifold. The second release impacted soil within the same pasture as the first release describe above. Samples were collected from the impacted areas to delineate the vertical and horizontal extent of impacts.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 12 miles south of Malaga, with an elevation of approximately 3032 feet above sea level. A search of the New Mexico State Engineer's Office (NMOSE) online water well database for groundwater wells in the vicinity of the release identified twenty (20) groundwater wells located within a three-mile radius of the site. Based on evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to greater than 100 feet below ground surface (bgs).



Recommended Remediation Action Levels (RRALs) are determined by the site ranking according to the NMOCD *Guidelines for Remediation of Leaks, Spills, and Releases* (1993). Table 2 presents the remediation standards and the site ranking for this location. Justification for this site ranking is found in Appendix B.

Table 2: Remediation Standards

Soil Remediation Standards	0 to 9	10 to 19	>19
Benzene	10 PPM	10 PPM	10 PPM
BTEX	50 PPM	50 PPM	50 PPM
TPH	5000 PPM	1000 PPM	100 PPM

Depth to Groundwater	NMOCD Numeric Rank
< 50 BGS = 20	
50' to 99' = 10	0
>100' = 0	
Distance to Nearest Surface Water	NMOCD Numeric Rank
< 200' = 20	
200' - 1000' = 10	
>1000' = 0	0
Well Head Protection	NMOCD Numeric Rank
<1000' (or <200' domestic) = 20	
> 1000' = 0	0
Total Site Ranking	0

3.0 Release Characterization

Upon receiving clearance from the underground utility locate (811), COG field personnel assessed the impacted area. Samples were collected on 10/18/2017 to characterize the extent of impacts and calculate a volume of soil to be excavated for disposal. All samples were collected and analyzed at a Nationally Environmental Laboratory Accreditation Program (NELAP) laboratory and in accordance with NMOCD soil sampling procedures. The samples were submitted to Xenco Laboratories for analyses including chlorides by Method 300.0, volatile organics (BTEX) by Method 8021B, and MRO, DRO, and GRO by EPA Method 8015D. Sample locations are depicted in Figure 2. All field screening and laboratory results are summarized in Table 3 with raw analytical reports included in Appendix C.

4.0 Soil Remediation Workplan

HRL will commence excavation of the impacted soils, after approval from area utilities owners via 811 and NMOCD. HRL will oversee the excavation activities. Excavation will occur to a depth of approximately 1 foot bgs within the contaminated area, including the pasture, as shown in Figure 2. Impacted soils will be stockpiled on location within a lined earthen berm containment cell prior to disposal. It is anticipated that approximately 100 cubic yards of contaminated soil is to be excavated and disposed of at an approved



solid waste disposal facility. Clean native soils will be used to backfill the excavation if necessary and the impacted area re-contoured to the surrounding area.

5.0 Revegetation

The surface will be left in a rough condition to approximate natural surface deviations. The site will be broadcast seeded with NMSLO seed mixture “L”. The site will be periodically monitored for revegetation and the development of noxious weeds. Should the site fail to re-vegetate or noxious weeds develop, HRL will contact NMSLO for mitigation strategy.

6.0 Scope and Limitations

The scope of HRL’s services consist of performing site characterization and remediation, verification of release stabilization, regulatory liaison, and preparation of this remediation work plan. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact Jennifer Knowlton at 505-238-3588.

Submitted by:
HRL Compliance Solutions, Inc

Jennifer Knowlton
Regional Manager - Permian

Attachments:

Figure 1: Vicinity and Wellhead Protection Map

Figure 2: Site and Sample Location Map

Table 3: Summary of Sample Results

Appendix A: Form C141 Initial

Appendix B: NMOSE Well Report

Appendix C: Laboratory Analytical Reports



Figure 1:
Site Vicinity Map

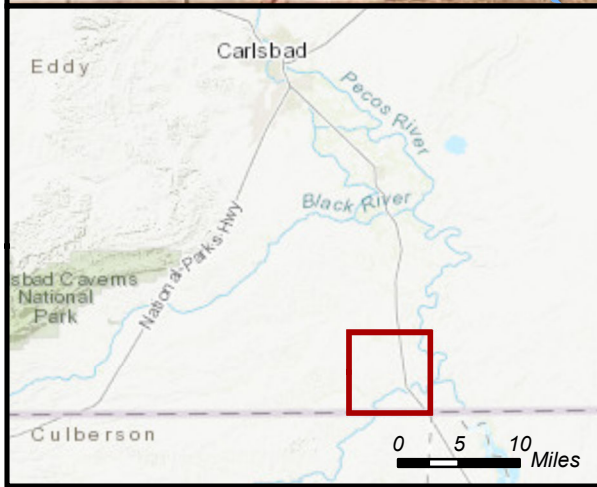
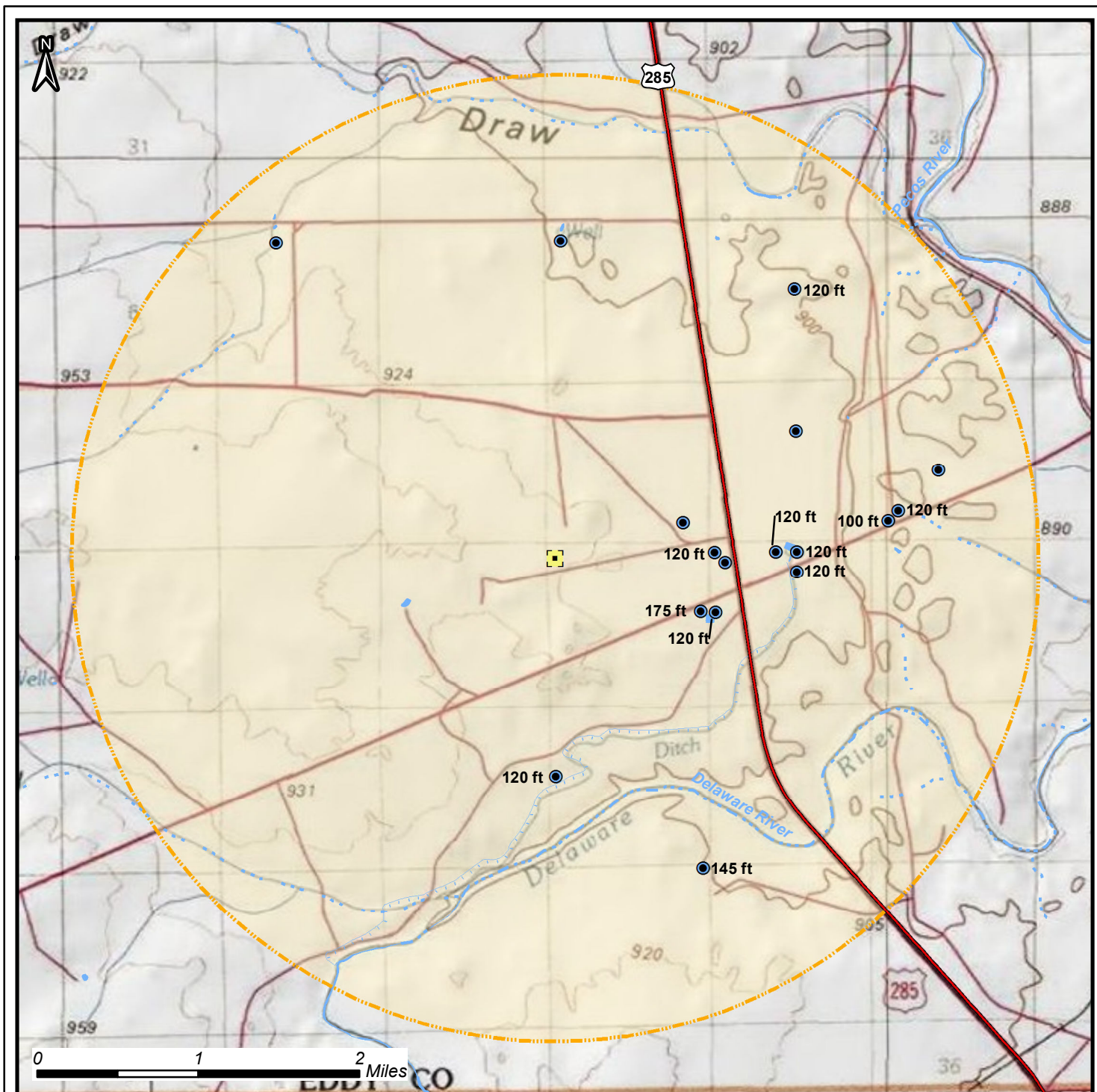


Figure 1: Location Map
SRO State Com #13H
 32.048656 -104.082245
 Section 15, Township 26 South, Range 28 East

Features

- Site Name
- Water Well
- 3 Mile Buffer

Hydrography

- Perennial River/Stream
- Intermittent River/Stream
- Ephemeral River/Stream
- Canal/Ditch

Waterbody

Transportation

US Route

* Depth to water level is indicated as applicable per well.

DISCLAIMER: This representation and the Geographic Information System (GIS) used to create it are designed as a source of reference and not intended to replace official records and/or legal surveys. HCS1 assumes no responsibility for any risks, dangers, or liabilities that may result from its use and makes no guarantees as to the quality or accuracy of the underlying data.



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SOLUTIONS

Author: E. Fought

Revision: 0

Date: 3/14/2018



Figure 2:
Site and Sample Location Map

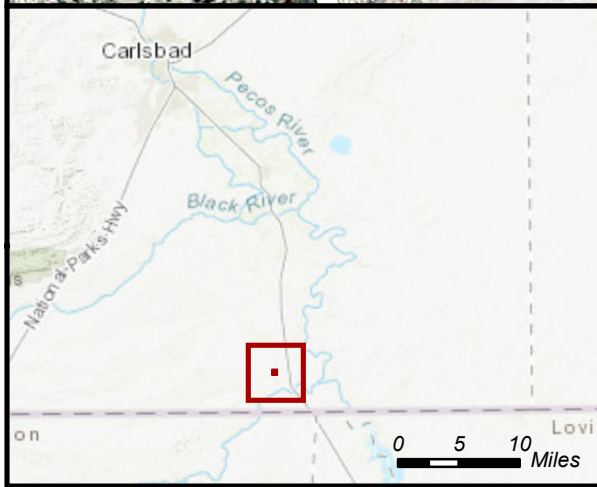


Figure 2: Sample Location Map
 SRO State Com #13H
 32.048656 -104.082245
 Section 15, Township 26 South, Range 28 East

Features

- Sample Location
- Impacted Area

DISCLAIMER: This representation and the Geographic Information System (GIS) used to create it are designed as a source of reference and not intended to replace official records and/or legal surveys. HCSL assumes no responsibility for any risks, dangers, or liabilities that may result from its use and makes no guarantee as to the quality or accuracy of the underlying data.



Author: E. Fought
 Revision: 0
 Date: 3/14/2018



Table 3: Analytical Results Summary

Summary of Delineation Sampling Analytical Results												
SAMPLE LOCATION	SAMPLE DEPTH (bgs)	SAMPLE DATE	SOIL STATUS	8021B					8015M			300.0
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYLBENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO (mg/Kg)	DRO (mg/Kg)	Total TPH (mg/Kg)	CHLORIDE (mg/Kg)
NMOCD - Guidelines for Remediation of Leaks, Spills and Releases				10	NE	NE	NE	50	NE	NE	5,000	600
Vertical Delineation Sampling												
T1	Surface	10/18/2017	In-Situ	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<24.9	<24.9	<24.9	612
T1	1'	10/18/2017	-	-	-	-	-	-	-	-	-	127
T1	2'	10/18/2017	-	-	-	-	-	-	-	-	-	64.3
T1	3'	10/18/2017	-	-	-	-	-	-	-	-	-	65.5
T1	4'	10/18/2017	-	-	-	-	-	-	-	-	-	138
T1	6'	-	-	-	-	-	-	-	-	-	-	-
T1	9'	10/18/2017	-	-	-	-	-	-	-	-	-	191
T1	10'	-	-	-	-	-	-	-	-	-	-	-
T1	12'	-	-	-	-	-	-	-	-	-	-	-
T1	14'	10/18/2017	-	-	-	-	-	-	-	-	-	93.5
T1	16'	-	-	-	-	-	-	-	-	-	-	
North	Surface	10/18/2017	-	-	-	-	-	-	-	-	-	<4.93
North	1'	10/18/2017	-	-	-	-	-	-	-	-	-	<4.96
North	2'	-	-	-	-	-	-	-	-	-	-	-
North	3'	-	-	-	-	-	-	-	-	-	-	-



Table 3: Analytical Results Summary (continued)

Summary of Delineation Sampling Analytical Results												
SAMPLE LOCATION	SAMPLE DEPTH (bgs)	SAMPLE DATE	SOIL STATUS	8021B					8015M			300.0
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYLBENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO (mg/Kg)	DRO (mg/Kg)	Total TPH (mg/Kg)	CHLORIDE (mg/Kg)
NMOCD - Guidelines for Remediation of Leaks, Spills and Releases				10	NE	NE	NE	50	NE	NE	5,000	600
Vertical Delineation Sampling												
East	Surface	10/18/2017	-	-	-	-	-	-	-	-	-	<4.94
East	1'	10/18/2017	-	-	-	-	-	-	-	-	-	17.7
East	2'	-	-	-	-	-	-	-	-	-	-	-
East	3'	-	-	-	-	-	-	-	-	-	-	-
South	Surface	10/18/2017	-	-	-	-	-	-	-	-	-	<4.98
South	1'	10/18/2017	-	-	-	-	-	-	-	-	-	10.8
South	2'	-	-	-	-	-	-	-	-	-	-	-
South	3'	-	-	-	-	-	-	-	-	-	-	-

mg/Kg - milligrams per

Kilogram

— = Not Established

Concentrations in **BOLD** exceed the NMOCD

Guidelines



Proposed excavated area



Appendix A: Form C141 Initial

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

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

AUG 01 2017

Form C-141
Revised August 8, 2011

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

RECEIVED

Release Notification and Corrective Action

NAB1781456546

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: SRO State Com #013H	Facility Type: Tank Battery

Surface Owner: State	Mineral Owner: State	API No. 30-015-37427
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LOCATION OF RELEASE

Unit Letter D	Section 15	Township 26S	Range 28E	Feet from the 660	North/South Line North	Feet from the 330	East/West Line West	County Eddy
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Latitude 32.0478973 Longitude -104.0828857

NATURE OF RELEASE

Type of Release: Produced Water (Lightning Strike)	Volume of Release: 60 bbls.	Volume Recovered: 55 bbls.
Source of Release: Overflow water tank was struck by lightning	Date and Hour of Occurrence: July 31, 2017 12:00 am	Date and Hour of Discovery: July 31, 2017 12:00 am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom? Rebecca Haskell	Date and Hour: August 1, 2017 Time of this email 3:01p	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was caused by lightning striking the overflow water tank.

Describe Area Affected and Cleanup Action Taken.*

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

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

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Signed By <i>M. L. Sanchez</i> Approved by Environmental Specialist:	
Title: Senior HSE Coordinator	Approval Date: 8/2/17	Expiration Date: N/A
E-mail Address: rhaskell@concho.com	Conditions of Approval: <i>See attached</i>	Attached <input type="checkbox"/>
Date: August 1, 2017 Phone: 432-683-7443		

* Attach Additional Sheets If Necessary

2P-4313

8/1/17 AB

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

AUG 17 2017

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

NAB1723320585

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: SRO State Com #013H	Facility Type: Tank Battery
Surface Owner: State	Mineral Owner: State
API No. 30-015-37427	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	15	26S	28E	660	North	330	West	Eddy

Latitude 32.0478973 Longitude -104.0828857

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 19 bbls.	Volume Recovered: 0 bbls.
Source of Release: Three-inch Tee	Date and Hour of Occurrence: August 17, 2017 11:00 am	Date and Hour of Discovery: August 17, 2017 11:00 am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was caused by corrosion on a steel three-inch tee on a water line manifold. The manifold will be redesigned.

Describe Area Affected and Cleanup Action Taken.*

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

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

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist: <i>Crystal W...</i>	
Title: Senior HSE Coordinator	Approval Date: <i>8/18/17</i>	Expiration Date: <i>N/A</i>
E-mail Address: rhaskell@concho.com	Conditions of Approval: <i>see attached</i>	Attached <input checked="" type="checkbox"/> <i>2RP-4328</i>
Date: August 17, 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

8/18/17 AB



Appendix B: NMOSE Well Report



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,
O=orphaned,
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02479	CUB	ED		4	4	10	26S	28E		587909	3546534*	1263	200		
C 02480	CUB	ED		4	4	10	26S	28E		587909	3546534*	1263	150		
C 04022 POD1	CUB	ED		4	4	2	15	26S	28E	588082	3545647	1520	220	175	45
C 02160 S5		ED		1	1	1	14	26S	28E	588225	3546237*	1544	300	120	180
C 02481	CUB	ED		1	1	14	26S	28E		588326	3546138*	1648	200		
C 02160 S6		ED		3	3	1	14	26S	28E	588232	3545635*	1664	300	120	180
C 02160 S3		ED		2	2	1	14	26S	28E	588834	3546241*	2153	300	120	180
C 02160 S4		ED		2	2	1	14	26S	28E	588834	3546241*	2153	300	120	180
C 02160 S7		ED		3	3	1	22	26S	28E	586638	3543998*	2239	300	120	180
C 02160 S		ED		1	1	2	14	26S	28E	589043	3546244*	2362	300	120	180
C 02160 S2		ED		1	1	2	14	26S	28E	589043	3546244*	2362	300	120	180
C 02160		ED		4	1	2	14	26S	28E	589243	3546044*	2569	300	120	180
C 02924	C	ED		1	3	2	11	26S	28E	589032	3547451*	2646			
C 02477	CUB	ED		1	1	03	26S	28E		586687	3549347*	3109	150		
C 01668		ED		3	3	12	26S	28E		589957	3546554*	3291	250	100	150
C 02160 S8		ED		2	3	3	12	26S	28E	590056	3546653*	3401	200	120	80
C 04022 POD2	CUB	ED		2	2	2	27	26S	28E	588106	3543082	3462	250	145	105
C 02160 S9		ED		3	3	2	02	26S	28E	589020	3548868*	3520	300	120	180
C 02894	C	ED		2	2	3	12	26S	28E	590458	3547061*	3866	240		
C 02478	CUB	ED		2	1	05	26S	28E		583848	3549325*	4190	100		

*UTM location was derived from PLSS - see Help

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

Average Depth to Water: **124 feet**

Minimum Depth: **100 feet**

Maximum Depth: **175 feet**

Record Count: 20

UTMNAD83 Radius Search (in meters):

Easting (X): 586680.43

Northing (Y): 3546237.1

Radius: 4828



Appendix C: Laboratory Analytical Reports

Analytical Report 566208

for
COG Operating, LLC

Project Manager: Sheldon Hitchcock

SRO State #13

25-OCT-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)

Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

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



25-OCT-17

Project Manager: **Sheldon Hitchcock**
COG Operating, LLC
600 W Illinois
Midland, TX 79701

Reference: XENCO Report No(s): **566208**
SRO State #13
Project Address:

Sheldon Hitchcock:

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) 566208. 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. 566208 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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



Sample Cross Reference 566208



COG Operating, LLC, Midland, TX

SRO State #13

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
North Surface	S	10-18-17 09:30	0	566208-001
North - 1'	S	10-18-17 09:30	1	566208-002
East Surface	S	10-18-17 09:30	0	566208-003
East 1'	S	10-18-17 09:30	1	566208-004
West Surface	S	10-18-17 09:30	0	566208-005
West 1'	S	10-18-17 09:30	1	566208-006



CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: SRO State #13

Project ID:

Work Order Number(s): 566208

Report Date: 25-OCT-17

Date Received: 10/19/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 566208

COG Operating, LLC, Midland, TX

Project Name: SRO State #13



Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am

Report Date: 25-OCT-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	566208-001	566208-002	566208-003	566208-004	566208-005	566208-006
	<i>Field Id:</i>	North Surface	North - 1'	East Surface	East 1'	West Surface	West 1'
	<i>Depth:</i>	0-	1-	0-	1-	0-	1-
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Oct-18-17 09:30	Oct-18-17 09:30	Oct-18-17 09:30	Oct-18-17 09:30	Oct-18-17 09:30	Oct-18-17 09:30
Chloride by EPA 300	<i>Extracted:</i>	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00
	<i>Analyzed:</i>	Oct-25-17 00:43	Oct-25-17 01:03	Oct-25-17 01:10	Oct-25-17 01:17	Oct-25-17 01:24	Oct-25-17 01:30
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.93 4.93	<4.96 4.96	<4.94 4.94	17.7 4.98	<4.98 4.98	10.8 4.92

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

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Kelsey Brooks
Project Manager

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



BS / BSD Recoveries



Project Name: SRO State #13

Work Order #: 566208

Project ID:

Analyst: MNV

Date Prepared: 10/24/2017

Date Analyzed: 10/24/2017

Lab Batch ID: 3031342

Sample: 7633143-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	250	100	250	249	100	0	90-110	20	

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

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: SRO State #13

Work Order #: 566208

Project ID:

Lab Batch ID: 3031342

QC- Sample ID: 566095-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/24/2017

Date Prepared: 10/24/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	58.4	247	308	101	247	310	102	1	90-110	20	

Lab Batch ID: 3031342

QC- Sample ID: 566207-007 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/25/2017

Date Prepared: 10/24/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	93.5	247	345	102	247	344	101	0	90-110	20	

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

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

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

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



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Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

Page 1 of 1

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

Phoenix, Arizona (480-355-0900)

www.xenco.com

566208

Client / Reporting Information		Project Information		Xenco Quote #		Xenco Job #																	
Company Name / Branch: COG Operating, LLC		Project Name/Number: 580 STATE #13																					
Company Address: 2407 Pecos Ave. Artesia NM 88210		Project Location:																					
Email: slhitchcock@concho.com Phone No: 575-703-6475 dhel2@concho.com; alleb@concho.com; thaskell@concho.com		Invoice To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland Tx, 79701																					
Project Contact: Sheldon Hitchcock		PO Number:																					
Sampler's Name: Sheldon Hitchcock																							
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	CHLORIDES	Field Comments					
1	NORTH-SURFACE	0	10-18-17	9:30	S	1																	
2	NORTH-1'	0			S	1																	
3	EAST-SURFACE	0			S	1																	
4	EAST-1'	0			S	1																	
5	WEST-SURFACE	0			S	1																	
6	WEST-1'	0			S	1																	
7					S	1																	
8					S	1																	
9					S	1																	
10					S	1																	
Turnaround Time (Business days)		Data Deliverable Information																					
<input type="checkbox"/> Same Day TAT		<input checked="" type="checkbox"/> 5 Day TAT		<input type="checkbox"/> Level II Std QC		<input type="checkbox"/> Level IV (Full Data Pkg / raw data)												Temp: 3.2		IR ID: R-8			
<input type="checkbox"/> Next Day EMERGENCY		<input type="checkbox"/> 7 Day TAT		<input type="checkbox"/> Level III Std QC+ Forms		<input type="checkbox"/> TRRP Level IV												CF: (0-6: -0.2°C)					
<input type="checkbox"/> 2 Day EMERGENCY		<input type="checkbox"/> Contract TAT		<input type="checkbox"/> Level 3 (CLP Forms)		<input type="checkbox"/> UST / RG-411												(6-23: +0.2°C)					
<input type="checkbox"/> 3 Day EMERGENCY				<input type="checkbox"/> TRRP Checklist																Corrected Temp: 3			
TAT Starts Day received by Lab, if received by 5:00 pm																			FED-EX / UPS: Tracking #				
Relinquished by Sampler:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:					
1		10/20/17 10:00 AM		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17					
3		10/20/17 10:00 AM		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17					
5		10/20/17 10:00 AM		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17		10-17-17					

Notice: Notice 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: 10/19/2017 11:45:00 AM

Work Order #: 566208

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)?	13.2
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Connie Hernandez

Date: 10/23/2017

Checklist reviewed by:

Kelsey Brooks

Date: 10/23/2017

Analytical Report 566207

for
COG Operating, LLC

Project Manager: Sheldon Hitchcock

SRO State #13

30-OCT-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)

Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

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



30-OCT-17

Project Manager: **Sheldon Hitchcock**
COG Operating, LLC
600 W Illinois
Midland, TX 79701

Reference: XENCO Report No(s): **566207**
SRO State #13
Project Address:

Sheldon Hitchcock:

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) 566207. 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. 566207 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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Sample Cross Reference 566207



COG Operating, LLC, Midland, TX

SRO State #13

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1- Surface	S	10-18-17 09:00	0	566207-001
T1- 1'	S	10-18-17 09:00	1	566207-002
T1- 2'	S	10-18-17 09:00	2	566207-003
T1- 3'	S	10-18-17 09:00	3	566207-004
T1- 4'	S	10-18-17 09:00	4	566207-005
T1- 9'	S	10-18-17 09:00	9	566207-006
T1- 14'	S	10-18-17 09:00	14	566207-007



CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: SRO State #13

Project ID:

Work Order Number(s): 566207

Report Date: 30-OCT-17

Date Received: 10/19/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3031366 BTEX by EPA 8021B

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

Batch: LBA-3031730 BTEX by EPA 8021B

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



Certificate of Analysis Summary 566207

COG Operating, LLC, Midland, TX

Project Name: SRO State #13



Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am

Report Date: 30-OCT-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	566207-001	566207-002	566207-003	566207-004	566207-005	566207-006
	<i>Field Id:</i>	T1- Surface	T1- 1'	T1- 2'	T1- 3'	T1- 4'	T1- 9'
	<i>Depth:</i>	0-	1-	2-	3-	4-	9-
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Oct-18-17 09:00	Oct-18-17 09:00	Oct-18-17 09:00	Oct-18-17 09:00	Oct-18-17 09:00	Oct-18-17 09:00
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-25-17 08:00	Oct-25-17 08:45				
	<i>Analyzed:</i>	Oct-25-17 10:18	Oct-25-17 10:39				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Benzene		<0.00201 0.00201	<0.00201 0.00201				
Toluene		<0.00201 0.00201	<0.00201 0.00201				
Ethylbenzene		<0.00201 0.00201	<0.00201 0.00201				
m,p-Xylenes		<0.00402 0.00402	<0.00402 0.00402				
o-Xylene		<0.00201 0.00201	<0.00201 0.00201				
Total Xylenes		<0.00201 0.00201	<0.00201 0.00201				
Total BTEX		<0.00201 0.00201	<0.00201 0.00201				
Chloride by EPA 300	<i>Extracted:</i>	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00	Oct-24-17 12:00
	<i>Analyzed:</i>	Oct-24-17 23:42	Oct-24-17 23:49	Oct-24-17 23:56	Oct-25-17 00:02	Oct-25-17 00:09	Oct-25-17 00:36
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		612 4.92	127 4.99	64.3 4.97	65.5 4.98	138 4.91	191 49.7
TPH by Texas1005	<i>Extracted:</i>	Oct-25-17 08:00	Oct-25-17 08:00				
	<i>Analyzed:</i>	Oct-25-17 16:29	Oct-25-17 16:49				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
C6-C12 Range Hydrocarbons		<24.9 24.9	<25.0 25.0				
C12-C28 Range Hydrocarbons		<24.9 24.9	<25.0 25.0				
C28-C35 Range Hydrocarbons		<24.9 24.9	<25.0 25.0				
Total TPH		<24.9 24.9	<25.0 25.0				

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 566207

COG Operating, LLC, Midland, TX

Project Name: SRO State #13



Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am

Report Date: 30-OCT-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	566207-007					
	<i>Field Id:</i>	T1- 14'					
	<i>Depth:</i>	14-					
	<i>Matrix:</i>	SOIL					
	<i>Sampled:</i>	Oct-18-17 09:00					
Chloride by EPA 300	<i>Extracted:</i>	Oct-24-17 12:00					
	<i>Analyzed:</i>	Oct-25-17 00:16					
	<i>Units/RL:</i>	mg/kg RL					
Chloride		93.5 4.93					

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Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Kelsey Brooks
Project Manager

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
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- 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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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: SRO State #13

Work Orders : 566207,

Lab Batch #: 3031366

Sample: 566207-001 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 10:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3031730

Sample: 566207-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 10:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031508

Sample: 566207-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 16:29

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.9	49.8	100	70-130	
1-Chlorooctane	104	99.6	104	70-130	

Lab Batch #: 3031508

Sample: 566207-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 16:49

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.1	49.9	102	70-130	
1-Chlorooctane	109	99.8	109	70-130	

Lab Batch #: 3031508

Sample: 7633266-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 09:32

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.3	50.0	115	70-130	
1-Chlorooctane	118	100	118	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



Form 2 - Surrogate Recoveries

Project Name: SRO State #13

Work Orders : 566207,

Lab Batch #: 3031366

Sample: 7633181-1-BLK / BLK

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 09:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3031730

Sample: 7633242-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 10:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0329	0.0300	110	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	80-120	

Lab Batch #: 3031366

Sample: 7633181-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 08:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0289	0.0300	96	80-120	

Lab Batch #: 3031730

Sample: 7633242-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 08:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0307	0.0300	102	80-120	
4-Bromofluorobenzene	0.0345	0.0300	115	80-120	

Lab Batch #: 3031508

Sample: 7633266-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 09:52

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.3	50.0	109	70-130	
1-Chlorooctane	117	100	117	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



Form 2 - Surrogate Recoveries

Project Name: SRO State #13

Work Orders : 566207,

Lab Batch #: 3031366

Sample: 7633181-1-BSD / BSD

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 08:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0243	0.0300	81	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

Lab Batch #: 3031730

Sample: 7633242-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 08:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	80-120	
4-Bromofluorobenzene	0.0337	0.0300	112	80-120	

Lab Batch #: 3031508

Sample: 7633266-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 10/25/17 10:11

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.6	50.0	97	70-130	
1-Chlorooctane	102	100	102	70-130	

Lab Batch #: 3031366

Sample: 566207-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 08:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0297	0.0300	99	80-120	
4-Bromofluorobenzene	0.0319	0.0300	106	80-120	

Lab Batch #: 3031730

Sample: 566207-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 09:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0325	0.0300	108	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



Form 2 - Surrogate Recoveries

Project Name: SRO State #13

Work Orders : 566207,

Lab Batch #: 3031508

Sample: 566223-001 S / MS

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 10:50

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	55.2	50.0	110	70-130	
1-Chlorooctane	95.4	99.9	95	70-130	

Lab Batch #: 3031366

Sample: 566207-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 09:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	80-120	
4-Bromofluorobenzene	0.0327	0.0300	109	80-120	

Lab Batch #: 3031730

Sample: 566207-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 09:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

Lab Batch #: 3031508

Sample: 566223-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 10/25/17 11:10

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	45.7	50.0	91	70-130	
1-Chlorooctane	101	99.9	101	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

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



BS / BSD Recoveries



Project Name: SRO State #13

Work Order #: 566207

Project ID:

Analyst: ALJ

Date Prepared: 10/25/2017

Date Analyzed: 10/25/2017

Lab Batch ID: 3031366

Sample: 7633181-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00201	0.101	0.121	120	0.100	0.125	125	3	70-130	35	
Toluene	<0.00201	0.101	0.115	114	0.100	0.118	118	3	70-130	35	
Ethylbenzene	<0.00201	0.101	0.115	114	0.100	0.117	117	2	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.229	114	0.200	0.232	116	1	70-135	35	
o-Xylene	<0.00201	0.101	0.110	109	0.100	0.112	112	2	71-133	35	

Analyst: ALJ

Date Prepared: 10/25/2017

Date Analyzed: 10/25/2017

Lab Batch ID: 3031730

Sample: 7633242-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00200	0.0998	0.0831	83	0.100	0.0805	81	3	70-130	35	
Toluene	<0.00200	0.0998	0.0985	99	0.100	0.0928	93	6	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.103	103	0.100	0.0978	98	5	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.204	102	0.201	0.192	96	6	70-135	35	
o-Xylene	<0.00200	0.0998	0.100	100	0.100	0.0948	95	5	71-133	35	

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

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: SRO State #13

Work Order #: 566207

Project ID:

Analyst: MNV

Date Prepared: 10/24/2017

Date Analyzed: 10/24/2017

Lab Batch ID: 3031342

Sample: 7633143-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	250	100	250	249	100	0	90-110	20	

Analyst: ARM

Date Prepared: 10/25/2017

Date Analyzed: 10/25/2017

Lab Batch ID: 3031508

Sample: 7633266-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C12 Range Hydrocarbons	<25.0	1000	1020	102	1000	942	94	8	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1070	107	1000	986	99	8	75-125	25	

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

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: SRO State #13

Work Order #: 566207

Project ID:

Lab Batch ID: 3031366

QC- Sample ID: 566207-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/25/2017

Date Prepared: 10/25/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.102	101	0.100	0.106	106	4	70-130	35	
Toluene	<0.00202	0.101	0.0922	91	0.100	0.0958	96	4	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0808	80	0.100	0.0821	82	2	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.160	79	0.200	0.162	81	1	70-135	35	
o-Xylene	<0.00202	0.101	0.0784	78	0.100	0.0801	80	2	71-133	35	

Lab Batch ID: 3031730

QC- Sample ID: 566207-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/25/2017

Date Prepared: 10/25/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.103	102	0.101	0.102	101	1	70-130	35	
Toluene	<0.00202	0.101	0.103	102	0.101	0.0982	97	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0895	89	0.101	0.0841	83	6	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.177	88	0.202	0.166	82	6	70-135	35	
o-Xylene	<0.00202	0.101	0.0845	84	0.101	0.0788	78	7	71-133	35	

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

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

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



Form 3 - MS / MSD Recoveries



Project Name: SRO State #13

Work Order # : 566207

Project ID:

Lab Batch ID: 3031342

QC- Sample ID: 566095-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/24/2017

Date Prepared: 10/24/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	58.4	247	308	101	247	310	102	1	90-110	20	

Lab Batch ID: 3031342

QC- Sample ID: 566207-007 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/25/2017

Date Prepared: 10/24/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	93.5	247	345	102	247	344	101	0	90-110	20	

Lab Batch ID: 3031508

QC- Sample ID: 566223-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/25/2017

Date Prepared: 10/25/2017

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Range Hydrocarbons	<25.0	999	998	100	999	888	89	12	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	1020	102	999	926	93	10	75-125	25	

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

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

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

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

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[illegible]

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xeno, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xeno 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 Xeno. A minimum charge of \$75 will be applied to each project. Xeno's liability will be limited to the cost of samples. Any samples received by Xeno 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: 10/19/2017 11:45:00 AM

Work Order #: 566207

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)?	13.2
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Connie Hernandez

Date: 10/23/2017

Checklist reviewed by:

Kelsey Brooks

Date: 10/23/2017